Appendix C

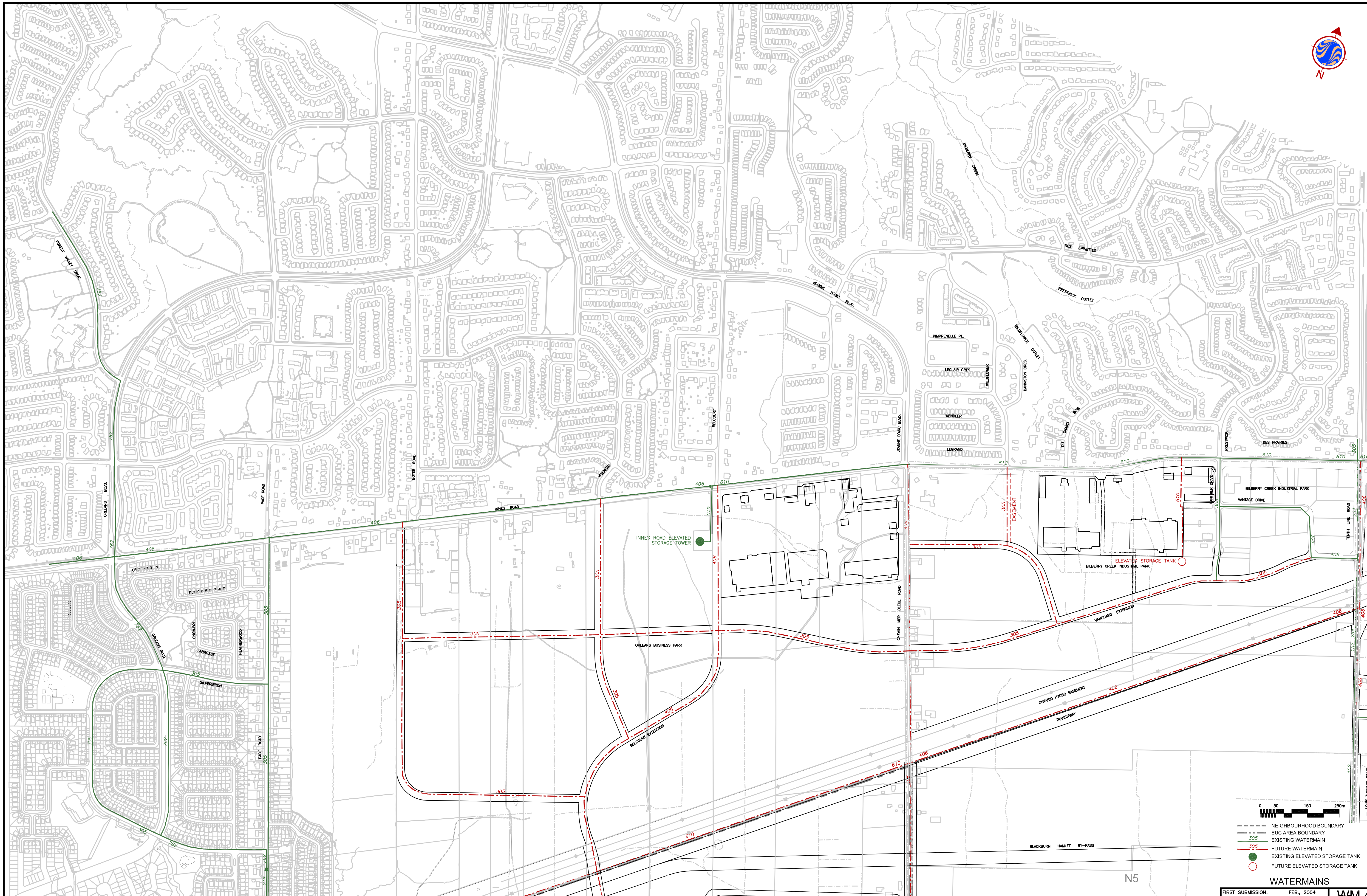
GLOUCESTER AND CUMBERLAND EAST URBAN COMMUNITY EXPANSION AREA AND BILBERRY CREEK INDUSTRIAL PARK MASTER SERVICING UPDATE

Prepared for:
City of Ottawa

File No. 163400602
November 2004
Updated June 2005
Updated October 2005
Updated July 2006

Prepared by:
Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa, Ontario
K1Z 7T1

Stantec



WATERMAINS

FIRST SUBMISSION: FEB., 2004
REVISION No.: 5 JUNE, 2006

WM 4
C2

SERVICING REPORT

FOR

TRAILS EDGE AND ORLEANS BUSINESS PARK

MINTO DEVELOPMENTS INC. RICHCRAFT GROUP OF COMPANIES

CITY OF OTTAWA

PROJECT NO.: 10-459

JULY 2017
REVISION 7

5.0 WATER SUPPLY SERVICING

5.1 Existing Water Supply Services

The Trails Edge Community and Orleans Business Park are situated within the City of Ottawa's water distribution Pressure Zone 2E. Within Pressure Zone 2E, an elevated storage tank on Innes Road (Innes EST) regulates hydraulic grade lines (HGLs) and balances peak demands.

There is an existing 600mm diameter transmission watermain along the Hydro Corridor, from Pagé Road to Mer Bleue Road, and an existing 400mm/600mm diameter watermains along Innes Road. There are also existing 300mm diameter watermains along Pagé Road and Renaud Road at the west and south ends of the development, and an existing 400 diameter watermain along Mer Bleue Road north of the Hydro One Corridor and south of Renaud Road. The approved *Gloucester and Cumberland EUC Expansion Area and Bilberry Creek Industrial Park Master Servicing Update* (Stantec, 2006) includes a planned 400m diameter watermain along Mer Bleue Road south of the Hydro One Corridor, to link these two feedermains. The existing watermains are shown in ***Figure 2.***

Within the study area, the approved *Gloucester and Cumberland EUC Expansion Area and Bilberry Creek Industrial Park Master Servicing Update* (Stantec, 2006) recommended a 400mm diameter watermain along Belcourt Extension to service the Orleans Business Park and Trails Edge Community. The analysis also recommended an internal network of 300mm watermains in the Orleans Business Park and a combination of 150mm, 200mm, and 300mm diameter watermains through the Trails Edge Community.

5.2 Proposed Water Supply

The proposed trunk water supply system has been updated from the *Gloucester and Cumberland EUC Expansion Area and Bilberry Creek Industrial Park Master Servicing Update* (Stantec, 2006) to reflect the updated road network and updated general demands generated from the projected land uses, as well as as-built information currently available.

A complete hydraulic analysis, named *Trails Edge Watermain Analysis* (Genivar, March 2014), was undertaken for the study area and is included in ***Appendix G***. To size the main trunk watermain network, a water distribution model has been prepared for ultimate conditions using boundary conditions provided by the City of Ottawa for planning-level consumption rates.

The applicable *Water Distribution Guidelines* (City of Ottawa, July 2010) and recommended consumption rates (City of Ottawa Email Correspondence, January 2013) that were used in the design of the water distribution network are summarized in ***Table 2***. The consumption rates differ from those presented in the *Water Distribution Guidelines* (City of Ottawa, July 2010), as the *Water Distribution Guidelines* are intended for the design for developments less than 50 ha in size.

Table 2: Water Supply Design Criteria

Design Parameter		Value
Extracted from Section 4: Ottawa Design Guidelines, Water Distribution (July 2010)		
Minimum Watermain Size		150 mm diameter
Service Lateral Size		19 mm diameter Soft Copper Type 'K'
Minimum Depth of Cover		2.4 m from top of watermain to finished grade
Desired Range of Operating Pressures		350 kPa and 480 kPa
Fire flow operating pressure minimum		140 kPa
City of Ottawa – Email Correspondence with Mr. John Sevigny (January 2013)		
Residential – Single Family	Average Day	570 L/unit/day
	Outdoor Water Demand	1050 L/unit/day
	Max Day	Average + OWD (L/unit/day)
	Peak Hour	1.5 x Avg Day + 2.1 x Max Day (L/unit/day)
Residential – Multi-Family	Average Day	560
	Outdoor Water Demand	0
	Max Day	Average (L/unit/day)
	Peak Hour	1.6 x Max Day (L/unit/day)
Residential - Apartment	Average Day	400 L/unit/day
	Outdoor Water Demand	0 L/unit/day
	Max Day	Average (L/unit/day)
	Peak Hour	1.6 x Max Day (L/unit/day)
Institutional / Commercial/ Industrial	Average Day	8500 L/ha/day
	Outdoor Water Demand	0 L/ha/day
	Max Day	Average (L/ha/day)
	Peak Hour	1.3 x Max Day (L/ha/day)
Total Average Day		Sum of Average Day for all land uses
Total Max Day		Sum Max Day for all land uses
Total Peak Hour		Sum of Peak Hour for all land uses
High Pressure Check		Minimum Hour = Average Day

The system-level unit demands and boundary conditions provided by the City were only for the purpose of sizing **major** watermains. As development proceeds, the City is expected to provide new boundary conditions for each phase of the development, to inform the detailed design of the different phases of the distribution network. Specifically, the local watermains shown in ***Appendix G*** will need to be re-analyzed and re-sized based on demands computed using the *Water Distribution Guidelines* (City of Ottawa, July 2010) and the associated new boundary conditions for each sub-area in the order of 50 ha or more. Note that although the trunk watermain alignment in the hydraulic model provided in ***Appendix G*** is consistent with the interim and ultimate land use plans (***Figure 3 & Figure 4***), the alignment of local watermains and land-use demands east of Belcourt Extension will also require updating as detailed design progresses for this area.

For the system-level analysis, fire flow requirements were taken as 100 L/s for detached single homes and 125 L/s for townhomes. The fire flows for commercial areas were taken as 217 L/s as per the *Gloucester EUC Infrastructure Servicing Study Update* (Stantec, 2006). A discussion on fire flow calculations is provided in ***Appendix G***. An ordinary construction coefficient has been applied at the system-level for single homes and townhouses. At the detailed design level, the fire demand parameters to be used will be reviewed once unit types, architectural details (such as firewalls), and unit spacing are determined. Similar to the two-step process for unit demands, it is recommended that the local watermain network be re-analysed and re-sized according to detailed Fire Underwriter's Survey calculations as detailed design progresses for the site. It is not expected that this would impact the sizing of the major watermains system presented in this 2014 Servicing Report. This statement is supported by the City of Ottawa Technical Bulletin ISDTB-2014-02 (May 27, 2014) which includes an interim qualification to the application of the FUS method, which may be used on an interim basis. Section 4 – 1 of Technical Bulletin ISDTB-2014-02 states the following:

- For single detached dwellings, the fire flow requirement may be capped at 10,000 L/min (167 L/s), provided that there is minimum separation of 10 metres between the backs of adjacent units.

Based on the water distribution model, to meet maximum hour and maximum day plus fire flow demands, the proposed trunk watermain network is as follows:

- The Trails Edge Development will be connected to the existing watermains by a proposed 400mm diameter watermain along the Belcourt Extension. New 300mm diameter trunk watermains will be required to service the development, designed in accordance with the City of Ottawa and MOE Guidelines. The proposed watermain servicing layout for the Trails Edge Community is presented in ***Figure 5***. The proposed watermain along Belcourt Extension will connect to the 600mm transmission watermain within the Hydro Corridor and the 300mm

diameter watermain on Renaud Road. In addition there are connections proposed to the Mer Bleue Road, Renaud Road, and Pagé Road watermains.

- The 400mm diameter watermain will be extended along the Belcourt Extension in the Orleans Business Park to Innes Road, as shown in ***Figure 6***, and 300mm diameter watermains would serve the rest of the Business Park.

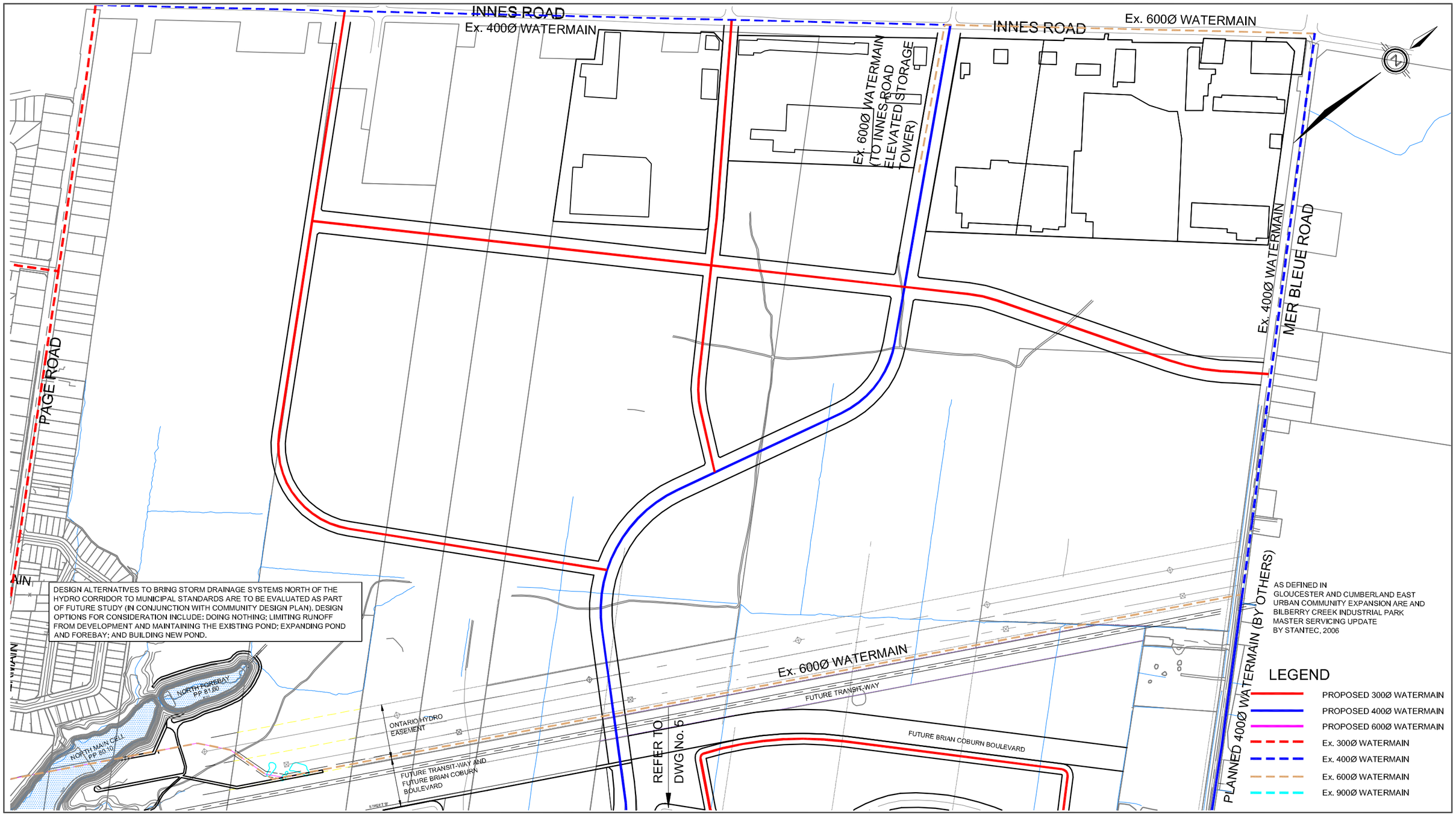
5.3 Water Supply Conclusion

The hydraulic analysis for the trunk watermains has been updated to reflect the updated road network, reflect the current water demands estimated for the projected populations/land uses, and to ensure compliance with the current *City of Ottawa Water Distribution Guidelines*, July 2010.

The watermain analysis indicates that the proposed trunk 300mm and 400mm diameter watermains satisfy the required demands. The service pressures are expected to range between 339 kPa and 469 kPa under the anticipated demand during average day, maximum hour and maximum day plus fire flow conditions, which is within the MOE and City of Ottawa required pressure range. The watermain concept is largely consistent with the *Gloucester and Cumberland EUC Expansion Area and Bilberry Creek Industrial Park Master Servicing Update* (Stantec, 2006).

The proposed major watermain network for the Trails Edge Development and Orleans Business Park can deliver all domestic and fire flows as per Ministry of the Environment, City of Ottawa and Fire Underwriters Criteria.

As noted in ***Section 5.2***, at the time of local network design, additional detailed modeling will be required to reflect the proposed phasing plan and refined design demands and fire flow requirements. Specifically, additional modeling will be required east of Belcourt Extension to reflect the land use distribution that is pursued in detailed design.



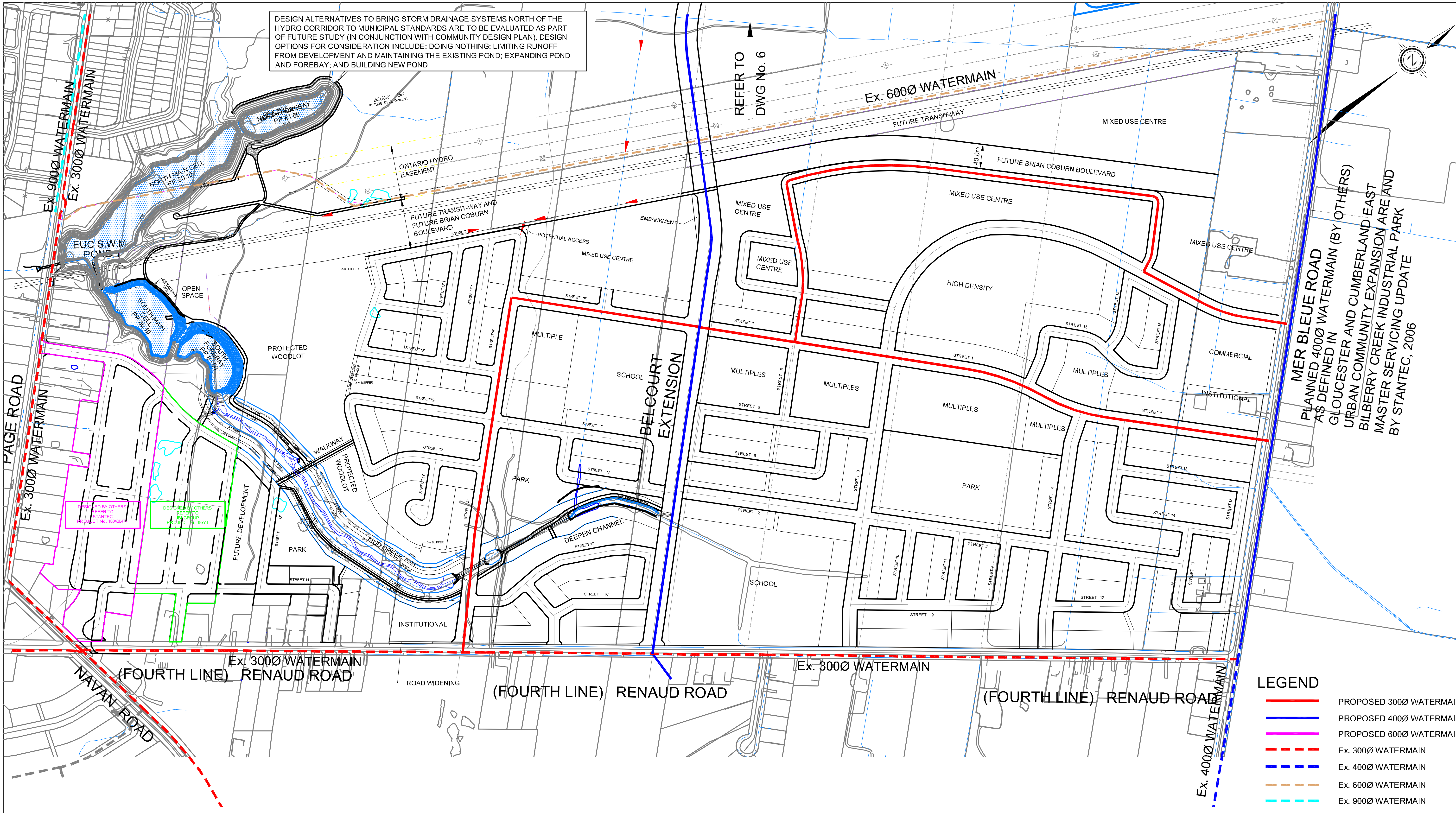
david schaeffer engineering ltd

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

ORLEANS BUSINESS PARK
CONCEPTUAL WATERMAIN SERVICING

DATE:	FEBRUARY 2014
SCALE:	1:6000
PROJECT No.:	10-459
FIGURE	6

C8


DESIGN ALTERNATIVES TO BRING STORM DRAINAGE SYSTEMS NORTH OF THE HYDRO CORRIDOR TO MUNICIPAL STANDARDS ARE TO BE EVALUATED AS PART OF FUTURE STUDY (IN CONJUNCTION WITH COMMUNITY DESIGN PLAN). DESIGN OPTIONS FOR CONSIDERATION INCLUDE: DOING NOTHING; LIMITING RUNOFF FROM DEVELOPMENT AND MAINTAINING THE EXISTING POND; EXPANDING POND AND FOREBAY; AND BUILDING NEW POND.
REFER TO
DWG No. 6
Ex. 600Ø WATERMAIN
FUTURE TRANSIT-WAY
MIXED USE CENTRE
FUTURE BRIAN COBURN BOULEVARD
40.0m
Ex. 900Ø WATERMAIN
Ex. 300Ø WATERMAIN
NORTH FOREBAY
NORTH MAIN CELL
ONTARIO HYDRO EASEMENT
FUTURE TRANSIT-WAY AND FUTURE BRIAN COBURN BOULEVARD
EUC S.W.M. POND
OPEN SPACE
SOUTH MAIN CELL
SOUTH FOREBAY
PROTECTED WOODLOT
POTENTIAL ACCESS
MIXED USE CENTRE
EMBANKMENT
MIXED USE CENTRE
MIXED USE CENTRE
HIGH DENSITY
MIXED USE CENTRE
MULTIPLE
SCHOOL
BELCOURT EXTENSION
MULTIPLES
MULTIPLES
MULTIPLES
MULTIPLES
MULTIPLES
COMMERCIAL
INSTITUTIONAL
MER BLEUE ROAD
PLANNED 400Ø WATERMAIN (BY OTHERS) AS DEFINED IN GLOUCESTER AND CUMBERLAND EAST URBAN COMMUNITY EXPANSION ARE AND BILBERRY CREEK INDUSTRIAL PARK MASTER SERVICING UPDATE BY STANTEC, 2006
PAGE ROAD
Ex. 300Ø WATERMAIN
WALKWAY
PROTECTED WOODLOT
PARK
PARK
PARK
FUTURE DEVELOPMENT
MUD CREEK
DEEPEN CHANNEL
SCHOOL
INSTITUTIONAL
Ex. 300Ø WATERMAIN
(FOURTH LINE) RENAUD ROAD
NAVAN ROAD
ROAD WIDENING
(FOURTH LINE) RENAUD ROAD
Ex. 300Ø WATERMAIN
(FOURTH LINE) RENAUD ROAD
Ex. 400Ø WATERMAIN
LEGEND
PROPOSED 300Ø WATERMAIN
PROPOSED 400Ø WATERMAIN
PROPOSED 600Ø WATERMAIN
Ex. 300Ø WATERMAIN
Ex. 400Ø WATERMAIN
Ex. 600Ø WATERMAIN
Ex. 900Ø WATERMAIN

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

TRAILS EDGE

CONCEPTUAL WATERMAIN SERVICING

DATE:	FEBRUARY 2014
SCALE:	1:6000
PROJECT No.:	10-459
FIGURE	5
	C9

david schaeffer engineering ltd

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

DESIGN BRIEF

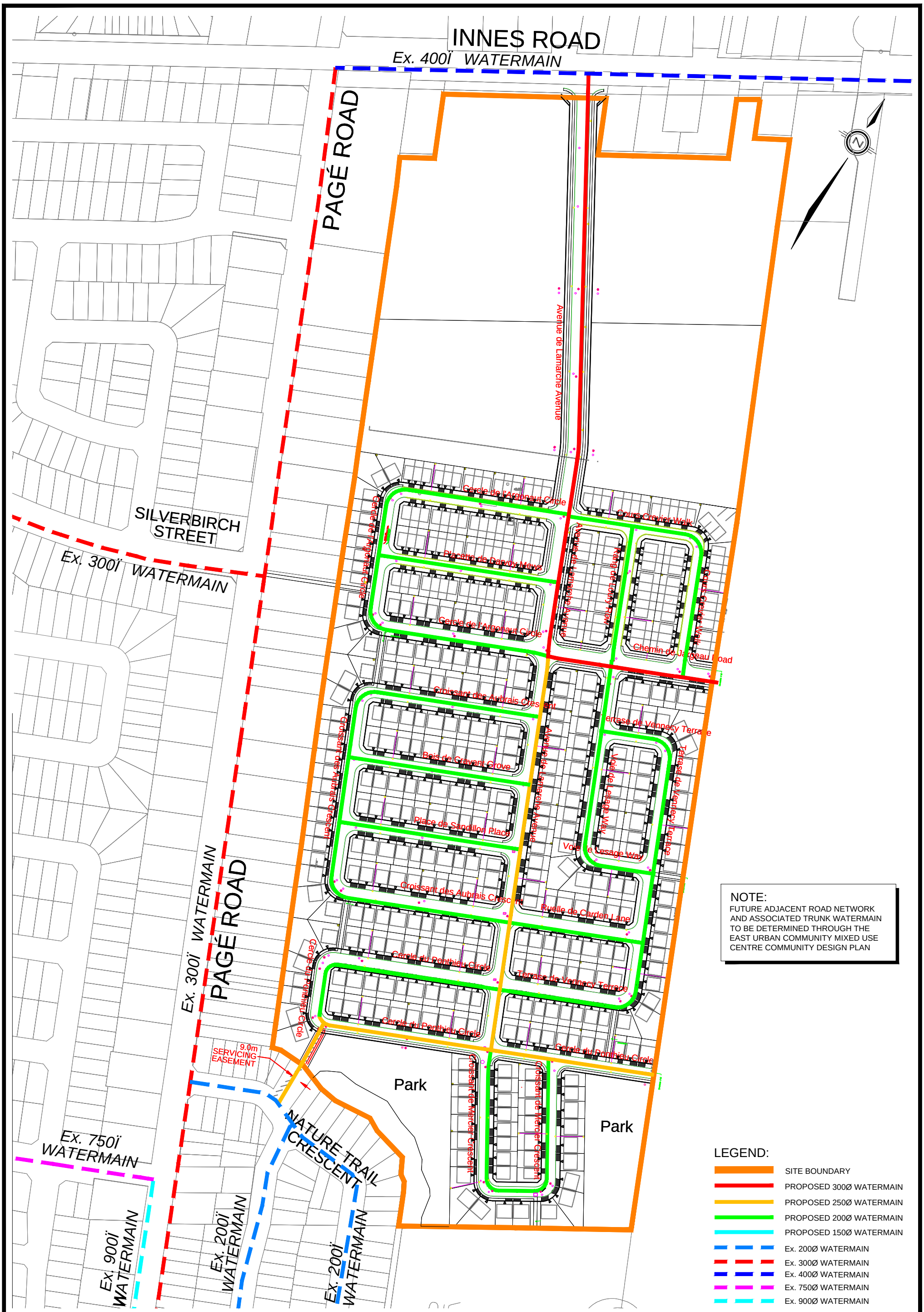
FOR

CAIVAN (ORLEANS VILLAGE) LIMITED
3490 INNES ROAD

CITY OF OTTAWA

PROJECT NO.: 15-881

MAY 2018 – VER 2



david schaeffer engineering ltd
SMART SUBDIVISIONS™

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

ORLEANS VILLAGE
WATER SERVICING

CITY OF OTTAWA

PROJECT No.: 16-881

DATE: MAY 2018

SCALE: 1:3000

FIGURE: 2

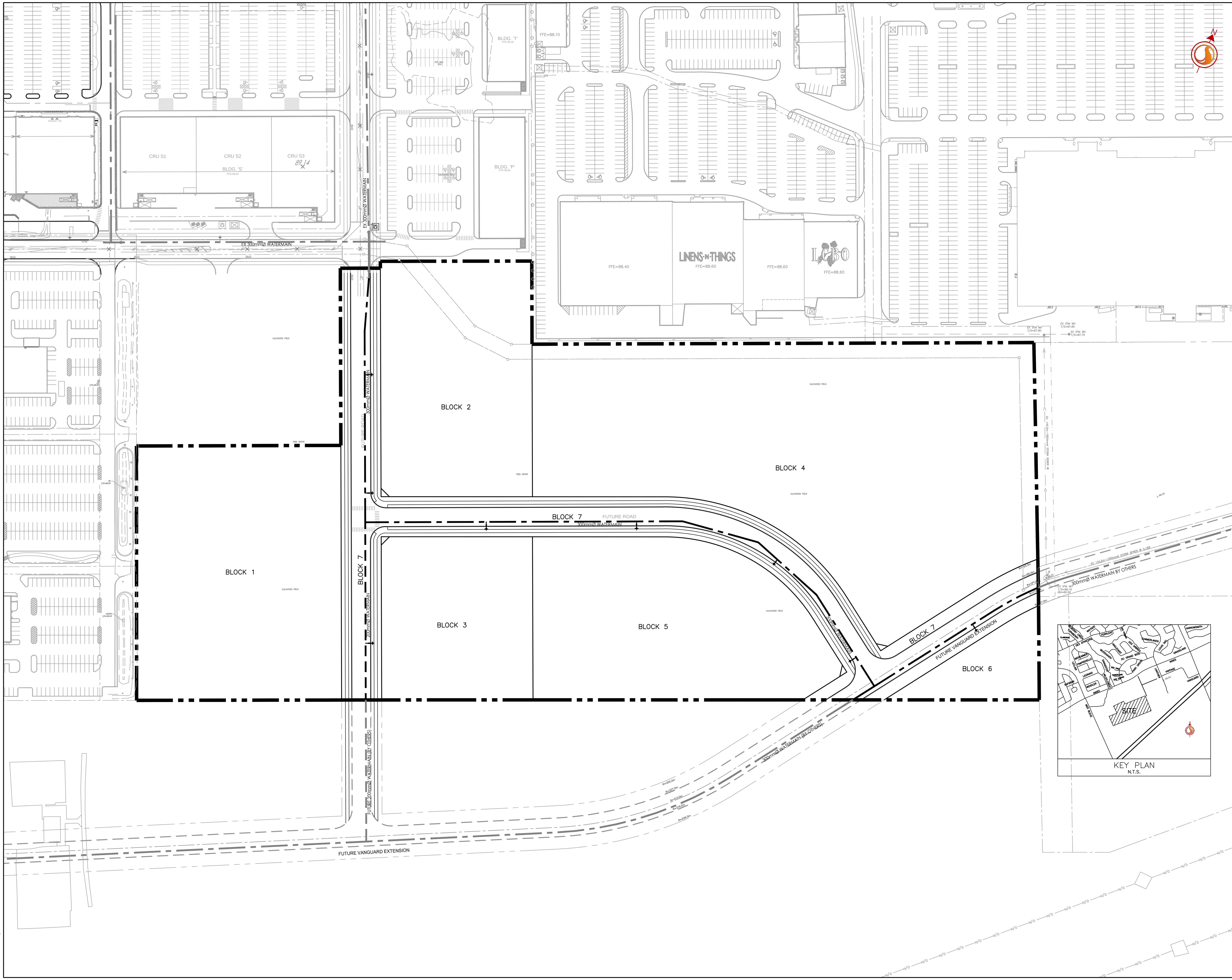
Site Servicing and Stormwater Management Report – Orleans II Draft Plan of Subdivision

Project # 160401419

Prepared for:
Innes Shopping Centres Limited

Prepared by:
Stantec Consulting Ltd.

April 12, 2018



W:\active\160401242_Orleans II\design\drawing\Subdivision\160401242-DB.dwg
2018/04/12 9:45 AM By: Thiffault, Dustin

ORIGINAL SHEET - ARCH D

Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

406mmØ WATERMAIN
305mmØ WATERMAIN
203mmØ WATERMAIN

EX. 406mmØ WATERMAIN
EX. 305mmØ WATERMAIN
EX. 203mmØ WATERMAIN

FUT. 406mmØ WATERMAIN
FUT. 305mmØ WATERMAIN
FUT. 203mmØ WATERMAIN

Notes

Revision	By	Appd.	YY.MM.DD
1 ISSUED FOR DRAFT PLAN OF SUBDIVISION	DT	KS	18.04.11

File Name: 160401242-DB	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	DT	KS	DT	18.04.09

Permit-Seal

Client/Project

INNES SHOPPING CENTRES LIMITED

ORLEANS II
DRAFT PLAN OF SUBDIVISION
Ottawa, ON

Title

OVERALL WATERMAIN LAYOUT

Project No. 160401419

Scale 1:1000 (0 10 30 50m)

Drawing No. WM-1

Sheet 3 of 4

Revision 1

C13

david schaeffer engineering ltd

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

SERVICING OPTIONS REPORT

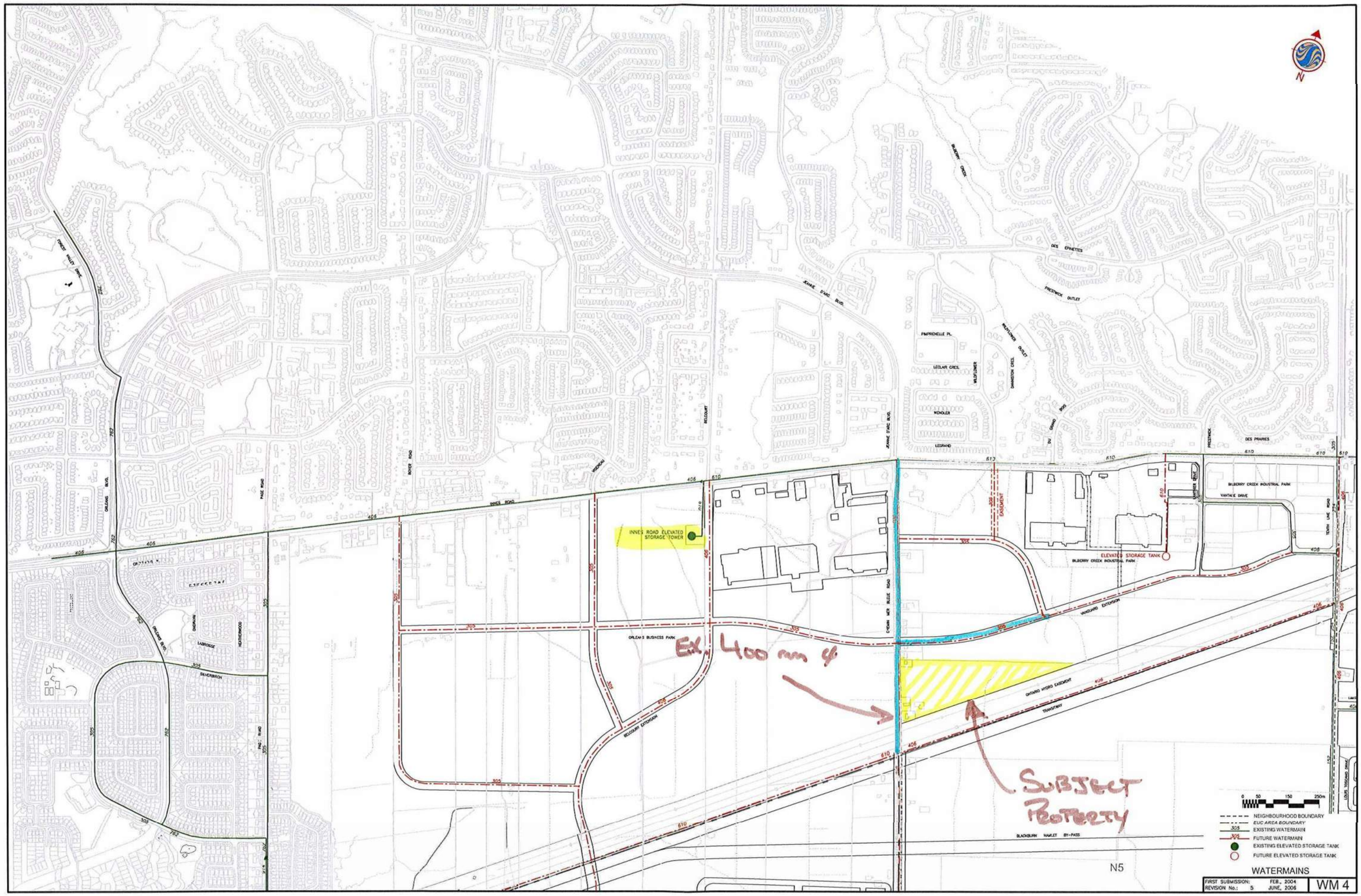
FOR

BLACKSHEEP DEVELOPMENTS
2159 MER-BLEUE ROAD

CITY OF OTTAWA

PROJECT NO.: 17-934

DECEMBER 2017 – REV 2


INNES ROAD ELEVATED STORAGE TOWER
ELEVATED STORAGE TANK
BLUBERRY CREEK INDUSTRIAL PARK
ORLEANS BUSINESS PARK
Ex. 400 mm ϕ
SUBJECT PROPERTY
ORLEANS BLVD.
INNES ROAD
PAGE ROAD
BOYER ROAD
TENTH LINE ROAD
VANGUARD EXTENSION
BLACKBURN HAMLET BY-PASS
ONTARIO HYDRO EASEMENT
TRANSITWAY
NEIGHBOURHOOD BOUNDARY
EUC AREA BOUNDARY
EXISTING WATERMAIN
FUTURE WATERMAIN
EXISTING ELEVATED STORAGE TANK
FUTURE ELEVATED STORAGE TANK
WATERMAINS
FIRST SUBMISSION: FEB., 2004
REVISION No.: 5 JUNE, 2006
WM 4

GLOUCESTER AND CUMBERLAND EAST URBAN COMMUNITY EXPANSION AREA AND BILBERRY CREEK INDUSTRIAL PARK MASTER SERVICING UPDATE

Prepared for:
City of Ottawa

File No. 163400602
November 2004
Updated June 2005
Updated October 2005
Updated July 2006

Prepared by:
Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa, Ontario
K1Z 7T1

Stantec

4.1.5.1 Proposed Water System Network

The proposed EUC is currently fed by three existing large diameter watermains. These include a 406mm diameter main along Mer Bleue Drive along with two 305mm diameter watermains – one along Page Road and the other along Navan Road.

In order to assess the internal watermain requirements for the EUC, a hydraulic model was developed for the proposed road layout and land use. This was accomplished using a previous hydraulic model of the entire PZ 2E water distribution system. The model used for this exercise was the same model used in the 2004 HEPC analysis noted above, which was originally provided to Stantec by the City of Ottawa. The software used to carry out the analysis was H_2OMAP by MWHSoft.

Modifications to the hydraulic model include the addition of internal network watermain throughout the proposed EUC. Nodes representing adjoining pipe lengths were inserted at intersections of watermain as well as along longer stretches of pipe. A higher density of nodes allows the modeler to be more detailed in the hydraulic analysis. **Figure 4-13** provides an overview of the watermain layout and diameters proposed for the EUC.

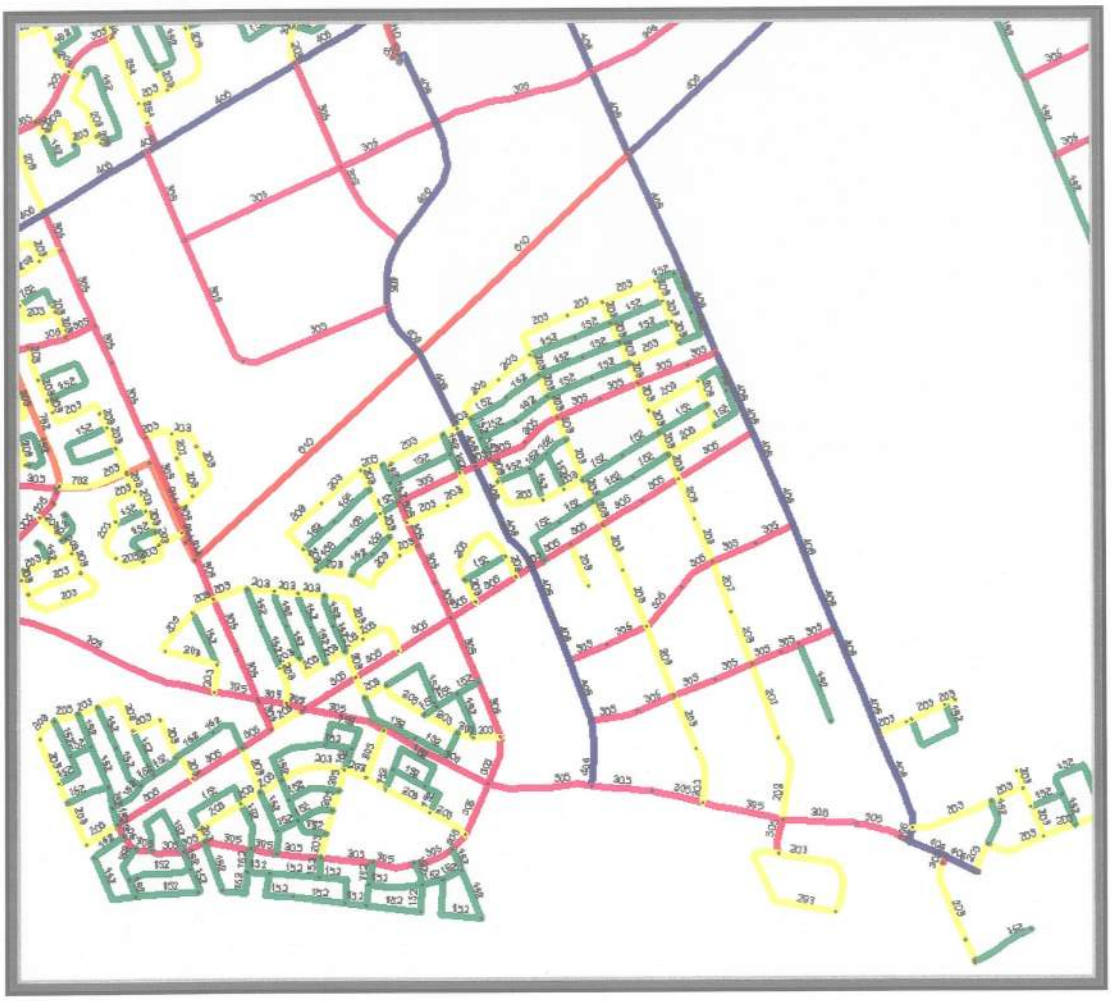
Watermain diameters were assigned in the internal network by first ensuring a strong transmission into the EUC. As noted previously, there are three existing feeds, two 305mm diameter watermain and a 406mm diameter watermain. The existing 203mm diameter watermain on Page Road north of Fourth Line Road and the 203mm diameter watermain west of Mer Bleue and south of Fourth Line Road were upgraded to 305mm diameter watermains. A fourth feed was added to the model along a proposed road that runs adjacent to the Innes Road EST and travels south over the HEPC into the EUC. With the feeds to the EUC established, watermains were sized to ensure good transmission throughout the EUC. As shown in **Figure 4-13**, several 305mm diameter watermains interconnect the four feeds coming into the EUC. These watermain provide a strong conveyance of peak flows and fire flows. They also ensure sufficient transmission should growth beyond the EUC occur in the future. In order to ensure sufficient fire flow capabilities at institutional and commercial facilities, a minimum of one 305mm diameter watermain was routed adjacent to these lands.

Within the localized neighborhoods, a combination of 203mm diameter watermain and 152mm diameter watermain were proposed. The smaller diameter watermains generally provide a limited amount of fire flow. However, due to their size, they reduce the amount of water retention in the pipe thereby helping to improve water quality. Various combinations of pipe diameters were considered prior to the final layout.

Once the internal pipe network was constructed within the model, elevations were added using a spatial join feature of H_2OMAP. A digital elevation file was first brought into the model as a GIS layer and using the spatial join feature, elevations were assigned to every node in the model. The lowest ground elevations within the EUC (approximately 68m) are located in the southwest area of the EUC near Navan Road. The highest elevations (approximately 88m) are

located in the northeast area of the EUC near Mer Bleue Road. It is noted that a difference in elevation of 20m represents a difference of 30 psi (200 kPa) in the static pressures.

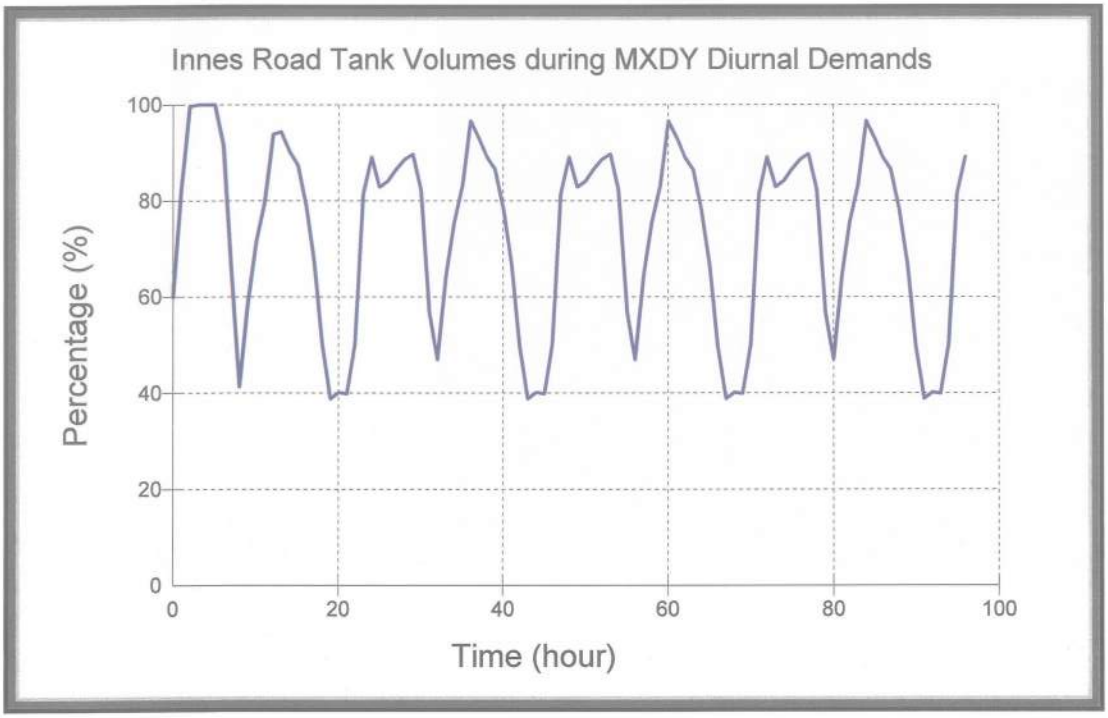
Figure 4-13: Proposed Watermain Layout in EUC Expansion Area



Controls at the two pumping stations were adjusted to ensure the fill and draw of the Innes Road EST between levels of 40% and 100% full. **Figure 4-14** shows how the Innes Road EST responded to maximum day flows with three-hour fires applied at periods when the tank reaches 40%. As indicated, the Innes Road EST was able to recover quickly following a fire event.

Roughness coefficients ("C" values) of 125 and 120 were used for larger and smaller watermains respectively. The larger watermains include diameters of 305mm and greater and the smaller include those smaller than 305mm in diameter.

Figure 4-14: Percentage of Water in Innes Road EST During Hydraulic Analysis



4.1.5.1.1 Demand Allocation

The residential, industrial, commercial and institutional (ICI) water demands were allocated using information from the sanitary sewer design tables and drawings. Demand nodes were created for each catchment area presented in the sewer design section. For each demand node, a demand was estimated for each of the four users (residential/ICI) within each catchment area.

For residential water demands, an average of 350Lpcd was applied to the population count for each demand node. A maximum day multiplier of 2.0 was used to establish the residential maximum day demand. The total residential population for the EUC (18,022) represents a demand of 12.6 ML/d fully developed.

To estimate the ICI flows, the gross area (ha) of land dedicated to each land use was summed for each demand node. For industrial flows, an average demand of 35,000 L/ha/d was applied to the gross area of industrial land at each demand node. The maximum day demand for industrial users is estimated at 1.5 the average demand. The total industrial maximum day demand was estimated to be 0.6 ML/d. For commercial and institutional flows, demands of 50,000 L/ha/d were applied to the gross area at each demand node for each land use. The total commercial and institutional maximum day demands were estimated to be 0.2M L/d and 2.0 ML/d respectively.

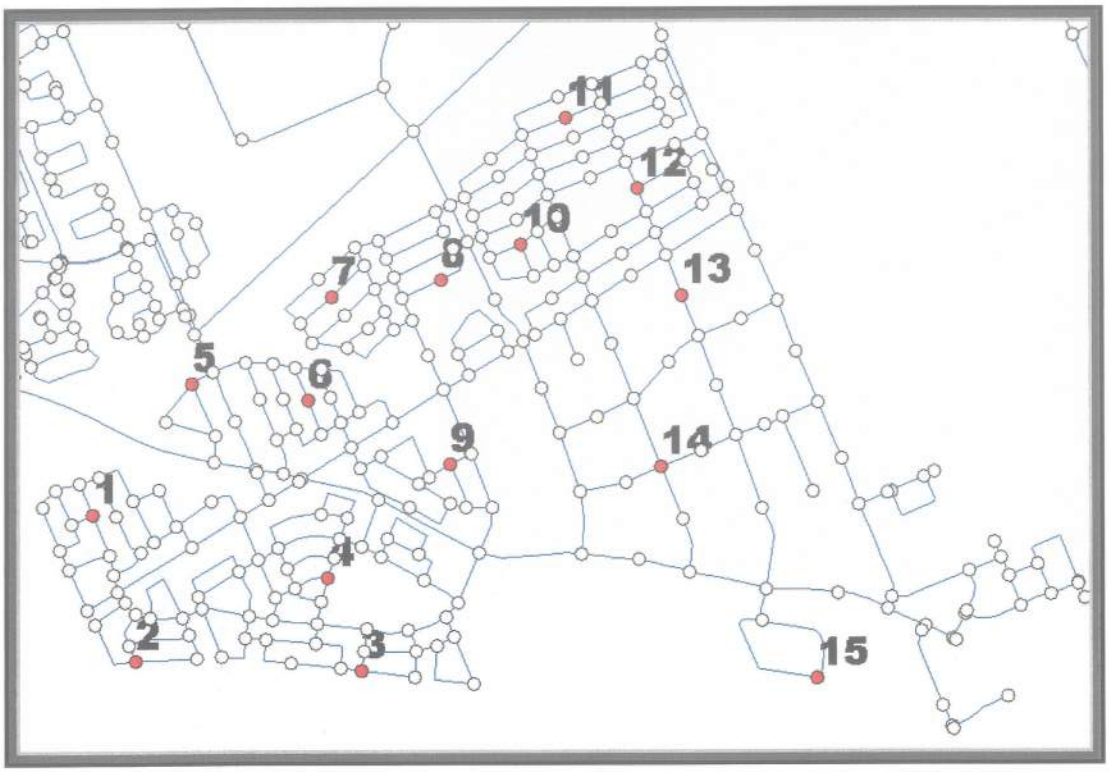
The total maximum day demand for the EUC is estimated to be 15.4 ML/d. Combined with the existing maximum day demand in Zone 2E, the total demand will just exceed the 2021 demand of 62 ML/d presented in the 2001 EUC Water Modeling report (assuming no water efficiency strategy).

4.1.5.1.2 Hydraulic Analysis

With respect to storage capacity, the 2001 EUC Water Modeling Report states: "By 2021, the current storage in Zone 2E (4.5 ML Innes Road EST with 40% balancing storage) will be adequate to the year 2021 with a pumping rate of approximately 114 ML/d. The existing firm capacity of the Orleans and Forest Ridge Pumping Stations (with the largest single pump out at Forest Ridge PS only) is 117 ML/d. Thus the existing pumping/storage combination to Zone 2E appears to be adequate until approximately the year 2021."

In order to verify and assess the hydraulics of the proposed watermain layout, a set of fifteen representative nodes were selected for analysis. The locations of the observation nodes are shown in **Figure 4-15**.

Figure 4-15: Location of Observation Nodes in EUC Expansion Area



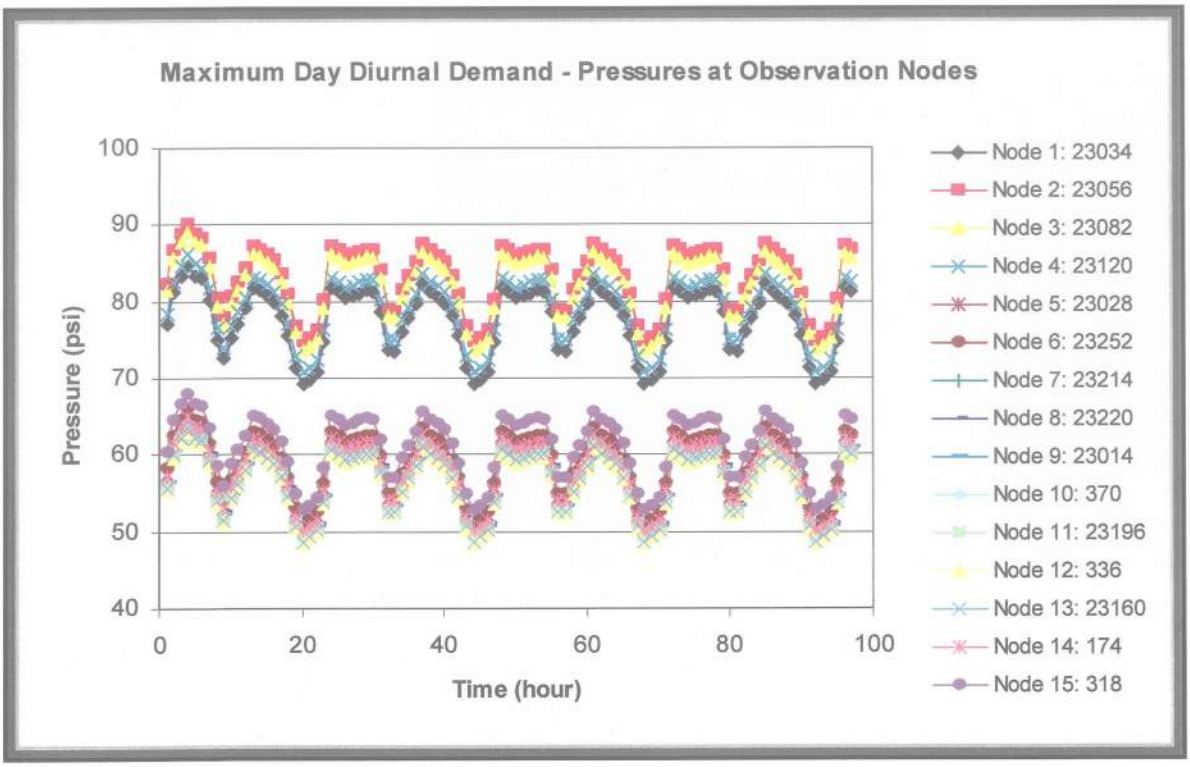
4.1.5.1.3 Average Day Demand Analysis

Under typical operating conditions, there is minimal headloss in the distribution system and therefore the pressures in the EUC will be dependant on ground elevations and hydraulic grade lines (HGLs) from the discharge of the pumping stations and the water levels in the Innes Road EST (which vary between 126m and 131m). The resulting average day pressures in the EUC vary between 50 psi and 90 psi, which are within the acceptable minimum and maximum pressure ranges (40 to 100 psi) recommended by the Ontario Ministry of the Environment and adopted by the City of Ottawa. The variations in pressures are due variations in HGLs as well variations in ground elevations, which range from (68m to 88m).

4.1.5.1.4 Peak Hour Demand Analysis

A peak hour demand analysis was carried out using an extended period simulation of maximum day demands. The diurnal patterns for residential and ICI demands were previously established in the City's hydraulic model. **Figure 4-16** shows the resulting pressures that are anticipated under peak hour conditions. Similar to the average day results, the observed pressures vary within the acceptable range of 50 psi to 90 psi.

Figure 4-16: Resultant Pressures Under Maximum Day Diurnal Demand Conditions



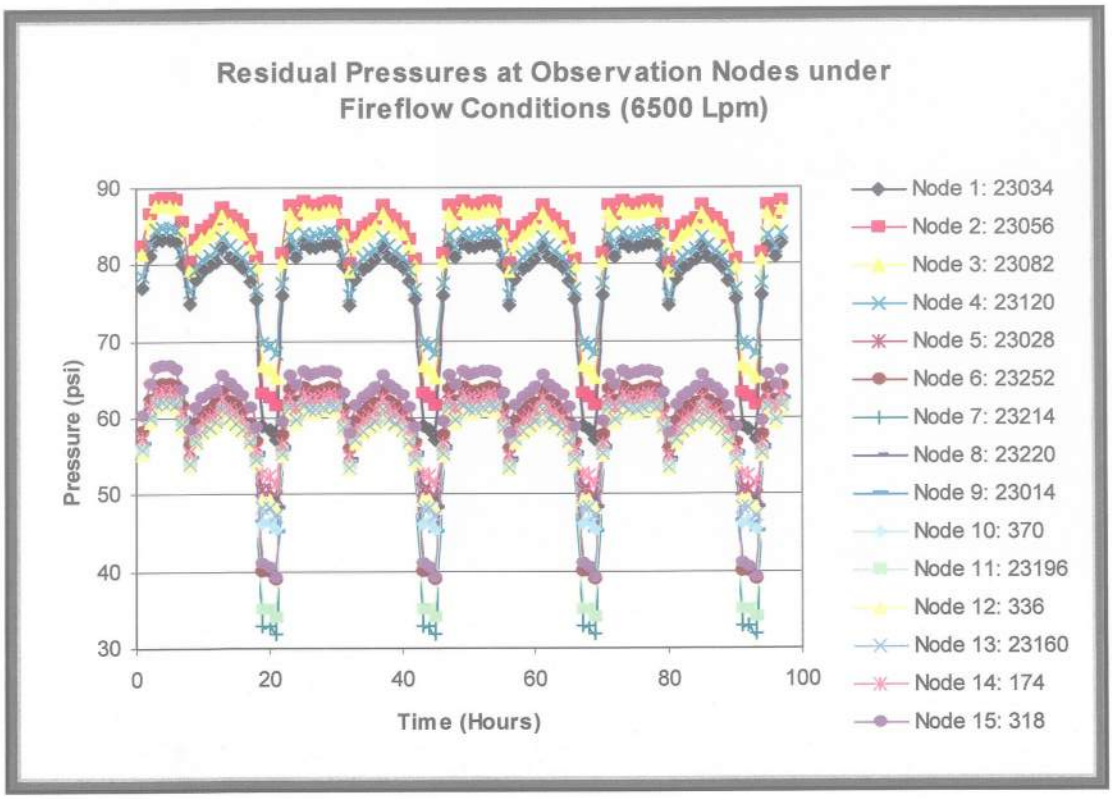
4.1.5.1.5 Maximum Day Fire flow Analysis

A fire flow analysis was carried out for each observation node under maximum day demand conditions. In order to observe the dynamic interactions of the pumping stations and the elevated storage during fire flow conditions, a 3-hour fire flow was modeled during various periods of an extended period analysis. The fire flows were modeled between the 19:00 and 22:00 hours. The guidelines the City of Ottawa uses for ensuring adequate fire flows (for general areas) are 6,500 Lpm for residential areas and 13,000 Lpm for areas with ICI components. It is noted that for specific buildings, the Underwriters Fire Survey requires a determination of the fire suppression need based on parameters such as building material and size.

4.1.5.1.6 Residential Fire Flow Analysis

A series of runs were carried out with a 6,500Lpm fire flow demand allocated at each of the 15 individual observation nodes. The results of this analysis are presented in **Figure 4-17**. As shown, all nodes are capable of providing the 6500 Lpm fire flow with residual pressures greater than 20 psi (140kPa).

Figure 4-17: Maximum Day Demand Fire Flow Analysis Results at 6,500Lpm



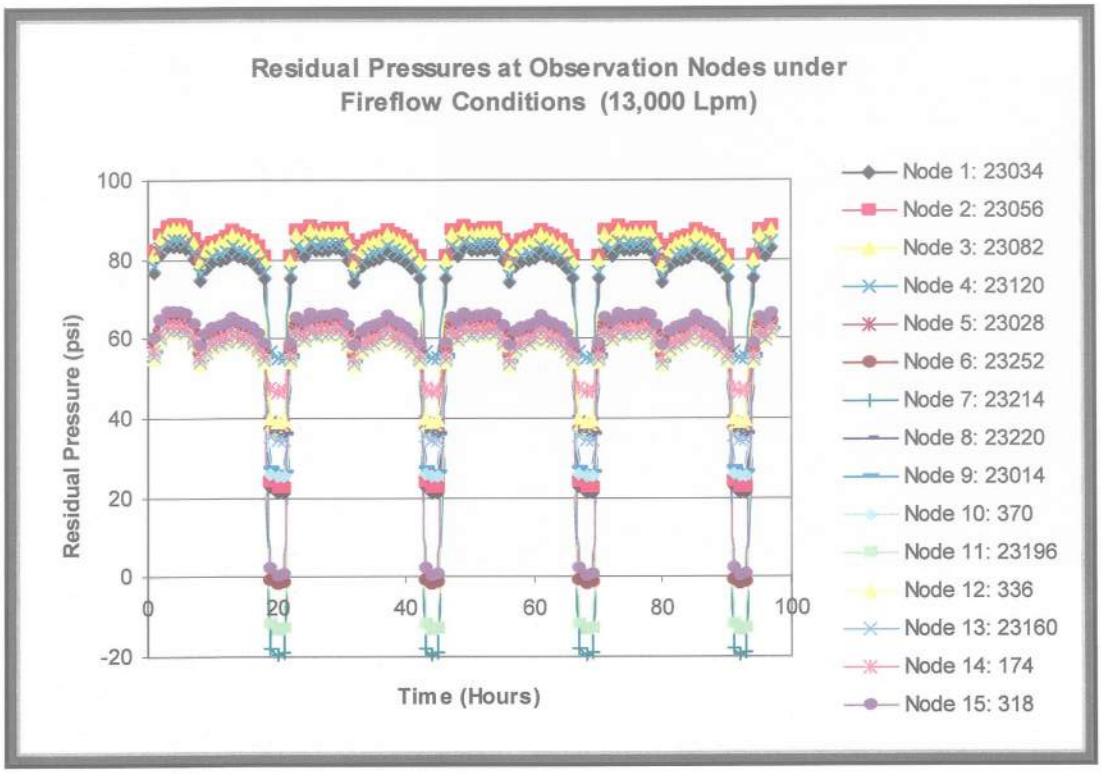
4.1.5.1.7 ICI Fire Flow Analysis

A series of runs were carried out with a 13,000 Lpm fire flow demand allocated at each of the 15 individual observation nodes. The results of this analysis are presented in **Figure 4-18**. As shown, all but four nodes are capable of providing the 13,000 Lpm fire flow with residual pressures greater than 20 psi (140kPa). This is acceptable because the nodes that cannot provide the higher fire flow are located along residential watermains that do not require the higher fire flow.

In analyzing the results, it is noted that the four observation nodes that did not meet the minimum pressure requirement are located at points in the distribution system that are only fed by two 152mm diameter watermain as well as being in areas with ground elevation greater than 85m. Junctions that are fed by three 152mm diameter watermains in the higher elevations (i.e. Nodes 9 and 10) are capable of meeting the higher fire flow of 13,000 Lpm. (This depends on the lengths of feeds).

The fourth node that cannot meet the higher ICI fire flow is Node 15 located in a residential area south of Navan Road. This node is serviced by a 305mm diameter feed that is connected to a 203mm diameter loop. The elevation of 84m is in the higher range of elevations.

Figure 4-18: Maximum Day Demand Fire Flow Analysis Results at 13,000 Lpm



4.1.5.1.8 Recommendations

The proposed network of large and small diameter watermains shown in **Figure 4-13** will be capable of providing the residential and ICI demands under average day, peak hour and fire flow conditions within the recommended minimum and maximum pressure ranges. Those areas designated as residential will meet (at minimum) the 6,500 Lpm fire flow requirements and those areas designated as ICI will meet (at minimum) the 13,000 Lpm fire flow requirements.

It is important to note that any future modifications to the proposed network consider higher fire flow needs of ICI areas as well as the constraints that the higher elevations in the expansion area may pose on the ability to meet the higher fire flow requirements.

Trails Edge East – Functional Servicing Report

Project #160401250

Prepared for:
Richcraft Group of Companies

Prepared by:
Stantec Consulting Ltd.

August 11, 2017

3.0 POTABLE WATER ANALYSIS

3.1 BACKGROUND

The proposed development is located within Zone 2E of the City of Ottawa's water distribution system. This zone is fed by the Forest Ridge Pump Station, with the Innes Road elevated storage tank providing balancing storage for peak flows and demands.

A 300mm diameter watermain exists along Renaud Road immediately south of the Trails Edge Development area, and a 400mm diameter main exists along Mer Bleue Road between Renaud Road and Brian Coburn Boulevard, and north of the Hydro One Corridor (HEPC). 400mm and 600mm watermains exist further north along Innes Road. A 600mm watermain exists at the northern boundary of the site along the HEPC.

3.2 PROPOSED WATERMAIN SIZING AND LAYOUT

The proposed watermain alignment and sizing for this development is shown on **Drawing WTR-1** with 203mm diameter and 305mm diameter piping. It should be noted that the pipe layout and sizing for the development is preliminary, and is to be verified upon detailed hydraulic analysis for the development area.

3.2.1 Ground Elevations

The proposed ground elevations of the development range from approximately 87.36m to 89.37m. Preliminary grading and elevations have been determined for the site and included on **Drawing GP-1**.

3.2.2 Water Demand

The current draft plan for the Trails Edge East Development calls for a total of 250 single units, 816 townhouse units, and an estimated population of 3,053 persons. An additional 32.12ha of future mixed-use development is expected to contribute to overall demands from the existing watermains at the northern boundary of the development.

Water demands for the development were estimated using the City of Ottawa's Water Distribution Design Guidelines. For residential developments, the average day (AVDY) per capita water demand is 350 L/cap/d. For maximum day (MXDY) demand, AVDY was multiplied by a factor of 2.5 and for peak hour (PKHR) demand, MXDY was multiplied by a factor of 2.2. For commercial and institutional use, the AVDY is based on the area of land use and is shown in the following tables. For MXDY demand, AVDY was multiplied by a factor of 1.5 and for PKHR demand, MXDY was multiplied by a factor of 1.8. The calculated residential water consumption

and future mixed use (area identified as MUC within the EUC Master Servicing Update) water consumption is represented in **Table 1** and **Table 2** for the Trails Edge East development:

Table 1: Residential Water Demands

Unit Type	Units	Person/Unit	Population	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Singles	250	3.4	850.0	3.44	8.61	18.94
Townhomes	816	2.7	2203.2	8.93	22.31	49.09
		Total	3053.2	12.37	30.92	68.03

Table 2: Mixed Use Area (MUC) Water Demands

Area (ha)	Population	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
32.12	1526	6.18	15.45	34.00

3.2.3 Connection to Existing Infrastructure

Potable water supply will be connected to the existing watermains located on Mer Bleue Road, Renaud Road, and Belcourt Boulevard. **Drawing WTR-1** shows the location of the connection points to the existing watermains.

It is anticipated that the development will be phased from west to east. A minimum of two connections to the surrounding 300mm and 400mm watermains will be provided as development proceeds to the west, with no more than 49 units serviced on a temporary basis via single feed per City guidelines.

3.3 HYDRAULIC ASSESSMENT

A hydraulic model was built by Stantec for the Zone 2E Watermain Extension (HEPC) Analysis in June 2004, and later revised for the EUC Master Servicing Update in July 2006. The model assumes a single proposed 300mm main bisecting the Trails Edge East development, along with existing 400mm mains within Mer Bleue, Renaud Road, and Belcourt Boulevard. It is of note that the majority of internal watermains to the Trails Edge East development were considered as being of 150mm in diameter. Stantec assessed the anticipated pressures in this development at full buildout to meet minimum servicing requirements (basic day and peak hour demands). A fire flow analysis was also performed under maximum day conditions (see **Appendix A** for excerpts). Additionally, DSEL/IBI Group completed individual hydraulic analyses to demonstrate available fire flow capacity within the adjacent Trails Edge West development areas west of Belcourt Boulevard during early 2015.

3.3.1 Allowable Pressures

The City of Ottawa Water Distribution Design Guidelines state that the desired range of system pressures under normal demand conditions (i.e. basic day, maximum day, and peak hour) should be in the range of 350 to 552 kPa (50 to 80 psi) and no less than 275kPa (40 psi) at the ground elevation in the streets (i.e. at hydrant level). The maximum pressure at any point in the distribution system is to be no higher than 552kPa (80 psi). As per the Ontario Building Code & Guide for Plumbing, if pressures greater than 552kPa (80 psi) are anticipated, pressure relief measures are required. Under emergency fire flow conditions, the minimum pressure in the distribution system is allowed to drop to 138kPa (20 psi).

3.3.2 Fire Flow

The Master Servicing Update model assessed a maximum fire flow of 13,000 L/min for EUC area based on Fire Underwriters Survey (FUS) requirements, and used a minimum requirement of 6,500L/min for residential areas where the 13,000 L/min target could not be achieved.

It should be noted that as per the City's most recent technical bulletin in regards to fire flow (ISDTB-2014-02) for traditional side-by-side towns and row houses constructed in accordance with the OBC, the fire flow requirement shall be capped at 10,000 L/min. As such, nodes that are able to meet the 13,000 L/min fire flow are expected to perform adequately for the proposed development.

Three nodes within the 2006 model are noted as lying within the Trails Edge East development area; nodes 10, 11 and 12. Of these, node 11 was unable to meet the 13,000 L/min target. It was noted in the June 2004 HEPC Analysis report that this was largely due to the model's assumption of two 150mm mains serving that particular node, while nodes 10 and 12 were to maintain three 150mm watermain connections. It is assumed that upgrading internal watermain links to 200mm in diameter will be sufficient to address fire flow requirements for the development area.

Fire flow assessment will be required at the subdivision approval phase in which local watermains are checked for their ability to provide the objective FUS fire flows, which in turn will be determined based on final unit layouts. Smaller, local internal watermains will need to be assessed and verified as development planning proceeds.

3.4 POTABLE WATER SUMMARY

The proposed piping alignment and sizing is capable of achieving the level of service in the Richcraft subdivision. Based on the hydraulic analysis created at the Master Servicing level, the following conclusions were made:

- The proposed water distribution system is recommended to include a combination of 305mm and 203mm diameter pipes;
- During peak hour conditions, the proposed system is capable of operating above the minimum pressure objective of 276kPa (40psi);
- During fire conditions, the proposed system is capable of providing sufficient fire flows (13,000L/min and above) while maintaining a residual pressure of 138kPa (20 psi) in the majority of the Trails Edge East development. Sizing of internal mains on local streets will be coordinated to ensure a minimum fire flow of 10,000 L/min may be achieved.

Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

- 406mmØ WATERMAIN
- 305mmØ WATERMAIN
- 203mmØ WATERMAIN
- 152mmØ WATERMAIN
- EX. 406mmØ WATERMAIN
- EX. 305mmØ WATERMAIN
- EX. 203mmØ WATERMAIN
- EX. 152mmØ WATERMAIN

Notes

Revision	By	Appd.	YY.MM.DD
2 DRAFT PLAN APPROVAL 2ND SUBMISSION	DT	SG	17.08.11
1 DRAFT PLAN APPROVAL 1ST SUBMISSION	MJS	SG	16.11.02

File Name: 160401250 MSS	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	MJS	SG	MJS	16.10.06

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
D. C. THIFFAULT
100186107
11/08/2017
PROVINCE OF ONTARIO

Client/Project

RICHCRAFT GROUP OF COMPANIES
2280 ST. LAURENT BLVD
OTTAWA, ON, K1G 4K1

TRAILSEDGE EAST SUBDIVISION

Title

OVERALL WATERMAIN SYSTEM

Project No.	Scale	Sheet	Revision
160401250	1:1500 (0, 15, 45, 75m)	C30	2
Drawing No.		3 of 5	
WTR-1			

W:\projects\160401250_trailsedge East\design drawings_160401250 MSS.dwg
20/10/2017 1:47 PM By: Thiffault, Dustin

ORIGINAL SHEET - ARCH D

Trails Edge East Phase 1

Servicing and Stormwater Management Report

Project # 160401250

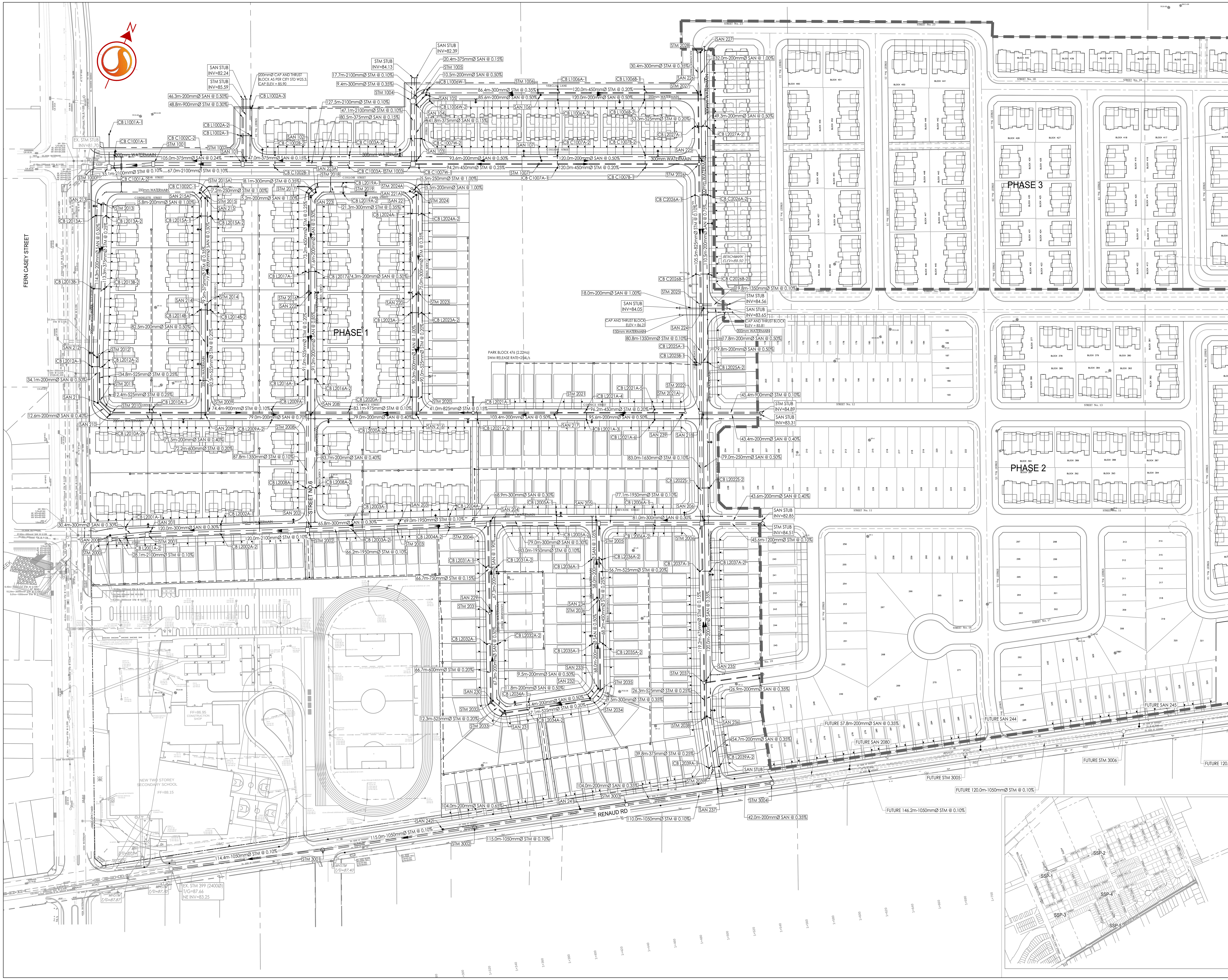
August 23, 2018

Prepared for:

Richcraft Group of Companies

Prepared by:

Stantec Consulting Ltd.



Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

- PROPOSED WATERMAIN
- PROPOSED VALVE AND VALVE BOX
- PROPOSED VALVE CHAMBER
- PROPOSED REDUCER
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED SUBDRAIN CATCHBASIN
- EXISTING WATERMAIN
- EXISTING VALVE AND VALVE BOX
- EXISTING VALVE CHAMBER
- EXISTING REDUCER
- EXISTING FIRE HYDRANT
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CATCHBASIN MANHOLE
- EXISTING CATCHBASIN
- EXISTING SUBDRAIN CATCHBASIN
- FUTURE WATERMAIN
- FUTURE VALVE AND VALVE BOX
- FUTURE VALVE CHAMBER
- FUTURE REDUCER
- FUTURE FIRE HYDRANT
- FUTURE SANITARY SEWER
- FUTURE STORM SEWER
- FUTURE CATCHBASIN MANHOLE
- FUTURE CATCHBASIN
- FUTURE SUBDRAIN CATCHBASIN
- (A) (B) (C) (D) (E) IPEX ICD TYPE AS NOTED OR EQUIVALENT
- HYDROVEX ICD OR EQUIVALENT (SEE DWG SD-1)
- CIRCULAR ORIFICE (SEE DWG SD-1)
- CATCHBASINS TO BE INTERCONNECTED
- DC PROPOSED DEPRESSED CURB LOCATIONS
- BARRIER / MOUNTABLE PROPOSED MOUNTABLE/BARRIER CURB LOCATION
- SERVICE LATERAL LOCATION (SANITARY, STORM AND WATER). SEE DRAWING DS-1 FOR TYPICAL SERVICING LATERAL LOCATIONS.
- TACTILE WALKING SURFACE INDICATOR
- PHASING LINES

Notes

2 REVISED AS PER CITY COMMENTS AND DRAFT PLAN	MJS	DT	18.08.23
1 REVISED AS PER CITY COMMENTS	MJS	DT	18.05.30
0 ISSUED TO CITY FOR REVIEW	MJS	DT	18.03.06
Revision	By	Appd.	YY.MM.DD

File Name: 160401250 OSSP.DWG	MJS	MJS	MJS	18.02.14
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project

RICHCRAFT GROUP OF COMPANIES
2280 ST. LAURENT BLVD
OTTAWA, ON, K1G 4K1

TRAILSEDGE EAST SUBDIVISION
OTTAWA, ON, CANADA

Title

OVERALL SITE SERVICING PLAN

Project No.	Scale
160401250	1:1250 (0 12.5 37.5 62.5m)

Drawing No.	Sheet	Revision
OSSP-1	2 of 44	3 C32

W:\active\160401250_Trailsedge East\design\drawing\160401250 OSSP.dwg
2018/08/23 4:34 PM By: Gillis, Sheridan

DESIGN BRIEF

FOR THE

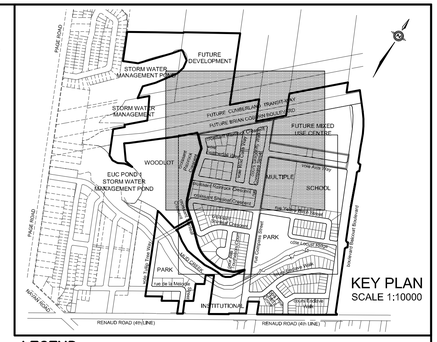
TRAILS EDGE WEST

RICHCRAFT GROUP OF COMPANIES

CITY OF OTTAWA

PROJECT NO.: 12-612

JANUARY 26, 2015
REVISION 3, 3RD SUBMISSION



KEY PLAN
SCALE 1:10000

LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE IN OTHER PHASES
- SANITARY MANHOLE IN OTHER PHASES
- RLCBS – ELBOW SECTION (CITY STD. S31) / "T" SECTION (CITY STD. S30), AS NOTED ON THE DRAWING
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- SINGLE WATER CONNECTION
- HYDRANT
- TEE
- VALVE & BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST A (Q max = 19.9 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST B (Q max = 28.4 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST C (Q max = 35.5 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST D (Q max = 50.1 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST F (Q max = 69.1 l/s)
- BARRIER CURB (STD. SC1.1) WITH DEPRESSED SECTION
- MOUNTABLE CURB (STD. SC1.3)
- PHASE LINE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE
- 3.0m HIGH WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
- 250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- BUILDING ENVELOPE
- THERMAL INSULATION AS PER CITY OF OTTAWA STD. W22
- TRANSFORMER

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC GEOMATICS LIMITED, FILE No. 161611903–111. SURVEY DATED AUGUST 2, 2012.

LEGAL INFORMATION

CALCULATED M–PLAN PROVIDED BY STANTEC GEOMATICS LIMITED, JOB No. 161613137–132, RECEIVED ON MARCH 28, 2014.

1st RE–SUBMISSION 14–05–16

NOT FOR CONSTRUCTION

ELEVATION NOTE ELEVATION = 86.708 m

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM NATIONAL CAPITAL COMMISSION No. 019680227, HAVING AN ELEVATION OF 86.708 m.

No.	BY	DATE	DESCRIPTION
2	Z.L.	14–05–16	1st RE–SUBMISSION
1	Z.L.	12–09–14	1st SUBMISSION

CITY OF OTTAWA

PROJECT No. 12–612

Z. LI
14-05-16
PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

GENERAL PLAN

© DSEL

RICHCRAFT GROUP OF COMPANIES

TRAILS EDGE WEST

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

DRAWN BY: W.L./C.M.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		5
SCALE: 1:1000	DATE: SEPTEMBER 2012		

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION

NOTE: ALL EXISTING POST & WIRE FENCE WITHIN LOTS, BLOCKS AND PROPOSED ROW TO BE REMOVED, WHERE APPLICABLE

NOTE: ALL EXISTING FENCE AND CULVERTS WITHIN LOTS, BLOCKS AND PROPOSED ROW TO BE REMOVED, WHERE APPLICABLE

REFER TO DWG No. 6

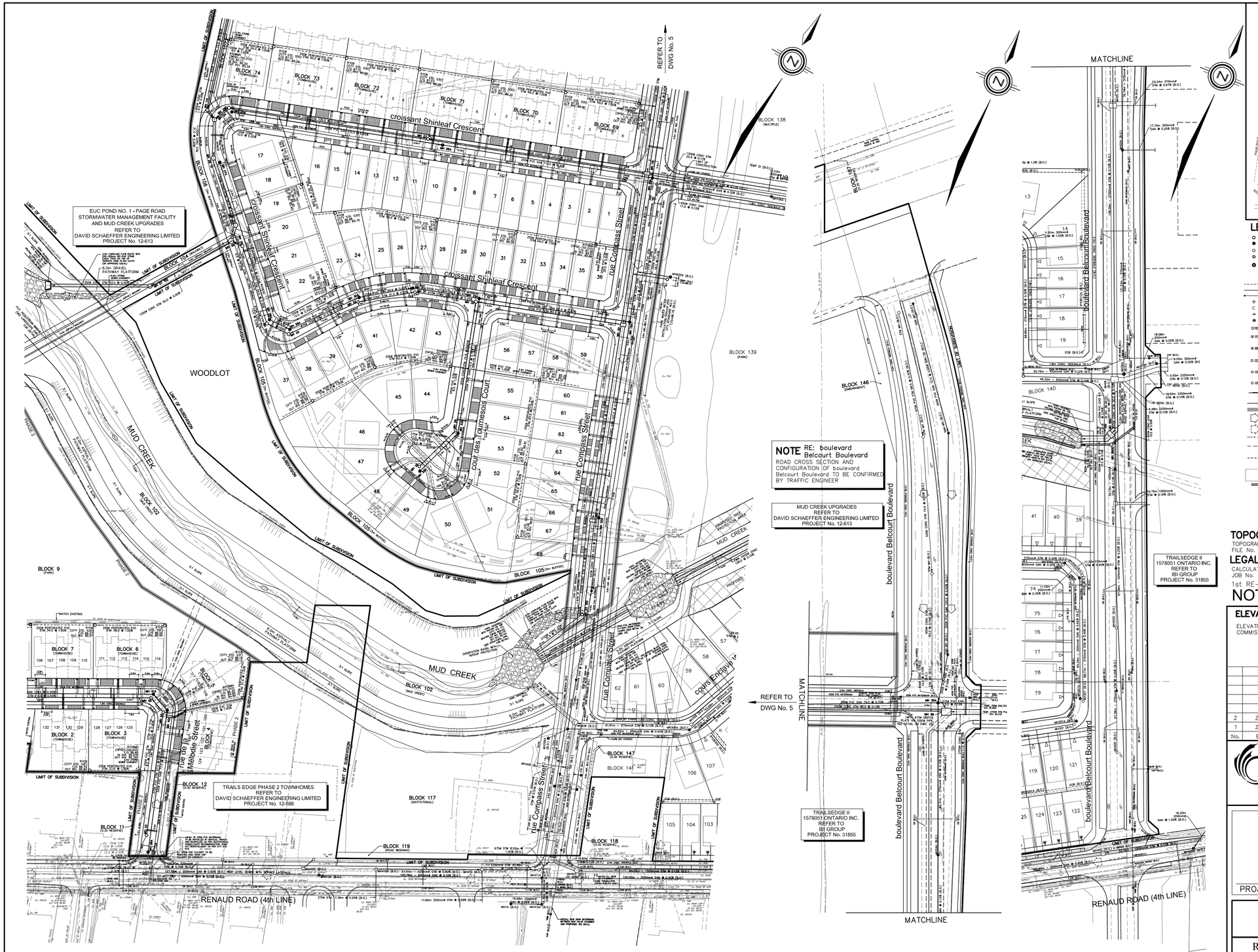
NOTE RE: WATERMAIN / WATER SERVICE

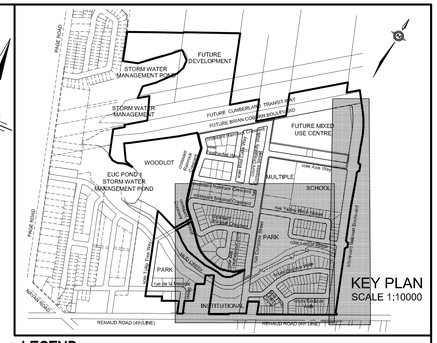
1. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.2m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. W23 FOR DETAIL.
2. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. W38 FOR DETAIL

NOTE FOR WATERMAIN CROSSING BELOW AND ABOVE SEWERS, REFER TO CITY STD. W25 AND W25.2, RESPECTIVELY, WHERE APPLICABLE

NOTE FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED

M:\12612\Subm2\General\05_06_612gen.dwg, 15/05/2014 5:46:40 PM, will





LEGEND

- STORM MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE IN OTHER PHASES
- SANITARY MANHOLE IN OTHER PHASES
- RLCBS – ELBOW SECTION (CITY STD. S31) / "T" SECTION (CITY STD. S30), AS NOTED ON THE DRAWING
- SINGLE STORM HOUSE CONNECTION
- SINGLE SANITARY HOUSE CONNECTION
- SINGLE WATER CONNECTION
- HYDRANT
- TEE
- VALVE & BOX
- VALVE & CHAMBER
- SINGLE/DOUBLE CATCHBASIN
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST A (Q max = 19.9 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST B (Q max = 28.4 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST C (Q max = 35.5 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST D (Q max = 50.1 l/s)
- CATCHBASINS WITH INLET CONTROL DEVICE IPEX TEMPEST F (Q max = 69.1 l/s)
- BARRIER CURB (STD. SC1.1) WITH DEPRESSED SECTION
- MOUNTABLE CURB (STD. SC1.3)
- PHASE LINE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- 1.5m HIGH BLACK VINYL CHAIN LINK FENCE
- 3.0m HIGH WOOD ACOUSTIC FENCE (SEE LANDSCAPE DWG. FOR DETAILS)
- 250ø PERFORATED PIPE (REFER TO CITY STD'S S29, S30 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY)
- BUILDING ENVELOPE
- THERMAL INSULATION AS PER CITY OF OTTAWA STD. W22
- TRANSFORMER

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC GEOMATICS LIMITED, FILE No. 161611903–111. SURVEY DATED AUGUST 2, 2012.

LEGAL INFORMATION

CALCULATED M–PLAN PROVIDED BY STANTEC GEOMATICS LIMITED, JOB No. 161613137–132, RECEIVED ON MARCH 28, 2014.

1st RE–SUBMISSION 14–05–16

NOT FOR CONSTRUCTION

ELEVATION NOTE ELEVATION = 86.708 m

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM NATIONAL CAPITAL COMMISSION No. 019680227, HAVING AN ELEVATION OF 86.708 m.

No.	BY	DATE	DESCRIPTION	BY
2	Z.L.	14–05–16	1st RE–SUBMISSION	
1	Z.L.	12–09–14	1st SUBMISSION	

Ottawa CITY OF OTTAWA

PROJECT No. 12–612

LICENSED PROFESSIONAL ENGINEER Z. LI 14-09-16 PROVINCE OF ONTARIO

GENERAL PLAN

© DSEL

RICHCRAFT GROUP OF COMPANIES

TRAILS EDGE WEST

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

DRAWN BY:	W.L./C.M.	CHECKED BY:	K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY:	K.M.	CHECKED BY:	Z.L.		6
SCALE:	1:1000	DATE:	SEPTEMBER 2012		

MER BLEUE COMMUNITY DESIGN PLAN
INFRASTRUCTURE SERVICING STUDY

Prepared for
C. FLEMING DEVELOPMENTS, TAGGART REALTY,
AND MINTO DEVELOPMENTS

3546-LD
APRIL, 2006

IBI GROUP

C36

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON K1Z 7T1
Tel: (613) 722-4420 Fax: (613) 722-2799
stantec.com

Stantec

March 15, 2006
File: 163400620

IBI Group
1770 Woodward Drive,
Ottawa, Ont.
K2C 0P8

Attention: Bob Wingate, P. Eng.

Dear Mr. Wingate:

Reference: Mer Bleue Community Design Plan – Potable Water Hydraulic Analysis

Stantec Consulting Ltd. (Stantec) is pleased to provide the following analysis of the proposed water distribution system in the Mer Bleue Community (MBC), previously referred to as Neighborhood N5 of the East Urban Community (EUC), located in the east end of the City of Ottawa (City) and south of Innes Road. The focus area of this analysis is situated between Mer Bleu Rd. and Tenth Line just south of the hydro easement corridor.

Past Studies

In recent years, Stantec has carried out several hydraulic capacity studies of the City's Pressure Zone 2E (PZ 2E). The following summarizes the findings related to the proposed MBC.

In June 2004, at the request of the City, Stantec carried out a hydraulic analysis for the proposed large diameter transmission watermain proposed along the Hydro Easement Power Corridor (HEPC). The conclusion of that report was that a smaller diameter watermain would be sufficient to meet the City's infrastructure needs. The recommended diameter for the proposed HEPC watermain was reduced from 762mm to a combination of 610mm and 406mm diameter watermain.

In December 2004, Stantec Consulting Ltd. prepared a technical memorandum for CCL Ltd. that presented a preliminary hydraulic analysis for the EUC Neighborhood #5. That memo concluded that the existing water distribution system in PZ 2E along with the proposed piping infrastructure would be capable of servicing the proposed growth. This current study provides additional analysis for the latest land use and population projections for the proposed MBC.

The most recent technical document that Stantec prepared for the City for this general area is the October 24, 2005 memo to Mike Wildman of the City entitled "East Urban Watermain Staging and Timing". The memo reviews two specific PZ 2E components including the PZ 2E HEPC watermain sizing, timing and alignment as well as the St Joseph Blvd/Trim Road watermain timing. Although both components are important to the future expansion of PZ 2E, the timing and alignment of the proposed HEPC watermain may have an impact on the proposed Mer Bleue development. In the October 2005 memo to the City, Stantec Consulting Ltd. concluded that that based on existing system conditions and reliability requirements, a significant cost savings to the City could be realized by relocating a section of the proposed 406mm diameter HEPC watermain through Neighborhood #5 (now MBC) without impacting the service level or the system reliability needs.

Background

The major water supply infrastructure needs for the MBC will follow the current City of Ottawa guidelines and standards. These include the need for provision of minimum pressures during peak demand periods (maximum demand in a summer day), adequate fire protection, appropriate system redundancy and looping, consideration of water quality in the distribution system and of future development.

The entire MBC lies within Zone 2E of the City's water distribution system. This zone is currently fed by two separate booster-pumping stations (which are fed directly from Zone 1E) and is considered "open" as the Innes Road Elevated Water Storage Tank regulates the pressure in this zone. The tank normally operates at a hydraulic grade line (HGL) between approximately 126m and 130m. With typical ground elevations in the MBC of approximately 88m, the average day pressure, assuming minimal headloss, would vary between **370 kPa (54psi) and 410Pa (60 psi)**.

Under peak demand conditions, the minimum design pressure (per City standards) is **275kPa (40 psi)**, although a higher value of 345kPa (50 psi) is preferred. Under fire flow conditions; the minimum pressure (per City standards) is **140kPa (20 psi)**.

Building-specific fireflow requirements are determined based on building type, material, spacing to adjacent structure, etc. For planning purposes, fireflows of **6,500L/min** for residential areas and **13,000L/min** for commercial and institutional lands are generally considered adequate.

System redundancy is an important part of the water distribution system as it ensures water service in the event of a break or outage of a major system component. For areas such as the MBC, this will require that "looped" watermain networks be used. Looped systems also have the benefit of minimizing long lengths of dead-end watermains, which assist in ensuring

movement of water within the pipe and thus avoids stagnation. By maximizing water movement, water quality is maintained in the system extremities. Looped systems of larger watermains should also be considered where future growth might require the capacity afforded by larger watermains.

Existing Water System Network

In general terms, the existing distribution system in PZ 2E is considered robust. There is a strong network of 610mm and 406mm diameter watermains east of the existing Innes Road Elevated Water Storage Tank. Initially, the major feeds to the Mer Bleue Community (Phase 1) will be through the existing 610mm on Innes Road, which feeds a newly constructed 406mm diameter watermain along Tenth Line to Lakepointe St. The second feed to the MBC will be through an existing 305mm diameter watermain along the proposed Blackburn Hamlet Bypass. Additional feeds will be provided by future connections to watermain in the Avalon South development located just east of the proposed MBC. As well, connections along Mer Bleue to the future HEPC large diameter trunk watermain in the north and to the distribution network in the south will further strengthen the supply to the community.

The proposed diameters and layout of watermain in and around the MBC are shown in **Figure 1**. The hydraulic analysis considered two phases; Phase 1 includes only two feeds (a 406mm and a 305mm diameter) to the MBC as shown in **Figure 2**. For the purpose of this study, the second phase, labeled build-out includes an additional two feeds to the Avalon South Community as shown in **Figure 3**. The build-out model did not include the connections along Mer Bleue as the timing of these developments is unknown at this time. Furthermore, the initial modeling exercise did not consider upsizing the existing 152mm diameter watermain along Tenth Line between Lakepointe St and the Blackburn Bypass, however the results demonstrate why this should be considered.

Hydraulic Analysis

The hydraulic modeling exercise was carried out using a complete-pipe hydraulic model for PZ 2E. The software package used was H2OMap Water by MWHSoft. The model, originally provided to Stantec by the City was modified to include future proposed developments in Avalon South and the Gloucester EUC. Larger diameter trunk watermains 305mm diameter and larger were placed in the MBC to ensure appropriate loping and servicing to all areas. Smaller diameter watermains to individual developments within the MBC were not included in this analysis. The sizing of internal watermains in MBC will be carried out at a later date.

Water demands in MBC were estimated using population figures and land use areas provided by IBI Group. Typical consumption and household sizes were assumed in order to determine an overall demand. **Table 1** provides the estimation of overall demands for the MBC. The total

demands in **Table 1** were then distributed to 36 nodes within the MBC. Sufficient nodes were added to the trunk lines in the model to ensure a good distribution of demands.

In order to determine the trunk watermain requirements for the MBC, four hydraulic conditions were modeled for the MBC water distribution analysis. They include:

1) Basic Day (BSDY) – Extended Period Simulation (EPS) analysis to determine typical pressures (usually helps to identify high pressure as well as water quality concerns).

2) Maximum Day (MXDY) + Fire – Steady State analysis to determine available flows (at minimum pressures) for Phase 1 and Build-Out.

3) Peak Hour (PKHR) – MXDY EPS analysis to determine typical pressures under peak (non-emergency) demands.

4) Reliability – BSDY + Fire + break in distribution system analysis to determine if sufficient fireflows can be provided under an emergency watermain break condition.

Basic Day (BSDY)

The BSDY diurnal analysis provides anticipated pressures under typical demand conditions. Under this demand condition, headlosses in the distribution system are minimal and therefore if there was a low ground elevation constraint high pressures might be experienced. However as stated in the background, elevations in the MBC lands are generally flat in the 88m above datum range and the resulting BSDY pressures vary between **370 kPa (54psi) and 410Pa (60 psi)** as the water level fluctuates in the Innes Road Elevated Water Storage Tank. These pressures are within the preferred pressure range of 345 kPa (50psi) to 550 kPa (80 psi). Therefore no additional measures are needed to address BSDY needs.

Maximum Day (MXDY) + Fire

The MXDY + Fire steady state analysis provides an indication as to the amount of water that will be available under a fire condition. Water distribution systems are designed to provide fireflows under maximum day demand conditions. The Fire Underwriters Survey usually establishes the required fire flow for specific buildings types. However when multi-use communities are being planned for, the City typically allows rule of thumb guidelines to be used. For example, in order to provide a suitable fireflow that meets most residential requirements, it is proposed that a minimum of **6500Lpm** be provided under MXDY demand conditions, whereas in order to provide a suitable fireflow that meets Industrial, Commercial and Institutional (ICI) requirements, a minimum of **13,000Lpm** should be provided under MXDY demand conditions.

Two scenarios were modeled for the MXDY + Fire condition, Phase 1 and Build-out. The Phase 1 scenario considers only two feeds to the MBC, one at Lakepointe and one at the Blackburn Bypass. It is anticipated, as shown in **Figure 4**, that all areas of the MBC will be provided with at least **13,000Lpm** of MXDY fireflow along the trunk watermains with the exception of locations along Tenth Line. The existing 152mm diameter watermain along Tenth Line restricts the flow significantly in this area; as such resulting fireflows at certain locations along Tenth Line may only reach **6500Lpm**. Considering that there is future commercial development proposed along Tenth Line there may be a requirement to upgrade the Tenth Line watermain to a larger diameter in order to provide the appropriate fireflows.

The second scenario modeled (build-out) was identical to the Phase 1 scenario with the exception that two additional feeds from Avalon South were opened. (The feeds along Mer Bleue remained closed). As shown in **Figure 5**, the additional feeds from Avalon South significantly increase the available flows in the southern portion of MBC. It is noted however that even with the additional feeds, the flows along the small diameter watermain on Tenth Line remain as low as **6500Lpm**.

Peak Hour (PKHR)

Figure 6 shows that under the peak hour demand conditions for Phase 1, the minimum pressures in the MBC distribution system along the large diameter trunk watermain are anticipated to be approximately 50 psi (345 kPa). **Figure 7** shows similar pressures are anticipated even with the additional two feeds. This minimum pressure is within the allowable range of 40 psi (275kPa) to 100psi(700kPa).

Reliability – BSDY + Fire + Break

A reliability analysis was carried out to determine whether the distribution system is capable of providing adequate fireflows under an emergency watermain break scenario. This analysis was carried out using an overall BSDY demand. Two critical break locations were modeled.

The first break location was along the 406mm diameter feed on Tenth Line north of Lakepointe as shown in **Figure 8**. Under this emergency condition, fireflows between 13,000 and 30,000 Lpm could be provided to the MBC (not including fireflows on Tenth Line). In general, this means that the system would be capable of providing at least **13,000Lpm** to all locations along the trunk watermains in MBC under this failure scenario.

A second break location was created in the proposed 406mm diameter watermain along Lakepointe just west of Tenth Line as shown in **Figure 9**. This is considered to be the most critical situation as available flows drop to the **8,000 to 10,000 Lpm** range in the MBC due to only one 305mm diameter feeding the community.

A third reliability scenario considered the same failure described in the previous scenario along Lakepointe St. however it also included an upgrade to the Tenth Line watermain (to 406mm diameter) between Lakepointe St. and the 305mm diameter Blackburn Bypass (**Figure 10**). The results show that this upgrade improves the overall system, increasing available flows to the **10,000 to 13,000Lpm** range.

The last reliability scenario considered the same failure noted in previous scenario along Lakepointe with the Tenth Line upgrade (406mm diameter between Lakepointe St. and the 305mm diameter Blackburn Bypass) and included a link to the Notre Dame des Champs water distribution network in the southwest corner (**Figure 11**). This connection significantly improved the available flows to values over **18,000Lpm**.

Conclusion

Stantec carried out a hydraulic analysis for the large diameter watermain network proposed for the MBC. Various demand conditions were modeled to determine anticipated flows and pressures under different network configurations. The results of this analysis indicate that the watermain network proposed in **Figure 12** is capable of providing appropriate flows throughout the community under typical, fire and emergency conditions. It is noted that in order to achieve commercial fireflows along Tenth Line (with a 152 mm diameter watermain), services will have to be looped into the commercial areas from the adjacent east-west large diameter watermains.

Should there be any questions regarding the findings presented in this letter, please contact the undersigned.

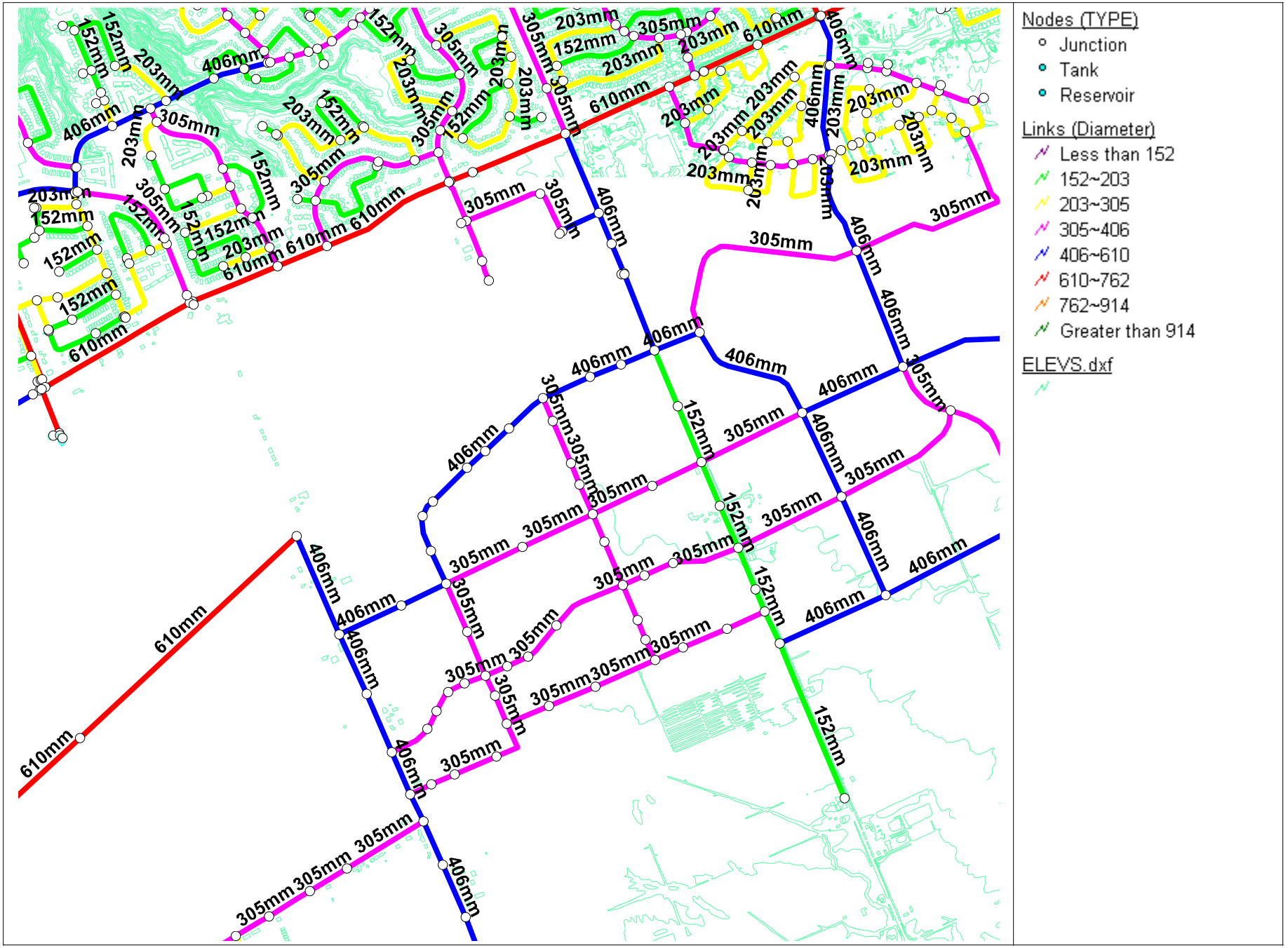
Yours truly,

STANTEC CONSULTING LTD.

Kevin Alemany, M.A.Sc., P.Eng.
Environmental Engineer
Tel: (613) 724-4091
Fax: (613) 722-2799
kalemany@stantec.com

ka v:\01-634\active\1634_00620 n5 sanitary overflow\preliminary\correspondence\letter\ltr_mer_bleue_cdp_ka_c15_2006.doc

Figure 12: Recommended watermain diameters (mm) for MBC



Prepared By: Kevin Alemany, M.A.Sc., P.Eng

Date: Wednesday, March 15, 2006

Orleans Family Health Hub

Stormwater Management & Servicing Report

Type of Document:
Site Plan Application

Project Name:
Orleans Family Health Hub (OFHH)

Project Number
OTT-00240132-A0

Prepared By:
exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
Canada

Date Submitted
April 5, 2018

WATERMAIN TABLE

STATION	DESCRIPTION	GROUND ELEVATION	TOP OF WATERMAIN
0+000	CONNECTION TO EXISTING	±88.41	±86.01
0+10		88.25	85.85
0+20		88.26	85.86
0+21	TEE c/w THRUSTBLOCK	88.26	85.86
0+30		88.36	85.96
0+40		88.16	85.76
0+50		88.15	85.75
0+60		88.28	85.88
0+70		88.39	85.99
0+73.8	VALVE & VLAVE BOX	88.43	86.03
0+80		88.49	86.09
0+90		88.55	86.15
0+97.6	TEE c/w THRUSTBLOCK	88.43	86.03
0+100		88.35	85.95
0+103.2	VALVE & VLAVE BOX	88.29	85.89
0+110		88.27	85.87
0+120		88.27	85.87
0+130		88.27	85.87
0+140		88.45	86.05
0+150		88.77	86.37
0+160		88.58	86.18
0+167.5	TEE c/w THRUSTBLOCK	88.76	86.36
0+170	TEE c/w THRUSTBLOCK	88.76	86.36
0+180		88.80	86.40
0+190	VALVE & VLAVE BOX	88.93	86.53
0+200		89.05	86.65
0+201.2	CAP 1.0m FROM BUILDING FACE	89.04	86.64
1+00	TEE c/w THRUSTBLOCK	88.26	85.86
1+10		87.78	85.38
1+13.8	VALVE & VLAVE BOX	87.75	85.35
1+20			
1+30			
1+40			
1+49.9	CAP 1.0m FROM BUILDING FACE	87.85	85.45
2+00	TEE c/w THRUSTBLOCK		
2+10		88.49	86.09
2+20		88.45	86.05
2+30		88.57	86.17
2+31.6	VALVE & VLAVE BOX	88.60	86.20
2+35.8	TEE c/w THRUSTBLOCK	88.63	86.23
2+40		88.67	86.27
2+50		88.71	86.31
2+60		88.78	86.38
2+70		88.80	86.40
2+80		88.70	86.30
2+90		88.70	86.30
2+100		87.60	85.20
2+104.9			
2+110	TEE c/w THRUSTBLOCK	88.76	86.36

WATERMAIN TABLE

STATION	DESCRIPTION	GROUND ELEVATION	TOP OF WATERMAIN
4+00	TEE c/w THRUSTBLOCK	88.70	86.30
4+10		88.70	86.30
4+20		88.70	86.30
4+30		88.80	86.40
4+40		88.80	86.40
4+50		88.80	86.40
4+60		88.80	86.40
4+70		88.80	86.40
4+80		88.80	86.40
4+90		88.80	86.40
4+100		88.80	86.40
4+110		88.80	86.40
4+120		88.80	86.40
4+130		88.80	86.40
4+134.9	45° BEND	88.70	86.30
4+140		88.70	86.30
4+150		88.70	86.30
4+156.6	45° BEND	88.70	86.30
4+160		88.70	86.30
4+170		88.70	86.30
4+180		88.70	86.30
4+184.8	45° BEND	88.70	86.30
4+190		88.70	86.30
4+196.8	VALVE & VLAVE BOX	88.70	86.30
4+200	FIRE HYDRANT	88.40	86.00

SANITARY SEWER STRUCTURE TABLE

STRUCTURE NUMBER	STRUCTURE TYPE	FRAME & COVER
SAN 301	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
SAN 302	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
SAN 303	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
SAN 303	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1

STORM SEWER STRUCTURE TABLE

STRUCTURE NUMBER	STRUCTURE TYPE	FRAME & COVER
CB101	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB102	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB103	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB104	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB105	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB106	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB107	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB108	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB109	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB110	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB111	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB112	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB113	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB114	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB115	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB116	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB117	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB118	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB119	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB120	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB121	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB122	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB123	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB124	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB125	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB126	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB127	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB128	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB129	600 x 600, OPSD 705.010	OPSD 400.020, S19
CB130	600 x 600, OPSD 705.010	OPSD 400.020, S19

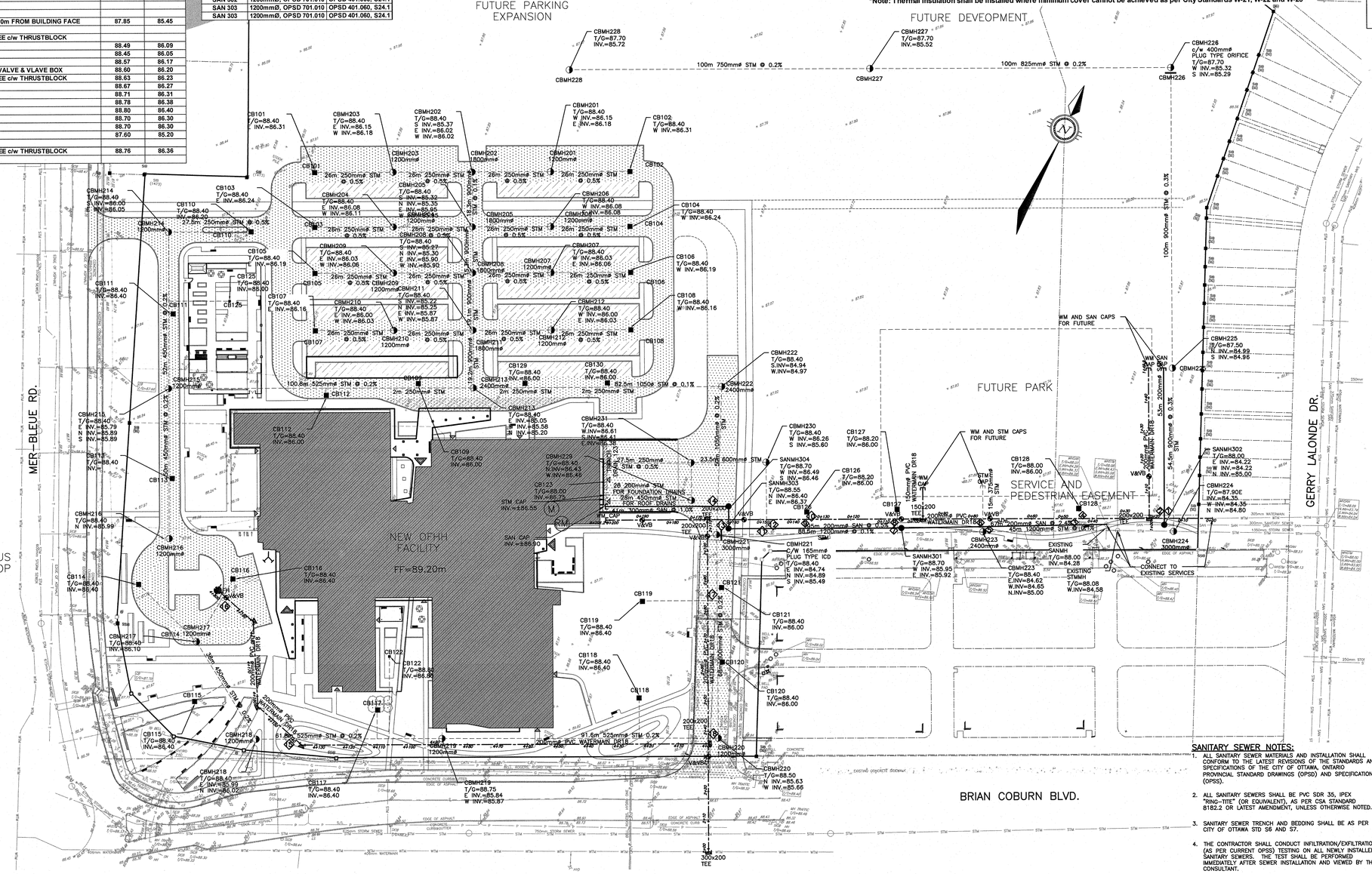
STORM SEWER STRUCTURE TABLE

STRUCTURE NUMBER	STRUCTURE TYPE	FRAME & COVER
CBMH201	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH202	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH203	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH204	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH205	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH206	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH207	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH208	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH209	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH210	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH211	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH212	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH213	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH214	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH215	1500mmØ, OPSD 701.011	OPSD 401.060, S24.1
CBMH216	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH217	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH218	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH219	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH220	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH221	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH222	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH223	3000mmØ, OPSD 701.014	OPSD 401.060, S24.1
CBMH224	3000mmØ, OPSD 701.014	OPSD 401.060, S24.1
CBMH225	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH226	2400mmØ, OPSD 701.013	OPSD 401.060, S24.1
CBMH227	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH228	1800mmØ, OPSD 701.012	OPSD 401.060, S24.1
CBMH229	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1
CBMH230	1500mmØ, OPSD 701.011	OPSD 401.060, S24.1
CBMH231	1200mmØ, OPSD 701.010	OPSD 401.060, S24.1

WATERMAIN / SEWER CROSSING TABLE

LOCATION	STORM SEWER Invert Elev	STORM SEWER Dia. (mm)	STORM SEWER Obvert Elev	SANITARY SEWER Invert Elev	SANITARY SEWER Dia. (mm)	SANITARY SEWER Obvert Elev	WATERMAIN Invert Elev	WATERMAIN Dia. (mm)	WATERMAIN Obvert Elev	CLEARANCES (mm)
1	84.81	900	85.71				86.01	200	86.21	300mm (STM Below)*
2				85	200	85.2	85.86	200	86.06	660mm (SAN Below)
3	85.4	250	85.65	84.4	200	84.6				800mm (STM Below)
4	85.5	250	85.7				85.00	200	85.20	300mm (STM Below)
5	84.9	300	85.2	85.35	200	85.55				150mm (STM Below)
6	84.95	300	85.25				86.03	200	86.23	780mm (STM Below)
7	85.55	250	85.8	85.95	200	86.15				150mm (STM Below)
8	85.6	250	85.85				86	200	86.2	150mm (STM Below)*
9	85.6	250	85.85	86.1	200	86.3				250mm (STM Below)
10	85.65	250	85.9				86.05	200	86.25	150mm (STM Below)*
11	85.3	600	85.9	86.25	200	86.45				350mm (STM Below)
12	85.35	600	85.95				86.25	200	86.45	250mm (STM Below)*
13				86.4	200	86.6	85.9	200	86.1	300mm (WM Below)
14	84.91	1050	85.96	86.5	200	86.7				540mm (STM Below)
15	85.95	525	86.48				86.7	200	86.9	220mm (STM Below)*
16	86.38	250	86.63				85.9	200	86.1	280mm (WM Below)
17	85.8	250	86.05				86.3	200	86.5	250mm (STM Below)
18	85.66	525	86.19				86.35	200	86.55	140mm (STM Below)*

***Note: Thermal Insulation shall be installed where minimum cover cannot be achieved as per City Standards W-21, W-22 and W-23**



LEGEND

- PROPERTY LINES
- 200mmø WATERMAIN — PROPOSED WATER MAIN
- 300mmø SAN — PROPOSED SANITARY SEWER
- 450mmø STM — PROPOSED STORM SEWER
- PROPOSED FENCE
- PROPOSED SILT FENCE
- PROPOSED RETAINING WALL
- EXISTING SWALE
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN MANHOLE
- V&VB — PROPOSED VALVE & VALVE BOX
- PROPOSED THRUST BLOCK
- FH — PROPOSED FIRE HYDRANT
- CONCRETE
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED HEAVY DUTY ASPHALT
- *88.33 — EXISTING GRADE
- 88.70 — PROPOSED GRADE
- PROPOSED SIAMESE CONNECTION
- M — PROPOSED WATER METER
- RM — PROPOSED REMOTE WATER METER

GENERAL NOTES:

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE.
2. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE LOCATION AND STATUS OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION OF PLANT AND EQUIPMENT FROM DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING SERVICES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL CONFIRM LOCATIONS AND ELEVATIONS OF EXISTING SERVICES AND STRUCTURES TO BE CONNECTED TO AND EXISTING SERVICES THAT MAY BE DAMAGED OR CAUSE CONFLICTS PRIOR TO CONSTRUCTION OF ANY NEW SEWER, WATER AND/OR STORM WATER WORKS. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES, INTERPRETATIONS, CHANGES AND ADDITIONS TO THESE DRAWINGS MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER, WHEN NOTED AND BEFORE PROCEEDING WITH CONSTRUCTION WORKS. DO NOT CONTINUE CONSTRUCTION IN AREAS WHERE DISCREPANCIES APPEAR UNTIL SUCH DISCREPANCIES HAVE BEEN RESOLVED.
4. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED. ALL DRAWINGS SHOULD NOT BE SCALED BY THE CONTRACTOR. ANY MISSING OR QUESTIONABLE DIMENSIONS ARE TO BE CONFIRMED WITH THE ENGINEER IN WRITING.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND BEAR COST OF THE SAME.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS", THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION, BACKFILL AND REINSTATEMENT OF ALL AREAS DISTURBED DURING CONSTRUCTION TO THE SATISFACTION OF THE CONSULTANT, THE CITY OF OTTAWA AND THE AUTHORITY HAVING JURISDICTION.
8. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL COMPLY WITH THE CITY OF OTTAWA REQUIREMENTS FOR TRAFFIC CONTROL WHEN WORKING ON CITY STREETS. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE M.T.O. MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST AMENDMENT).
10. EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE.
11. THE SITE LAYOUT IS THE RESPONSIBILITY OF THE CONTRACTOR. AS-BUILT SITE SERVICING & GRADING DRAWINGS SHALL BE MAINTAINED ON SITE BY THE CONTRACTOR.
12. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT.
13. CIVIL DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, STRUCTURAL, LANDSCAPE AND LEGAL DRAWINGS.

STORM SEWER NOTES:

1. ALL STORM SEWER MATERIALS AND INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
3. THE CONTRACTOR SHALL CONSTRUCT FLEXIBLE STORM SEWERS IN ACCORDANCE WITH OPSD 802.010 AND 802.013. RIGID STORM PIPE SHALL BE CONSTRUCTED IN ACCORDANCE WITH OPSD 802.030. DURING CONSTRUCTION THE CONTRACTOR SHALL PROTECT THE PIPES FROM HEAVY CONSTRUCTION EQUIPMENT. BEDDING AND BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% SPMDD.
4. SEWER BEDDING AS PER CITY STANDARD S6 & S7.
5. WITHIN THE FROST ZONE, THE BACKFILL IN THE SERVICE TRENCHES SHOULD MATCH THE SOIL ON SIDES TO MINIMIZE DIFFERENTIAL FROST HEAVING IN THE SUBGRADE.
6. THE CONTRACTOR SHALL CONDUCT CCTV INSPECTION OF ALL NEWLY INSTALLED STORM SEWERS AND EXISTING SEWERS CONNECTED TO. THE TEST SHALL BE PERFORMED IMMEDIATELY AFTER SEWERS INSTALLED.
7. ALL CATCH BASIN LEADS TO BE 250mm DIAMETER WITH A SLOPE OF 0.5% UNLESS NOTED OTHERWISE.

SANITARY SEWER NOTES:

1. ALL SANITARY SEWER MATERIALS AND INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. ALL SANITARY SEWERS SHALL BE PVC SDR 35, IPEX "RING-TITE" (OR EQUIVALENT), AS PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE NOTED.
3. SANITARY SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD S6 AND S7.
4. THE CONTRACTOR SHALL CONDUCT INFILTRATION/EXFILTRATION (AS PER CURRENT OPSS) TESTING ON ALL NEWLY INSTALLED SANITARY SEWERS. THE TEST SHALL BE PERFORMED IMMEDIATELY AFTER SEWER INSTALLATION AND VIEWED BY THE CONSULTANT.
5. THE CONTRACTOR SHALL CONDUCT CCTV INSPECTION OF ALL NEWLY INSTALLED SANITARY SEWERS AND EXISTING SEWERS CONNECTED TO. THE TEST SHALL BE PERFORMED IMMEDIATELY AFTER SEWERS INSTALLED.
6. THE CONTRACTOR SHALL CONSTRUCT FLEXIBLE SANITARY SEWERS IN ACCORDANCE WITH OPSD 802.010 AND 802.013. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROTECT THE PIPES FROM HEAVY CONSTRUCTION EQUIPMENT. BEDDING AND BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% SPMDD.
7. ALL SANITARY BUILDING DRAINS TO BE EQUIPPED WITH SANITARY BACKWATER VALVES INSTALLED PER CITY OF OTTAWA STANDARD DRAWING S14.1.
8. WITHIN THE FROST ZONE, THE BACKFILL IN THE SERVICE TRENCHES SHOULD MATCH THE SOIL ON SIDES TO MINIMIZE DIFFERENTIAL FROST HEAVING IN THE SUBGRADE.

WATERMAIN NOTES:

1. ALL WATERMAIN MATERIALS AND INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. NO WORK SHALL COMMENCE UNLESS A CITY WATER WORKS INSPECTOR IS ON SITE. WATERMAIN CONNECTIONS BY CITY OF OTTAWA FORCES WITH ALL EXCAVATION BACKFILL AND ROAD REINSTATEMENT BY CONTRACTOR.
3. WATERMAINS TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17, UNLESS OTHERWISE SPECIFIED.
4. ALL WATERMAINS TO BE INSTALLED AT MINIMUM COVER OF 2.4m. THERMAL INSULATION SHALL BE INSTALLED WHERE MINIMUM COVER CANNOT BE ACHIEVED AS PER CITY STANDARDS W-21, W-22 AND W-23.
5. IF WATERMAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.
6. DISINFECTION AND TESTING OF WATERMAIN TO BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS.

PRELIMINARY
NOT FOR CONSTRUCTION

HDR Architecture Associates Inc.
300 Richmond Road. Suite 200, Ottawa, ON K1Z 6X6

exp Services Inc.
T +1.613.688.1899 | F +1.613.225.7330
2650 Queensview Drive, Unit 100
Ottawa, ON K2B 8H6
Canada

Montfort

Orleans Health Hub (OHH)
2225 Mer-Bleue Road
Orleans, ON., K4A 3T8

LICENSED PROFESSIONAL ENGINEER
M.A. ANSARI
APR 13 2018
PROVINCE OF ONTARIO

MARK	DATE	DESCRIPTION
01.	2017-11-22	MOHLTC Stage 3.2 Submission
02.	2018-04-05	SITE PLAN APPLICATION

Project Number: OTT-00240132-A0
Original Issue

Sheet Name
OHH - SITE SERVICING PLAN

Scale: HORIZONTAL 1:600 (0, 6m, 12m, 24m)

Sheet Number
C-001

Project Status

• Taggart Group of Companies

Infrastructure Servicing Brief

Type of Document
Issued for Site Plan Application

Project Name
Chaperal – Site Plan

Project Number
2762

Prepared By:

exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
Canada

Date Submitted
February 22, 2013
August 22, 2013 – Revision 1
October 8, 2013 – Revision 2
November 20, 2013 – Revision 3

WATERMAIN SCHEMATIC

CHAPERAL – BLOCK '20'

Figure 2