SERVICING & STORMWATER MANAGEMENT REPORT
35-37 WILLIAM STREET RE-DEVELOPMENT

Project No.: CP-19-0588

City File No.: D07-12-20-0006

Prepared for:

Domenic Santaguida
35 William Street
Ottawa, ON, K1N6Z9

Prepared by:

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December 18, 2019
Rev01: May 6th, 2020

McINTOSH PERRY

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Domenic Santaguida to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed 4-storey mixed-use building located at 35-37 William Street within the City of Ottawa (City File No. D07-12-20-0006).

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (City), the Rideau Valley Conservation Authority (RVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- CP-19-0588, C101 – Removals, Site Servicing, Lot Grading and Drainage Plan

1.2 Site Description

The property is located at 35-37 William Street. It is described as Lot 11, Registered Plan 42482, Ward 12 – Rideau-Vanier, City of Ottawa, Ontario. The land in question covers approximately 0.05 ha and is located east of William Street, just south of the intersection of York Street and William Street. See Appendix 'A' for Key Plan.

The site was developed with a restaurant and other small buildings in the rear however, the site currently consists of the burned remains of those buildings due to a fire.

The proposed development consists of a four-storey mixed-use commercial and residential building with a basement level. The building will consist of 16 housing units and a restaurant. The foundation footprint is approximately 471 m². The basement and the first floor will hold the restaurant while the second through fourth floors will have residential units. The residential units are all 1-bedroom units. There will be access to the building from entrances off of William Street and York Street.

2.0 BACKGROUND STUDIES

Background studies that have been completed for the site include review of the City of Ottawa as-built drawings, and a topographical survey of the site.

As-built drawings of the existing services within the vicinity of the site were obtained from the City of Ottawa Information Center and were reviewed in order to determine proper servicing and stormwater management schemes for the site. A copy of the drawings can be found in Appendix 'B'.

A topographic survey of the site was completed by Annis, O'Sullivan, Vollebekk LTD. (Job No. 191004) and can be found in Appendix 'B'.

The following reports have been reviewed and are available under separate cover:

- Geotechnical Investigation completed by Paterson Group, dated February 6, 2020
- Phase I ESA completed by Paterson Group, dated November 29, 2019
- Phase II ESA completed by Paterson Group, dated December 03, 2019

3.0 PRE-CONSULTATION SUMMARY

City of Ottawa Staff have been pre-consulted regarding the proposed development in person on June 5, 2019. Specific design parameters to be incorporated within this design include the following:

- Pre-development time of concentration (TC) of 20 minutes or calculated but not less than 10 minutes and post-development flow shall be calculated using a time of concentration of 10 minutes.
- Control 5 through 100-year post-development flows to the 5-year pre-development flows, respectively, with a combined C value to a maximum of 0.50.
- Services shall be extended from William Street
- Through correspondence with RVCA, it was noted the site has no quality control requirements.

Correspondence can be found in Appendix 'B'.

4.0 EXISTING SERVICES

The following subsections describe the existing services within the William Street right of way.

4.1 Existing Sanitary

The is an existing 250 mm diameter PVC Sanitary Sewer located within William Street. The sewer drains to the Ottawa Outfall Trunk and then on to the Interceptor Sewer discharging at the Robert O. Pickard Environmental Centre (ROPEC). As-built information provided by the City of Ottawa indicates there is an existing sanitary service extending from the 250 mm sewer which services the existing development on 35 William Street.

4.2 Existing Storm

There is an existing 375 mm diameter Storm Sewer within William Street. Catch basins are present near the existing site entrance as well as across the road. The catch basins are connected to the storm main within William Street. The storm sewer drains to the West Kind Edward Storm Trunk Sewer and outlets to the Ottawa River. As-built information provided by the City of Ottawa indicates there is an existing storm service extending from the 375 mm sewer which services the existing development on 35 William Street.

4.3 Existing Water

There is an existing 300 mm diameter Watermain within William Street. As-Built information provided by the City of Ottawa indicates a 100 mm diameter water service extends from the 300 mm watermain to service the existing development on 35 William Street.

4.4 Site Utilities

As-built information provided by the City of Ottawa indicates a 50 mm diameter Gas main and a 680 mm diameter hydro duct within the eastern sidewalk of William Street. The contractor is responsible for confirming the location of all Utilities.

5.0 SERVICING PLAN

5.1 Proposed Servicing Overview

The overall servicing will be provided via service connections to the mains within William Street. The water service will be extended from the 300 mm diameter watermain. Similarly, the storm and sanitary services will be connected to the 375 mm diameter and 250 mm diameter mains, respectively. Details pertaining to the final proposed servicing locations have been reviewed and are shown on the proposed Site Servicing Plan.

5.2 Proposed Water Design

A new 100mm diameter PVC watermain is proposed to service the site complete with a water valve located at the property line and will be connected to the existing 300 mm diameter watermain within William Street. The watermain is designed to have a minimum of 2.4m cover.

The Fire Underwriters Survey 1999 (FUS) method was utilized to determine the required fire flow for the site. The 'C' factor (type of construction) for the FUS calculation was determined to be 1.0 (ordinary type construction). The total floor area ('A' value) for the FUS calculation was determined to be 1,655.12 m^2. The results of the calculations yielded a required fire flow of 13,000 L/min. A fire flow of 4,500 L/min was calculated using the Ontario Building Code (OBC) requirements. The detailed calculations for the FUS and OBC can be found in Appendix 'C'.

The water demands for the proposed building have been calculated to adhere to the Ottawa Design Guidelines – Water Distribution manual and can be found in Appendix 'C'. The results have been summarized below:

Table 1: Water Demands

Average Day Demand (L/s)	0.11
Maximum Daily Demand (L/s)	0.25
Peak Hourly Demand (L/s)	0.54
OBC Fire Flow Requirement (L/s)	75.00
FUS Fire Flow Requirement (L/s)	216.66
Max Day + Fire Flow (FUS) (L/s)	216.92

Boundary conditions have been provided by the City of Ottawa for the current conditions and are available in Appendix 'C'. The subject site is located in pressure zone 1W. A water model was completed using Bentley's WaterCAD based on the boundary conditions. The results determined that the proposed 100mm watermain can adequately service the proposed development and provide sufficient fire flow since Hydrant H-1 produced available fire flows of 22,736 L/min. Refer to drawing for more details. The results are available in Appendix 'C' of this report.

Prior to connecting to the municipal water distribution system, it is essential to determine whether the system has adequate capacity and that the overall impact to the existing system is minimal. A WaterCAD model was generated to determine the capacity, pressure and size of pipes required to service the proposed site. Three (3) different scenarios were analyzed within the model, namely average day, maximum day + fire flow and peak hourly demands.

When modelling the proposed water distribution system for 35-37 William Street, it was necessary to determine which scenario produced a greater demand: the maximum day + fire flow or peak hourly. It was concluded that the maximum day + fire flow scenario would govern the design process, since it produced the higher demand. A layout of the WaterCAD model has been attached in Appendix C.

The normal operating pressure range is anticipated to be 422 kPa to 529 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi). The proposed watermain will meet the minimum required 20 psi (140 kPa) at the ground level under maximum day demand and fire flow conditions.

Table 2: Water Pressure at Junctions per Scenario

Junction	Average Day (psi)	Peak Hourly (psi)	Max. Day + Fire Flow (psi)
J-1 (BLDG)	76.78	66.13	61.16

To confirm the adequacy of fire flow to protect the proposed development, public and private on-site fire hydrants within 150 m of the proposed building were analysed per City of Ottawa ISTB 2018-02 Appendix I Table 1. The results are demonstrated below.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m (5,700 L/min)	Fire Hydrant(s) within 150m (3,800 L/min)	Combined Fire Flow (L/min.)
35-37 William Street	13,000	2	4	26,600

5.3 Proposed Sanitary Design

A new 100 mm diameter gravity sanitary service will be connected to the existing 250 mm diameter sanitary sewer within William Street.

The subject site is a proposed four-storey mixed-use commercial and residential building. The total area of the building is 471 m^2. The peak design flows for the proposed building were calculated using criteria from the City of Ottawa – Sewer Design Guidelines, October 2012. The proposed site development area (0.05ha) will generate a flow of 0.44 L/s.

The proposed 100 mm diameter gravity sanitary service will be installed with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. Design parameters for the site include an infiltration rate of 0.28 l/s/ha.

The proposed service for the site will be connected to existing 250 mm diameter sanitary sewer within William Street. It is anticipated that flow from the site has been previously accounted for within the downstream infrastructure as a sanitary service from the previous restaurant development would have connected to this sewer. Although the sanitary flow is likely slightly higher for the proposed development, it is anticipated that there will be no issues with capacity constraints for the existing 250 mm sanitary main within William Street as less than 1% of additional capacity would be required.

See Sanitary Flow Calculations and Sanitary Sewer Design Sheet in Appendix 'D' of this report for more details.

5.4 Proposed Storm Design (Conveyance and Management)

Stormwater runoff will be conveyed by way of roof drains which will discharge into the existing infrastructure within William Street. The roof will provide storage by the use of roof drains before leaving the site. Roof drains will restrict the flow to conform to City requirements.

A new 150 mm diameter storm service will be connected to the existing 375 mm diameter storm main within William Street. The storm service is provided as an outlet for the foundation drain system. The restricted flow from the roof drains will be connected to an additional 150 mm diameter storm service which will also be connected to the existing 375 mm diameter storm main within William Street.

From discussions with the City of Ottawa and the Rideau Valley Conservation Authority (RVCA), quality control will not be provided within the site. Correspondence with the RVCA is available in Appendix 'B'. Further details and calculations pertaining to the quantity and quality of the stormwater management system are provided in Section 6.0.

6.0 PROPOSED STORMWATER MANAGEMENT

6.1 Design Criteria and Methodology

Stormwater management for this site will be maintained through roof storage and positive drainage away from the proposed building. Stormwater runoff will be restricted on the proposed roof and directed to the proposed storm service before reaching the existing storm main within William Street. Overland flow will be directed towards the William Street and York Street right-of-way. Stormwater Best Management Practices (SWM BMP's) will be implemented at the "Lot level", "Conveyance" and "End of Pipe" locations. These concepts will be explained further in Section 6.4. In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the RVCA and City:

Quality Control

- No quality control is required for the site as per the RVCA.

Quantity Control

- Post-development flow 5/100-year is be restricted to match the 5-year pre-development flow with a maximum C value of 0.50.

6.2 Runoff Calculations

Runoff calculations presented in this report are derived using the Rational Method, given as:

$$Q = 2.78CIA \text{ (L/s)}$$

Where C = Runoff coefficient

I = Rainfall intensity in mm/hr (City of Ottawa IDF curves)

A = Drainage area in hectares

It is recognized that the rational method tends to overestimate runoff rates. As a by-product of using extremely conservative prediction method, any facilities that are sized using these results are expected to function as intended in real world conditions.

The following coefficients were used to develop an average C for each area:

Roofs/Concrete/Asphalt	0.90
Gravel	0.60
Undeveloped and Grass	0.20

As per the City of Ottawa Sewer Design Guidelines, the 5-year balanced 'C' value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

As per correspondence with City of Ottawa Staff the time of concentration (Tc) used for pre-development flows is to be calculated or 20 minutes and post-development flows shall be 10 minutes.

6.2.1 Pre-Development Drainage

The existing site drainage limits are demonstrated on the Pre-Development Drainage Area Plan. The existing site has been demonstrated as drainage area A1. See drawing CP-19-0588 – PRE within Appendix 'E' of this report for more details. Existing conditions have the overland stormwater runoff flowing from high points located within the property and draining to existing storm infrastructure to the west (William Street) and to the east (existing parking lot for 87 George Street). A summary of the Pre-Development Runoff Calculations can be found below.

Table 4: Pre-Development Runoff Summary

Area ID	Drainage Area (ha)	Balanced Runoff Coefficient (C) 5-year	Balanced Runoff Coefficient (C) 100-year	5-Year Flow Rate (l/s)	100-Year Flow Rate (l/s)
A1	0.048	0.63	0.71	8.69	16.80
Total	0.048			8.69	16.80

(See Appendix 'G' for Calculations)

6.2.2 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CP-19-0588 - POST in Appendix 'F' of this report for more details. A summary of the Post-Development Runoff Calculations can be found below.

Table 5: Post-Development Runoff Summary

Area ID	Drainage Area (ha)	Balanced Runoff Coefficient (C) 5-year	Balanced Runoff Coefficient (C) 100-year	5-year Flow Rate (L/s)	100-year Flow Rate (L/s)
B1	0.006	0.90	1.00	1.56	2.96
B2	0.002	0.90	1.00	0.47	0.89
B3A	0.011	0.90	1.00	2.84	5.41
B3B	0.009	0.90	1.00	2.43	4.62
B3C	0.013	0.90	1.00	3.36	6.40
B4	0.005	0.90	1.00	1.25	2.38
B5	0.002	0.90	1.00	0.56	1.06
Total	**0.048**			12.46	23.73

(See Appendix 'G' for Calculations)

Runoff from areas B1-B4 will be restricted through the use of roof drains. The roof restrictions will restrict the 100-year runoff to the 5-year pre-development flow rate while accounting for the proposed unrestricted flow from drainage area B5. See Appendix 'G' for calculations. This restriction will be further detailed in Section 6.3.

6.3 Quantity Control

After discussing the stormwater management criteria for the site with City of Ottawa staff, the 5 and 100-year post-development runoff for this site has been restricted to match the 5 year flow rate with a maximum C value of 0.5 (See Appendix 'B' for correspondence). These values create the following allowable release rates and storage volumes for the development site.

Table 6: Allowable Release Rate

Area	Drainage Area (ha)	Balanced Runoff Coefficient (C) 5-yr	Tc (min)	5-Year Flow Rate (L/s)
A1	0.048	0.50	10	6.92

(See Appendix 'G' for Calculations)

Reducing site flows will be achieved using roof drains and will create the need for roof storage. Runoff from areas B1- B4 will be restricted as detailed below.

Table 7: Post-Development Stormwater Management Summary

Area ID	Area (ha)	Restricted Flow (L/s)		Storage Required (m^3)		Storage Provided (m^3)	
		5-yr	100-yr	5-yr	100-yr	5-yr	100-yr
B1	0.006	0.32	0.57	0.88	1.72	1.12	2.02
B2	0.002	0.19	0.32	0.17	0.34	0.20	0.34
B3A	0.011	0.38	0.63	1.98	3.95	2.45	4.08
B3B	0.009	0.32	0.50	1.70	3.47	2.33	3.73
B3C	0.013	0.38	0.69	2.51	4.81	2.79	5.12
B4	0.005	0.25	0.50	0.72	1.32	0.73	1.44
B5	0.002	0.56	1.06				
Total	**0.048**	2.40	4.27				

(See Appendix 'G' for Calculations)

Area B1 is the Lower Terrace on the West side of the building roof area (Level 2 Roof). Runoff from Area B1 will be restricted by one roof drain restricting the flows to 0.32 L/s and 0.57 L/s for the 5-year and 100-year storm events. Area B2 is the Western portion of the third level roof. Area B2 will be restricted by one roof drain restricting the flows to 0.19 L/s and 0.32 L/s for the 5-year and 100-year storm events. Area B3 is the fourth

level roof. Area B3 will be restricted by three roof drains restricting the flows to 0.38 L/s and 0.63 L/s, 0.32 L/s and 0.50 L/s, and 0.38 L/s and 0.69 L/s for the 5-year and 100-year storm events in subcatchment areas B3A, B3B, and B3C. Area B4 is the southern portion of the second level roof. Area B4 will be restricted by one roof drain restricting the flows to 0.25 L/s and 0.50 L/s for the 5-year and 100-year storm events. Drainage areas for the roof are depicted on CP-19-0588 – POST plan available within Appendix 'E'. The table below details the required and provided rooftop storage volumes for the development.

Table 8: Roof Drain Summary

Area ID	Area (ha)	Number of roof Drains	Total Restricted Flow (L/s)		Storage Depth (m)		Storage Volume Required (m^3)		Storage Volume Available (m^3)	
			5-Yr	100-Yr	5-Yr	100-Yr	5-Yr	100-Yr	5-Yr	100-Yr
B1	0.006	1	0.32	0.57	0.025	0.045	0.88	1.72	1.12	2.02
B2	0.002	1	0.19	0.32	0.015	0.030	0.17	0.34	0.20	0.34
B3A	0.011	1	0.38	0.63	0.030	0.050	1.98	3.95	2.45	4.08
B3B	0.009	1	0.32	0.50	0.025	0.040	1.70	3.47	2.33	3.73
B3C	0.013	1	0.38	0.69	0.030	0.055	2.51	4.81	2.79	5.12
B4	0.005	1	0.25	0.50	0.020	0.045	0.72	1.32	0.73	1.44

(See Appendix 'G' for Calculations)

In the event that there is a rainfall above the 100-year storm event, or a blockage within the storm sewer system, an emergency roof scuppers have been provided so that the storm water runoff will not build up on the roof.

6.4 Quality Control

The development of this lot will employ Best Management Practices (BMP's) wherever possible. The intent of implementing stormwater BMP's is to ensure that water quality and quantity concerns are addressed at all stages of development. Lot level BMP's typically include temporary retention of the lot runoff, minimizing ground slopes and maximizing landscaped areas. Some of these BMP's cannot be provided for this site due to site constraints and development requirements.

As per the discussions with the RVCA, there are no quality control requirements for the site. Please refer to Appendix 'B' for correspondence with the RVCA. The combination of the above BMP's and the proposed flow control measures will aid in the protection of the natural environment.

7.0 EROSION AND SEDIMENT CONTROL

7.1 Temporary Measures

Before construction begins, temporary silt fence, straw bale or rock flow check dams will be installed at all natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The rock flow, straw bale & silt fence check dams and barriers shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required. Fibre roll barriers are to be installed at all existing curb inlet catchbasins and filter fabric is to be placed under the grates of all existing catchbasins and manholes along the frontage of the site and any new structures immediately upon installation. The measures for the existing/proposed structures are to be removed only after all areas have been paved. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

Although not anticipated, work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the City and/or Conservation Authority to review the site conditions and determine the appropriate course of action. As the ground begins to thaw, the Contractor shall place silt fencing at all required locations as soon as ground conditions warrant. Please see the Removals, Site Servicing, Lot Grading and Drainage Plan for additional details regarding the temporary measures to be installed and their appropriate OPSD references.

8.0 SUMMARY

- A new 471 m^2 ground floor area four-story mixed-use commercial and residential building will be constructed on the site located at 35-37 William Street.
- A new 150 mm diameter sanitary service will be installed and connected to the existing 250 mm diameter sewer within William Street.
- A new 100 mm diameter water lateral will be extended from the existing 300 mm diameter main within William Street.
- A new 150 mm storm service will be installed for the roof drainage system and connected to the existing 375 mm diameter sewer within William Street.
- A new 150 mm storm service will be installed for the foundation drainage system and connected to the existing 375 mm dimeter sewer within William Street.
- As discussed with City of Ottawa staff, the stormwater management design will ensure that the post-development flow rates are restricted to the 5-year pre-development flow rates calculated with a maximum C value of 0.5.
- Storage for the 5 and 100-year storm events will be provided on the proposed flat roof.

9.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management Report in support of the proposed development located at 35-37 William Street.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.

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10.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of Vittoria Trattoria. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, City of Ottawa and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
KEY PLAN

McINTOSH PERRY

LEGEND

- Site Location
- Local Road
- Major Road
- Watercourse
- Waterbody
- Wooded Area

500 250 0 500

Scale 1:15,000

Metres

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2019.

CLIENT: DOMENIC SANTAGUIDA

PROJECT: 35-37 WILLIAM STREET RE-DEVELOPMENT

TITLE: SITE LOCATION

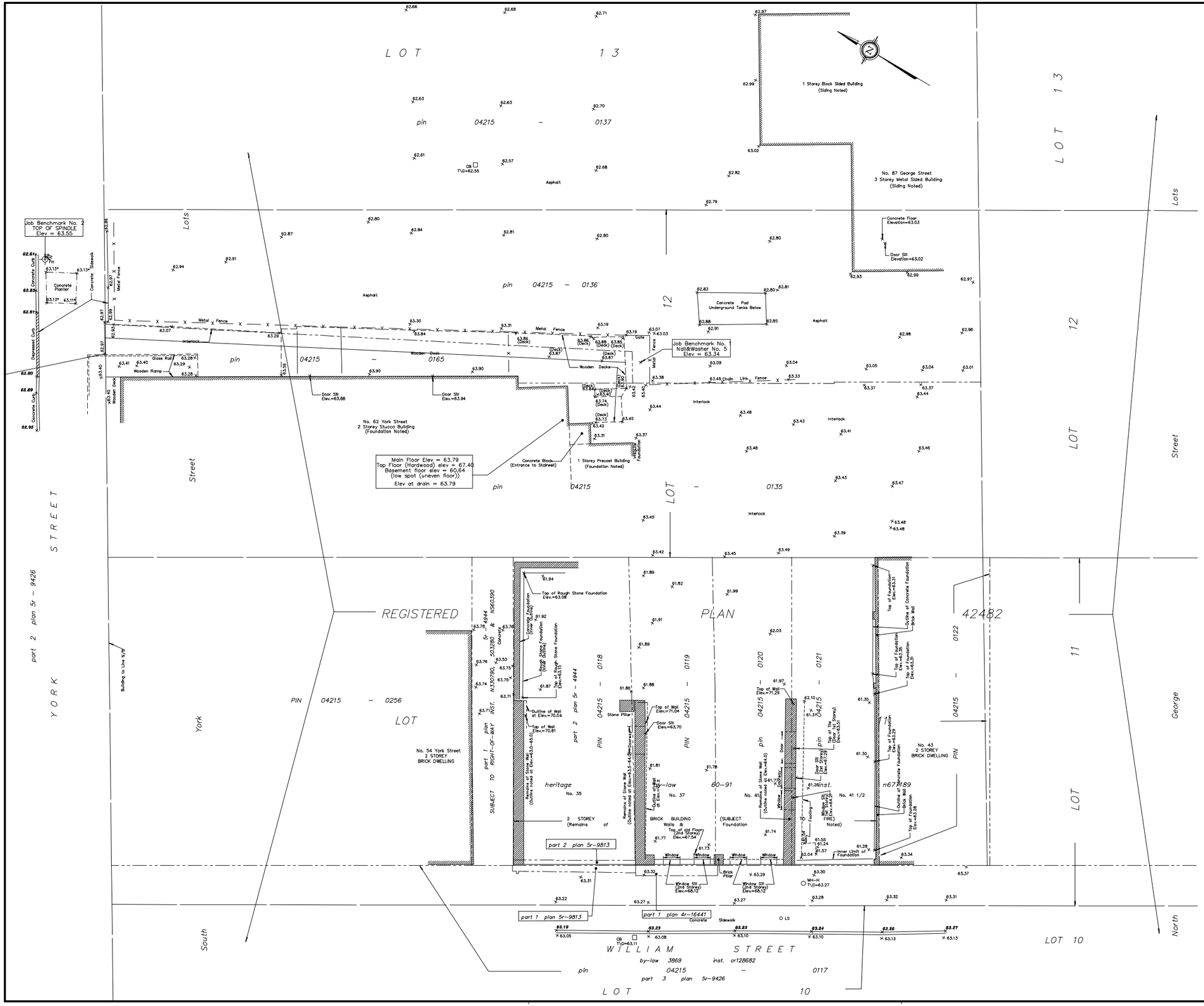
McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO:	CP-19-0588
Date	Dec., 17, 2019
GIS	LC
Checked By	NV

FIGURE: 1

APPENDIX B
BACKGROUND DOCUMENTS

McINTOSH PERRY



TOPOGRAPHICAL SKETCH OF

41 WILLIAM STREET
62 YORK STREET
87 GEORGE STREET
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 100

4 3 2 1 0 2 4 Metres

Metric

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

Date

E. H. Herweyer
Ontario Land Surveyor

Notes & Legend

—□—	Denotes	Survey Monument Planted
—■—	=	Survey Monument Found
SIB	=	Standard Iron Bar
SSIB	=	Short Standard Iron Bar
IB	=	Iron Bar
(WIT)	=	Witness
(AOG)	=	Annis, O'Sullivan, Vollebekk Ltd.
Meas.	=	Measured
(P1)	=	Plan 5R-9426
(P2)	=	(AOG) Plan April 28th, 1999
(P3)	=	4R-16441
(P4)	=	(857) Plan September 7th, 2007
(P5)	=	(AOG) Plan May 9th, 1995
(D1)	=	NS113342
□ CB	=	Catch Basin
T/C	=	Top of Grate
○ MH–H	=	Maintenance Hole (Hydro)
○ LS	=	Light Standard
CLF	=	Chain Link Fence
MF	=	Metal Fence

Notes & Legend

	Denotes	
—□—	=	Survey Monument Planted
—■—	=	Survey Monument Found
SIB	=	Standard Iron Bar
SSIB	=	Short Standard Iron Bar
IB	=	Iron Bar
(WIT)	=	Witness
Meas.	=	Measured
(AOG)	=	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	=	Plan 5R-9426
(P2)	=	(AOG) Plan April 28th, 1999
(P3)	=	4R-16441
(P4)	=	(857) Plan September 7th, 2007
(P5)	=	(AOG) Plan May 9th, 1995
(D1)	=	NS113342
○ LS	=	Light Standard
□ CB	=	Catch Basin
⊕ FH	=	Fire Hydrant
○ MH–H	=	Maintenance Hole (Hydro)
T/G	=	Top of Grate
CLF	=	Chain Link Fence
MF	=	Metal Fence
+65.00	=	Location of Elevations
+65.00+	=	Top of Planter of Elevations
+65.00	=	Top of Curb Elevations

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum, derived from vertical control monument No. 251 with an elevation of 65.69 metres.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

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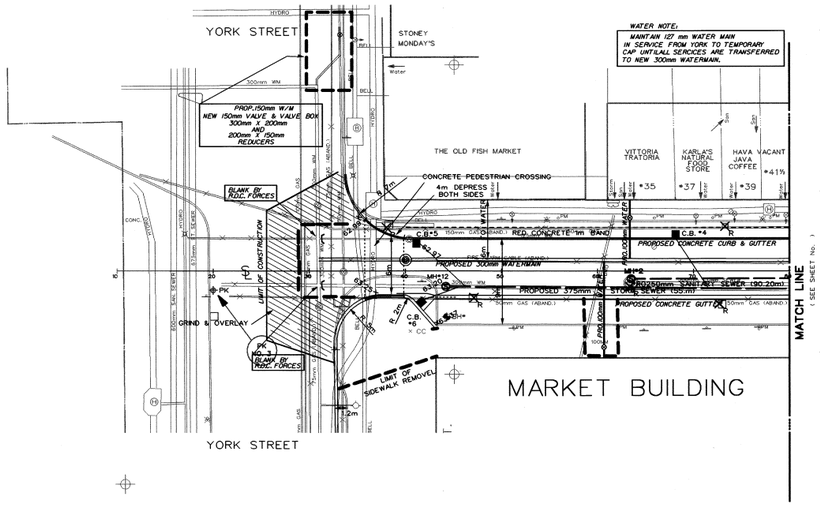
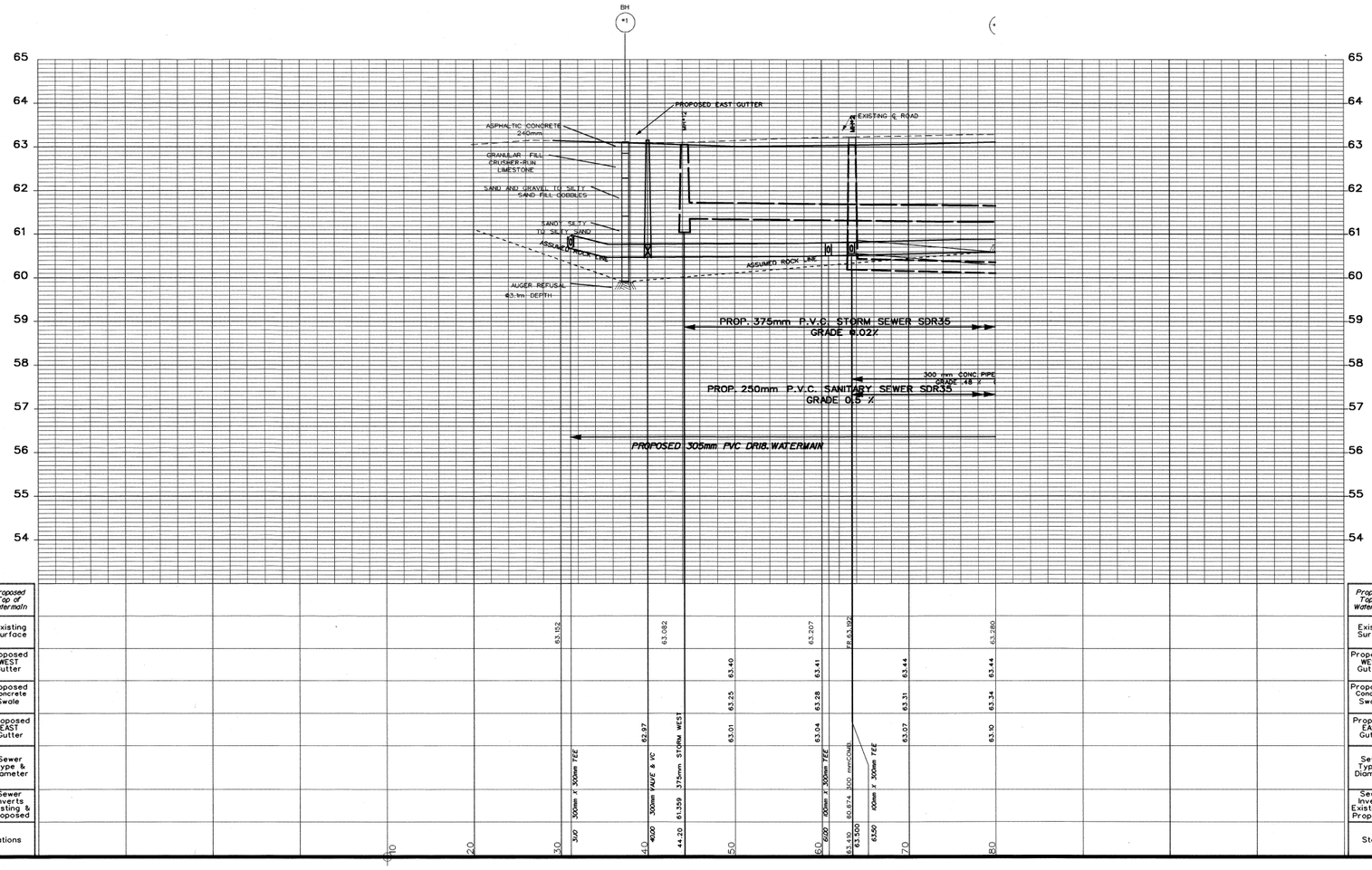
Job No.191004 Topo Survey – AOSV | lg

3252 WILLIAM STREET (4)

WILLIAM STREET





Revisions:

No.	Date	Description	Drawn By	Approved By

Design:

Designed By: WADE CLOUTHIER P.Eng	Date: SEPT/2000	Checked By:	Date:
Survey Detail By: R. LESTER J.FRANCE	Date: JUNE/2000	Field Checked By: RICK LEGAULT	Date: SEPT/2000
Drafting By: RICK LEGAULT	Date: SEPT/2000	Checked By:	Date:

LICENCED PROFESSIONAL ENGINEER — Sept 21/2000 — W.CLOUTHIER — PROVINCE OF ONTARIO — ROAD & SEWER

REGISTERED PROFESSIONAL ENGINEER — F. MARCUCCIO — 24/09/00 — PROVINCE OF ONTARIO — WATER ONLY

Chief Design & Construction Engineer
H. V. Pascoe, P.Eng.

Final Measurements:

Construction Type	Inspector
Work Commenced	Project Manager
Work Completed	Field Book #
Contractor	Date
Drafting Revisions Date	Checked By

Tender Notes:

1. Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
2. Soil information taken from : TROW ENG.
3. Date of television inspection : FEB \ 2000
4. This plan supercedes (in whole or in part) plan #
5. While illustrations and utilities shown are taken from the best available information, they cannot be guaranteed.
6. The contractor is requested to check with all utility companies.

Watermain Notes:

1. All watermain materials and construction methods shall be in accordance with the latest edition of the Region of Ottawa Carleton (Region), Environment Section Standard Specifications and Standard Drawings.

Regional Municipality of Ottawa-Carleton Environment & Transportation Department / Municipalité régionale d'Ottawa-Carleton La Service de l'environnement et des transports

Approved

Date 22/9/00

WATER WORKS

REGIONAL Drawing No. 5514

Legal Survey Notes:

Boundary information shown hereon has been compiled and calculated from Teranet data and not based on an actual survey.

Distances shown to survey monuments are for reference purposes only, survey monuments may not define property boundaries.

THIS IS NOT A PLAN OF SURVEY

This plan was compiled from plans and documents recorded in the Land Registry System and has been prepared for property indexing purposes only.

City of Ville d' **Ottawa**

Department of Urban Planning & Public Works
Engineering Branch
Design And Construction Division
111 SUSSEX DRIVE, SUSSEX PAVILION, 7TH FLOOR, OTTAWA, ONTARIO, K1N 5A1

E.M. Robinson, Commissioner | W.R. Cole, P.Eng., Branch Director

WILLIAM STREET

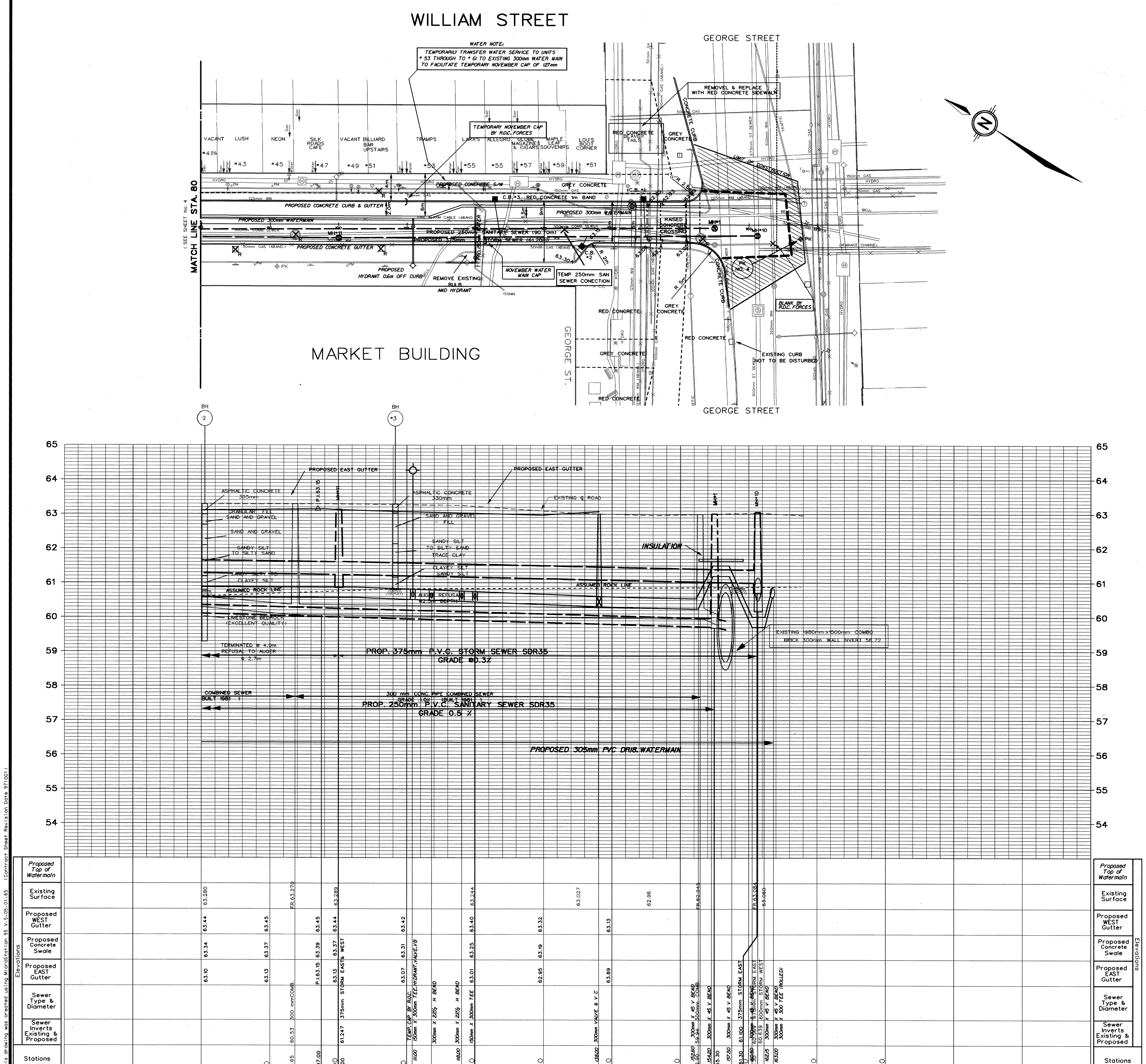
FROM YORK TO GEORGE

Contract No:	Survey Books:	Scales: (See note)	Plan No:
00C3252		HOR. 1:250 VERT. 1:50	3252 Sheet 4 of 8

Filename: SHEET4
Reference: 3252B
3252BP
3252WBP1
3252WPP

#this drawing was created using MicroStation 95 V.5.05.01.65 (compost Sheet Revision Date 9/11/01)

3252 WILLIAM STREET (5)



Revisions:

No.	Date	Description	Drawn By	Approved By

Design:

Designed By WADE CLOUTHIER P.Eng. Date SEPT/2000 | Checked By | Date
Survey Detail By R. LESTER J.FRANCE Date JUNE/2000 | Field Checked By RICK LEGAULT Date SEPT/2000
Drafting By RICK LEGAULT Date SEPT/2000 | Checked By | Date

W. CLOUTHIER — ROAD & SEWER
MARCUCCIO — WATER ONLY

Chief Design & Construction Engineer
H. V. Pascoe, P.Eng.

Final Measurements:

Construction Type	Inspector
Work Commenced	Project Manager
Work Completed	Field Book #
Contractor	Date
Drafting Revisions Date	Checked By

Tender Notes:

1. Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
2. Soil information taken from : TROW ENG.
3. Date of television inspection : FEB \ 2000
4. This plan supercedes (in whole or in part) plan #
5. While illustrations and utilities shown are taken from the best available information, they cannot be guaranteed.
6. The contractor is requested to check with all utility companies.

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Regional Municipality of Ottawa-Carleton Environmental & Transporation Department / Municipalité régionale d'Ottawa-Carleton Le Service de l'environnement et des transports
Approved
Date 22SEP00 WATER WORKS
REGIONAL Drawing No. 5514

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Engineering Branch
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111 SUSSEX DRIVE, SUSSEX PAVILION, 7TH FLOOR, OTTAWA, ONTARIO. K1N 5A1

E.M. Robinson, Commissioner — W.R. Cole, P.Eng., Branch Director

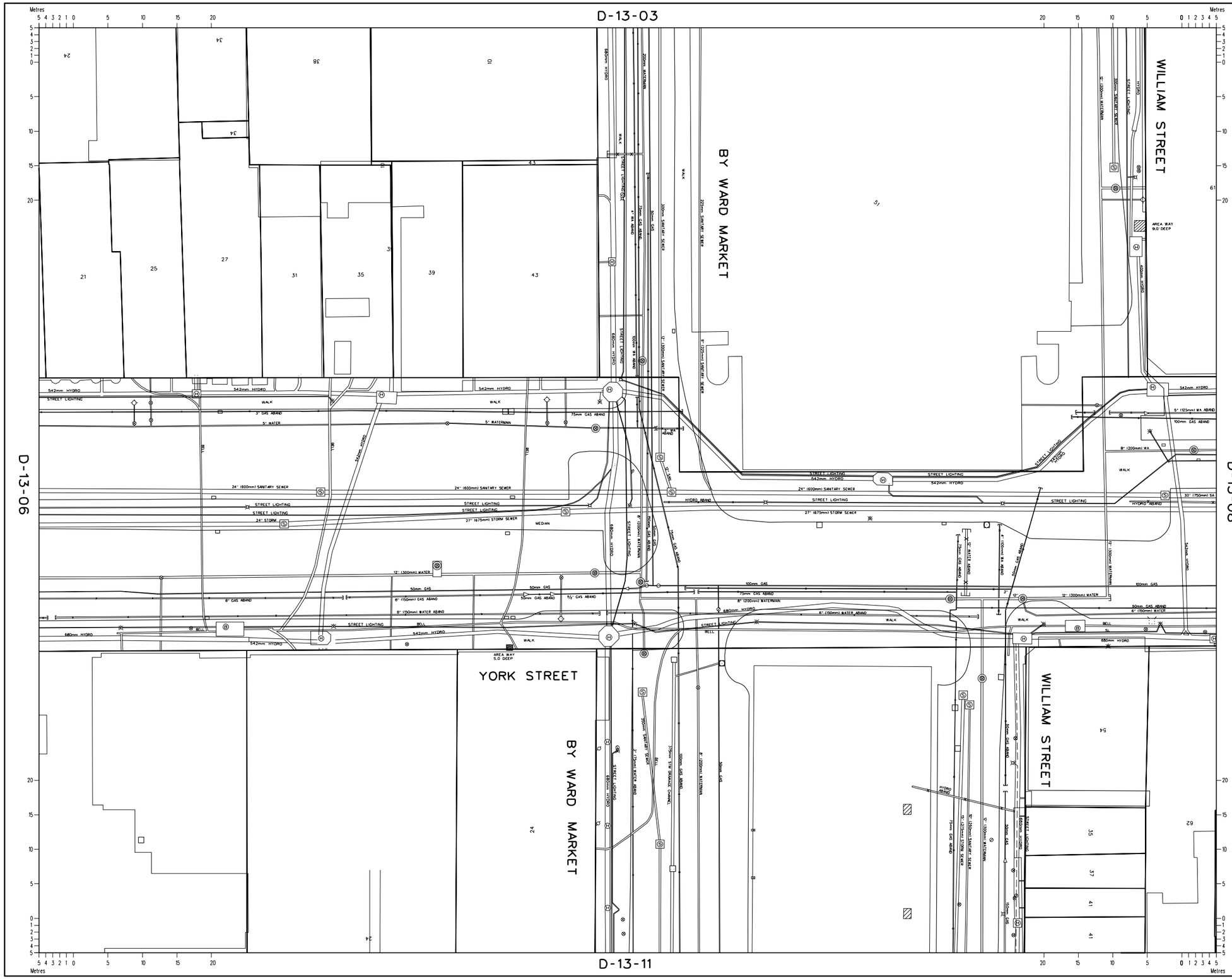
WILLIAM STREET

YORK TO GEORGE

Contract No: 00C3252 | Survey Books: | Scales: (See note) HOR. 1:250 VERT. 1:50 | Plan No: 3253 Sheet 5 of 8

Filename: SHEET5.DGN
Reference: 3252B 3252BP 3252WBP 3252WBP1

*This drawing was created using MicroStation 95 V.5.05.01.65 (Contract Sheet Revision Date 97.0011)



REVISIONS / RÉVISIONS	DATE	BY
308 (EDWARD) 3252 (WILLIAM) SEWER, WATER, ROAD, UTILITIES REVISED	DEC 2002	SR
CITY, ALL EXTERNAL AGENCIES DIGITIZED FROM CITY/UTILITY DATA RECEIVED	JAN 2017	JM

LEGEND

- Water Valve, Valve Chamber, Fire Hydrant
- Sewer Manhole, Catch Basin Manhole
- Catch Basin / Drainage, Wing Wall, Head Wall
- Pole, Pole w/light, Decorative, Lawn Light
- Power Supply, Panel, Pedestal, Transformer, Tower, Regulator (P2P, CR)
- Amp, Hand Hole, Vault, Gas Valve
- OC Transpo: Bus Shelter-No Power, Energized, Isolated (BUS)
- Streetscape: Planter Box, Grate Square, Eng. Soil (TCS)
- Traffic Connect Box : Disconnect Box, SL Disconnect (TCB, TDB, SDB)
- R.L Hand Hole, R.L. Camera (TMH)
- Scada: Hand Hole, Monitoring Panel
- Reducer
- Pipe, Duct, Conduit, Lateral
- Culvert
- Abandoned
- Capped
- Buried Cable
- Property Line
- Install Year (2015)

TELECOM GLOSSARY

A ..... Allstream	P ..... Primus
AT ..... Arta	P2P ..... Canadian P2P Fibre
B ..... Bell	R ..... Rogers
BH ..... Birch Hill	S ..... Sprint
F ..... Fibre Noir	SL ..... Street Lighting
G ..... Globility	T ..... Traffic
GT ..... Group Telecom	TO ..... Telecom Ottawa
H ..... Hydro Ottawa	TU ..... Telus
H1 ..... Hydro One	V ..... Videotron
L / L3 ..... Level 3	Z ..... Zayo

GLOSSARY - OTHER

DD ..... Dept. of Defence	PED ..... Pedestal (owner unknown)
MH ..... Manhole (owner unknown)	PW ..... Public Works
O/OC ..... OCTranspo	UP ..... Utility Pole (owner unknown)
SCD ..... Scada	

CAUTION/ATTENTION

Although utility locations are established using the best available information, they cannot be guaranteed.
Property lines were compiled from plans and documents recorded in the Land Registry System and are for indexing purposes only.

Bien que l'emplacement des services publics soient établis en utilisant la meilleure information disponible, ils ne peuvent pas être garantis.
Des lignes de propriété ont été compilées en utilisant des plans et des documents enregistrés dans le système de cadastre et sont pour l'indexation seulement.

Ottawa

Right of Way, Heritage, and Urban Design Services /
Gestionnaire: Services des emprises, du patrimoine, et du design urbain
Planning, Infrastructure and Economic Development Department /
Direction generale de la planification, de l'infrastructure et du developpement economique
100 Constellation Cres., 6th Floor East / 6ème Etage Est, Ottawa, ON K2G 6J8

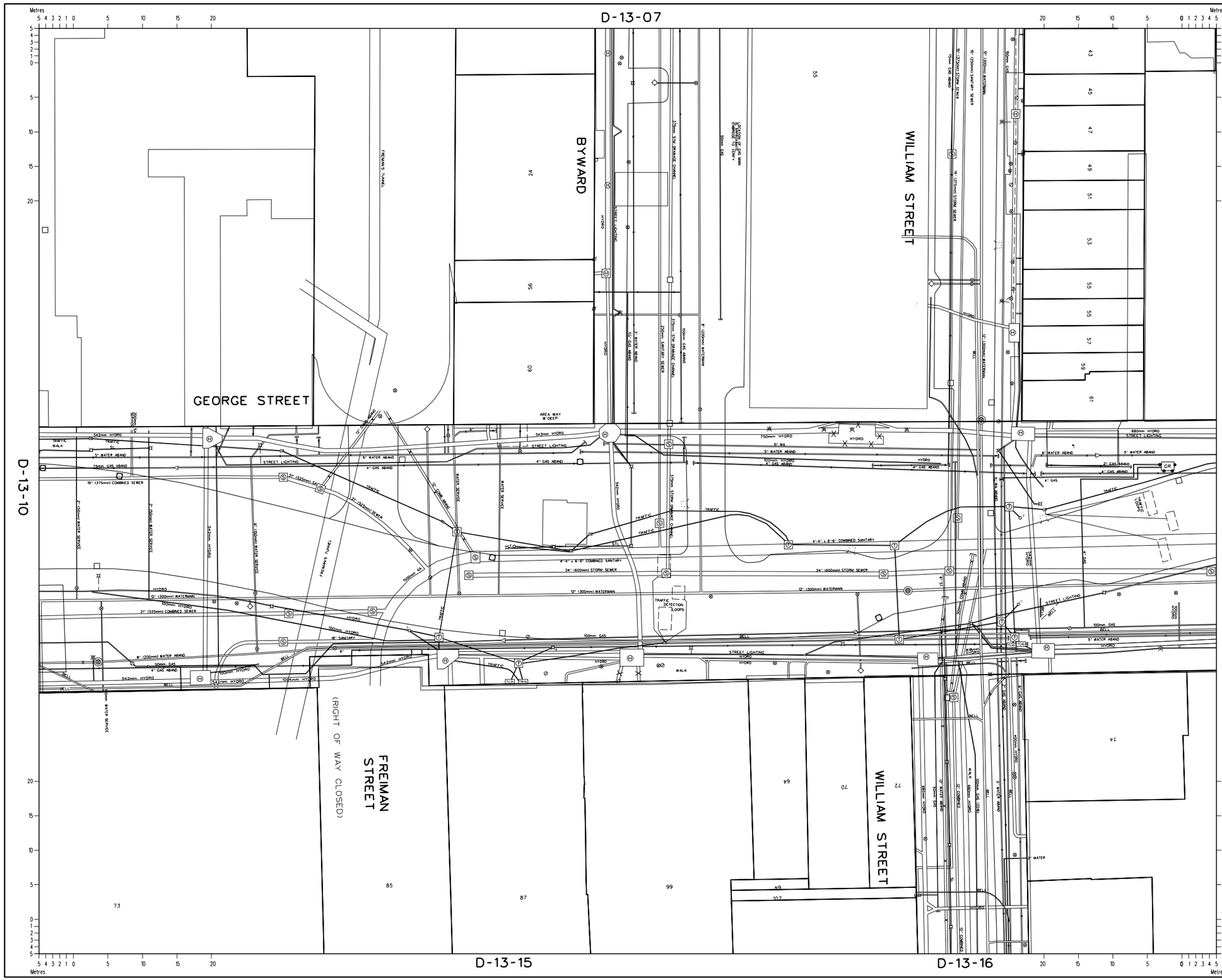
OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY
COMITÉ DE COORDINATION DES SERVICES PUBLICS D'OTTAWA
ENREGISTREMENT CENTRAL

UCC Ottawa CCSP — UTILITY COORDINATING COMMITTEE / COMITÉ DE COORDINATION DES SERVICES PUBLICS

PRODUCED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
D-13-07



REVISIONS / RÉVISIONS	DATE	BY
3136 (BYWARD), 3252 (WILLIAM) SEWER, WATER, ROAD, UTILITY REVISED	FEB 2003	SR
4724 (FRANCIS) & 1589 - GEORGE FREMAN'S TUNNEL ADDED TO GEORGE	JAN 2012	DC
9721 - GEORGE (AUG 2001) SITE SERVICING	AUG. 2012	ZB
1700 - GEORGE (MAY 1882) WATER / SEWERS APPLIED	AUG 2012	ZB
CITY - 3137 (SEPT. 2000) SEWER & WATER ON BYWARD MARKET	DEC. 2012	KJ
HYDRO,BELL,ENBRIDGE,ROGERS, CITY SEWER, WATER, TRAFFIC, SL COMPILED/DIGITIZED FROM UTILITY/CITY DATA	JAN 2017	JM

LEGEND

Water Valve, Valve Chamber, Fire Hydrant	
Sewer Manhole, Catch Basin Manhole	
Catch Basin / Drainage, Wing Wall, Head Wall	
Pole, Pole w/light, Decorative, Lawn Light	
Power Supply, Panel, Pedestal, Transformer, Tower, Regulator	PS CR
Amp, Hand Hole, Vault, Gas Valve	
OC Transpo: Bus Shelter-No Power, Energized, Isolated	BUS BUS BUS
Streetscape: Planter Box, Grate Square, Eng. Soil	TCS
Traffic Connect Box : Disconnect Box, SL Disconnect	TCB TDB SDB
R.L Hand Hole, R.L. Camera	
Scada: Hand Hole, Monitoring Panel	
Reducer	
Pipe, Duct, Conduit, Lateral	
Culvert	
Abandoned	
Capped	
Buried Cable	
Property Line	
Install Year	(2015)

TELECOM GLOSSARY

A	Allstream
AT	Arda
B	Bell
BH	Birch Hill
F	Fibre Noir
G	Globility
GT	Group Telecom
H	Hydro Ottawa
H1	Hydro One
L / L3	Level 3
P	Primus
P2P	Canadian P2P Fibre
R	Rogers
S	Sprint
SL	Street Lighting
T	Traffic
TO	Telecom Ottawa
TU	Telus
V	Videotron
Z	Zayo

GLOSSARY - OTHER

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OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY
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ENREGISTREMENT CENTRAL

PRODUCED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
D-13-11

Nicholas Vachon

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: December 6, 2019 8:52 AM
To: Nicholas Vachon
Subject: RE: 35-37 William Street - RVCA Requirements

Hi Nicholas,

The RVCA has no requirements for quality control at this location based on the proposed site plan provided. Best Management practices are encouraged on site where possible to be integrated into the design.

Thank you,

Eric Lalande, MCIP, RPP
Planner, Rideau Valley Conservation Authority
613-692-3571 x1137

From: Nicholas Vachon <n.vachon@mcintoshperry.com>
Sent: Thursday, December 05, 2019 1:16 PM
To: Eric Lalande <eric.lalande@rvca.ca>
Cc: Tyler Ferguson <t.ferguson@mcintoshperry.com>
Subject: 35-37 William Street - RVCA Requirements

Hi Eric,

We have a development moving forward at 35-37 William Street. They are proposing to add a 4-storey (plus basement) Mixed Use Commercial and Residential Building as per the attached Site Plan. We had a pre-consultation with the City. Can you confirm the quality control requirement for the site?

If you could please review and let me know, any questions feel free to contact me.

Regards,

Nicholas Vachon, EIT
Engineering Intern
115 Walgreen Road, R.R. 3, Carp, ON K0A 1L0
T. 613.903.5805
n.vachon@mcintoshperry.com | www.mcintoshperry.com
McINTOSH PERRY

Pre-application Consultation Meeting Minutes
Address: 35 and 37 William Street and 54 York Street
Formal Pre-consultation File No.: PC2019-0129
Date: Wednesday June 5, 2019, 11:00am – 12:30pm
Location: Room 4105, City Hall, 110 Laurier Ave W
City Contact: Ann O'Connor

City of Ottawa Staff Present:
Ann O'Connor – File Lead, Planner, Central Development Review
Sally Coutts – Heritage Planner
Christopher Moise – Urban Designer
Shawn Wessel – Infrastructure Project Manager
Wally Dubyk – Transportation Project Manager
Mark Gordon – Planning Student

Invitees Present:
Robert (Bob) Tritt – Lowertown Community Association Representative
Bill Holzman – Planner, Holzman Consultants
Barry Padolsky – Architect, Barry Padolsky Associates Inc.
Domenic Santaguido – Property Owner

Introductions and Acknowledgements
- Round table introductions
- Acknowledgement that an NDA has been signed by the Lowertown Community Association Representative

Overview of Proposal (Domenic Santaguido, Bill Holzman, and Barry Padolsky)
- The property at 35 and 37 William Street is currently occupied by a two-storey restaurant, known as Vittoria Trattoria, which was recently damaged in a fire. The extent of the façade and structural fire damage is still being researched.

- The proposal is to replace the damaged structure with a three or four-storey building. The third and fourth storey are to be set back from the front façade of the building. The redevelopment also includes developing the rear (southern half) of 62 York Street. This land has not yet been severed or acquired.

- Domenic owns 35 William Street and rents 37 William Street (which is a part of the existing restaurant).

- A southern portion of 54 York Street is undeveloped and located between the building at 54 York Street and the building at 35 and 37 William Street. This area is known as "feathers lane". Until recently, this area was used to manage the waste for both properties and is currently filled with scaffolding (as a result of the fire). As a part of this redevelopment, the applicant is also considering cantilevering the upper storeys over feathers lane.

Preliminary Comments from the City

Planning Comments (Ann O'Connor)

- Based on the current proposal, the following are required:
    - Site Plan Control
        - Please note that this would be a "New Mixed-Use Building" as there is no Site Plan Agreement on title. An application is considered 'new' if site plan control approval has never been granted.
        - Whether or not this application will be "Complex" (subject to public consultation) or "Standard" will depend on the ultimate proposal.
        - The policy requires that the following is subject to public consultation (Complex): "New mixed-use buildings containing fourteen or more units, five or more storeys or with a gross floor area of 1,400 square metres or more". Please note that when calculating the GFA, include the basement area (see the definition of GFA in the Zoning Bylaw).

    - Committee of Adjustment Minor Variance application or a Minor Zoning By-law Amendment application. Depending on the number and type of variances requested, one approach may be more appropriate than the other.

    - Heritage application through the Heritage Act.

    - Request to participate in the Urban Design Review Panel (UDRP) during the other Planning Act applications.

- Planning Services supports the redevelopment of the property post-fire. It is important to the department that the proposal be sensitively designed to be respectful of the existing heritage and built form context.

- The property is designated "Central Area" in Schedule B of the Official Plan.

- The properties are subject to the Central Area Secondary Plan
    - *Schedule B* designates the properties "ByWard Market" character area
    - *Schedule B-2A* designates the properties as being within the "ByWard Market" area and subject to building heights outlined in Volume 2 – Central Area Secondary Policy Plan
    - Note that the ByWard Market is designated a Heritage Conservation District. Alterations to properties within the area will be assessed on their sensitivity to the heritage character of the property and the district as a whole. And, in accordance with the Secondary Plan, Council shall ensure that the scale of development is predominantly low profile, is of a human

scale, is compatible with the heritage character of the area, and protects sunlight patterns and significant views.

- The properties 35 and 37 William Street, 54 York Street, and 62 York Street are all zoned MD2 S73 – Mixed Use Downtown Zone, Subzone 2, Schedule 73. It is also within the Heritage Overlay (Section 60 of the Zoning By-law). There are some known and some not-yet-known areas of non-compliance. Below is a list of potential areas of non-compliance:
    - Height (9.2m required and currently 13.5m proposed)
    - Heritage Overlay provisions
    - Maximum width of uses at ground floor (currently limited to 6m; there appears to be an existing non-conforming situation)
    - Amenity space for proposed dwelling units (currently none is illustrated on the floor plans)
    - Bicycle parking (Planning would prefer to see all required bike parking provided)
    - Visitor vehicular parking (some visitor parking may be required depending on number of proposed dwelling units)
    - Outdoor storage (none is permitted)

- The properties are a part of the ByWard Market Public Realm Study. As a part of this study, a pilot project is currently taking place whereby William Street between George and York is closed to vehicles (pedestrian and cycling only). This pilot project is stated to finish in October 2019. Jillian Savage is the project lead for this study at the City of Ottawa.

- The property is subject to the ByWard Market Precinct Strategy, as outlined in DOUDS (Downtown Ottawa Urban Design Strategy).

- The properties are located within a “Design Priority Area” as the property is located in the Central Area. Despite the fact that the building is four storeys or less, Planning Services encourages the applicant to go through the Urban Design Review Panel (UDRP) process. The property location has heritage and design significance and the proposal would benefit from this additional process.

- Comments on the current proposal and approach:
    - There are many unknowns that require further research and clarity before proceeding with the current design. These unknowns include:
        - The extent of the fire damage (to be confirmed through an ongoing study)
        - The existing ownership and potential land transfer of the property illustrated as being used as a rear-yard access (municipally known as 87 George St).

- The potential severance and land transfer to the east (as an extension of this 87 George St parcel) to access the proposed rear-yard patio for 35 and 37 William St.
- The potential severance and land transfer of the rear portion of 62 York.
- The potential establishment of an easement over a southern strip of 54 York in favour of 35 and 37 William Street ("feathers lane").

- It would be valuable for the applicant's team to model the surrounding context to illustrate the proposal's relationship to the existing built forms and abutting context. The proposal can then be put into the model, and the massing can be adjusted to respond to this context. This will be particularly helpful in understanding: (1) how the height relates to 54 York; and (2) how the wrap-around mass in the rear yard relates to 41, 41 ½ , and 43 William Street.

- Ensure the new design continues to respond to the William Street context. Regardless of whether the residential component has access at the rear, the building façade facing William should continue to be active and engage with the public realm.

- Address waste management. The waste management situation in "feathers lane" currently appears to serve both 54 York and 35 and 37 William Street. Consider how both properties/uses will be impacted by the proposed new waste management strategy. Consider accessibility, convenience, and the possible nuisance (smell) of waste storage and removal.

- Address the pedestrian and cycling connections. Easily accessible and secure bicycle parking is a priority.

- Address how to make the development accessible and sustainable.

Heritage Comments (Lesley Collins / Sally Coutts)

- The property is designated under Part V of the Ontario Heritage Act and is located in the ByWard Market HCD.

- An application under the Ontario Heritage Act will be required for the stabilization or reconstruction of the building, a Cultural Heritage Impact Statement is also required. The CHIS must be prepared by an independent heritage professional and not the architect for the project. Further details regarding the application requirement will be provided once the proposal is finalized (ie. Demolish and reconstruction or stabilize and construct etc)

- Staff would like to see a 3D model of the proposed building, as well as a view analysis using the views in the attached document.

- See attached map of requested views for heritage.

Urban Design Comments (Christopher Moise)

- Provide clarity as to whether the second storey will be occupied by a commercial use

- Provide clarity on how feather lane and how waste management will be managed

- There is some concern about the quality of the space (depth and access to light) used by the dwelling units.

- Provide clarity on how the basement will be used without any windows

- Explore the idea of doubling the height of the lobby

- Model how the development will function, including access to light and glazing opportunities.

Infrastructure Comments (Shawn Wessel)

- Infrastructure:
    - A 305 mm dia. PVC Watermain (c. 2001) is available on William St.

    - A 250 mm dia. PVC Sanitary Sewer (c. 2000) on William St., which drains to Otawa Outfall Trunk and on to the Interceptor Sewer discharging at ROPEC.

    - A 375 dia. mm PVC Storm Sewer (c. 2000) on William St., which drains to the West King Edward Storm Trunk Sewer and Outlets to the Ottawa River.

    - Please note: Applicant to contact Rideau Valley Conservation Authority (RVCA) for possible restrictions due to quality control. Provide correspondence in Report.

    - The following apply to this site and any development within a separated sewer area:
        - Total (San & Stm) allowable release rate will be 5 year pre-development rate if:
            - Not within a partially separated sewer area

        - Sewer Pipe is newer than 1970 or within Vanier Area where no less than 450mm dia. - otherwise use 2 year pre-dev. Rate

    - Coefficient (C) of runoff will need to be determined as per existing conditions but in no case more than 0.5

    - TC = 20 minutes or can be calculated
        - TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.

    - Any storm events greater than 5 year, up to 100 year, and including 100 year storm event must be detained on site.

    - Two separate sewer laterals (one for sanitary and other for storm) will be required. Please note:
        - Foundation drains are to be independently connected to sewermain (separated or combined) unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
        - Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

- Boundary Conditions will be provided at request of consultant after providing Average Daily Demands, Peak Hour Demands & Max Day + Fire Flow Demands

- Other:
    - Due to more sensitive use a Record of Site Condition (RSC) is required. Ensure Phase I, and if applicable, Phase II ESA's speak to required RSC.

    - Buildings and Facilities renewal project planned for By Ward Markey Square for this season.

    - Water Supply Redundancy – Fire Flow:
        - Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)

    - Where underground storage (UG) and surface ponding are being considered:
        - Show all ponding for 5 and 100 year events

        - Note - There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope

that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

- Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.

- Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2 and 100 year event storage requirements.

- In regards to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

  - Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

  - Provided Info:
    - Please be advised that it is the responsibility of the applicant and their representatives/consultants to verify information provided by the City of Ottawa.
    - Please contact City View and Release Info Centre at Ext. 44455

- Environmental Source Information:
  - City of Ottawa - Historical Land Use Inventory (HLUI)
    - The HLUI database is currently undergoing an update. The updated HLUI will include additional sources beyond those included in the current database, making the inclusion of this record search even more important.

    - Although a municipal historic land use database is not specifically listed as required environmental record in O. Reg 153/04, Schedule D, Part II states the following:

    - The following are the specific objectives of a records review:

- To obtain and review records that relate to the Phase I (One) property and to the current and past uses of and activities at or affecting the Phase I (One) property in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.
- To obtain and review records that relate to properties in the Phase I (One) study area other than the Phase I (One) property, in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

- It is therefore reasonable to request that the HLUI search be included in the Phase I ESA to meet the above objectives. Please submit.
- Existing buildings require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on site servicing plans.

CCTV Scan Guideline.pdf

- There is a possibility that a large sanitary lateral existing under and servicing buildings from 54 York to 61 William Streets where sanitary and roof storm water flows are collected and likely discharged into City infrastructure on George St. This will need to be investigated to ensure that if such sanitary lateral exists, that this service is not severed and/or interrupted and is protected from damage etc.

- Due to this SPC application and the fact that storm water (particularly roof water) is not permitted to drain into the sanitary sewer lateral and into City Sanitary infrastructure, a new storm lateral is required.

- Furthermore, a Site servicing & SWM Report will be required to speak to how the roof tops, terraces and patio are drained and to specific details about site servicing.

Transportation Comments (Wally Dubyk)

- The TIA Step 1 – Screening report is to be revised to reflect any changes to the proposal. Provided no additional triggers are met, no further TIA reports will be required.

- In the submission, provide an explanation of how loading / drop-off for the restaurant use will be accommodated.

- A construction Traffic Management Plan is to be provided for approval by the Senior Engineer, Traffic Management, Transportation Services Dept.

- Bicycle parking spaces are required as per Section 111 of the Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.

- Further comments related to a Site Plan will be provided.

Preliminary Comments from Lowertown Community Association Representative (Bob Tritt)

- Desire to conserve as much as possible.

- Overall, the community sees it as a priority to see this property be re-built.

- Happy to see residential incorporated into the proposal.

- Consider how bicycle parking will be dealt with.

- Consider how waste management will be dealt with.

Next Steps

- Finalize the ongoing study to determine the extent of the fire damage. This will be critical in determining the façade and structural impacts.

- Research property ownership and legal agreements on abutting lands that are proposed to be incorporated into the proposal.

- Refine the proposal to address issues raised through the pre-consultation.

- The applicant is encouraged to return for another meeting with Planning Services prior to submission once the proposal is refined. If a Committee of Adjustment Minor Variance is being pursued, please advise me and I will invite a Committee of Adjustment planner to attend.

- It is recommended that the applicant team seek input from the Ward Councillor, Lowertown Community Association, and neighbouring property owners.

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CP-19-0588 - 35-37 William Street - Water Demands

Project:	35-37 William Street
Project No.:	CP-19-0588
Designed By:	N.B.V.
Checked By:	T.D.F.
Date:	December 17, 2019
Site Area:	0.05 Gross ha
Units:	16 Units
Residents:	22.4 People

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	350	L/c/d
Industrial - Light	35,000	L/gross ha/d
Industrial - Heavy	55,000	L/gross ha/d
Shopping Centres	2,500	L/(1000m² /d
Hospital	900	L/(bed/day)
Schools	70	L/(Student/d)
Trailer Parks no Hook-Ups	340	L/(space/d)
Trailer Park with Hook-Ups	800	L/(space/d)
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motels	150	L/(bed-space/d)
Hotels	225	L/(bed-space/d)
Tourist Commercial	28,000	L/gross ha/d
Other Commercial	28,000	L/gross ha/d
AVERAGE DAILY DEMAND	0.11	L/s

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	2.5 x avg. day	L/c/d
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	0.25	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	2.2 x max. day	L/c/d
Industrial	1.8 x max. day	L/gross ha/d
Commercial	1.8 x max. day	L/gross ha/d
Institutional	1.8 x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	0.54	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

CP-19-0588 - 35-37 William Street - OBC Fire Calculations

Project:	35-37 William Street
Project No.:	CP-19-0588
Designed By:	N.B.V.
Checked By:	T.D.F.
Date:	December 17, 2019

Ontario 2006 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting - Mixed Use Commercial and Residential Building

Building is classified as Group : C and D (from table 3.2.2.55)
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with subsections 3.2.2., including loadbearing walls, columns and arches

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

Stot = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

Stot = 1.0 + [Sside1+Sside2+Sside3+...etc.]

K	16	(from Table 1 pg A-31) (Worst case occupancy {C/ D} 'K' value used)
V	4,552	(Total building volume in m³.)
Stot	2.0	(From figure 1 pg A-32)
Q =	145,650.56 L	

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

4500 L/min (if Q <162,000 L and Q >135,000)
1189 gpm

			From Figure 1 (A-32)
Snorth	0	m	0.5
Seast	6.45	m	0.4
Ssouth	0	m	0.5
Swest	15	m	0.0

*approximate distances

McINTOSH PERRY

CP-19-0588 - 35-37 William Street - Fire Underwriters Survey (FUS) Fire Calculations

Project:	35-37 William Street
Project No.:	CP-19-0588
Designed By:	N.B.V.
Checked By:	T.D.F.
Date:	December 17, 2019

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:

F = 220 x C x vA Where:

F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine The Coefficient Related To The Type Of Construction

The building is considered to be of ordinary construction type. Therefore,

C = 1.00

B. Determine Ground Floor Area

As provided by the Architect:

Floor Area (Floor One)	=	471.52	m²
Floor Area (Floor Two)	=	471.52	m²
Floor Area (Floor Three)	=	365.03	m²
Floor Area (Floor Four)	=	347.05	m²
A	=	1,655.12	m²

This floor area represents the final build-out of the development; as outlined on the Site Plan drawing.

C. Determine Height in Storeys

From Architectural Drawings:

Number of Storeys = 4.00

D. Calculate Required Fire Flow

F = 220 x C x vA

F = 220.00 X 1.00 X v 1655.12

F = 8,950.30 L/min.

E. Determine Increase or Decrease Based on Occupancy

From note 2, Page 18 of the Fire Underwriter Survey:

C2 and C3
No Change

Occupancy Decrease = 0.00 L/min.

F = 8,950.30 L/min.

F. Determine the Decrease, if any for Sprinkler Protection

From note 3, Page 18 of the Fire Underwriter Survey:

- The flow requirement may be reduced by up to 50% for complete automatic sprinkler protection depending upon adequacy of the system.
- The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.
- Additional credit of 10% if water supply is standard for both the system and fire department hose lines
- If sprinkler system is fully supervised system, an additional 10% credit is granted
- The entire building will be installed with a fully automated, standardized with the City of Ottawa Fire Department
- Therefore the value obtained in Step E is reduced by 30% (The building is sprinklered with a standard system and fire department hose lines)

Reduction = 8,950.30 L/min. X 30%

Reduction = 2,685.09 L/min.

G. Determine the Total Increase for Exposures

From note 4, Page 18 of the Fire Underwriter Survey:

- Exposure distance to the existing buildings to the north & south of the proposed building is approximately 0m. East and West are 6.5m and 15m respectively
- There are existing buildings surrounding the remainder of the site that are within 45m.
- Therefore the charge for exposure is 75% of the value obtained in Step E.

Increase = 8,950.30 L/min. X 75%

Increase = 6,712.73 L/min.

H. Determine the Total Fire Demand

- To the answer obtained in E, substract the value obtained in F and add the value obtained in G
- Fire flow should be no less than 2,000L/min. and the maximum value shoul not exceed 45,000L/min.

F = 8,950.30 L/min. - 2,685.09 L/min. + 6,712.73 L/min.
F = 12,977.94 L/min.

Therefore, after rounding to the nearest 1,000 L/min, the total required fire flow for the development is 13,000 L/min (3,434 GPM).

Nicholas Vachon

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: December 18, 2019 9:24 AM
To: Nicholas Vachon
Cc: Tyler Ferguson; O'Connor, Ann
Subject: RE: Boundary Condition Request - 35-37 William Street
Attachments: 35-34 William Dec 2019.pdf

Good morning Mr. Vachon.

Further to your request, please find boundary conditions below:

The following are boundary conditions, HGL, for hydraulic analysis at 35-37 William (zone 1W) assumed to be connected to the 305mm on William (see attached PDF for location).

Minimum HGL = 107.5m

Maximum HGL = 115.0m

MaxDay + FireFlow (217 L/s) = 104.0m

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.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale

Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

From: Nicholas Vachon <n.vachon@mcintoshperry.com>
Sent: December 06, 2019 12:21 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Tyler Ferguson <t.ferguson@mcintoshperry.com>
Subject: Boundary Condition Request - 35-37 William Street

Good Afternoon,

I have conducted water demand and fire flow calculations with the information available and would like to request boundary conditions for the development located at 35 – 37 William Street.

The development includes adding a new Mixed use Commercial and Residential Building. I have attached a location map showing the subject site and the approximate location of the water service as well as the calculations.

Please find the below a summary of the water demands to obtain boundary conditions.

	35-37 William Street
Type of Development:	Mixed Use + Residential
Location of Service:	William Street
Amount of Fire Flow Required (FUS):	13,000 L/min
Site Area (ha):	0.05
Average Daily Demand (L/sec):	0.11
Maximum Daily Demand (L/sec):	0.25
Maximum Hourly Demand (L/sec):	0.54

If you require any further information or have any questions, please feel free to contact me.

Thank you,

Nicholas Vachon, EIT
Engineering Intern
115 Walgreen Road, R.R. 3, Carp, ON K0A 1L0

T. 613.903.5805
n.vachon@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

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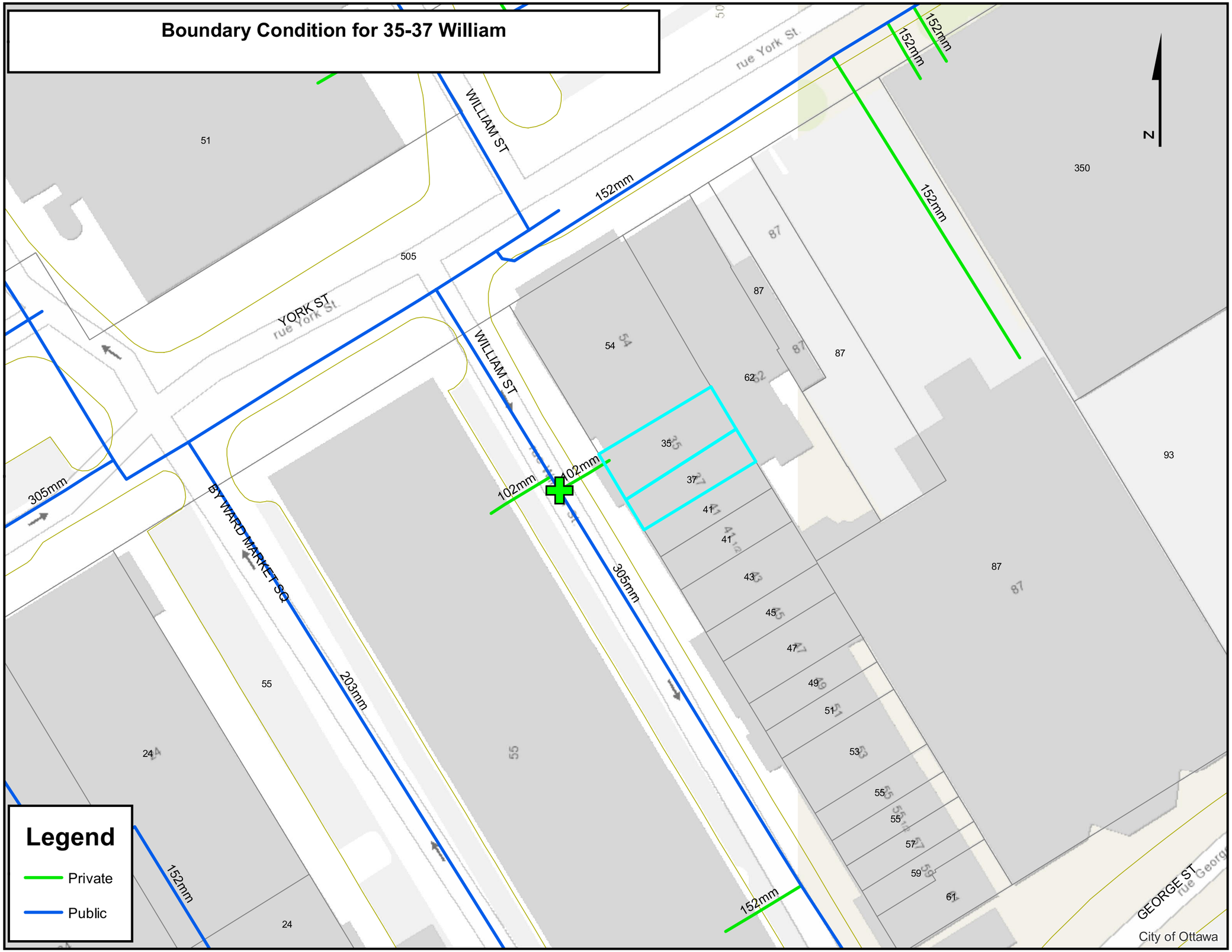
Boundary Condition for 35-37 William



APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

Project:	CP-19-0588 – 35-37 William Street
Designed By:	NBV
Checked By:	TDF
Date:	December 17, 2019

Re: Sanitary Flow Calculations

1. Building Occupancy

The maximum number of bedroom units will be 16 units as per the floors plans and there will be 270 seats in the restaurant as per the attached unit break down from the Architect.

2. Daily Volume in Litres

As per the extract of the City of Ottawa Sewer Design Guidelines, Appendix 4-A; Daily Sewage Flow for Dwellings;

- Each Dwelling unit of 1 bedroom
  = 275 Liters/Dwelling/Day
- Each Seat in an Ordinary Restaurant
  = 125 Liters/Seat/Day

3. Peak Flow (Q/p)

- $Q_{1\text{-BED}}(p) = F_{1\text{-BED}} \times P_{1\text{-BED}}$ Where:
  $F_{1\text{-BED}}$ = 275 Litres/Dwelling/Day (as per City of Ottawa Sewer Design Guidelines)
  $P_{1\text{-BED}}$ = 16 Units (as per Site Plan)
- Therefore, $Q_{1\text{-BED}}(p) = (275) \times (16) =$ <u>4,400 L/Day (0.051 L/sec)</u>
- $Q_{2\text{-RES}}(p) = F_{RES} \times P_{RES}$ Where:
  F_{RES} = 125 Litres/Dwelling/Day (as per City of Ottawa Sewer Design Guidelines)
  P_{RES} = 270 Units (as per architect)
- Therefore, $Q_{2\text{-RES}}(p) = (125) \times (270) =$ <u>33,750 L/Day (0.391 L/sec)</u>
- $Q_{TOTAL}(p) = Q_{1\text{-BED}} + Q_{2\text{-RES}}$ Where:
  $Q_{1\text{-BED}}$ = 4,400 L/Day
  $Q_{2\text{-RES}}$ = 33,750 L/Day
- Therefore, $Q_{TOTAL}(p) = (4,400) + (33,750) =$ <u>38,150 L/Day (0.442 L/sec)</u>

The capacity of a 250mm sewer with a slope of 0.5% is 43.87 L/s. Therefore, the existing 250mm diameter PVC sanitary main within William Street has the capacity to accommodate the new flows as the additional flow from the development is only 1% of the capacity.

SANITARY SEWER DESIGN SHEET

PROJECT: 35-37 William Street Re-Development
LOCATION: 35-37 William Street
CLIENT: Domenic Santaguida

McINTOSH PERRY

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			FLOW	SEWER DATA						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES SF	SD	TH	APT	AREA (ha)	POPULATION IND	CUM	PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha) INSTITUTIONAL IND	CUM	COMMERCIAL IND	CUM	INDUSTRIAL IND	CUM	PEAK FLOW (L/s)	AREA (ha) IND	CUM	FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY L/s	(%)
		BLD	Ex. 250mm				16	0.05	36.8	36.8	4.00	0.05		0.00	0.39	0.39		0.00	0.39	0.05	0.05	0.02	0.46	22.47	8.41	150	2.00	1.232	22.01	97.96
													Commercial Flow as per Sanitary Flow Calculations																	

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	28,000	L/Ha/day	1.5
APT	2.3	p/p/u	COM	28,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart

Notes:

1. Mannings coefficient (n) =	0.013	
2. Demand (per capita):	280	L/day
3. Infiltration allowance:	0.33	L/s/Ha
4. Residential Peaking Factor:		
Harmon Formula = 1+(14/(4+P^0.5)*0.8)		
where P = population in thousands		

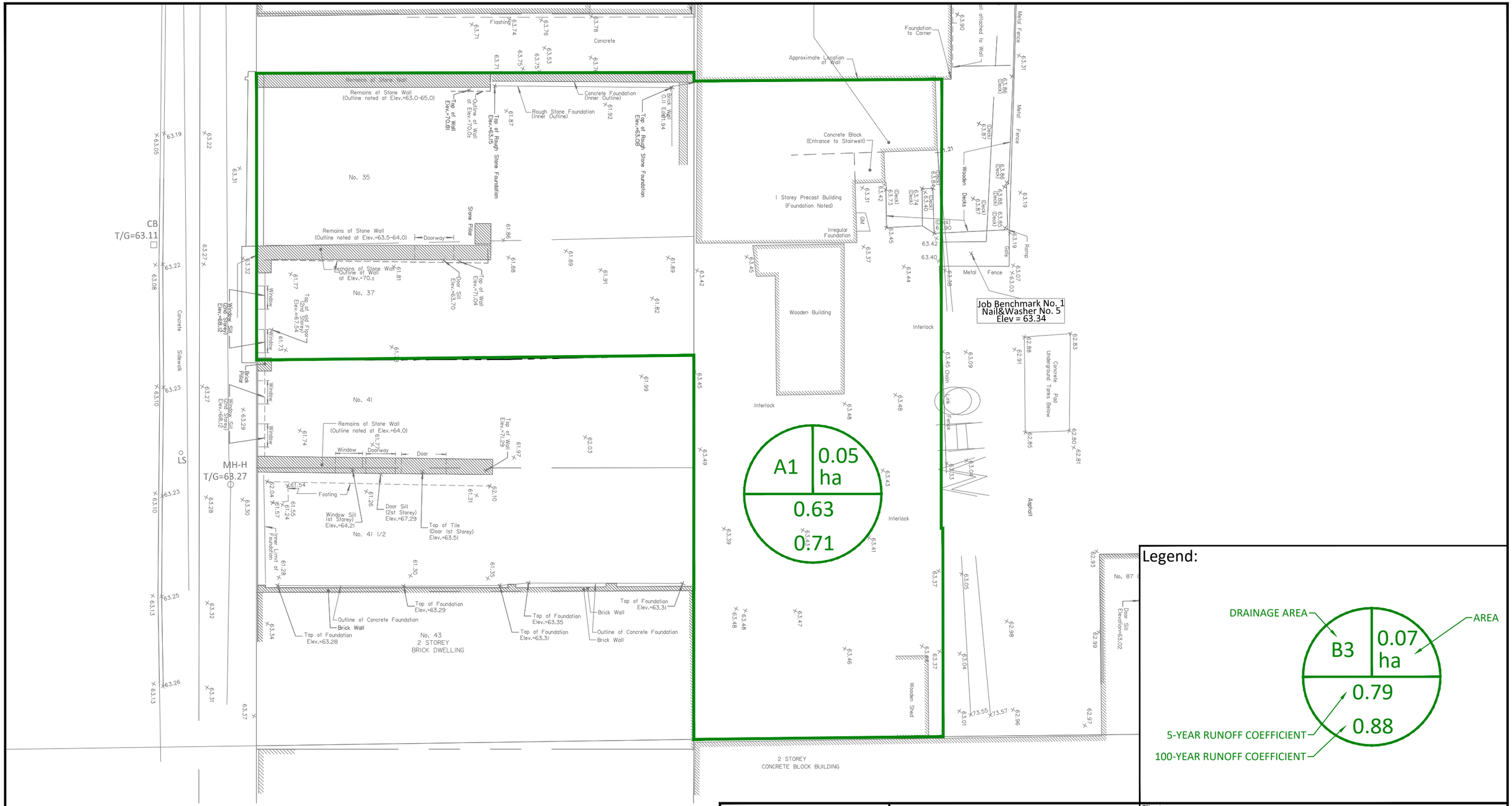
Designed: NBV
Checked: TDF
Project No.: CP-19-0588

No.	Revision	Date
1.	City Submission #1	2019-12-18

Sheet No: 1 of 1

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



SCALE 1 : 150

0 5 10 15 Metres

Legend:

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Client: VITTORIA TRATTORIA
35 WILLIAM STREET, OTTAWA, ON, K1N 6Z9

Project: VITTORIA TRATTORIA
35-37 WILLIAM STREET RE-DEVELOPMENT

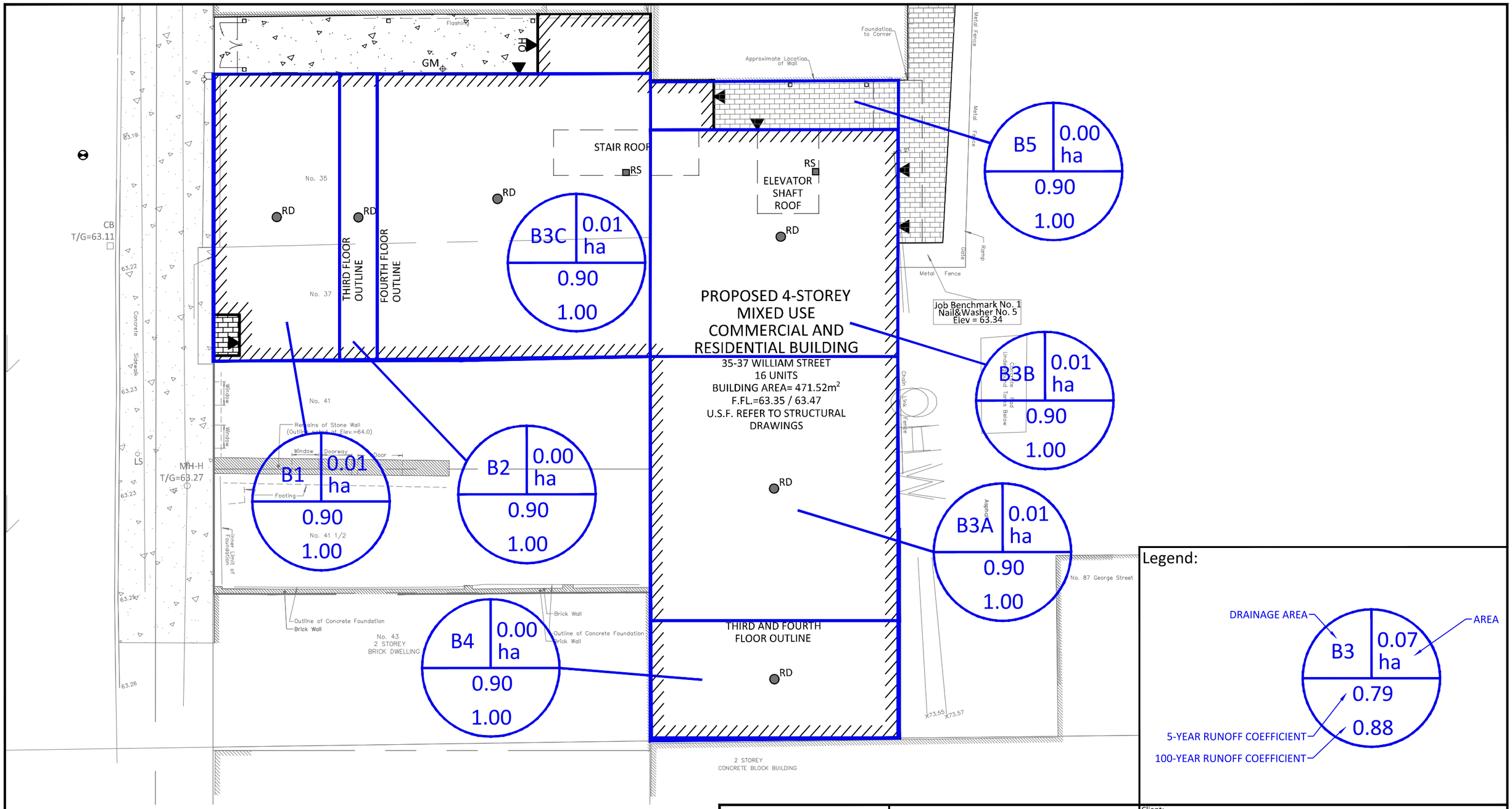
Drawing Title: POST-DEVELOPMENT DRAINAGE AREA PLAN

Drawn by:	Checked By:			Drawing Number:
N.B.V.	T.D.F.			PRE
Scale: 1:150	Project Number: CP-19-0588	1	ISSUED FOR REVIEW	DEC. 18, 2019
		No.	Revisions	Date

FILENAME: H:\01 Project - Proposals\2019 Jobs\CP\0CP-Projects\0CP-19-0588 Domenic Santaguida_Vittoria Trattoria_35 William St\12 - Drawings\CP-19-0588 PRESENTATION.dwg
LAST SAVED: Wednesday, December 18, 2019 LAST SAVED BY: n.vachon
LAST PLOTTED: Wednesday, December 18, 2019, 5:08 PM, EST, DWG —

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



Legend:

DRAINAGE AREA — B3 0.07 ha — AREA

0.79 — 5-YEAR RUNOFF COEFFICIENT

0.88 — 100-YEAR RUNOFF COEFFICIENT

SCALE 1 : 150

0 5 10 15 Metres

N

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Client: VITTORIA TRATTORIA
35 WILLIAM STREET, OTTAWA, ON, K1N 6Z9

Project: VITTORIA TRATTORIA
35-37 WILLIAM STREET RE-DEVELOPMENT

Drawing Title: POST-DEVELOPMENT DRAINAGE AREA PLAN

Drawn by:	Checked By:
N.B.V.	T.D.F.
Scale: 1:150	Project Number: CP-19-0588

No.	Revisions	Date
2	UPDATED AS PER CITY COMMENTS	MAY 6, 2020
1	ISSUED FOR REVIEW	DEC. 18, 2019

Drawing Number: POST

FILENAME: U:\Ottawa\01 Project - Proposals\2019 jobs\CP\OCP-Projects\OCP-19-0588 Domenic Santaguida_ Vittoria Trattoria_35 William St\12 - Drawings\[CP-19-0588 PRESENTATION.dwg
LAST SAVED: Tuesday, May 05, 2020 LAST SAVED BY: n.vachon
LAST PLOTTED: Wednesday, May 06, 2020 - CTB FILE USED: -

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

Pre-Development Runoff Coefficient

Drainage Area	Area (ha)	Impervious Area (m^2)	C	Gravel Area (m^2)	C	Pervious Area (m^2)	C	C_{AVG} 5-Year	C_{AVG} 100-Year
A1	0.048	291.97	0.90	0.00	0.60	186.15	0.20	0.63	0.71

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	I (mm/hr)		Q (L/s)	
					5-Year	100-Year	5-Year	100-Year
A1	0.048	0.63	0.71	10	104.2	178.6	8.69	16.80
Total	0.048						8.69	16.80

Post-Development Runoff Coefficient

Drainage Area	Area (ha)	Impervious Area (m^2)	C	Gravel Area (m^2)	C	Pervious Area (m^2)	C	C_{AVG} 5-Year	C_{AVG} 100-Year
B1	0.006	59.72	0.90	0.00	0.60	0.00	0.20	0.90	1.00
B2	0.002	17.96	0.90	0.00	0.60	0.00	0.20	0.90	1.00
B3A	0.011	108.90	0.90	0.00	0.60	0.00	0.20	0.90	1.00
B3B	0.009	93.16	0.90	0.00	0.60	0.00	0.20	0.90	1.00
B3C	0.013	128.92	0.90	0.00	0.60	0.00	0.20	0.90	1.00
B4	0.005	48.04	0.90	0.00	0.60	0.00	0.20	0.90	1.00
B5	0.002	21.42	0.90	0.00	0.60	0.00	0.20	0.90	1.00

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	I (mm/hr)		Q (L/s)	
					5-Year	100-Year	5-Year	100-Year
B1	0.006	0.90	1.00	10	104.2	178.6	1.56	2.96
B2	0.002	0.90	1.00	10	104.2	178.6	0.47	0.89
B3A	0.011	0.90	1.00	10	104.2	178.6	2.84	5.41
B3B	0.009	0.90	1.00	10	104.2	178.6	2.43	4.62
B3C	0.013	0.90	1.00	10	104.2	178.6	3.36	6.40
B4	0.005	0.90	1.00	10	104.2	178.6	1.25	2.38
B5	0.002	0.90	1.00	10	104.2	178.6	0.56	1.06
Total	0.048						12.46	23.73

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	I (mm/hr)	Q (L/s)
				5-Year	5-Year
A1	0.048	0.50	10	104.2	6.92

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/s)		Restricted Flow (L/s)		Storage Required (m^3)		Storage Provided (m^3)		
	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year	
B1	1.56	2.96	0.32	0.57	0.88	1.72	1.12	2.02	Restricted
B2	0.47	0.89	0.19	0.32	0.17	0.34	0.20	0.34	Restricted
B3A	2.84	5.41	0.38	0.63	1.98	3.95	2.45	4.08	Restricted
B3B	2.43	4.62	0.32	0.50	1.70	3.47	2.33	3.73	Restricted
B3C	3.36	6.40	0.38	0.69	2.51	4.81	2.79	5.12	Restricted
B4	1.25	2.38	0.25	0.50	0.72	1.32	0.73	1.44	Restricted
B5	0.56	1.06	0.56	1.06					Unrestricted
Total	12.46	23.73	2.40	4.27	7.95	15.61	9.63	16.73	

Storage Requirements for Area B1

5-Year Storm Event

Tc (min)	I (mm/hr)	B1 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	1.56	0.32	1.24	0.74
20	70.3	1.05	0.32	0.73	0.88
30	53.9	0.81	0.32	0.49	0.87
40	44.2	0.66	0.32	0.34	0.82
50	37.7	0.56	0.32	0.24	0.73
60	32.9	0.49	0.32	0.17	0.62
70	29.4	0.44	0.32	0.12	0.50
80	26.6	0.40	0.32	0.08	0.37
90	24.3	0.36	0.32	0.04	0.23
100	22.4	0.33	0.32	0.01	0.09

Maximum Storage Required 5-Year (m^3) =	0.88

100-Year Storm Event

Tc (min)	I (mm/hr)	B1 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	2.96	0.57	2.39	1.44
20	120.0	1.99	0.57	1.42	1.71
30	91.9	1.53	0.57	0.96	1.72
40	75.1	1.25	0.57	0.68	1.63
50	64.0	1.06	0.57	0.49	1.48
60	55.9	0.93	0.57	0.36	1.29
70	49.8	0.83	0.57	0.26	1.08
80	45.0	0.75	0.57	0.18	0.85

Maximum Storage Required 100-Year (m^3) =	1.72

Storage Occupied In Area B1

5-Year Storm Event

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Roof	44.79	0.025	1.12
		Total	1.12

Storage Available (m^3) =	1.12
Storage Required (m^3) =	0.88

100-Year Storm Event

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Roof	44.79	0.045	2.02
		Total	2.02

Storage Available (m^3) =	2.02
Storage Required (m^3) =	1.72

*Area is 75% of the total roof area

Roof Drain Flow (B1)

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	1	
	5-Year	100-Year
Rooftop Storage (m^3)	1.12	2.02
Storage Depth (m)	0.025	0.045
Flow (Per Roof Drain) (L/s)	0.32	0.57
Total Flow (L/s)	0.32	0.57

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

2 roof drains during a 5 year storm
elevation of water = 30mm
Flow leaving 2 roof drains = (2 x 0.36 L/s) = 0.72 L/s

2 roof drains during a 100 year storm
elevation of water = 45mm
Flow leaving 2 roof drains = (2 x 0.54 L/s) = 1.08 L/s

	Roof Drain Flow		
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
	0.19	15	0.19
	0.25	20	0.25
5-Year	0.32	25	0.32
	0.38	30	0.38
	0.44	35	0.44
	0.50	40	0.50
100-Year	0.57	45	0.57
	0.63	50	0.63
	0.69	55	0.69
	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.13	90	1.13
	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.76	140	1.76
	1.83	145	1.83
	1.89	150	1.89

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Storage Requirements for Area B2

5-Year Storm Event

Tc (min)	I (mm/hr)	B2 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	0.47	0.19	0.28	0.17
20	70.3	0.32	0.19	0.13	0.15
30	53.9	0.24	0.19	0.05	0.09
40	44.2	0.20	0.19	0.01	0.02
50	37.7	0.17	0.19	-0.02	-0.06
60	32.9	0.15	0.19	-0.04	-0.15

Maximum Storage Required 5-Year (m^3) =	0.17

100-Year Storm Event

Tc (min)	I (mm/hr)	B2 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	0.89	0.32	0.57	0.34
20	120.0	0.60	0.32	0.28	0.33
30	91.9	0.46	0.32	0.14	0.25
40	75.1	0.38	0.32	0.06	0.13
50	64.0	0.32	0.32	0.00	0.00
60	55.9	0.28	0.32	-0.04	-0.15

Maximum Storage Required 100-Year (m^3) =	0.34

Storage Occupied In Area B2

5-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	13.47	0.015	0.20
		Total	0.20

Storage Available (m^3) =	0.20
Storage Required (m^3) =	0.17

100-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	13.47	0.025	0.34
		Total	0.34

Storage Available (m^3) =	0.34
Storage Required (m^3) =	0.34

*Area is 75% of the total roof area

Roof Drain Flow (B2)

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	1	
	5-Year	100-Year
Rooftop Storage (m^3)	0.20	0.34
Storage Depth (m)	0.015	0.025
Flow (Per Roof Drain) (L/s)	0.19	0.32
Total Flow (L/s)	0.19	0.32

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

3 roof drains during a 5 year storm
elevation of water = 55mm
Flow leaving 4 roof drains = (3 x 0.66 L/s) = 1.98 L/s

3 roof drains during a 100 year storm
elevation of water = 85mm
Flow leaving 4 roof drains = (3 x 1.02 L/s) = 3.06 L/s

	Roof Drain Flow		
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
5-Year	0.19	15	0.19
	0.25	20	0.25
100-Year	0.32	25	0.32
	0.38	30	0.38
	0.44	35	0.44
	0.50	40	0.50
	0.57	45	0.57
	0.63	50	0.63
	0.69	55	0.69
	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.13	90	1.13
	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.76	140	1.76
	1.83	145	1.83
	1.89	150	1.89

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Storage Requirements for Area B3

5-Year Storm Event

Tc (min)	I (mm/hr)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	2.84	0.38	2.46	1.48
20	70.3	1.91	0.38	1.53	1.84
30	53.9	1.47	0.38	1.09	1.96
40	44.2	1.20	0.38	0.82	1.98
50	37.7	1.03	0.38	0.65	1.94
60	32.9	0.90	0.38	0.52	1.86

Maximum Storage Required 5-Year (m^3) =	1.98

100-Year Storm Event

Tc (min)	I (mm/hr)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	5.41	0.63	4.78	2.87
20	120.0	3.63	0.63	3.00	3.60
30	91.9	2.78	0.63	2.15	3.87
40	75.1	2.27	0.63	1.64	3.95
50	64.0	1.94	0.63	1.31	3.92
60	55.9	1.69	0.63	1.06	3.82

Maximum Storage Required 100-Year (m^3) =	3.95

Storage Occupied In Area B3

5-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	81.68	0.030	2.45
		Total	2.45

Storage Available (m^3) =	2.45
Storage Required (m^3) =	1.98

100-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	81.68	0.050	4.08
		Total	4.08

Storage Available (m^3) =	4.08
Storage Required (m^3) =	3.95

*Area is 75% of the total roof area

Roof Drain Flow (B3)

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	1	
	5-Year	100-Year
Rooftop Storage (m^3)	2.45	4.08
Storage Depth (m)	0.030	0.050
Flow (Per Roof Drain) (L/s)	0.38	0.63
Total Flow (L/s)	0.38	0.63

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

4 roof drains during a 5 year storm
elevation of water = 50mm
Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

4 roof drains during a 100 year storm
elevation of water = 75mm
Flow leaving 4 roof drains = (4 x 0.90 L/s) = 3.60 L/s

	Roof Drain Flow		
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
	0.19	15	0.19
	0.25	20	0.25
	0.32	25	0.32
5-Year	0.38	30	0.38
	0.44	35	0.44
	0.50	40	0.50
	0.57	45	0.57
100-Year	0.63	50	0.63
	0.69	55	0.69
	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.13	90	1.13
	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.76	140	1.76
	1.83	145	1.83
	1.89	150	1.89

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Storage Requirements for Area B3

5-Year Storm Event

Tc (min)	I (mm/hr)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	2.43	0.32	2.11	1.27
20	70.3	1.64	0.32	1.32	1.58
30	53.9	1.26	0.32	0.94	1.69
40	44.2	1.03	0.32	0.71	1.70
50	37.7	0.88	0.32	0.56	1.67
60	32.9	0.77	0.32	0.45	1.61

Maximum Storage Required 5-Year (m^3) =	1.70

100-Year Storm Event

Tc (min)	I (mm/hr)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	4.62	0.50	4.12	2.47
20	120.0	3.11	0.50	2.61	3.13
30	91.9	2.38	0.50	1.88	3.38
40	75.1	1.95	0.50	1.45	3.47
50	64.0	1.66	0.50	1.16	3.47
60	55.9	1.45	0.50	0.95	3.41

Maximum Storage Required 100-Year (m^3) =	3.47

Storage Occupied In Area B3

5-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	93.16	0.025	2.33
		Total	2.33

Storage Available (m^3) =	2.33
Storage Required (m^3) =	1.70

100-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	93.16	0.040	3.73
		Total	3.73

Storage Available (m^3) =	3.73
Storage Required (m^3) =	3.47

*Area is 75% of the total roof area

Roof Drain Flow (B3)

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	1	
	5-Year	100-Year
Rooftop Storage (m^3)	2.45	4.08
Storage Depth (m)	0.025	0.040
Flow (Per Roof Drain) (L/s)	0.32	0.50
Total Flow (L/s)	0.32	0.50

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

4 roof drains during a 5 year storm
elevation of water = 50mm
Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

4 roof drains during a 100 year storm
elevation of water = 75mm
Flow leaving 4 roof drains = (4 x 0.90 L/s) = 3.60 L/s

	Roof Drain Flow		
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
	0.19	15	0.19
	0.25	20	0.25
5-Year	0.32	25	0.32
	0.38	30	0.38
	0.44	35	0.44
100-Year	0.50	40	0.50
	0.57	45	0.57
	0.63	50	0.63
	0.69	55	0.69
	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.13	90	1.13
	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.76	140	1.76
	1.83	145	1.83
	1.89	150	1.89

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Storage Requirements for Area B3

5-Year Storm Event

Tc (min)	I (mm/hr)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	3.36	0.38	2.98	1.79
20	70.3	2.27	0.38	1.89	2.26
30	53.9	1.74	0.38	1.36	2.45
40	44.2	1.43	0.38	1.05	2.51
50	37.7	1.21	0.38	0.83	2.50
60	32.9	1.06	0.38	0.68	2.46

Maximum Storage Required 5-Year (m^3) =	2.51

100-Year Storm Event

Tc (min)	I (mm/hr)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	6.40	0.69	5.71	3.43
20	120.0	4.30	0.69	3.61	4.33
30	91.9	3.29	0.69	2.60	4.68
40	75.1	2.69	0.69	2.00	4.81
50	64.0	2.29	0.69	1.60	4.81
60	55.9	2.00	0.69	1.31	4.73

Maximum Storage Required 100-Year (m^3) =	4.81

Storage Occupied In Area B3

5-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	93.16	0.030	2.79
		Total	2.79

Storage Available (m^3) =	2.79
Storage Required (m^3) =	2.51

100-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	93.16	0.055	5.12
		Total	5.12

Storage Available (m^3) =	5.12
Storage Required (m^3) =	4.81

*Area is 75% of the total roof area

Roof Drain Flow (B3)

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	1	
	5-Year	100-Year
Rooftop Storage (m^3)	2.45	4.08
Storage Depth (m)	0.030	0.055
Flow (Per Roof Drain) (L/s)	0.38	0.69
Total Flow (L/s)	0.38	0.69

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

4 roof drains during a 5 year storm
elevation of water = 50mm
Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

4 roof drains during a 100 year storm
elevation of water = 75mm
Flow leaving 4 roof drains = (4 x 0.90 L/s) = 3.60 L/s

	Roof Drain Flow		
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
	0.19	15	0.19
	0.25	20	0.25
	0.32	25	0.32
5-Year	0.38	30	0.38
	0.44	35	0.44
	0.50	40	0.50
	0.57	45	0.57
	0.63	50	0.63
100-Year	0.69	55	0.69
	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.13	90	1.13
	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.76	140	1.76
	1.83	145	1.83
	1.89	150	1.89

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Storage Requirements for Area B4

5-Year Storm Event

Tc (min)	I (mm/hr)	B4 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	1.25	0.25	1.00	0.60
20	70.3	0.84	0.25	0.59	0.71
30	53.9	0.65	0.25	0.40	0.72
40	44.2	0.53	0.25	0.28	0.67
50	37.7	0.45	0.25	0.20	0.61
60	32.9	0.40	0.25	0.15	0.53

Maximum Storage Required 5-Year (m^3) =	0.72

100-Year Storm Event

Tc (min)	I (mm/hr)	B4 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	2.38	0.50	1.88	1.13
20	120.0	1.60	0.50	1.10	1.32
30	91.9	1.23	0.50	0.73	1.31
40	75.1	1.00	0.50	0.50	1.21
50	64.0	0.85	0.50	0.35	1.06
60	55.9	0.75	0.50	0.25	0.89

Maximum Storage Required 100-Year (m^3) =	1.32

Storage Occupied In Area B4

5-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	36.03	0.020	0.73
		Total	0.73

Storage Available (m^3) =	0.73
Storage Required (m^3) =	0.72

100-Year Storm Event

Roof Storage			
Location	Area	Depth	Volume (m^3)
Roof	36.03	0.040	1.44
		Total	1.44

Storage Available (m^3) =	1.44
Storage Required (m^3) =	1.32

*Area is 75% of the total roof area

Roof Drain Flow (B4)

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	1	
	5-Year	100-Year
Rooftop Storage (m^3)	0.73	1.44
Storage Depth (m)	0.020	0.040
Flow (Per Roof Drain) (L/s)	0.25	0.50
Total Flow (L/s)	0.25	0.50

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

4 roof drains during a 5 year storm
elevation of water = 50mm
Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

4 roof drains during a 100 year storm
elevation of water = 75mm
Flow leaving 4 roof drains = (4 x 0.90 L/s) = 3.60 L/s

	Roof Drain Flow		
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
	0.19	15	0.19
5-Year	0.25	20	0.25
	0.32	25	0.32
	0.38	30	0.38
	0.44	35	0.44
100-Year	0.50	40	0.50
	0.57	45	0.57
	0.63	50	0.63
	0.69	55	0.69
	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.13	90	1.13
	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.76	140	1.76
	1.83	145	1.83
	1.89	150	1.89

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	18	0.60	5	4

Therefore, a Tc of 10 can be used

Tc= (3.26(1.1-c)L^0.5/S^0.33)

c= Blanced Runoff Coefficient

L= Length of drainage area

S= Average slope of watershed

WATTS®	Adjustable Accutrol Weir Tag: _____	Adjustable Flow Control for Roof Drains

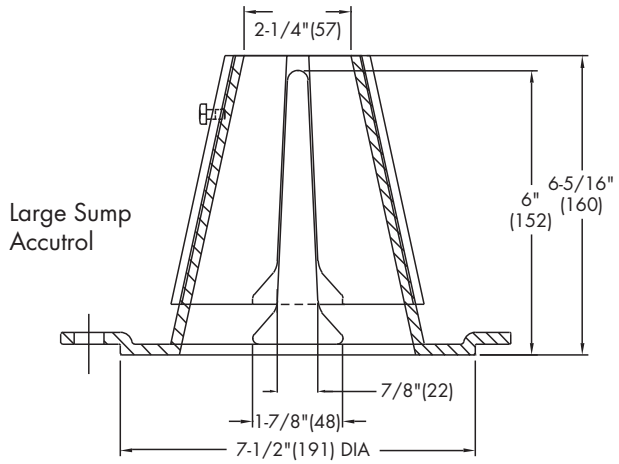
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

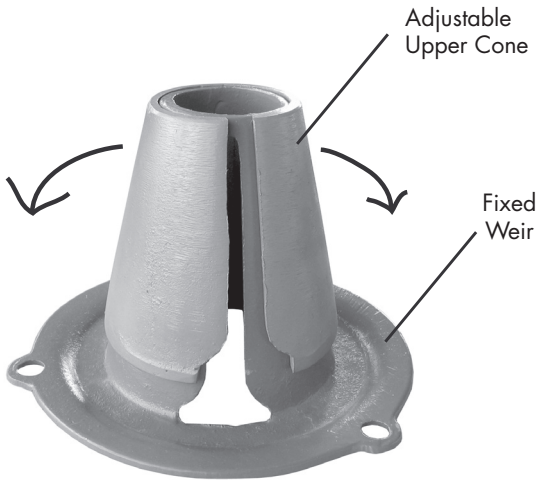
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2"of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3"of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Job Name _____ Contractor _____

Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

WATTS®
A Watts Water Technologies Company

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

STORM SEWER DESIGN SHEET

PROJECT: 289 Carling Avenue
LOCATION: Ottawa, Ontario
CLIENT: John Howard Society

McINTOSH PERRY

LOCATION				CONTRIBUTING AREA (ha)								RATIONAL DESIGN FLOW											SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
STREET	AREA ID	FROM MH	TO MH	C-VALUE						INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)	
				0.20	0.60	0.79	0.85	0.87	0.90																DIA	W	H			(L/s)	(%)
	B1 - B4	BLDG	Tee						0.05	0.04	0.04	10.00	0.13	10.13	104.19	122.14	178.56	12.46				12.46	22.47	9.59	150			2.00	1.232	10.00	44.53%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: N.V.B.

Checked: T.D.F.

Project No.: CP-19-0007

No.	Revision	Date
1.	Issued for review	2019-12-12

Sheet No: 1 of 1

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

McINTOSH PERRY

City of Ottawa

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

Criteria	Location (if applicable)
☐ Executive Summary (for larger reports only).	N/A
☐ Date and revision number of the report.	On Cover
☐ Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
☐ Plan showing the site and location of all existing services.	Site Servicing Plan (C102)
☐ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
☐ Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
☐ Statement of objectives and servicing criteria.	3.0 Pre-Consultation Summary

☐ Identification of existing and proposed infrastructure available in the immediate area.	N/A
☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)
☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)
☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐ Proposed phasing of the development, if applicable.	N/A
☐ Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Backround Studies
☐ All preliminary and formal site plan submissions should have the following information: o Metric scale o North arrow (including construction North) o Key plan o Name and contact information of applicant and property owner o Property limits including bearings and dimensions o Existing and proposed structures and parking areas o Easements, road widening and rights-of-way o Adjacent street names	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)

4.2 Development Servicing Report: Water

Criteria	Location (if applicable)
☐ Confirm consistency with Master Servicing Study, if available	N/A
☐ Availability of public infrastructure to service proposed development	N/A
☐ Identification of system constraints	N/A
☐ Identify boundary conditions	Appendix C
☐ Confirmation of adequate domestic supply and pressure	N/A
☐ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Appendix C
☐ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐ Address reliability requirements such as appropriate location of shut-off valves	N/A
☐ Check on the necessity of a pressure zone boundary modification.	N/A
☐ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Appendix C

☐ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Site Servicing Plan (C102)
☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☐ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Criteria	Location (if applicable)
☐ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	N/A
☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☐ Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.3 Proposed Sanitary Design

☐ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 5.3 Proposed Sanitary Design
☐ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A
☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 5.3 Proposed Sanitary Design
☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐ Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Criteria	Location (if applicable)
☐ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 6.0 Stormwater Management
☐ Analysis of available capacity in existing public infrastructure.	N/A
☐ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
☐ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5-year event (dependent on the receiving sewer design) to 100-year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 6.0 Stormwater Management
☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 6.0 Stormwater Management
☐ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.0 Stormwater Management
☐ Set-back from private sewage disposal systems.	N/A
☐ Watercourse and hazard lands setbacks.	N/A
☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☐ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Site Grading, Drainage, Sediment & Erosion Control Plan
☐ Calculate pre-and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 6.0 Stormwater Management Appendix G
☐ Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Stormwater Management
☐ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.0 Stormwater Management
☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐ Identification of potential impacts to receiving watercourses	N/A
☐ Identification of municipal drains and related approval requirements.	N/A
☐ Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.0 Stormwater Management
☐ 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)
☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A

☐ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0 Sediment & Erosion Control
☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐ Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

Criteria	Location (if applicable)
☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	N/A
☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐ Changes to Municipal Drains.	N/A
☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

Criteria	Location (if applicable)
☐ Clearly stated conclusions and recommendations	Section 8.0 Summary Section 9.0 Recommendations
☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	All are stamped
☐ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped