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- Commercial & Institutional
- Environmental Restoration

2175 Prince of Wales Drive Ottawa, ON

Serviceability Report

2175 PRINCE OF WALES DRIVE
OTTAWA, ONTARIO

SERVICEABILITY REPORT

Prepared By:

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

September 2015
Revised: July 17, 2024

Ref: R-2015-035
Novatech File: 117074 (formerly 107005)

NOVATECH
Engineers, Planners & Landscape Architects

July 12, 2024

City of Ottawa
Planning and Growth Management Department
4th Floor
110 Laurier Avenue West
Ottawa, Ontario
K1P 1J1

Attention: Keiran Watson, Planner II

Dear Mr. Belan:

Re: 2175 Prince of Wales Drive
Serviceability Report
Our File No.: 117074 (formerly 107005)

Please find enclosed the Serviceability Report for the above noted property. This report has been revised per City comments and is submitted in support of a Zoning Amendment Application for the property at 2175 Prince of Wales Drive.

If you have any questions, please contact the undersigned.

Sincerely,

NOVATECH

Cara Ruddle, P.Eng.
Senior Project Manager
Land Development

cc:

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1.0. INTRODUCTION

Novatech has been retained by Zena Investment Corporation to prepare a Serviceability Report in support of a Zoning Amendment Application. The site is located at 2175 Prince of Wales Drive within the City of Ottawa. *Figure 1* is a Key Plan showing the site location.

2.0. EXISTING AND PROPOSED DEVELOPMENT

The property is approximately 3.22 hectares in size. The property is currently undeveloped vacant land with 2 existing accesses from Prince of Wales Drive and 2 existing accesses from Waterbend Lane. The topography of the site is relatively flat with a gentle slope towards the east side of the site. The slope increases along the east side of the property adjacent to the Rideau River, it also increases as it drains to an existing watercourse on the north side of the property outletting to the Rideau River. The site is bounded by West Hunt Club Rd and the existing watercourse to the north, Rideau River to the east, residences fronting on Waterbend Lane to the south, and Prince of Wales Drive to the West. *Figure 2* shows the existing conditions.

The proposed development is not defined at this time. It is anticipated that commercial or light industrial use buildings will be constructed.

The purpose of this report is to demonstrate that commercial and/or light industrial uses can be serviced with the existing Municipal infrastructure surrounding the subject site.

3.0. WATER SERVICING

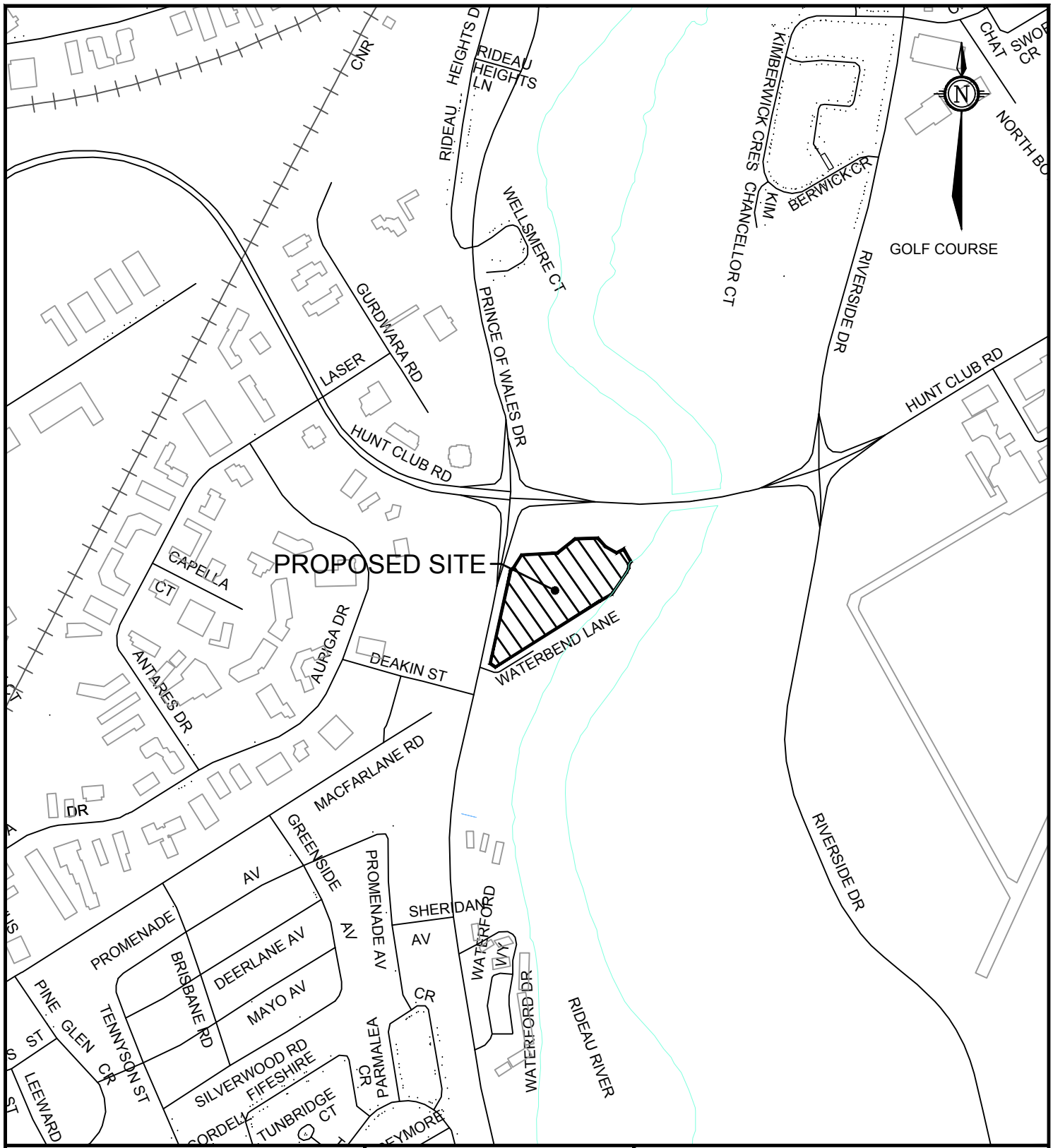
There is an existing 400mm diameter watermain within the Prince of Wales right-of-way and a 150mm diameter watermain in Waterbend Lane. A portion of the City watermain mapping is provided in Appendix A for reference.

A water service connection could be made to either of the two existing watermains noted above to service the subject property. Calculations have been prepared for both industrial and commercial uses. Preliminary water demands and fire flows have been calculated as follows:

Use	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
Industrial Use	2.05	3.08	5.54	250
Commercial Use	1.04	1.56	2.81	217

The maximum water demands were provided to the City and the following boundary conditions were provided for both the 150mm watermain in Waterbend Lane and the 400mm watermain in Prince of Wales Drive. Correspondence is provided in Appendix A for reference.

Waterbend Lane:
Minimum HGL = 124.2m (52.9 psi)
Maximum HGL = 132.0m (63.9 psi)
Max Day + Fire Flow (89L/s) = 101.1m (20 psi)
Max Day + Fire Flow (91L/s) = 101.1m (20 psi)



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

2175 PRINCE OF WALES DRIVE

KEY PLAN

SCALE		
NTS		
DATE	JOB	FIGURE
JUL 2024	117074	1

M:\2017\117074\CAD\Design\Figures\Report Figures\117074-KP.dwg, KP, Jul 12, 2024 - 1:53pm, madeoti

SHT8X11.DWG - 216mmx279mm

M:\2017\117074\CAD\Design\Figures\Report Figures\117074-FIG2.dwg, EXCOND, Jul 12, 2024 - 2:26pm, madeoli

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2175 PRINCE OF WALES DRIVE

EXISTING CONDITIONS

SCALE 1 : 2500 (0, 25, 50, 75, 100)

DATE	JOB	FIGURE
JUL 2024	117074	2

SHT11X17.DWG 279mmX432mm

Prince of Wales:
Minimum HGL = 124.2m (52.9 psi)
Maximum HGL = 132.0m (63.9 psi)
Max Day + Fire Flow (250L/s) = 126.9m (56.7 psi)
Max Day + Fire Flow (217L/s) = 126.5m (56.2 psi)

The water results are summarized in the table below.

Table 3.0 Water Analysis Results Summary

Condition	Street	Demand (L/s)	Min/Max Allowable Operating Pressures (psi)	Limits of Design Operating Pressures (psi)
High Pressure	Waterbend	2.05	80psi (Max)	63.9
	Prince of Wales			63.9
Maximum Daily Demand and *Fire Flow* Industrial / Commercial	Waterbend	89 / 91	20psi (Min)	20.0 / 20.0
	Prince of Wales	250 / 217		56.7 / 56.1
Peak Hour	Waterbend	5.54	40psi (Min)	52.9
	Prince of Wales			52.9

Based on the boundary conditions provided by the City, the watermain along Prince of Wales could provide adequate water supply for domestic water and fire flow demands while the watermain along Waterbend Lane could only provide adequate water supply for domestic water demand. If a connection is made to the existing watermain along Waterbend Lane, a dry hydrant or a fire pump and an onsite fire suppression water storage tanks will be needed to meet the fire flow pressure demand. There is also the possibility of upsizing a portion of the existing watermain along Waterbend Lane to a 200 or 300mm diameter watermain to service the property. This can be reviewed in more detail when a defined development concept has been prepared.

The existing watermain infrastructure can provide adequate water supply for domestic water and fire flow demands. Refer to *Figure 3* Conceptual Servicing Plan for the existing watermain information and proposed service locations.

4.0. SANITARY SERVICING

There is an existing 525mm diameter sanitary sewer within the Prince of Wales right-of-way and an existing 200mm diameter sanitary sewer within the Waterbend Lane right-of-way. A portion of the City sewer mapping is included in Appendix B for reference.

Flows for the proposed development have been estimated for both industrial and commercial uses and are 11.0 L/s and 2.0 L/s respectively. Sanitary flow calculations are also included in Appendix B for reference.

The subject property can be serviced with a connection to either of the two existing sanitary sewers noted above. *Figure 3* Conceptual Servicing Plan shows the two servicing options. The

HUNT CLUB ROAD

EXISTING FIRE HYDRANT

EX. 2176 PRINCE OF WALES DRIVE

EX. 400mmØ WM

EX. 525mmØ SAN SEWER

PRINCE OF WALES DRIVE

PROPOSED WATER SERVICE OPTION 2

PROPOSED SANITARY SERVICE OPTION 2

PROPOSED STORM OUTLET

PROPOSED WATER SERVICE OPTION 1

PROPOSED SANITARY SERVICE OPTION 1

WATERBEND LANE

EX. 200mmØ PVC SAN

EX. 150mmØ D.I. WM

EXISTING FIRE HYDRANT

EX. 400mmØ D.I. WM

2

6

8

10

12

RIDEAU RIVER

LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER

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Website www.novatech-eng.com

2175 PRINCE OF WALES DRIVE

CONCEPTUAL SERVICING PLAN

SCALE 1 : 1000 (0, 10, 20, 30, 40)

DATE JUL 2024 | JOB 117074 | FIGURE 3

existing sanitary sewer along Waterbend Lane only services the 5 existing residential dwellings along this road and has excess capacity to service the subject property. This existing sewer drains into the existing 525mm diameter sanitary sewer along Prince of Wales Drive. The 525mm diameter sanitary sewer along Prince of Wales Drive is considered a collector sewer and a direct service connection will likely not be the City's preferred alternative.

The site is serviceable from the existing municipal sanitary sewer system and the recommended option is to connect to the existing sanitary sewer along Waterbend Lane.

5.0. STORM SERVICING

As indicated previously the site is currently undeveloped vacant land. Stormwater currently sheet drains to the Rideau River along the east side of the property and to the existing watercourse along the north side of the property that drains into the Rideau River. The existing watercourse along the north property limit is an outlet for an existing 1650mm diameter trunk storm sewer servicing an area west of Prince of Wales Drive. A portion of the City sewer mapping is included in Appendix C for reference.

Development of the subject property would cause an increase in the existing storm runoff from the property. Therefore, stormwater management is required including both quality and quantity control. However, due to the close proximity to the Rideau River, it is recommended that storm flows be released directly from the site without quantity control. Storm flows from the site would outlet into the Rideau River well before the natural peak occurs in the river from the upstream watershed.

The site will continue to outlet to the Rideau River in post-development conditions. During detailed design, the velocity of the stormwater being released will need to be reviewed to ensure there are no negative impacts or erosive effects to the receiving watercourse. Refer to *Figure 3* Conceptual Servicing Plan for a proposed storm outlet location. Quality control of stormwater can be provided through the installation of an Oil Grit Separator (OGS) unit prior to release from the site.

Preliminary stormwater calculations have been prepared. The pre-development release rate is calculated to be 112.4 L/s and 240.8 L/s for the 5 and 100 year storm events respectively. Post-development flows are estimated to be 477.6 L/s and 914.9 L/s for the 5 and 100 year storm events respectively. A drainage area plan and stormwater calculations are provided in Appendix C for reference.

During storms, in excess of the 100 year storm event, the existing overland flow route is to the Rideau River. This overland flow route would be maintained and incorporated into the design of the subject property.

Therefore, the site is serviceable in terms of storm servicing and stormwater management. Once a defined development plan has been prepared, detailed stormwater calculations can be provided.

6.0. EROSION AND SEDIMENT CONTROL MEASURES

Temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter bags will be placed under the grates of nearby catchbasins and manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

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

7.0. CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this report are as follows:

- Water servicing, including both domestic and fire protection, can be provided by connection to the existing watermain infrastructure within Prince of Wales Drive. The watermain within Waterbend Lane can provide servicing for domestic flows and some additional measures may be required for fire protection depending on the type of development.
- Sanitary servicing can be provided from the existing sanitary sewer within Waterbend Lane or Prince of Wales Drive.
- Stormwater can outlet, as per existing conditions, to the Rideau River or the existing watercourse along the north property limit.
- Stormwater management is required for the development however, quantity control is not recommended given the close proximity of the site to the Rideau River. The velocity of stormwater will be reviewed as part of the detailed design to ensure there are no negative impacts to the receiving watercourse.
- Quality control of stormwater can be provided through the installation of an oil grit separator unit prior to release of stormwater from the site.
- An overland flow route will be provided.
- Erosion and sediment control measures will be implemented during construction.

NOVATECH

Prepared by:

Cara Ruddle, P.Eng
Project Manager

Reviewed by:

J. Lee Sheets, CET
Sr. Project Manager

APPENDIX A
Watermain Information

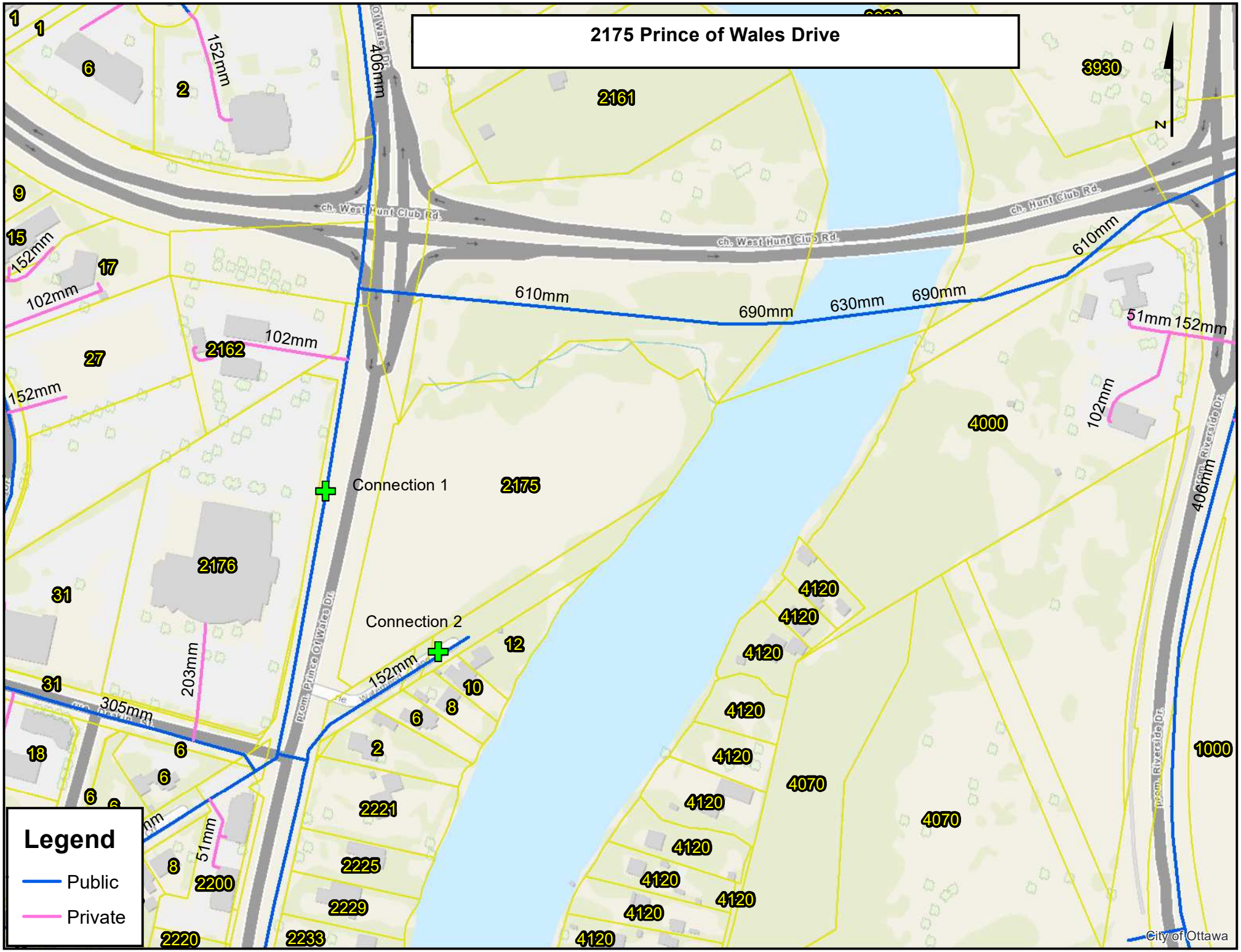

2175 Prince of Wales Drive
Connection 1
Connection 2
Legend
Public
Private
City of Ottawa

Table 1

Water Demand

	Area (ha)	Demand (L/s)		
		Avg Day	Max. Daily	Peak Hour
Industrial Use	**3.22**	2.05	3.08	5.54
Commercial Use	**3.22**	1.04	1.56	2.81

Notes:

Avg. Daily Demand:		
- Heavy Industrial	55000	L/ha/day
- Commercial	28000	L/ha/day
Max. Daily Demand:	1.5	x Avg. Day
Peak Hourly Demand:	1.8	x Max. Day

Per City of Ottawa *Water Distribution Systems Design Guidelines, 2010*

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 117074
Project Name: 2175 Prince of Wales Drive
Date: 5/31/2024
Input By: Leonel Perez
Reviewed By: Cara Ruddle
Drawing Reference:

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multi-Storey Industrial Building
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	8000			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**20,000**	
	F	**Base fire flow without reductions**				**25,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	0%	**25,000**
		Limited combustible		-15%		
		Combustible	Yes	0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-10,000**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	24000	100%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**0**
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**0%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**15,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**250**
				or	USGPM	3,963

FUS - Fire Flow Calculations

Engineers, Planners & Landscape Architects

Novatech Project #: 117074
Project Name: 2175 Prince of Wales Drive
Date: 5/31/2024
Input By: Leonel Perez
Reviewed By: Cara Ruddle
Drawing Reference:

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020) Formula Method

Building Description: Multi-Storey Commercial Building
Type I - Fire resistive construction (2 hrs)

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.6	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)	Yes	0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	8000			
		Number of Floors/Storeys	4			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**24,000**	
	F	**Base fire flow without reductions**				**20,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	0%	**20,000**
		Limited combustible		-15%		
		Combustible	Yes	0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-7,500**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Sub-Total	**-50%**	
		Area of Sprinklered Coverage (m^2)	24000	75%		
				Cumulative Total	**-38%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**0**
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**0%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**13,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**217**
				or	USGPM	3,435

FW: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

Cara Ruddle <c.ruddle@novatech-eng.com>

Mon 7/8/2024 3:41 PM

To:Micheal Adeoti <m.adeoti@novatech-eng.com>;Jesse Appiah-Kubi <j.appiah-kubi@novatech-eng.com>

1 attachments (644 KB)

2175 Prince of Wales Drive June 2024.pdf;

Please update the calculations and Serviceability Report based on the below water boundary conditions.

Thanks.

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719

From: Brault, Ryan <ryan.brault@ottawa.ca>
Sent: Wednesday, July 3, 2024 5:29 PM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Subject: RE: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

Hi Cara,

Please find the below boundary conditions for the 2175 Prince of Wales Drive site:

The following are boundary conditions, HGL, for hydraulic analysis at 2175 Prince of Wales Drive (zone 2W2C) assumed to be connected to the 406mm watermain on Prince of Wales Drive or the 152mm watermain on Waterbend Lane (see attached PDF for location).

Scenario 1 (Industrial):

Minimum HGL = 124.2 m

Maximum HGL = 132.0 m

Max Day + Fire Flow (250 L/s) at Prince of Wales Drive connection = 126.9 m

Max Day + Available Fire Flow at 152mm on Waterbend Lane is 89 L/s with a residual pressure of 20 psi

Scenario 2 (Commercial):

Minimum HGL = 124.2 m

Maximum HGL = 132.0 m

200Max Day + Fire Flow (217 L/s) at Prince of Wales Drive connection = 126.5 m

Max Day + Available Fire Flow at 152mm on Waterbend Lane is 91 L/s with a residual pressure of 20 psi

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

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Please note that the Fire Flow is not met at connection 2 (Waterbend Lane).

Please let me know if you have any questions.

Regards,

Ryan Brault, M.Eng., P.Eng
Project Manager - Infrastructure Approvals

City of Ottawa
Development Review - West Branch
Planning, Development, and Building Services
110 Laurier Ave West, 4th Floor East;
Ottawa ON K1P 1J1
Tel: 613-580-2424 x 32540

From: Cara Ruddle <c.ruddle@novatech-eng.com>
Sent: July 03, 2024 10:41 AM
To: Brault, Ryan <ryan.brault@ottawa.ca>
Subject: RE: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

That is great news.

Thanks.

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719

From: Brault, Ryan <ryan.brault@ottawa.ca>
Sent: Wednesday, July 3, 2024 10:38 AM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Subject: RE: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

Hi Cara,

I actually received them yesterday but sent a question back to my colleagues to confirm one of the notes they provided.

You should have them by end of day today.

Regards,

Ryan Brault, M.Eng., P.Eng
Project Manager - Infrastructure Approvals

City of Ottawa
Development Review - West Branch
Planning, Development, and Building Services
110 Laurier Ave West, 4th Floor East;
Ottawa ON K1P 1J1
Tel: 613-580-2424 x 32540

From: Cara Ruddle <c.ruddle@novatech-eng.com>
Sent: July 03, 2024 10:01 AM
To: Brault, Ryan <ryan.brault@ottawa.ca>
Subject: RE: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

Ryan:
Just thought I would try to get an update on the timing for these boundary conditions so I can give an update to my client.

Thanks.

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719

From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: Friday, June 14, 2024 11:04 AM
To: Cara Ruddle <c.ruddle@novatech-eng.com>; Brault, Ryan <ryan.brault@ottawa.ca>
Subject: RE: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

Hi Cara,

Ryan Brault will be helping me with this file and will review your BC request. Once he's done his review, he will send it to the City's water modelling team to get you the BC information. This part may take up to 2 weeks after Ryan's review. If he has any questions, he'll reach out to you.

Regards,
Gabrielle (Gabi) Schaeffer, P.Eng
Senior Engineer - Infrastructure Applications

City of Ottawa
Development Review - West Branch
Planning, Development and Building Department
110 Laurier Ave West, 4th Floor East;
Ottawa ON K1P 1J1
Tel: 613-580-2424 x 22517

From: Cara Ruddle <c.ruddle@novatech-eng.com>
Sent: June 14, 2024 8:48 AM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Subject: 2175 Prince of Wales Drive (107005) - Water boundary conditions request

Gabrielle:
Please find attached information for water demands for a proposed development at 2175 Prince of Wales. I am looking to get boundary conditions in order to update a Serviceability Report to support a Zoning Amendment Application. In addition to the water demand and FUS calculations, attached is a portion of the GeoOttawa mapping showing the existing watermain infrastructure surrounding the subject site. Please note that the property could be serviced with either commercial or light industrial use and an FUS calculation has been provided for both uses. Also, a water service could be connected to either the existing 400mm diameter watermain along Prince of Wales or the 150mm diameter watermain along Waterbend Lane. Please provide updated boundaries conditions as soon as possible so that our report can be updated and submitted to the City for review and approval.

Thanks.

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Name : 2175 - Prince of Wales
Date : July 10 / 2024
Project : 117074
By : MA

400mm WM (Prince of Wales)

* Assumed Finished grade = 87.0 ±

Min HGL – 124.2m
Max HGL – 132.0m
Max Day + Fire flow – 126.9m (Industrial)
Max Day + Fire flow – 126.5m (Commercial)

Max Day – 3.08 L/s
Fire flow – 250 L/s (Industrial)
Fire flow – 217 L/s (Commercial)

Avg Day = 132.0m – 87.0m = 45m
≈ 63.9 psi

Peak Hour = 124.2m – 87.0m = 37.2m
≈ 52.9 psi

Max Day + FF (Industrial) = 126.9m – 87.0m = 39.9m
≈ 56.7 psi

Max Day + FF (Commercial) = 126.5m – 87.0m = 39.5m
≈ 56.1 psi

150 mm WM (Waterbend)

Min HGL – 124.2 m
Max HGL – 132.0 m
(Industrial) Max Day + Fire Flow – 89 L/s (Residual 20 psi)
(Commercial) Max Day + Fire Flow – 91 L/s (Residual 20 psi)

Avg. Day = 132.0 m – 87.0 m = 45 m
≈ 63.9 psi

Peak Hour = 124.2 m – 87.0 m = 37.2 m
≈ 52.9 psi

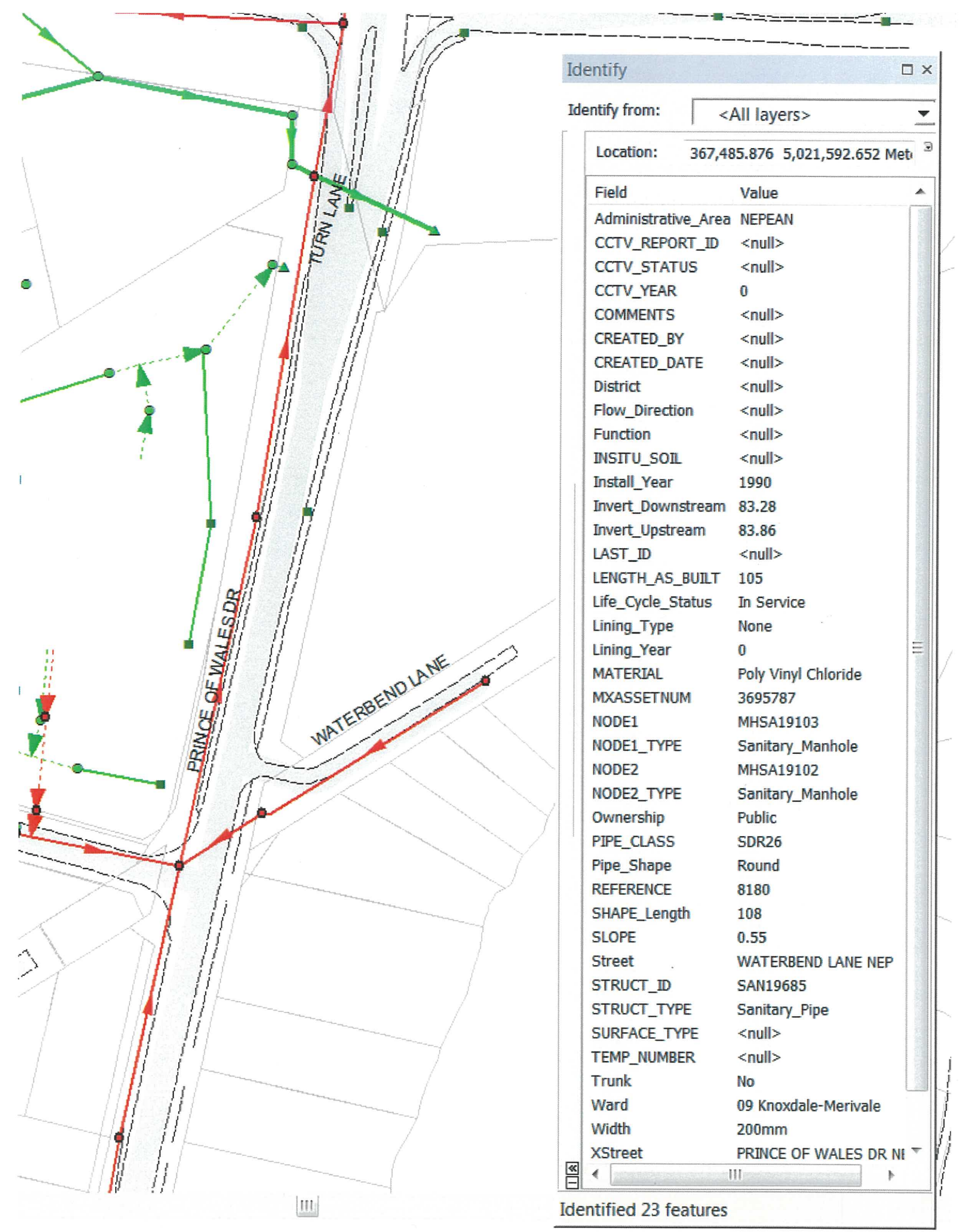
Max Day + FF = 89 L/s @ 20 psi (Industrial)
20 psi = 14.1 m

∴ HGL = 14.1 m + 87.0 m = 101.1 m @ 20 psi

Max Day + FF = 91 L/s @ 20 psi (Commercial)
20 psi = 14.1 m

∴ HGL = 14.1 m + 87.0 m = 101.1 m @ 20 psi

APPENDIX B
Sanitary Calculations



Identify

Identify from: <All layers>

Location: 367,485.876 5,021,592.652 Met

Field	Value
Administrative_Area	NEPEAN
CCTV_REPORT_ID	<null>
CCTV_STATUS	<null>
CCTV_YEAR	0
COMMENTS	<null>
CREATED_BY	<null>
CREATED_DATE	<null>
District	<null>
Flow_Direction	<null>
Function	<null>
INSITU_SOIL	<null>
Install_Year	1990
Invert_Downstream	83.28
Invert_Upstream	83.86
LAST_ID	<null>
LENGTH_AS_BUILT	105
Life_Cycle_Status	In Service
Lining_Type	None
Lining_Year	0
MATERIAL	Poly Vinyl Chloride
MXASSETNUM	3695787
NODE1	MHSA19103
NODE1_TYPE	Sanitary_Manhole
NODE2	MHSA19102
NODE2_TYPE	Sanitary_Manhole
Ownership	Public
PIPE_CLASS	SDR26
Pipe_Shape	Round
REFERENCE	8180
SHAPE_Length	108
SLOPE	0.55
Street	WATERBEND LANE NEP
STRUCT_ID	SAN19685
STRUCT_TYPE	Sanitary_Pipe
SURFACE_TYPE	<null>
TEMP_NUMBER	<null>
Trunk	No
Ward	09 Knoxdale-Merivale
Width	200mm
XStreet	PRINCE OF WALES DR NI

Identified 23 features

PROJECT #: 117074
PROJECT NAME: 2175 PRINCE OF WHALES DRIVE
LOCATION: CITY OF OTTAWA

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DATE PREPARED: March 31, 2015
DATE REVISED: June 24, 2024

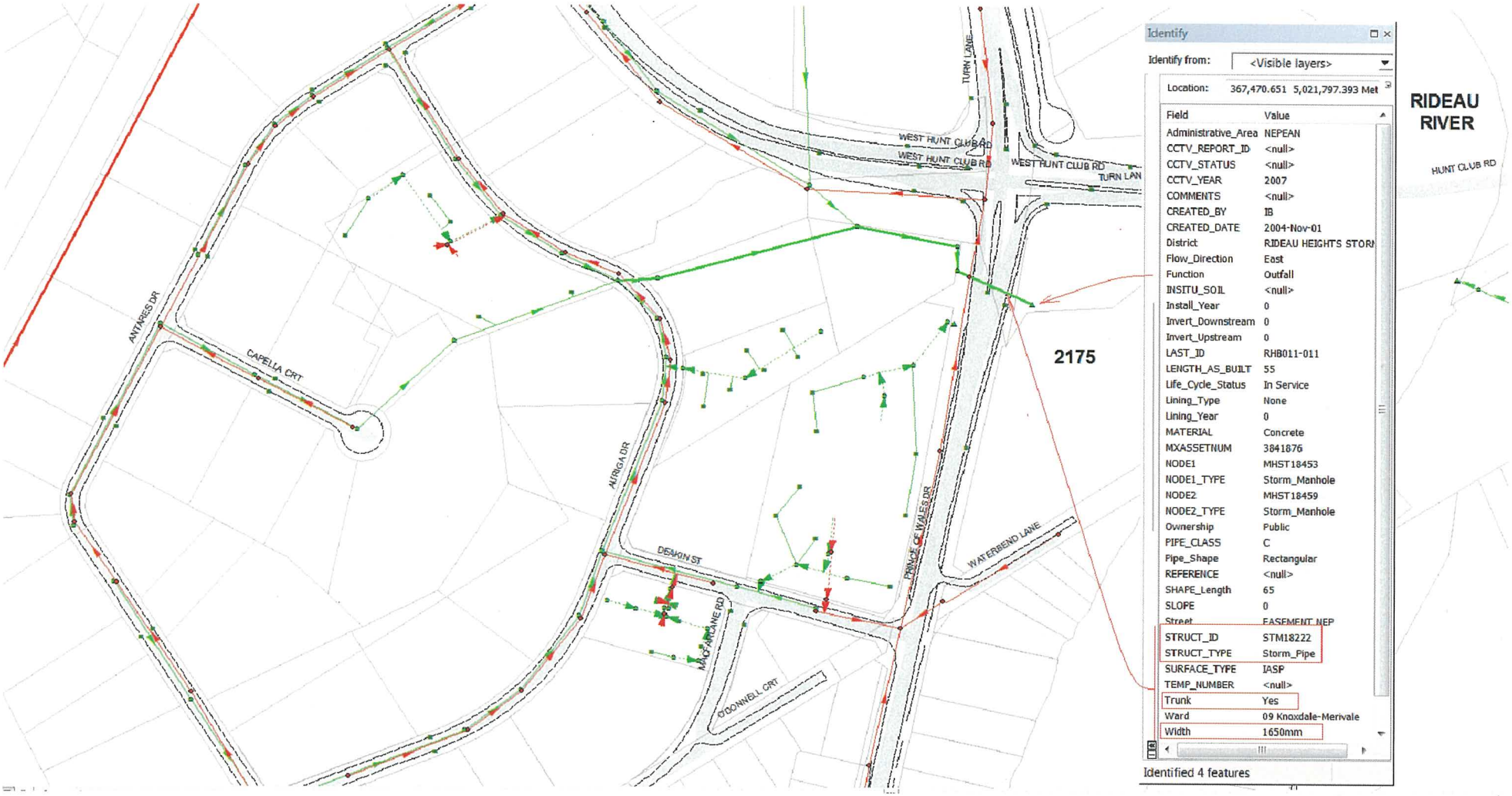
Analysis of Existing Sanitary Sewer on Waterbend Lane

LOCATION			EXISTING RESIDENTIAL					ICI				INFILTRATION				PIPE					
Site Use	FROM	TO	SINGLES Units	SINGLES Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)	Commercial Area (ha)	Industrial Area (ha)	Accum. Area (ha)	Peak Flow (l/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
Industrial	EX SANMH 2	EX SANMH 1	5	16.5	16.5	3.7	0.2		3.22	3.22	9.6	4.08	4.08	1.1	11.0	200	0.55	81	25.4	0.78	43.2%
Commercial	EX SANMH 2	EX SANMH 1	5	16.5	16.5	3.7	0.2	3.22		3.22	1.6	4.08	4.08	1.1	2.9	200	0.55	81	25.4	0.78	11.5%

Design Parameters:

Extraneous Flows = 0.28 l/s/ha
Industrial Flow = 55,000 l/ha/day
Commercial Flow = 28,000 l/ha/day
CHANGES AS PER CITY TECHNICAL BULLETING 2018-01
Peaking Factor Commercial = 1.5
Peaking Factor Heavy Industrial = 4.7 **(Based on Appendix 4-B.1, *Ottawa Sewer Deisgn Guidelines*)**
Domestic Flow:
Avg Flow/Person 280 l/day
Population Density: 3.3 people/unit
Residential Peaking Factor = Harmon Equation (max 4, min 2)
Pipe Friction n = 0.013

APPENDIX C
Stormwater Management Calculations



2175 Prince of Wales Dr – ArcMAP (2015) – Storm Sewer Data

LEGEND

- MAJOR OVERLAND FLOW
- TRIBUTARY AREA
- PRE / 1.94ha / 0.20 — AREA I.D / DRAINAGE AREA / RUNOFF COEFFICIENT
- PROPOSED STM SEWER

HUNT CLUB ROAD

EX. 2176 PRINCE OF WALES DRIVE

PRINCE OF WALES DRIVE

WATERBEND LANE

PROPOSED STORM OUTLET

PRE 1.94ha 0.20

POST 1.94ha 0.85

RIDEA

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Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

2175 PRINCE OF WALES DRIVE

DEVELOPMENT DRAINAGE PLAN

SCALE 1 : 1000 (0 10 20 30 40)

DATE JUL 2024 | JOB 117074 | FIGURE 4

SHT11X17.DWG 279mmX432mm

PROJECT #: 117074

PROJECT NAME: 2175 Prince of Wales Dr
LOCATION: Ottawa, ON
DATE PREPARED: March 2015
DATE REVISED: July 2024

Engineers, Planners & Landscape Architects

TABLE C1: Free Flow **Pre-Development**

Pre-Development Runoff Coefficient "C"

			1:5 Year Event		1:100 Year Event	
Area	Surface	Ha	C	C_5	C	C_{100}
Total	Hard	0.000	0.90	0.20	1.00	0.25
1.940	Soft	1.940	0.20		0.25	

Runoff Coefficient Equation
$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$
$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

Pre-Development Free Flows

Outlet Options	Area (ha)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Overland Free flow	1.940	**112.4**	**240.8**

Time of Concentration	Tc=	10	min
Rainfall Intensity (5 Year Event)	I_5=	104.19	mm/hr
Rainfall Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053)$^{0.814}$

PROJECT #: 117074

PROJECT NAME: 2175 Prince of Wales Dr
LOCATION: Ottawa, ON
DATE PREPARED: March 2015
DATE REVISED: July 2024

NOVATECH
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TABLE C2: Free Flow **Post-Development**

Post-Development Runoff Coefficient "C"

			1:5 Year Event		1:100 Year Event	
Area	Surface	Ha	C	C_5	C	C_{100}
Total	Hard	1.804	0.90	0.85	1.00	0.95
1.940	Soft	0.136	0.20		0.25	

Runoff Coefficient Equation
$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$
$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

Post-Development Free Flows

Outlet Options	Area (ha)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Overland Free flow	1.940	**477.6**	**914.9**

Time of Concentration	Tc=	10	min
Rainfall Intensity (5 Year Event)	I_5=	104.19	mm/hr
Rainfall Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053)$^{0.814}$