SERVICING AND STORMWATER MANAGEMENT REPORT

THE FOUNDERS RESIDENCES WESTBORO
1705 CARLING AVENUE
OTTAWA, ONTARIO

Prepared by:

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

April 20, 2018
Revised: August 8, 2018

Novatech File: 117216
Ref No. R-2018-059

NOVATECH
Engineers, Planners & Landscape Architects

August 8, 2018

Planning and Infrastructure Approvals
City of Ottawa
110 Laurier Avenue West
Ottawa, Ontario, K1P 1J1

Attention: Kersten Nitsche, Planner II,

Dear Ms. Nitsche:

Reference: 1705 Carling Avenue, Ottawa, ON
Servicing and Stormwater Management Report
Our File No. : 117216

Please find enclosed the 'Servicing and Stormwater Management Report' for the above noted project. This report has been revised per City of Ottawa comments and is submitted for approval.

Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH

Cara Ruddle, P. Eng.
Senior Project Manager
Encl.

cc: Bruce Stewart, The Founders Residences

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICIES

LIST OF ENGINEERING DRAWINGS

Grading Plan (117216-GR)
Servicing Plan (117216-GP)
Stormwater Management Plan (117216-SWM)

1.0 INTRODUCTION

Novatech has been retained to prepare a Servicing and Stormwater Management Report for the proposed residence located at 1705 Carling Avenue, Ottawa, Ontario. This report will support a Site Plan Application for the subject development. **Figure 1** Key Plan shows the site location.

2.0 EXISTING CONDITIONS

The site is approximately 0.893 hectares and is currently developed consisting of mostly asphalt with minimal grassed areas. There are existing buildings on the site including, The Rosebowl Steakhouse Restaurant and Webbs Motel which consists of three buildings (80 units) with associated parking and an entrance from Carling Avenue. There is also a residence at the rear of the property with access from Tillbury Avenue.

The site slopes in a north westerly direction towards Tillbury Avenue with a grade difference of approximately 2.75m across the site. **Figure 2** shows the existing site conditions.

3.0 PROPOSED DEVELOPMENT

It is proposed to re-develop the site with a nine-storey, 198-unit residential care facility. The main entrance is located on the east side of the building with a secondary entrance on Carling Avenue. Surface parking is provided as well as a one level underground parking garage. The approximate building footprint is 2065m^2.

The existing residence at the rear of the site is to remain and this area is not included in the discussion or analysis of this report. A park is also proposed at the rear of the site and is labelled as 'proposed park' on figures and drawings. The park is also not included in the discussion or analysis of this report. The remaining existing buildings will be demolished, and any existing services will be abandoned prior to the development construction. Refer to **Figure 3** for the proposed site layout.

4.0 SITE CONSTRAINTS

A geotechnical report was completed by Paterson Group entitled 'Geotechnical Investigation Proposed Residential Development' dated February 16, 2018. The report indicates that bedrock is present within the site area which will require removal. This also means that any potential post-construction settlement should be negligible. The report also indicates the presence of groundwater and a Permit to Take Water may be required for the construction activities.

5.0 WATER SERVICING

There are City watermains on both Carling Avenue and Tillbury Avenue that can service the proposed development including: an existing 150mm diameter watermain that is capped by the southeast corner of the site along Carling Avenue and an existing 150mm diameter watermain along Tillbury Avenue. Each of these options was reviewed and it was determined that a connection to the existing 150mm diameter watermain along Tillbury Avenue is the preferred option.

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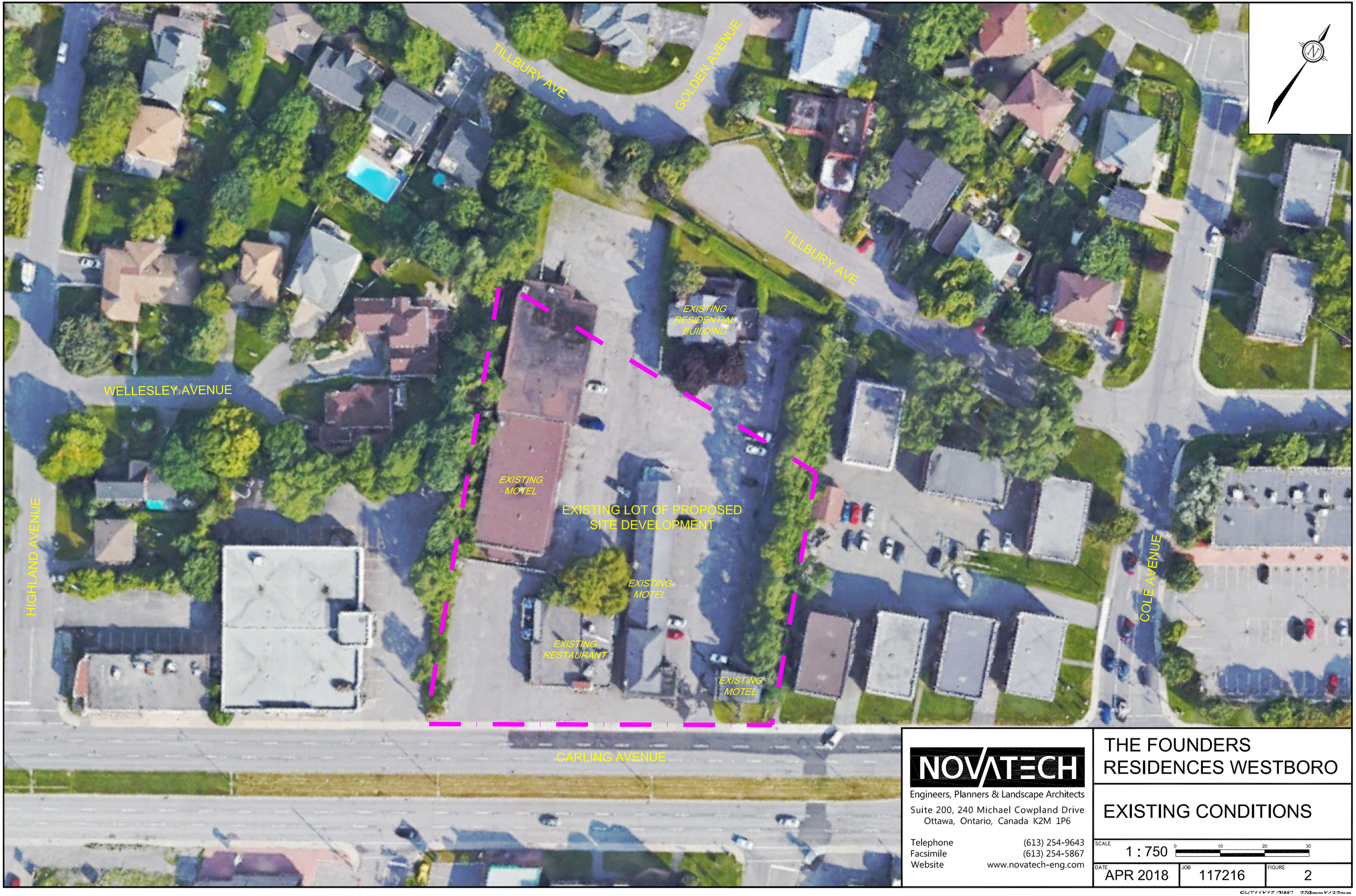
THE FOUNDERS RESIDENCES WESTBORO

KEY PLAN

SCALE		
N.T.S.		
DATE	JOB	FIGURE
APR 2018	117216	1

M:\2017\117216\CAD\Design\Figures\117216-Report Figures.dwg, KP, Apr 23, 2018 - 8:45am, alavallee

SHT8X11.DWG - 216mmx279mm



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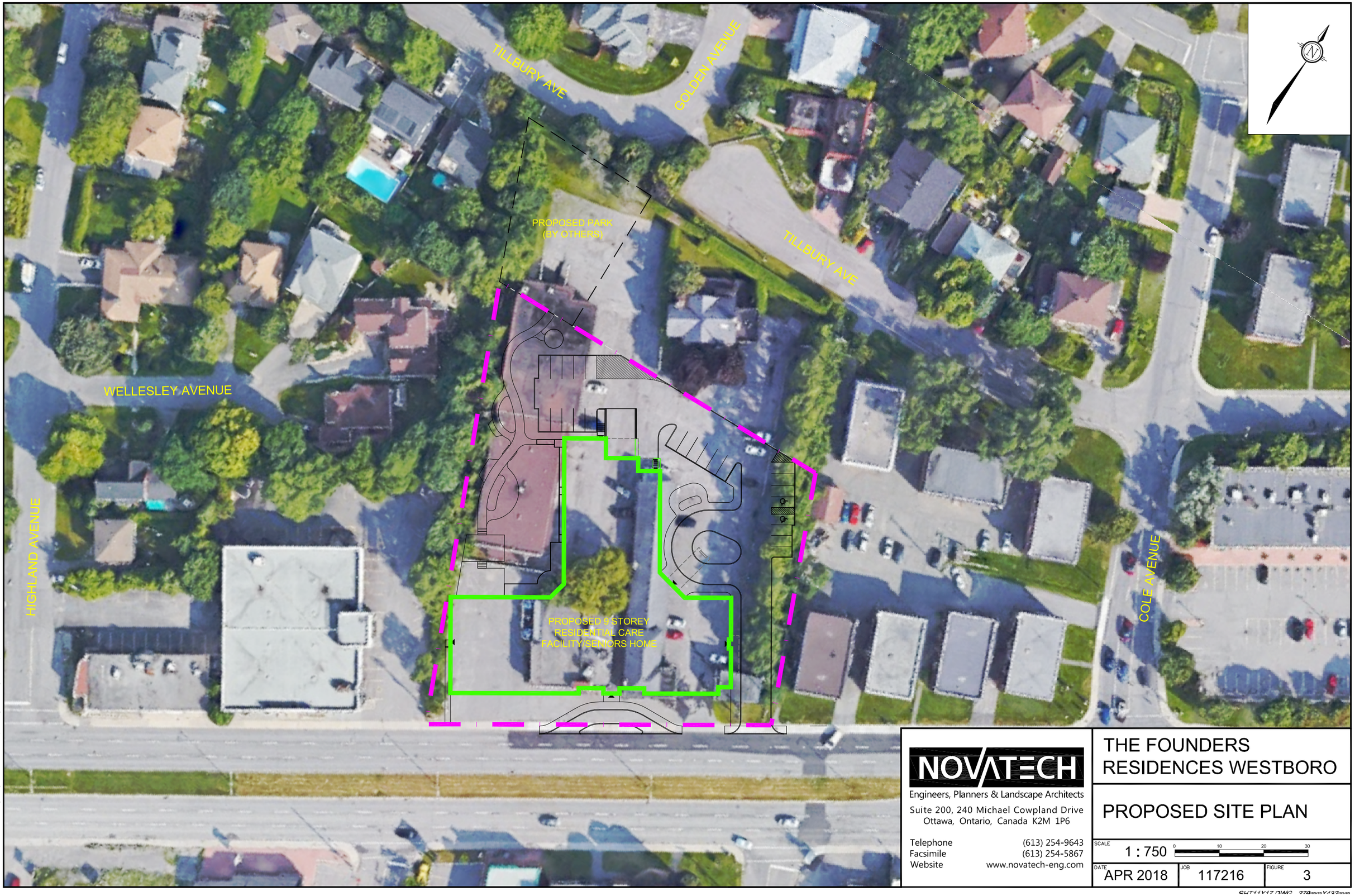
THE FOUNDERS RESIDENCES WESTBORO

EXISTING CONDITIONS

SCALE 1 : 750 (0, 10, 20, 30)
DATE APR 2018
JOB 117216
FIGURE 2



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THE FOUNDERS RESIDENCES WESTBORO

PROPOSED SITE PLAN

SCALE 1 : 750 (0 10 20 30)
DATE APR 2018
JOB 117216
FIGURE 3

It is proposed to service the development with a 150mm diameter watermain. In accordance with the City design guidelines, two service connections to City infrastructure will be provided (separated by an existing valve). Refer to the General Plan of Services drawing (117216-GP) for the water servicing information.

The City of Ottawa and the MOE design guidelines for drinking water systems were used to calculate the theoretical water demand for the proposed nine storey building. The water demand has been calculated for the residence and is as follows:

Ave Day = 1.23 L/s
Max. Day = 3.06 L/s
Peak Hourly Demand = 6.74 L/s

The required fire demand is calculated using the Fire Underwriters Survey (FUS) Guidelines and is calculated to be 2,114 USGPM (or 8,000 L/min). Refer to **Appendix A** for a copy of the FUS fire flow calculations.

This water demand information was submitted to the City and boundary conditions provided from the City's water model. The boundary conditions were used to complete a simple hydraulic analysis to confirm the existing watermain infrastructure has capacity for the proposed development. The hydraulic analysis was completed to confirm that the existing water infrastructure will meet the required pressures in the average day and peak hour conditions under domestic use. Refer to **Table 5.1** for the results of the hydraulic analysis for the domestic demands.

Table 5.1 Domestic Demand Water Analysis Results Summary

Condition	Service Connection Location	Demand (L/s)	Min/Max Allowable Operating Pressures (psi)	Limits of Design Operating Pressures (psi)
High Pressure	Tillbury	1.23	80psi (Max)	49.6
Peak Hour	Tillbury	6.74	40psi (Min)	41.4

Therefore, the existing watermain along Tillbury Avenue can provide adequate pressures for domestic use.

The proposed development is to be sprinklered with the Siamese located at the front northeast corner of the building. There are four existing fire hydrants along Carling Avenue and three existing fire hydrants along Tillbury Avenue within the vicinity of the proposed development which will provide fire protection for the proposed development. Refer to **Figure A1** in **Appendix A** for the existing hydrant locations. Boundary conditions were requested for fire protection from the existing 150mm diameter watermain along Carling Avenue. The City indicated that there is 35 L/s of available flow at a pressure of 20 psi. The low flow available at this location is due to a dead end watermain that supplies four existing residences and an existing hydrant on Carling Avenue.

The fire flow required for the proposed development as indicated previously is 8,000 L/min based on the FUS guidelines. As per the City of Ottawa Technical Bulletin ISTB-2018-02 Appendix I, the aggregate fire flow of all contributing fire hydrants within 150m of the site should not be less than the required fire flow. In the case of the proposed development there are seven class AA (blue top) hydrants within 150m of site. The total combined aggregate flow from the seven existing hydrants as per Table 1 in the ISTB-2018-02 technical bulletin would allow for a total fire flow of 26,600 L/min.

Therefore, based on the boundary condition information provided by the City, the existing watermain infrastructure can provide adequate flow and pressure for domestic demand and fire protection for the proposed development. Refer to **Appendix A** for water demands, fire flow calculations, boundary conditions, hydraulic analysis calculations, and the hydrant location **Figure A1**.

6.0 SANITARY SERVICING

There are multiple sanitary sewers surrounding the site including: a 250mm diameter sanitary sewer along the north side of Carling Avenue, a 225mm diameter sanitary sewer along both the east and west section of Tillbury Avenue and a 300mm diameter sanitary sewer along Golden Avenue. Each of these options was reviewed to service the site and it was determined that a connection to the existing 300mm diameter sanitary sewer along Golden Avenue was the preferred option.

The proposed development will be serviced with a 250mm diameter sanitary sewer which will connect to an existing sanitary manhole on Golden Avenue. Drainage from the parking garage will be pumped to the proposed sanitary service (refer to Mechanical drawings for details). Refer to the General Plan of Services (117216-GP) for information on the existing and proposed sanitary servicing.

The theoretical peak sanitary flow for the proposed development is calculated to be 4.45 L/s using City of Ottawa Design Guidelines. The existing sanitary sewer along Golden Avenue connects to an existing 300mm diameter sanitary sewer along Parr Avenue then to the existing 300 mm diameter and then downstream to a 450mm diameter sanitary sewer along Tillbury Avenue. A downstream analysis was completed of this existing sanitary sewer system and its drainage area. The calculations confirm there is adequate capacity in the existing sanitary sewer system to service the proposed development. Refer to the drainage area plan and design sheet in **Appendix B** for details.

7.0 STORM SERVICING

There are also multiple storm sewers surrounding the subject site which include: an existing 300mm diameter storm sewer along the south side of Carling Avenue, a 375mm diameter storm sewer along the west section of Tillbury Avenue and a 300mm diameter storm sewer along Golden Avenue. Each of these options was reviewed to service the site and it was determined that a connection to the existing 300mm diameter storm sewer along Golden Avenue was the preferred option.

Stormwater from the site will be collected by catchbasins and conveyed in private storm sewer system to outlets to an existing storm manhole on Golden Avenue. Drainage from the footing drains will be pumped to the proposed storm service (refer to Mechanical drawings for details). Refer to the General Plan of Services (117216-GP) for information on the existing and proposed storm servicing.

8.0 STORMWATER MANAGEMENT

8.1 Stormwater Management Criteria

The following Stormwater Management criteria is proposed:

- Control post-development flow from the site to the 1:5 year predevelopment level for all storm events up to and including 1:100 year storm.
- Pre-development flow to be calculated using the smaller of a runoff coefficient of 0.4 or the actual existing runoff coefficient.
- Use either a Tc of 20 minutes or calculated the pre-development Tc but not less than 10 minutes
- Maximum ponding on the parking lot surface during 1:100 year storm event to be no greater than 300mm
- Best Management Practices are to be used where possible for quality control of stormwater.

8.2 Existing Site Drainage

As indicated previously the site is currently developed. In the existing condition stormwater from the majority of the site generally drains to the northwest west where it is captured by a catchbasin. Refer to **Figure C1,** Existing Drainage Area Plan in **Appendix C**, which shows the existing site topography and existing drainage patterns.

The re-development area was used to determine the allowable release rate. As described previously the existing residence at the rear of the property is to remain and a park is proposed at the rear or northwest corner of the site. The allowable release rate for the site was calculated to be 24.4 L/s. Supporting calculations are included in **Appendix C** for reference.

8.3 Quantity Control

Stormwater from storms up to and including the 100-year storm event will be controlled to pre-development levels.

Storage of stormwater will be provided on the roof of the building and in a pond at the rear of the building with minimal storage of stormwater on the surface in the parking and grassed area. Inlet control devices and control flow roof drains will be used to control the release of stormwater to the allowable release rate prior to outletting to the existing storm sewer in Golden Avenue. The Tempest Inlet Control Devices Manual and Watts Drainage Roof Drain Specification Sheet were used to size the inlet control devices and roof drains respectively and are provided in **Appendix C**.

Stormwater from the parking area will enter into the site storm sewer system and then backup into the landscape pond feature. The landscape pond is designed to store stormwater between

the elevations of 77.30 (permanent water elevation) and 77.70 (overflow elevation). Calculations including runoff coefficients, release rates, and storage volumes required and provided are included in **Appendix C**. Refer to the Grading Plan (117216-GR) and the Stormwater Management Plan (117216-SWM) for more details. A summary of the stormwater management calculations is provided below in **Table 8.1**.

Table 8.1 Stormwater Management Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	*ICD Type and Size	5 Year Storm Event			100 Year Storm Event		
				*Flow (L/s)	*Req Vol (cu.m)	Max. Vol. Prov (cu.m.)	*Flow (L/s)	*Req Vol (cu.m)	Max. Vol. Prov (cu.m.)
A-1	0.055	0.34	N/A	5.4	N/A	N/A	10.8	N/A	N/A
A-2a*	0.063	0.90	N/A	16.4	N/A	N/A	31.3	N/A	N/A
A-2b**	0.146	0.90	N/A	4.3	28.4	73.0	6.6	58.1	73.0
A-3	0.274	0.80	LMF 60	15.8	32.5	101.4	16.6	84.0	101.4
A-4	0.072	0.39	LMF 105	4.3	2.4	7.9	4.5	7.8	7.9
Total Flow to Golden Ave Sewer				**46.2**			**69.8**		
Total Flow Allocated to Golden Ave Sewer				**70.7**			**70.7**		

*Uncontrolled roof area
**Controlled roof area – 6 roof drains with 1.1 L/s each

8.4 Quality Control

The Rideau Valley Conservation Authority indicated that Best Management Practices are to be used where possible for quality control of stormwater. Correspondence from the Rideau Valley Conservation Authority is provided in Appendix C for reference. Therefore, Best Management Practices will be implemented where possible including:

- Surface drainage via grassed swales where possible;
- Construction of swales at minimal slopes where possible;
- 300mm deep sumps in all storm maintenance holes;
- 600mm deep sumps in all catchbasins;

8.5 Major Overland Flow Route

A major overland flow route will be provided for storms greater than the 100-year storm event. Stormwater will be directed to the rear of the site to an easement (adjacent to the proposed park) which will allow stormwater to flow overland to the Tillbury Avenue Right-of-Way. The major overland system is shown on the Grading Plan (dwg 117216-GR).

9.0 EROSION AND SEDIMENT CONTROL

9.1 Temporary Measures

Temporary erosion and sediment control measures will be implemented during construction. Silt fence, straw bales and filter socks in catchbasins will be used as erosion and sediment control measures.

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair or replacement requirements. Sediments or granulars that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Grading Plans (117216-GR) for additional information.

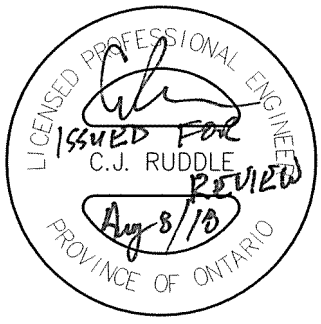
10.0 CONCLUSIONS AND RECOMMENDATIONS

- Water servicing for the proposed development will be provided by connecting to the existing 150mm diameter watermain on Tillbury Avenue. The existing watermain infrastructure can provide adequate flow and pressure for domestic use. As per the City of Ottawa Technical Bulletin ISTB 2018-02 the multiple fire hydrants within the direct vicinity of the proposed development will provide adequate flow and pressure for fire protection.
- The sanitary service for the proposed building will connect to the existing 300mm diameter sanitary sewer in Golden Avenue. The existing sanitary sewer has adequate capacity to service the proposed development.
- Quantity control of stormwater will be provided through storage of stormwater on the building roof and in a landscape pond at the rear of the site. Inlet control devices and control flow roof drains will be used to control the release of stormwater to the allowable release rate prior to outletting to the City storm sewer system.
- Best Management Practices are proposed, where possible, to provide quality control of stormwater as requested by the Rideau Valley Conservation Authority.
- An overland flow route is provided;
- Erosion and sediment control measures will be implemented prior to and during construction.

NOVATECH

Prepared by:

Reviewed by:



Matt Hrehoriak, EIT
Engineering Intern

Cara Ruddle, P.Eng.
Senior Project Manager

APPENDIX A
Water Servicing Information

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SENIOR CARE FACILITY
THE FOUNDERS RESIDENCES WESTBORO
HYDRAULIC ANALYSIS

JOB NO. 117216

Water Demand Calculations

Node	Assisted Living Beds		Employees	Assisted Living Demand (L/s)			Employee Demand (L/s)			Total Demand (L/s)		
	Units			Avg Day	Max. Daily	Peak Hour	Avg Day	Max. Daily	Peak Hour	Avg Day	Max. Daily	Peak Hour
	Assisted Living Units	Total Beds	No. Employees									
Building	198	228	44	1.19	2.97	6.53	0.04	0.10	0.21	1.23	3.06	6.74

Design Parameters:

Ontario Building Code Table 8.2.1.3B:

- Nursing Homes, Rest Homes, etc.	450	L/Bed/Day
- Employee Flow per 8 Hour Shift	75	L/Emp/Shift

Section 4.0 Ottawa Sewer Design Guidelines

Max. Daily Demand:

- Residential	2.5	x Avg.Day

Peak Hourly Demand:

- Residential	2.2	x Max.Day

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

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Novatech Project #: 117216
Project Name: The Founders Residences Westboro
Date: 05/04/2018
Input By: Ambur Lavallee
Reviewed By: Cara Ruddle

Legend: Input by User; No Information or Input Required

Building Description: 8 Storey Building with 1 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Fire resistive construction (2 to 3 hrs)		0.7		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	2100			
		Total Floors/Storeys (Podium)	1			
		Tower Footprint (m^2)	2100			
		Total Floors/Storeys (Tower)	8			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**3,150**	
	F	**Base fire flow without reductions**				**10,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**8,500**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-4,250**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	**3,825**
		East Side	10.1 - 20 m		15%	
		South Side	30.1- 45 m		5%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**45%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**8,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**133**
				or	USGPM	2,114
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	960

FUS - Fire Flow Calculations - User Guide - Fire Resistive

Novatech Project #: 117216
Project Name: The Founders Residence
Date: 05/04/2018
Input By: Ambur Lavallee
Reviewed By: Cara Ruddle

- Please use the notes below as a guide when completing the FUS Fire Flow Calculations
- When in doubt, confirm construction material, firewalls, etc. with architect/owner
- When in doubt, err on conservative side

Note: This form only applies for Fire Resistive

Enter a description of the building or unit being considered, i.e. use/most stringent condition/address

Summary		
Construction Type	Fire Resistive Construction	
Floor Area Considered	3,150	m^2
Occupancy Reduction	0%	
Sprinkler Reduction	-50%	
Exposure Surcharge	45%	
Total Fire Flow	8,000	L/min

Project Manager Review
Date: _____
Name: _____
Signature: _____

Base Fire Flow

1 Construction Material

Does not apply for this form
Does not apply for this form
Does not apply for this form
Only Use if can be confirmed with client/architect
Only Use if can be confirmed with client/architect

2 Floor Area

If considered gross floor area, then enter 1 floor/storey. If Fire wall, then reduce footprint accordingly.

Un-Protected **7** = number of floors above first 2, up to max of 10 floors total

Protected **2** =number of additional immediately adjoining floors to be considered, up to 2

Do vertical openings have minimum 1 hour rating between floors? Confirm this with the architect.

For unprotected openings scenario only, can be mix of podium and tower

Reductions or Surcharges

3 Occupancy hazard reduction or surcharge

Residential - with no garage
Residential - with garage
General Commercial - Generally, no reduction
Check usage with FUS
Check usage with FUS

4 Sprinkler Reduction

Only Use if can be confirmed with client/architect
Only Use if can be confirmed with client/architect
Only Use if can be confirmed with client/architect

5 Exposure Surcharge (cumulative %)

For Fire walls: FUS considers a Fire wall to have a minimum 2 hour rating per NBC.

Results

6

NOTE: Refer to City Technical Bulletin ISDTB-2014-02 for additional considerations to cap this value at 10,000L/min

If IGPM is needed, divide USGPM by 1.20095

7

For Rural areas, or where required

Ambur Lavallee

From: Cara Ruddle
Sent: April-12-18 3:26 PM
To: Ambur Lavallee; Matthew Hrehoriak
Subject: FW: 1705 Carling Avenue - boundary condition request
Attachments: 1705 Carling April 2018.pdf

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

From: Wessel, Shawn [mailto:shawn.wessel@ottawa.ca]
Sent: Thursday, April 12, 2018 3:22 PM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Cc: Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Susan Gordon <s.gordon@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 1705 Carling Avenue - boundary condition request

Good afternoon Ms. Ruddle.

Further to your request, please note the following:

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions (fire flow only), for hydraulic analysis at 1705 Carling (zone 1W) assumed to be connected to the 152mm on Carling (see attached PDF for location).

Available Flow at 20psi assuming a ground elevation of 79.8m = 35 L/s

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
shawn.wessel@ottawa.ca

From: Wessel, Shawn
Sent: Monday, April 09, 2018 8:18 AM
To: 'Cara Ruddle' <c.ruddle@novatech-eng.com>
Cc: Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Susan Gordon <s.gordon@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 1705 Carling Avenue - boundary condition request

Thank you for your email Ms. Ruddle.

I have forwarded your request to our Water Dept. for their response to your boundary conditions request for Carling Ave.

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
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110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
shawn.wessel@ottawa.ca

From: Cara Ruddle <c.ruddle@novatech-eng.com>
Sent: Friday, April 06, 2018 1:36 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Sandercott, Robert <Robert.Sandercott@ottawa.ca>; Susan Gordon <s.gordon@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 1705 Carling Avenue - boundary condition request

Shawn:
Thanks for the information below. Any fire fighting of the proposed development will likely occur using hydrants along Carling Avenue and Cole Avenue as highlighted on the attached sketch. Can you please provide boundary conditions for the watermain along Carling Avenue?

Thanks.

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

From: Wessel, Shawn [mailto:shawn.wessel@ottawa.ca]
Sent: Friday, March 23, 2018 7:47 AM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Cc: Sandercott, Robert <Robert.Sandercott@ottawa.ca>
Subject: RE: 1705 Carling Avenue - boundary condition request

Att: Cara Ruddle.

Please find attached and below the boundary condition information you seek for the 1705 Carling Ave. project.

Please refer to Guidelines and Technical bulletin ISDTB-2014-02 concerning basic day demands greater than 0.5 L/s.

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 1705 Carling (zone 1W) assumed to be connected to the 152mm on Tillsbury (see attached PDF for location).

Minimum HGL = 108.7m

Maximum HGL = 114.5m

Max Day + Fire Flow (133 L/s) = 92.6m

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
shawn.wessel@ottawa.ca

From: Wessel, Shawn
Sent: Tuesday, March 20, 2018 1:25 PM
To: 'Cara Ruddle' <c.ruddle@novatech-eng.com>
Subject: RE: 1705 Carling Avenue - boundary condition request

Thank you for your email Ms. Ruddle.

I will have this information for you as soon as possible.

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
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City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
shawn.wessel@ottawa.ca

From: Cara Ruddle [mailto:c.ruddle@novatech-eng.com]
Sent: Tuesday, March 20, 2018 1:14 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Subject: 1705 Carling Avenue - boundary conditions

Shawn:
Please find below the water demand information for the proposed re-development at the 1705 Carling Avenue. Please provide boundary conditions for the existing watermain infrastructure highlighted on the attached plan so we can confirm the existing infrastructure has capacity for the proposed development.

Water Demands for the proposed development:

AVG DAY = 1.40L/s
MAX DAY = 3.50L/s
PEAK HOUR = 7.70L/s
MAX DAY + FIRE =136.50L/s

Thanks,

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

'

THE FOUNDERS RESIDENCES WESTBORO
HYDRAULIC ANALYSIS

CALCULATED WATER DEMNADS:

PROPOSED DEVELOPMENT (9 STOREY BUILDING)

AVERAGE DAY =	1.41	L/s
MAXIMUM DAY =	3.53	L/s
PEAK HOUR =	7.77	L/s
MAX DAY + FIRE =	136.53	L/s

CITY OF OTTAWA BOUNDARY CONDITIONS:

BOUNDAY CONDITIONS BASED ON (ZONE 1W) CONNECTION TO 150mm DIA. TILLBURY AVENUE.

MINIMUM HGL =	108.7	m
MAXIMUM HGL =	114.5	m
MAX DAY + FIRE =	92.6	m

WATERMAIN ANALYSIS:

1705 CARLING AVENUE WATERMAIN CONNECTIONS

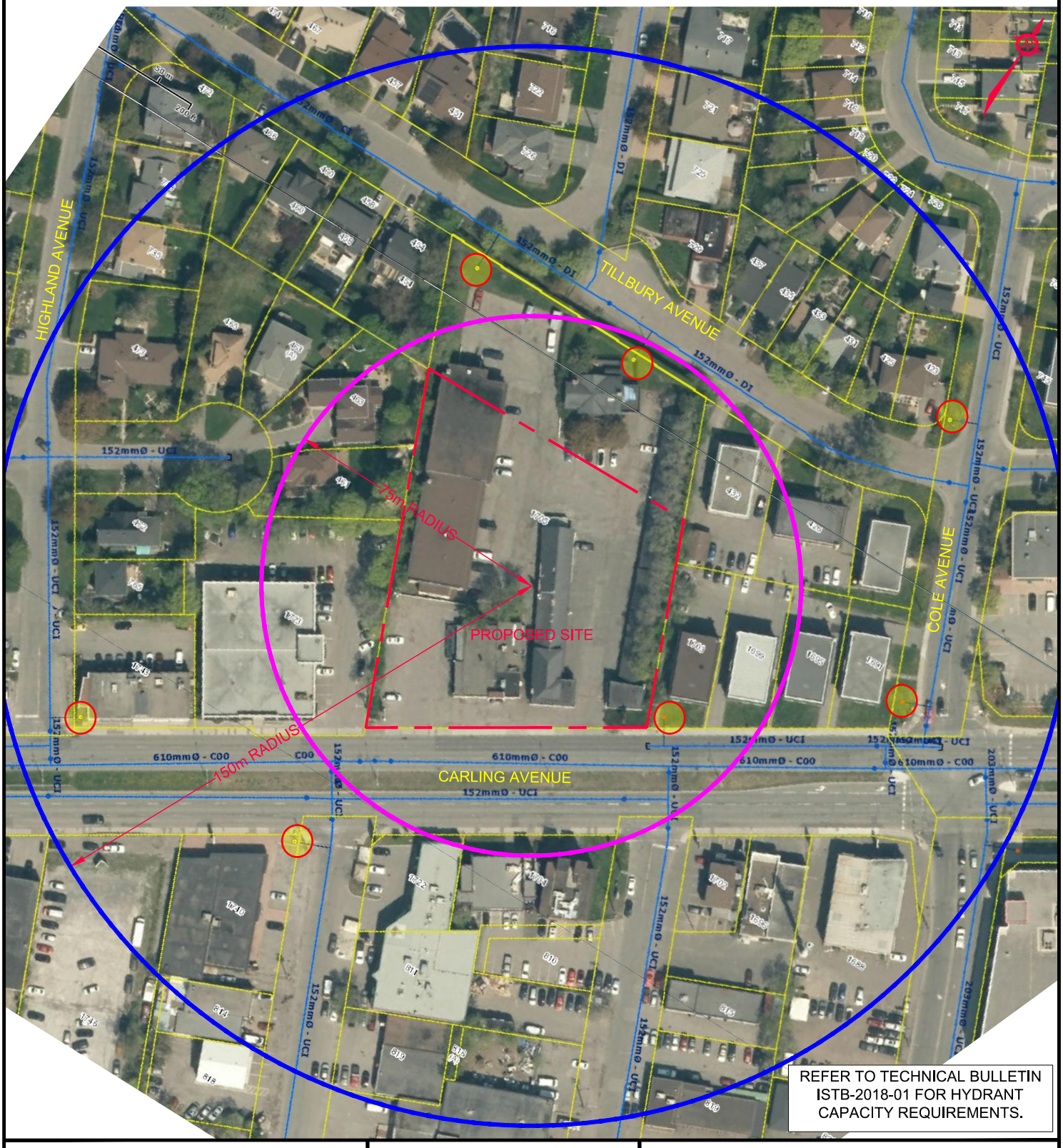
FINSIHED FLOOR GROUND ELEVATION = 79.6 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI

HIGH PRESSURE = 49.6 PSI

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI

LOW PRESSURE = 41.4 PSI



REFER TO TECHNICAL BULLETIN ISTB-2018-01 FOR HYDRANT CAPACITY REQUIREMENTS.

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Ottawa, Ontario, Canada K2M 1P6

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

LEGEND

EXISTING HYDRANT LOCATION

THE FOUNDERS RESIDENCES WESTBORO

HYDRANTS WITHIN 150m RADIUS OF SITE

SCALE 1 : 1500 (0, 15, 30, 45, 60)

DATE APR 2018 | JOB 117216 | FIGURE A1

SHT8X11.DWG - 216mmx279mm

M:\2017\117216\CAD\Design\Figures\117216-WM.dwg, HYD 150, Apr 23, 2018 - 5:46pm, alavallee

Ambur Lavallee

From: Cara Ruddle
Sent: March-08-18 3:02 PM
To: Matthew Hrehoriak; Ambur Lavallee
Subject: FW: Staffing for 1705 Carling Ave

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

From: Danna SeeHar
Sent: Thursday, March 08, 2018 2:01 PM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Cc: Murray Chown <m.Chown@novatech-eng.com>; Susan Gordon <s.gordon@novatech-eng.com>; Jennifer Luong <j.luong@novatech-eng.com>
Subject: FW: Staffing for 1705 Carling Ave

Cara,

Please see email below from client. Is this information sufficient?

Regards,
Danna

Danna See-Har, M.PL., Planner
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 296

From: Bruce Stewart [mailto:bwstewart01@gmail.com]
Sent: March-08-18 1:58 PM
To: Murray Chown <m.Chown@novatech-eng.com>; Susan Gordon <s.gordon@novatech-eng.com>; Roderick Lahey <rlahey@rlaarchitecture.ca>; Robert Verch <rverch@rlaarchitecture.ca>; Danna SeeHar <d.seehar@novatech-eng.com>; Jennifer Luong <j.luong@novatech-eng.com>
Subject: Staffing

To all:

Further to my discussion operations advises me the following is the head count for the three daily shifts:

Day - 25
Evening - 14
Night - 5

I trust this is sufficient for the analysis.

Bruce

--

Bruce W Stewart
The Founders Residences Ottawa LP
20 Holly Street, Suite 300
Toronto ON M4S3B1
1-833-OTTAWA1 (688-2921)

Ambur Lavallee

From: Cara Ruddle
Sent: April-06-18 10:40 AM
To: Ambur Lavallee
Subject: FW: 1705 Carling - building construction

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

From: Roderick Lahey [mailto:rlahey@rlaarchitecture.ca]
Sent: Thursday, March 15, 2018 10:37 AM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Cc: Robert Verch <rverch@rlaarchitecture.ca>; Susan Gordon <s.gordon@novatech-eng.com>
Subject: Re: 1705 Carling - building construction

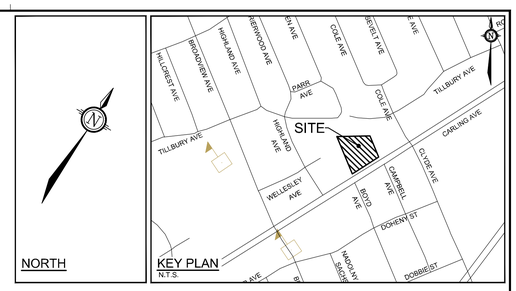
Hi Cara
The building is non combustible with its structural members having a fire resistant rating of 2hrs.
Rod

Sent from my iPhone

On Mar 15, 2018, at 10:33 AM, Cara Ruddle <c.ruddle@novatech-eng.com> wrote:

> Rob & Rod:
> We are preparing the fire flow calculations to submit to the City in order to obtain boundary conditons for the existing watermain system. You indicated that the building is a non-combustible structure. Please confirm if the structural members in the building are to have a fire resistive rating and if so is it greater or less than 3 hours?
>
> Thanks.
>
> **Cara Ruddle**, P.Eng., Senior Project Manager | Land Development Engineering
> **NOVATECH** Engineers, Planners & Landscape Architects
> 240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867
>

APPENDIX B
Sanitary Servicing Information



LEGEND

- 0.71 TILLBURY1 23 77.2 — DRAINAGE AREA (ha); DRAINAGE AREA IDENTIFIER; RESIDENTIAL # UNITS / POPULATION
- 0.12 DMEDL 1 0 — INSTITUTIONAL / COMMERCIAL DEVELOPED AREA (ha); DEVELOPMENT TYPE; # UNITS / POPULATION
- 225mmØ SAN — SANITARY SEWER c/w MANHOLE AND FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- SUBJECT SITE BOUNDARY
- 101 — SANITARY MANHOLE NUMBER

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
2.	REVISED PER CITY COMMENTS	AUG 8/18	CJR
1.	SITE PLAN APPLICATION	APR 20/18	CJR

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

DESIGN AJL
CHECKED CJR
DRAWN AJL
CHECKED CJR
APPROVED SG

FOR REVIEW ONLY

I HEREBY CERTIFY THAT THIS PLAN IS EFFECTIVE TO SUPERSEDE ALL PREVIOUS SUBMISSIONS WITH RESPECT TO THE APPROVAL OF THE ABOVE NOTED AGENCY. C.J. RUDDLE — ISSUED FOR REVIEW — Aug 8/18 — PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
THE FOUNDERS RESIDENCES WESTBORO

DRAWING NAME
SANITARY DRAINAGE AREA PLAN

PROJECT No. 117216-00
REV REV # 2
DRAWING No. 117216-SAN

D07-12-18-0062
PLAN NO. 17662

M:\2017\117216\CAD\Design\Figures\SAN\117216-SAN dwg, 2500, Jul 30, 2018 - 1:51pm, mmelvonuk

PROJECT #: 117216
PROJECT NAME: THE FOUNDERS RESIDENCES WESTBORO
LOCATION: 1705 CARLING AVENUE

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: MARCH 22,2018
DATE REVISED: APRIL 12, 2018

Existing Condition Sanitary Flows

Location			Residential		Institutional		Cumulative		Peak Factor		Institutional		Residential	Infiltration		Peak Design Flow (l/s)	PIPE					
Street / Area	From	To	Population	Area (ha)	Area (ha)	Accu. Area (ha)	Pop.	Area (ha)	Res Peak Factor	Insti Peak Factor	Peak Flow (l/s)	Accu. Peak Flow	Peak Flow (l/s)	Infilt. Flow (l/s)	Accu Infil. Flow		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
GOLDEN 1	**101**	**102**	23.8	0.69			23.8	0.69	3.7		0.0	0.00	**0.29**	0.23	0.23	0.51	300	0.50	63.2	68.3	0.97	0.8%
GOLDEN 2	**102**	**103**	6.8	0.19			30.6	0.88	3.7		0.0	0.00	**0.37**	0.06	0.29	0.66	225	0.64	35.8	35.9	0.90	1.8%
GOLDEN 3	**-**	**103**	74.8	1.67			74.8	1.67	3.6		0.0	0.00	**0.88**	0.55	0.55	1.43	N/A					
PARR 1	**103**	**104**	13.6	0.38			119.0	2.93	3.6		0.0	0.00	**1.38**	0.13	0.97	2.35	200	0.32	72.8	18.5	0.59	12.7%
PARR 2	**104**	**105**	0.0	0.00			119.0	2.93	3.6		0.0	0.00	**1.38**	0.00	0.97	2.35	200	0.32	10.7	18.5	0.59	12.7%
BRIER 1	**-**	**105**	85.0	1.90			85.0	1.90	3.6		0.0	0.00	**0.99**	0.63	0.63	1.62	N/A					
BRIER 2	**105**	**106**	6.8	0.17			210.8	5.00	3.5		0.0	0.00	**2.40**	0.06	1.65	4.05	300	0.19	46.8	42.1	0.60	9.6%
BRIER 3	**106**	**107**	0.0	0.00			210.8	5.00	3.5		0.0	0.00	**2.40**	0.00	1.65	4.05	300	1.50	14.5	118.3	1.68	3.4%
TILLBURY 1	**-**	**107**	27.2	0.71			27.2	0.71	3.7		0.0	0.00	**0.33**	0.23	0.23	0.56	N/A					
HIGHLAND 1	**-**	**107**	61.2	2.54	0.42	0.42	61.2	2.54	3.6	1.0	0.14	0.14	**0.72**	0.84	0.84	1.70	N/A					
TILLBURY 2	**107**	**108**	6.8	0.25	0.00	0.42	306.0	8.50	3.5	1.0	0.0	0.14	**3.43**	0.08	2.81	6.37	300	0.19	62.6	42.1	0.60	15.1%
HIGHLAND 2	**-**	**108**	85.0	1.79			85.0	1.79	3.6		0.0	0.00	**0.99**	0.59	0.59	1.59	N/A					
TILLBURY 3	**108**	**109**	13.6	0.42	0.00	0.42	404.6	10.71	3.4	1.0	0.0	0.14	**4.48**	0.14	3.53	8.15	300	0.27	85.3	50.2	0.71	16.2%
CARLING 1	**-**	**109**	1347.0	53.82	33.49	33.49	1347.0	53.82	3.2	1.5	16.28	16.28	**13.84**	17.76	17.76	47.88	N/A					
BROADVIEW 1	**-**	**109**	64.6	1.58			64.6	1.58	3.6		0.0	0.00	**0.76**	0.52	0.52	1.28	N/A					
TILLBURY 4	**109**	**110**	6.8	0.32	0.00	33.91	1823.0	66.4	3.1	1.5	0.0	16.42	**18.28**	0.11	21.92	56.61	450	0.29	83.5	152.7	0.96	37.1%

Ontario Building Code Table 8.2.1.3B:

Single Family	3.4	persons/unit
Average Apartments	1.8	persons/unit
Duplex	2.3	persons/unit
Semi-detached	2.7	persons/unit
Section 4.0 Ottawa Sewer Design Guidelines		
- Average Domestic Flow Existing Development	280	l/person/day
- Average Domestic Flow Proposed Development	280	l/person/day
- Institutional / Commercial Flow	28000	l/ha/day
- Foundation Drain Allowance	3.0	l/ha/day
- Wet & Dry Weather Extraneous Flows	0.33	L/s/ha
Residential Peaking Factor	Harmon Equation	
Institutional / Commercial Peaking Factor	1.0	
Institutional / Commercial Peaking Factor > 20%	1.5	

*Assumed minimum slope for a 200mm diameter sewer (due to missing information)

Notes: Used the Average Apt./Persons Per Unit Value of 1.8 when determining the apartment populations.
The number of units in an apartment buildings are assumed values.
Pipe information taken from Geo Ottawa, downstream inverts used from GeoOttawa

PROJECT #: 117216
PROJECT NAME: THE FOUNDERS RESIDENCES WESTBORO
LOCATION: 1705 CARLING AVENUE

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: April 6, 2018
REVISED: August 8, 2018

1705 CARLING AVENUE SANITARY FLOWS

LOCATION											INFILTRATION				PIPE					
AREA	FROM	TO	Residential Care Facility Units				TOTAL													
			1 Bed Units	1 Bed Unit + Den	2 Bed Units	Total Beds	Pop. / Beds	Accum. Pop. / Beds	Peak Factor	Peak Flow (l/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
	BLDG	MH2	137	31	30	228	228	228	3.5	4.16	0.61	0.61	0.20	4.36	250	2.00	22.8	84.0	1.71	5.2%
	MH2	MH1						228	3.5	4.16	0.29	0.90	0.30	4.45	250	0.50	34.1	42.0	0.86	10.6%
	MH1	EX						228	3.5	4.16		0.90	0.30	4.45	250	0.50	26.7	42.0	0.86	10.6%

Design Parameters:

Section 4.0 Ottawa Sewer Design Guidelines

- Care Facility Flow 450 L/bed/day
- Extraneous Flows 0.33 l/s/ha

Residential Peaking Factor Harmon Equation

APPENDIX C
Stormwater Management Calculations

TILLBURY AVENUE

TILLBURY AVENUE

454 TILLBURY AVENUE

432 TILLBURY AVENUE

76

78

0.610
EX-1
0.40

PROPOSED SITE
1705 CARLING AVENUE

1743 CARLING AVENUE

1723 CARLING AVENUE

1703 CARLING AVENUE

1699 CARLING AVENUE

1695 CARLING AVENUE

1691 CARLING AVENUE

CARLING AVENUE

EX CONCRETE SIDEWALK

EX STM/MH T/G=76.59 INV.=77.21

EX STM/MH T/G=79.04 INV.=77.19

EX STM/MH T/G=79.77 INV.=78.05

EX STM/MH INV.=78.36

EXCB T/G=79.12

EXCB T/G=76.58

EXSTM/MH T/G=76.51

LEGEND

EXISTING DRAINAGE DIRECTION

STORM DRAINAGE AREA

0.610 — DRAINAGE AREA (hectares)

EX-1 — AREA IDENTIFIER

0.40 — RUN-OFF COEFFICIENT

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

THE FOUNDERS RESIDENCES WESTBORO

EXISTING DRAINAGE PLAN

SCALE 1 : 750 (0 10 20 30)

DATE APR 2018 | JOB 117216 | FIGURE C1

PROJECT #: 117216
PROJECT NAME: THE FOUNDERS RESIDENCES WESTBORO
LOCATION: 1705 CARLING AVE

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: APRIL 18, 2018

TABLE 1A: Allowable Runoff Coefficient "C"

Area	"C"
Total	0.40
0.610	

TABLE 1B: Allowable Flows

Outlet Options	Area (ha)	"C"	Tc (min)	$Q_{5\ Year}$ (L/s)
Tillbury Ave	0.610	0.40	10	**70.7**

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

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

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Time of Concentration - Existing Conditions

TABLE 2A: Time of Concentration (Uplands Overland Flow Method)

Area ID	Overland Flow						Channel Flow			Overall	
	Length (m)	Elevation U/S (m)	Elevation D/S (m)	Slope (%)	Velocity (Uplands) (m/s)	Travel Time (min)	Length (m)	Velocity * (m/s)	Travel Time (min)	Time of Concentration (min)	Time to Peak (min)
PRE	150	79.8	76	2.5%	0.97	3	N/A	N/A	N/A	3	2

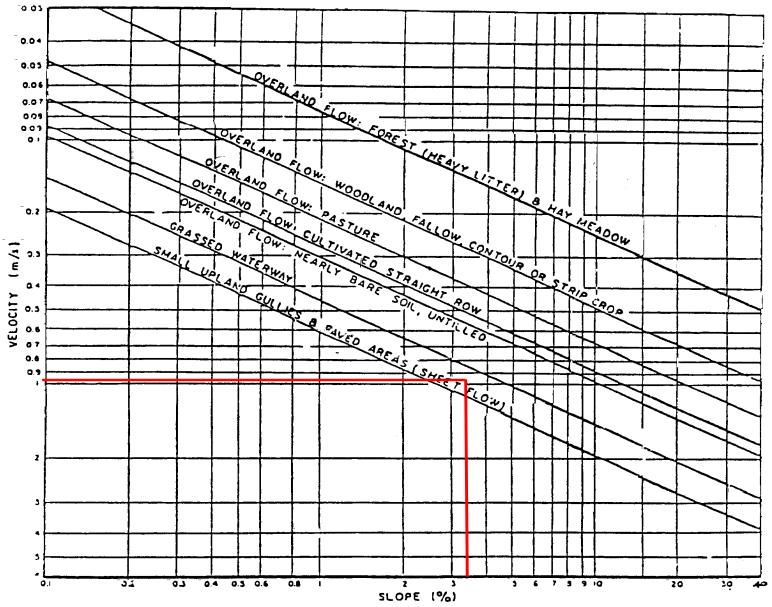


Figure A.5.2: Upland Method for Estimating Time of Concentration
(SCS National Engineering Handbook, 1971)

PROJECT #: 117216
PROJECT NAME: THE FOUNDERS RESIDENCES WESTBORO
LOCATION: 1705 CARLING AVE

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: APRIL 18, 2018

TABLE 3A: Post-Development Runoff Coefficient "C" - A-1

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.011	0.90	0.34	0.40
0.055	Soft	0.044	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

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

TABLE 3B: Post-Development A-1 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Carling Ave	0.055	0.34	10	**3.9**	**5.4**	**10.8**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014)$^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053)$^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199)$^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 4A: Post-Development Runoff Coefficient "C" - A-2A Uncontrolled Roof Area

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.063	0.90	0.90	1.00
0.063	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

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

TABLE 4B: Post-Development A-2A Uncontrolled Roof Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Tillbury Avenue	0.063	0.90	10	**12.1**	**16.4**	**31.3**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014)$^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053)$^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199)$^{0.810}$

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 5A: Post-Development Runoff Coefficient "C" - A-2B Controlled Roof Area

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	*C_{avg}
Total	Hard	0.000	0.90	0.90	1.00	1.00
0.146	Roof	0.146	0.90		1.00	
	Soft	0.000	0.20		0.25	

TABLE 5B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-2B Controlled Roof Area

0.146 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	30	40.04	14.63	3.8	10.85	19.53
	35	36.06	13.17	3.8	9.39	19.72
	40	**32.86**	**12.01**	**3.8**	**8.23**	**19.74**
	45	30.24	11.05	3.8	7.27	19.62
	50	28.04	10.24	3.8	6.46	19.39

TABLE 5C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-2B Controlled Roof Area

0.146 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	35	48.52	17.72	4.3	13.42	28.19
	40	44.18	16.14	4.3	11.84	28.42
	45	**40.63**	**14.84**	**4.3**	**10.54**	**28.46**
	50	37.65	13.75	4.3	9.45	28.36
	55	35.12	12.83	4.3	8.53	28.15

TABLE 5D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3B Controlled Roof Area

0.146 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	45	69.05	28.03	6.6	21.43	57.85
	50	63.95	25.96	6.6	19.36	58.07
	55	**59.62**	**24.20**	**6.6**	**17.60**	**58.08**
	60	55.89	22.69	6.6	16.09	57.91
	65	52.65	21.37	6.6	14.77	57.60

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

Table 5E: Roof Drain Flows

Roof Drains		
Roof Area	1460	m^2
Qty	6	
Type	Accutrol RD-100-A-ADJ	
Setting	1/2 Open	
Design Head	0.05-0.15	m
Design Flow 1" of head	0.32	L/s (ea)
Design Flow 2" of head	0.63	L/s (ea)
Design Flow 3" of head	0.79	L/s (ea)
Design Flow 4" of head	0.95	L/s (ea)
Design Flow 5" of head	1.10	L/s (ea)
Design Flow 6" of head	1.26	L/s (ea)

Table 5F: Total Roof Storage

Storm Event	# Roof Drains	Avg Area Per Roof Drain (m^2)	Avg Ponding Depth Per Roof Drain (m)	*Total Volume (m^3)	Total Volume (m^3) Required
2 Year	6	243.3	0.0510	24.82	19.74
5 Year	6	243.3	0.0625	30.42	28.36
100 Year	6	243.3	0.1250	60.83	58.08
Max Storage	6	243.3	0.1500	73.00	

*NOTE: Ponding volumes for A-2 calculated using cone equation: $V = \frac{Area\ X\ Depth}{3}$

TABLE 6A: Post-Development Runoff Coefficient "C" - A-3

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.191	0.90	0.80	1.00	0.90
0.274	Roof	0.000	0.90		1.00	
	Pond	0.017	1.00		1.00	
	Soft	0.154	0.20		0.25	

TABLE 6B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3

0.274 =Area (ha)
0.80 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	5	103.57	63.26	15.6	47.66	14.30
	10	76.81	46.91	15.6	31.31	18.79
	15	**61.77**	**37.73**	**15.6**	**22.13**	**19.91**
	20	52.03	31.78	15.6	16.18	19.41
	25	45.17	27.59	15.6	11.99	17.98

TABLE 6C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3

0.274 =Area (ha)
0.80 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	10	104.19	63.64	15.8	47.84	28.70
	15	83.56	51.03	15.8	35.23	31.71
	20	**70.25**	**42.91**	**15.8**	**27.11**	**32.53**
	25	60.90	37.19	15.8	21.39	32.09
	30	53.93	32.94	15.8	17.14	30.85

TABLE 6D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-3

0.274 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	25	103.85	71.16	16.6	54.56	81.84
	30	91.87	62.95	16.6	46.35	83.44
	35	**82.58**	**56.59**	**16.6**	**39.99**	**83.98**
	40	75.15	51.49	16.6	34.89	83.75
	45	69.05	47.32	16.6	30.72	82.94

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 6E: Structure information

Structures	Size Dia.(mm)	Area (m^2)	T/G	Inv IN	Inv OUT
CBMH 1	1500	1.82	77.45	75.04	74.83
CBMH 2	1200	1.16	77.75	75.32	75.29
CBMH 3	1200	1.16	78.60	76.10	76.04
CB 2	600	0.36	79.00		76.50
LD 1	300	0.07	77.40		75.39

TABLE 6F: Storage Provided - A-2

Area A-1: Storage Table									Total Storage			
Elevation (m)	System Depth (m)	CBMH 1 Volume (m^3)	CBMH 2 Volume (m^3)	CBMH 3 Volume (m^3)	CB 2 Volume (m^3)	LD 1 Volume (m^3)	Pipe Storage Volume (m^3)	Underground Volume (m^3)*	CBMH 1 Ponding Volume (m^3)	LD 1 Ponding Volume (m^3)	Ponding Volume (m^3)	**Total Volume (m^3)**
74.830	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
74.850	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	**0.04**
75.000	0.17	0.31	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	**0.31**
76.800	1.97	3.59	1.75	0.88	0.11	0.10	7.00	13.43	0.00	0.00	0.00	**13.43**
76.850	2.02	3.68	1.81	0.94	0.13	0.10	-	13.66	0.00	0.00	0.00	**13.66**
76.900	2.07	3.77	1.87	1.00	0.14	0.11		13.89	0.00	0.00	0.00	**13.89**
76.950	2.12	3.86	1.93	1.06	0.16	0.11		14.12	0.00	0.00	0.00	**14.12**
77.300	2.47	4.50	2.33	1.46	0.29	0.14		15.72	0.00	0.00	0.00	**15.72**
77.350	2.52	4.59	2.39	1.52	0.31	0.14		15.94	0.00	8.56	0.00	**15.94**
77.400	2.57	4.68	2.45	1.58	0.32	0.14		16.17	0.00	17.27	0.00	**16.17**
77.450	2.62	4.77	2.51	1.64	0.34	-		16.40	0.00	26.12	26.12	**42.52**
77.500	2.67	-	2.56	1.69	0.36			16.53	0.37	35.12	35.49	**52.02**
77.550	2.72		2.62	1.75	0.38			16.67	1.45	44.27	45.72	**62.39**
77.600	2.77		2.68	1.81	0.40			16.80	3.50	53.57	57.07	**73.87**
77.650	2.82		2.74	1.87	0.41			16.93	6.76	63.02	69.78	**86.71**
77.700	2.87		2.80	1.93	0.43			17.07	11.46	72.63	84.09	**101.16**

TABLE 6G: ORIFICE SIZING INFORMATION - A3

Control Device				
Tempest ICD		105 LMF		
Design Event	**Flow**	**Head**	**Elevation**	**Outlet Dia. (mm)**
1:2 Year	15.6	2.42	77.40	300
1:5 Year	15.8	2.45	77.43	300
1:100 Year	16.6	2.72	77.70	300

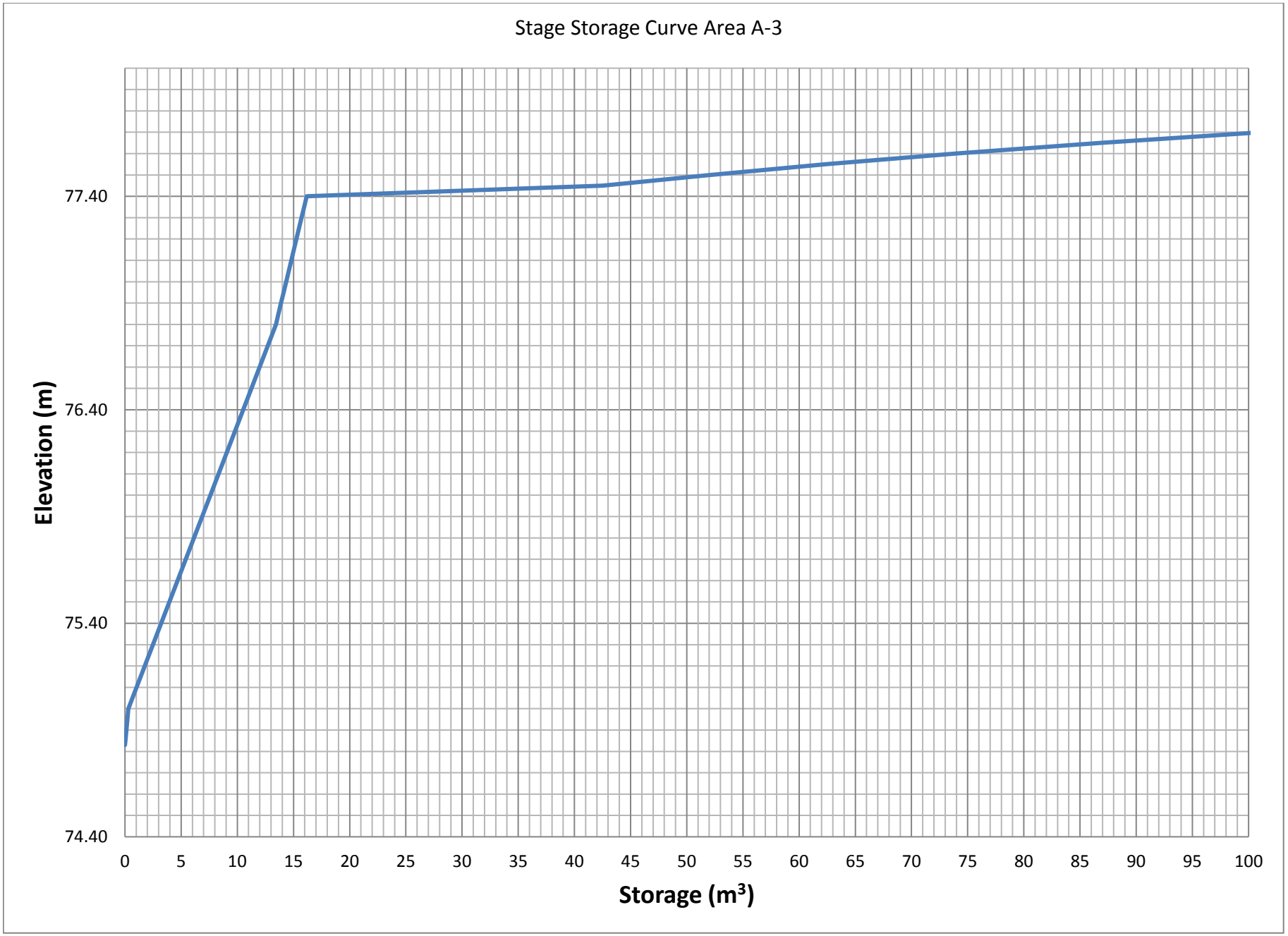

Stage Storage Curve Area A-3
Elevation (m)
77.40
76.40
75.40
74.40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Storage (m³)

TABLE 7A: Post-Development Runoff Coefficient "C" - A-4

			5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.020	0.90	0.39	1.00	0.46
0.072	Roof	0.000	0.90		1.00	
	Soft	0.052	0.20		0.25	

TABLE 7B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-4

0.072 =Area (ha)
0.39 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	0	167.22	13.20	4.2	9.00	0.00
	5	**103.57**	**8.18**	**4.2**	**3.98**	**1.19**
	10	76.81	6.06	4.2	1.86	1.12
	15	61.77	4.88	4.2	0.68	0.61
	20	52.03	4.11	4.2	-0.09	-0.11

TABLE 7C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-4

0.072 =Area (ha)
0.39 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	0	230.48	18.20	4.3	13.90	0.00
	5	141.18	11.15	4.3	6.85	2.05
	10	**104.19**	**8.23**	**4.3**	**3.93**	**2.36**
	15	83.56	6.60	4.3	2.30	2.07
	20	70.25	5.55	4.3	1.25	1.50

TABLE 7D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-4

0.072 =Area (ha)
0.46 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	10	178.56	16.38	4.5	11.88	7.13
	15	142.89	13.11	4.5	8.61	7.75
	20	**119.95**	**11.00**	**4.5**	**6.50**	**7.81**
	25	103.85	9.53	4.5	5.03	7.54
	30	91.87	8.43	4.5	3.93	7.07

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 7E: ORIFICE SIZING INFORMATION - A4

Control Device *Tempest ICD*			60 LMF	
Design Even	**Flow**	**Head**	**Elevation**	**Outlet Dia. (mm)**
1:2 Year	4.2	1.68	76.80	250
1:5 Year	4.3	1.85	76.97	250
1:100 Year	4.5	1.97	77.10	250

PROJECT #: 117216
PROJECT NAME: THE FOUNDERS RESIDENCES WESTBORO
LOCATION: 1705 CARLING AVE

NOVATECH
Engineers, Planners & Landscape Architects

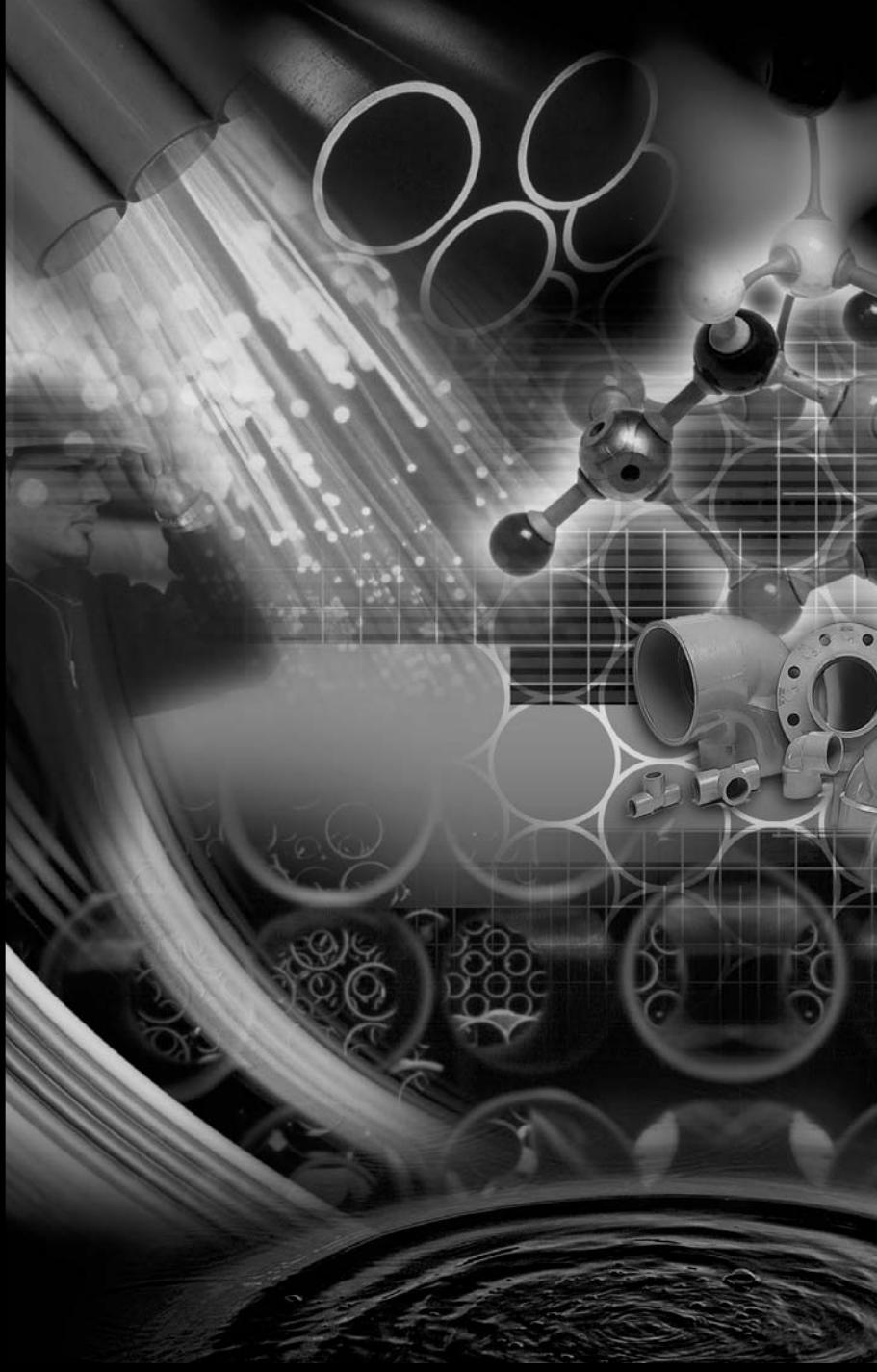
DATE PREPARED: APRIL 18, 2018
REVISED: JULY 30, 2018

Table 8: Post-Development Stormwater Mangement Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	1:100 Year Weighted Cw	Outlet Location	2 Year Storm Event				5 Year Storm Event				100 Year Storm Event			
					Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)	Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)	Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)
A-1	0.055	0.34	0.40	Carling	3.9	N/A	N/A	N/A	5.4	N/A	N/A	N/A	10.8	N/A	N/A	N/A
A-2a	0.063	0.90	1.00	Tillbury	12.1	N/A	N/A	N/A	16.4	N/A	N/A	N/A	31.3	N/A	N/A	N/A
A-2b	0.146	0.90	1.00	Tillbury	3.8	0.051	19.7	73.0	4.3	0.063	28.4	73.0	6.6	0.125	58.1	73.0
A-3	0.274	0.80	0.90	Tillbury	15.6	0.00	19.9	101.2	15.8	0.000	32.5	101.2	16.6	0.250	84.0	101.2
A-4	0.072	0.39	0.46	Tillbury	4.2	0.00	1.2	7.9	4.3	0.170	2.4	7.9	4.5	0.300	7.8	7.9
Total					**39.6**				**46.2**				**69.8**			
Allowable					**70.7**				**70.7**				**70.7**			

Volume III: TEMPEST™ INLET CONTROL DEVICES

Municipal Technical Manual Series



SECOND EDITION

LMF (Low to Medium Flow) ICD

HF (High Flow) ICD

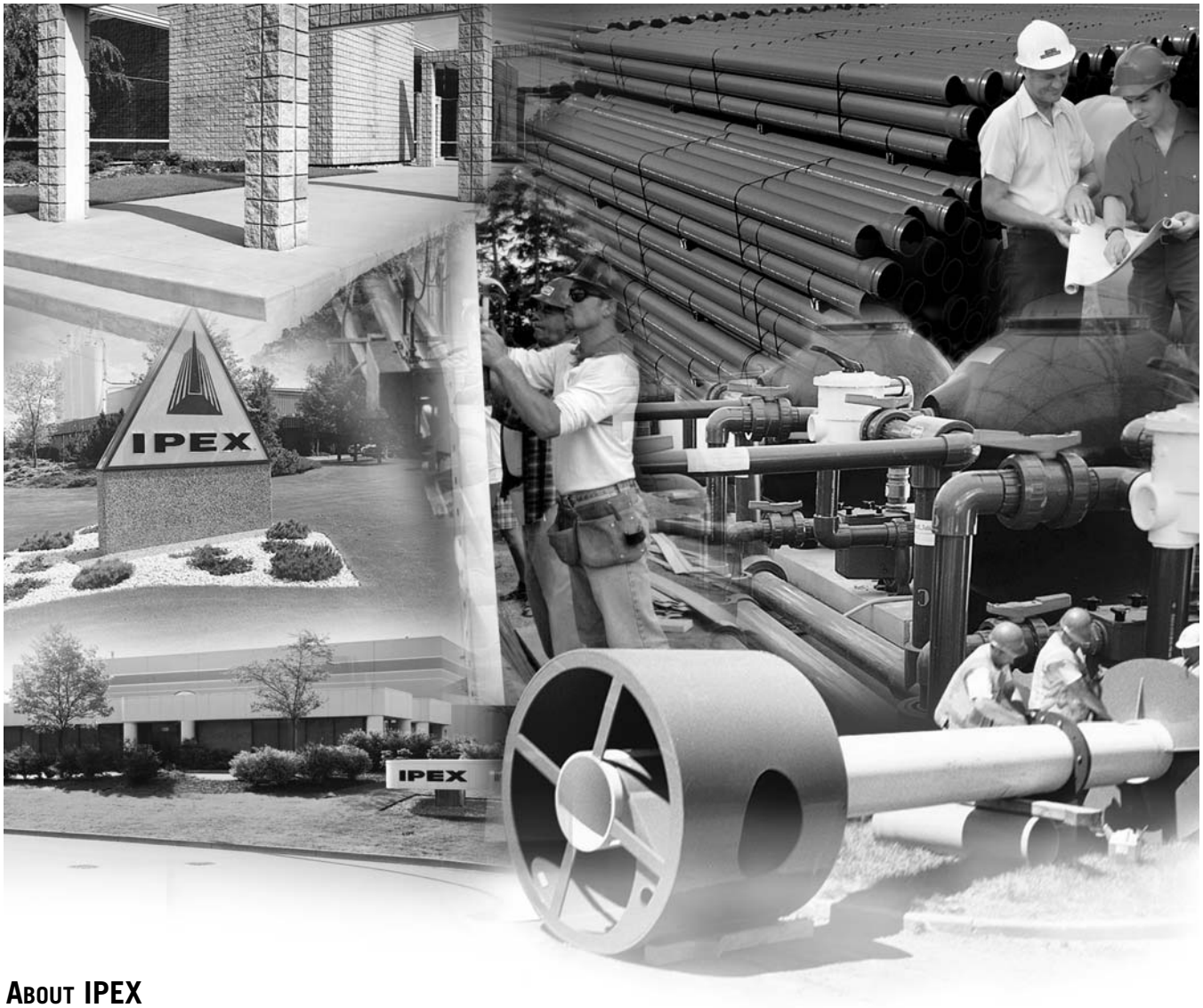
MHF (Medium to High Flow) ICD

IPEX

IPEX Tempest™ Inlet Control Devices

Municipal Technical Manual Series

Vol. I, 2nd Edition



About IPEX

At IPEX, we have been manufacturing non-metallic pipe and fittings since 1951. We formulate our own compounds and maintain strict quality control during production. Our products are made available for customers thanks to a network of regional stocking locations throughout North America. We offer a wide variety of systems including complete lines of piping, fittings, valves and custom-fabricated items.

More importantly, we are committed to meeting our customers' needs. As a leader in the plastic piping industry, IPEX continually develops new products, modernizes manufacturing facilities and acquires innovative process technology. In addition, our staff take pride in their work, making available to customers their extensive thermoplastic knowledge and field experience. IPEX personnel are committed to improving the safety, reliability and performance of thermoplastic materials. We are involved in several standards committees and are members of and/or comply with the organizations listed on this page.

For specific details about any IPEX product, contact our customer service department.

CONTENTS

PRODUCT INFORMATION: TEMPEST LOW, MEDIUM FLOW (LMF) ICD

Purpose

To control the amount of storm water runoff entering a sewer system by allowing a specified flow volume out of a catch basin or manhole at a specified head. This approach conserves pipe capacity so that catch basins downstream do not become uncontrollably surcharged, which can lead to basement floods, flash floods and combined sewer overflows.

Product Description

Our LMF ICD is designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter and larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 14 preset flow curves, the LMF ICD has the ability to provide flow rates: 2lps – 17lps (31gpm – 270gpm)

Product Function

The LMF ICD vortex flow action allows the LMF ICD to provide a narrower flow curve using a larger orifice than a conventional orifice plate ICD, making it less likely to clog. When comparing flows at the same head level, the LMF ICD has the ability to restrict more flow than a conventional ICD during a rain event, preserving greater sewer capacity.

Product Construction

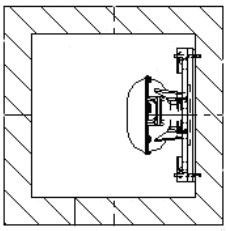
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

Product Applications

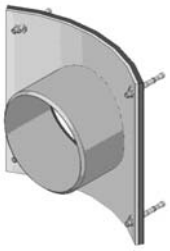
Will accommodate both square and round applications:

Square Application

Universal Mounting Plate



Round Application



+

Spigot CB Wall Plate

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Universal Mounting Plate Hub Adapter

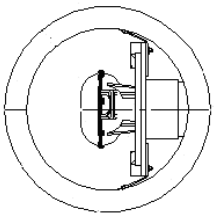


Chart 1: LMF 14 Preset Flow Curves

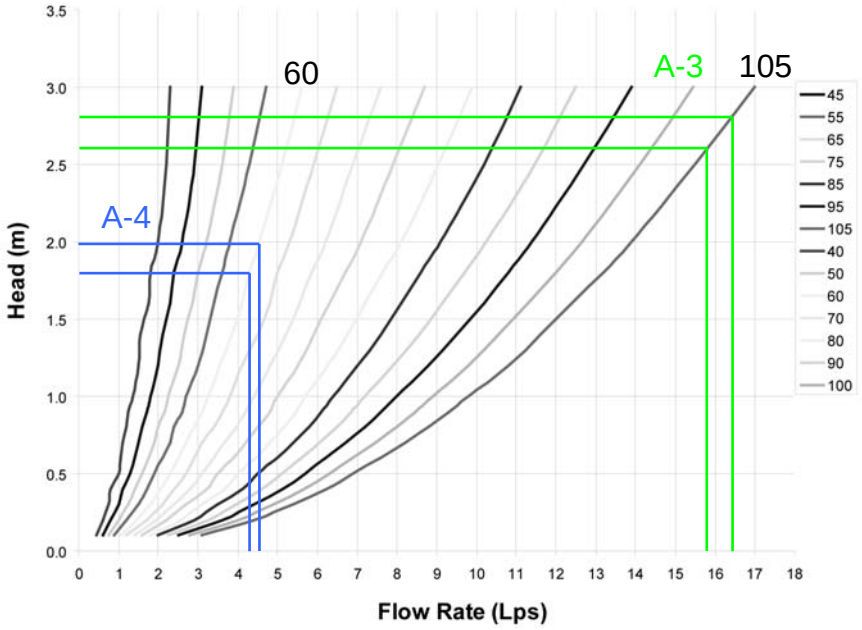
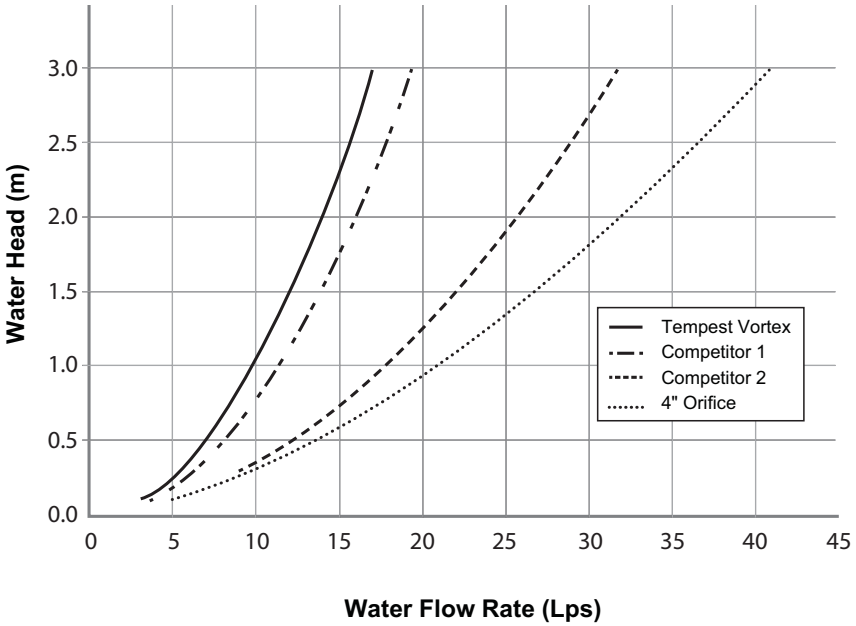


Chart 2: LMF Flow vs. ICD Alternatives



PRODUCT INSTALLATION

Instructions to assemble a TEMPEST LMF ICD into a Square Catch Basin:

STEPS:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device.
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

Instructions to assemble a TEMPEST LMF ICD into a Round Catch Basin:

STEPS:

1. Materials and tooling verification.
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut back the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at www.ipexinc.com.
- Call your IPEX representative for more information or if you have any questions about our products.

PRODUCT TECHNICAL SPECIFICATION

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

PRODUCT INFORMATION: TEMPEST HF & MHF ICD

Product Description

Our HF, HF Sump and MHF ICD's are designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter or larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 5 preset flow curves, these ICDs have the ability to provide constant flow rates: 9lps (143 gpm) and greater

Product Function

TEMPEST HF (High Flow): designed to manage moderate to higher flows 15 L/s (240 gpm) or greater and prevent the propagation of odour and floatables. With this device, the cross-sectional area of the device is larger than the orifice diameter and has been designed to limit head losses. The HF ICD can also be ordered without flow control when only odour and floatable control is required.

TEMPEST HF (High Flow) Sump: The height of a sewer outlet pipe in a catch basin is not always conveniently located. At times it may be located very close to the catch basin floor, not providing enough sump for one of the other TEMPEST ICDs with universal back plate to be installed. In these applications, the HF Sump is offered. The HF Sump offers the same features and benefits as the HF ICD; however, is designed to raise the outlet in a square or round catch basin structure. When installed, the HF sump is fixed in place and not easily removed. Any required service to the device is performed through a clean-out located in the top of the device which can be often accessed from ground level.

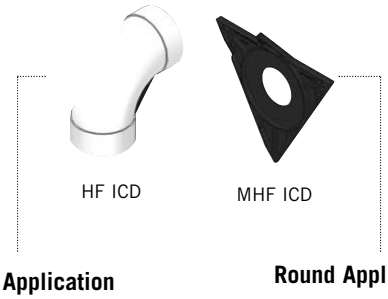
TEMPEST MHF (Medium to High Flow):
The MHF plate or plug is designed to control flow rates 9 L/s (143 gpm) or greater. It is not designed to prevent the propagation of odour and floatables.

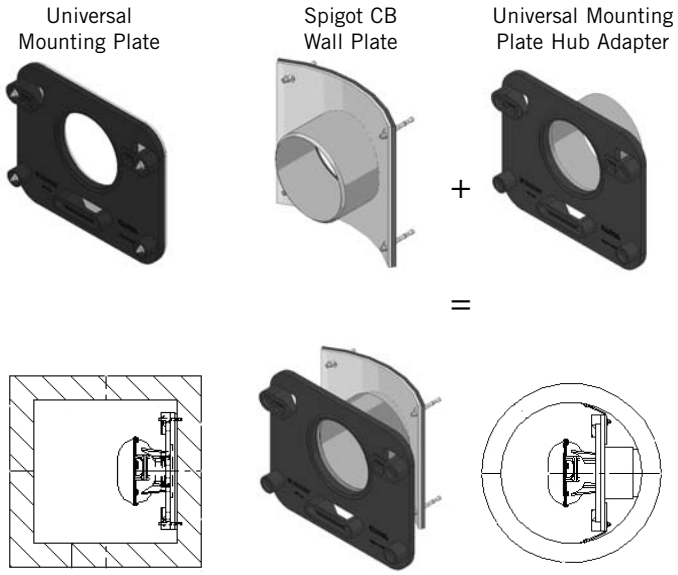
Product Construction

The HF, HF Sump and MHF ICDs are built to be light weight at a maximum weight of 6.8 Kg (14.6 lbs).

Product Applications

The HF and MHF ICD's are available to accommodate both square and round applications:





The HF Sump is available to accommodate low to no sump applications in both square and round catch basins:

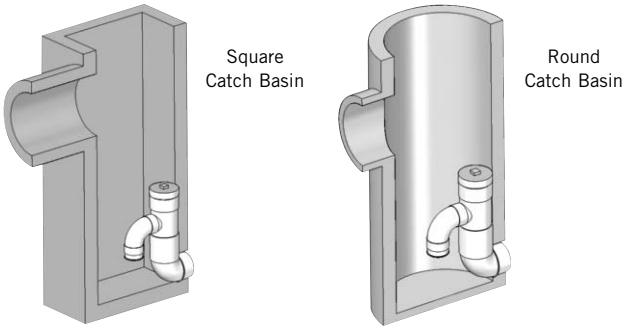
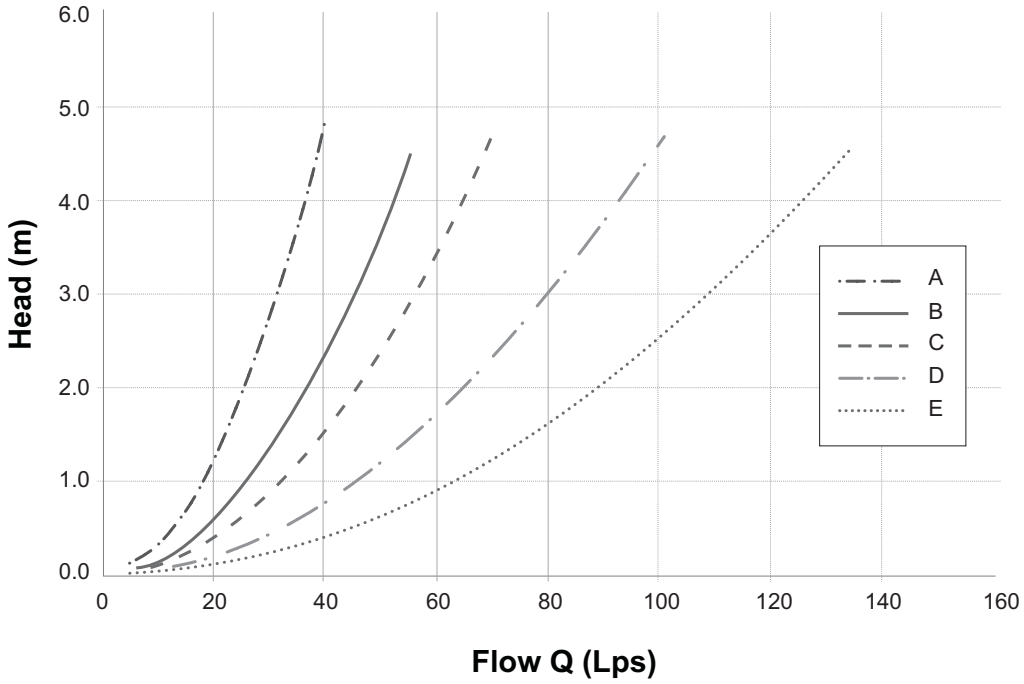


Chart 3: HF & MHF Preset Flow Curves



PRODUCT INSTALLATION

Instructions to assemble a TEMPEST HF or MHF ICD into a Square Catch Basin:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal wall mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal wall mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

Instructions to assemble a TEMPEST HF or MHF ICD into a Round Catch Basin:

STEPS:

1. Materials and tooling verification.
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the round catch basin spigot adaptor to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the spigot CB wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot CB wall plate and the catch basin wall.
6. Put solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at www.ipexinc.com.
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Instructions to assemble a TEMPEST HF Sump into a Square or Round Catch Basin:

STEPS:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, mastic tape and metal strapping
   - Material: (2) concrete anchor 3/8 x 3-1/2, (2) washers, (2) nuts, HF Sump pieces (2).
2. Apply solvent cement to the spigot end of the top half of the sump. Apply solvent cement to the hub of the bottom half of the sump. Insert the spigot of the top half of the sump into the hub of the bottom half of the sump.
3. Install the 8" spigot of the device into the outlet pipe. Use the mastic tape to seal the device spigot into the outlet pipe. You should use a level to be sure that the fitting is standing at the vertical.
4. Use an impact drill with a 3/8" concrete bit to make a series of 2 holes along each side of the body throat. The depth of the hole should be between 1-1/2" to 2-1/2". Clean the concrete dust from the 2 holes.
5. Install the anchors (2) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you hit the anchors. Remove the nuts from the ends of the anchors.
6. Cut the metal strapping to length and connect each end of the strapping to the anchors. Screw the nuts in place with a maximum torque of 40 N.m (30 lbf-ft). The device should be completely flush with the catch basin wall.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at www.ipexinc.com.
- Call your IPEX representative for more information or if you have any questions about our products.

PRODUCT TECHNICAL SPECIFICATION

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

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High Flow (HF) Sump devices shall consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

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The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

NOTE: Do not use or test the products in this manual with compressed air or other gases including air-over-water-boosters

SALES AND CUSTOMER SERVICE

Canadian Customers call IPEX Inc.

Toll free: (866) 473-9462

www.ipexinc.com

U.S. Customers call IPEX USA LLC

Toll free: (800) 463-9572

www.ipexamerica.com

About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, ABS, PEX, FR-PVDF and PE pipe and fittings (1/4" to 48")
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- PE Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

Products manufactured by IPEX Inc. and distributed in the United States by IPEX USA LLC.

MNMNTPIP110817

IPEX

WATTS® DRAINAGE

Adjustable Accutrol Weir

Tag: RD-100-A-ADJ

Adjustable Flow Control for Roof Drains

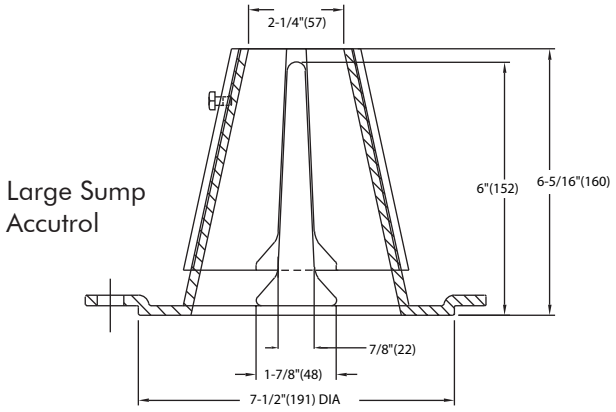
ADJUSTABLE ACCUTROL(for Large Sump Roof Drains only)

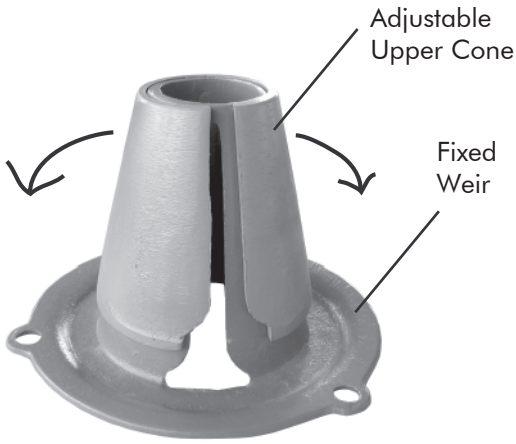
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the 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	Head of Water 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	10	10	10	10	10

Job Name _____ Contractor _____

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

Engineer _____ Representative _____

WATTS® DRAINAGE
CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattsdrainage.ca
CANADA

PROJECT #: 117216
PROJECT NAME: THE FOUNDERS RESIDENCES WESTBORO
LOCATION: 1705 CARLING AVENUE

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: APRIL 10, 2018
REVISED: JULY 30, 2018

5 Year Storm Sewer Design Sheet

LOCATION		AREA (Ha)			FLOW					PROPOSED SEWER							
FROM	TO	TOTAL AREA	R= 0.2	R= 0.9	INDIV 2.78 AR	ACCUM 2.78 AR	TIME OF CONC.	RAINFALL INTENSITY I	*PEAK FLOW Q (l/s)	PIPE SIZE (mm)	PIPE SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min.)	EXCESS CAPACITY (l/s)	Q/Qfull
CB 2	CBMH 3	0.090	0.019	0.071	0.19	0.19	10.00	104.19	19.61	254.0	2.00	19.8	87.82	1.73	0.19	68.21	0.22
CBMH 3	CBMH 2	0.030	0.006	0.024	0.06	0.25	10.19	103.20	25.96	304.8	2.00	35.8	142.81	1.96	0.31	116.85	0.18
CBMH 2	CBMH 1	0.065	0.015	0.050	0.13	0.57	10.50	101.65	58.27	304.8	0.50	16.8	71.41	0.98	0.29	13.14	0.82
LD 1	CBMH 1	0.084	0.038	0.046	0.14	0.14	10.00	104.19	14.19	254.0	1.50	23.6	76.06	1.50	0.26	61.87	0.19
CBMH 1	STMMH2	0.031	0.002	0.029	0.07	0.78	10.78	100.24	*16.60*	304.8	0.50	9.7	71.41	0.98	0.17	54.81	0.23
BLDG	STMMH 2	0.207	0.000	0.207	0.52	0.52	10.00	104.19	*37.90*	254.0	1.00	23.1	62.10	1.22	0.31	24.20	0.61
CB 1	STMMH 2	0.049	0.038	0.011	0.05	0.05	10.00	104.19	*4.50*	254.0	1.00	11.6	62.10	1.22	0.16	57.60	0.07
STMMH 2	STMMH 1	0.000	0.000	0.000	0.00	1.35	10.95	99.44	*59.00*	304.8	0.75	32.9	87.45	1.20	0.46	28.45	0.67
STMMH1	EX	0.000	0.000	0.000	0.00	1.35	11.41	97.31	*59.00*	304.8	0.75	23.7	87.45	1.20	0.33	28.45	0.67

***Note:**
Flows will be attenuated with ICD's and controlled flow roof drains.
Design sheet flows that are *italicized* are controlled flows.

Definitions
Q = 2.78 AIR
Q = Peak Flow, in Litres per second (L/s)
A = Area in hectares (ha)
I = 5 YEAR Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min Velocity = 0.76 m/sec.
3) 5 Year intensity = 998.071 / (time + 6.053)$^{0.814}$
10 Year intensity = 1174.184 / (time + 6.014)$^{0.816}$
100 Year intensity = 1735.688 / (time + 6.014)$^{0.820}$

Ambur Lavallee

From: Cara Ruddle
Sent: March-26-18 11:27 AM
To: Ambur Lavallee; Matthew Hrehoriak
Subject: FW: 1705 Carling Avenue - quality control requirements

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

From: Jamie Batchelor [mailto:jamie.batchelor@rvca.ca]
Sent: Monday, March 26, 2018 11:26 AM
To: Cara Ruddle <c.ruddle@novatech-eng.com>
Subject: RE: 1705 Carling Avenue - quality control requirements

Hi Cara,

The storm sewer on Carling Avenue runs more than 2km to an outlet of the Ottawa River with no municipal treatment for quality provided. In the opinion of the Conservation Authority, the distance to the outlet is sufficiently far that onsite quality controls would have negligible impact on surface water improvement. The RVCA would therefore accept that stormwater runoff from the site does not require any additional onsite water quality control measures save and except best management practices.

From: Cara Ruddle [mailto:c.ruddle@novatech-eng.com]
Sent: Tuesday, March 20, 2018 1:11 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: 1705 Carling Avenue - quality control requirements

Jamie:
The site at 1705 Carling Avenue (former Rose Bowl Restaurant) is being re-developed. I am looking for the stormwater quality control requirements to incorporate into our stormwater management design. Can you please provide this information?

Thanks.

Cara Ruddle, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 220 | Cell: 613.261.7719 | Fax: 613.254.5867

APPENDIX D
Development Servicing Study Checklist

1705 CARLING AVENUE, OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.1 General Content	Addressed (Y/N/NA)	Comments
Executive Summary (for larger reports only).	N/A	
Date and revision number of the report.	Y	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Refer to Report Figures
Plan showing the site and location of all existing services.	Y	Refer to Grading and Servicing Plans
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.	Y	Refer to Site Plan
Summary of Pre-consultation Meetings with City and other approval agencies.	Y	
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.	N/A	
Statement of objectives and servicing criteria.	Y	Report Sections: 5.0 Water Servicing , 6.0 Sanitary Servicing, 7.0 Storm Servicing
Identification of existing and proposed infrastructure available in the immediate area.	Y	
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).	N/A	
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 neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	Refer to Grading Plan and Stormwater Management Plan

1705 CARLING AVENUE, OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.1 General Content	**Addressed (Y/N/NA)**	**Comments**
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.	Y	Report Section 4.0 Site Constraints
All preliminary and formal site plan submissions should have the following information:		
Metric scale	Y	
North arrow (including construction North)	Y	
Key plan	Y	
Name and contact information of applicant and property owner	Y	
Property limits including bearings and dimensions	Y	
Existing and proposed structures and parking areas	Y	
Easements, road widening and rights-of-way	Y	
Adjacent street names	Y	

4.2 Water	**Addressed (Y/N/NA)**	**Comments**
Confirm consistency with Master Servicing Study, if available.	N/A	
Availability of public infrastructure to service proposed development.	Y	Report Sections: 5.0 Water Servicing , 6.0 Sanitary Servicing, 7.0 Storm Servicing
Identification of system constraints.	N/A	
Identify boundary conditions.	Y	Provided by City of Ottawa
Confirmation of adequate domestic supply and pressure.	Y	Refer to Appendix 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.	Y	Refer to Appendix A
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.	Y	Refer to Appendix 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.	Y	Refer to Appendix 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.	Y	Report Section 5.0 Water Servicing
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.	Y	Report Section 5.0 Water Servicing
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.	Y	Report Section 5.0 Water Servicing
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A	

4.3 Wastewater	Addressed (Y/N/NA)	**Comments**
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).	Y	Report Section 6.0 Sanitary Servicing
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.	Y	Report Section 6.0 Sanitary Servicing
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)	y	Refer to Appendix B
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.	Y	Report Section 6.0 Sanitary Servicing
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	

1705 CARLING AVENUE, OTTAWA
DEVELOPMENT SERVICING STUDY CHECKLIST

4.4 Stormwater	Addressed (Y/N/NA)	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	Report Sections 7.0 Storm Servicing and 8.0 Stormwater Management
Analysis of the available capacity in existing public infrastructure.	N/A	The allowable flow was provided by the City of Ottawa.
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y	Refer to Stormwater Management Plan
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.	Y	Report Section 8.0 Stormwater Management
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	Report Section 8.0 Stormwater Management
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	Report Section 8.0 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 calcs) and conveyance capacity for 5 yr and 100 yr events.	Y	Refer to Appendix C
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A	
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.	Y	Refer to Appendix C
Any proposed diversion of drainage catchment areas from one outlet to another.	N/A	
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities.	N/A	
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	

4.4 Stormwater	**Addressed (Y/N/NA)**	**Comments**
Identification of potential impacts to receiving watercourses.	N/A	
Identification of municipal drains and related approval requirements.	N/A	
Description of how the conveyance and storage capacity will be achieved for the development.	Y	Report Section 8.0 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.	Y	Refer to Stormwater Management Plan
Inclusion of hydraulic analysis including HGL elevations.	N/A	
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	Report Section 9.0 Erosion and Sediment 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 constrains related to floodplain and geotechnical investigation.	N/A	

4.5 Approval and Permit Requirements	**Addressed (Y/N/NA)**	**Comments**
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.	Y	Refer to Appendix C
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	**Addressed (Y/N/NA)**	**Comments**
Clearly stated conclusions and recommendations.	Y	Report Section 10.0 Conclusions and 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.	N/A	T.B.D.
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	

APPENDIX E
Drawings

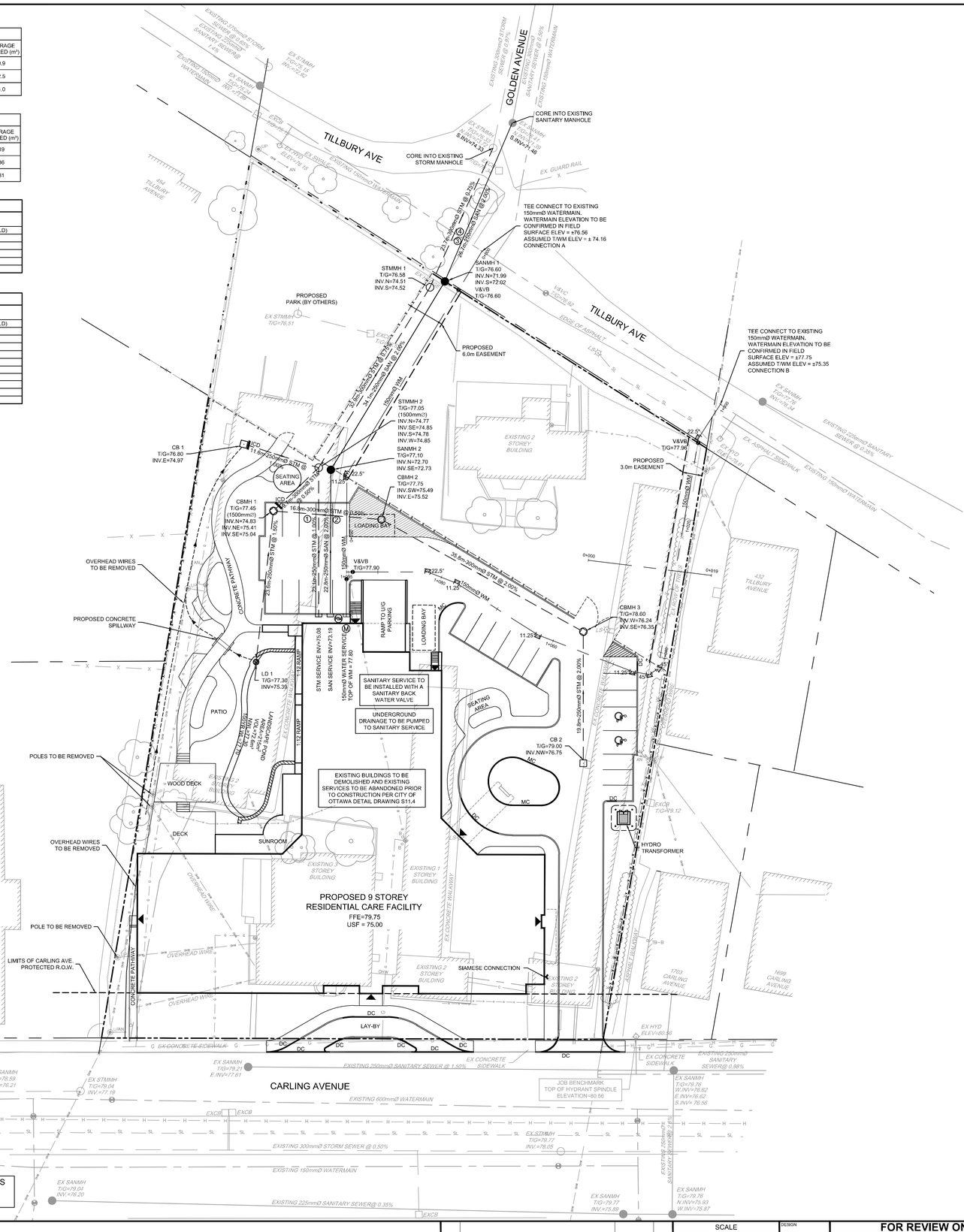
INLET CONTROL DEVICE FOR AREA A-3 @ CBMH 1					
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	*STORAGE REQUIRED (m³)
1:2 YEAR	TEMPEST LMF 105	300	15.6	2.55	19.9
1:5 YEAR	TEMPEST LMF 105	300	15.8	2.58	32.5
1:100 YEAR	TEMPEST LMF 105	300	16.6	2.85	84.0

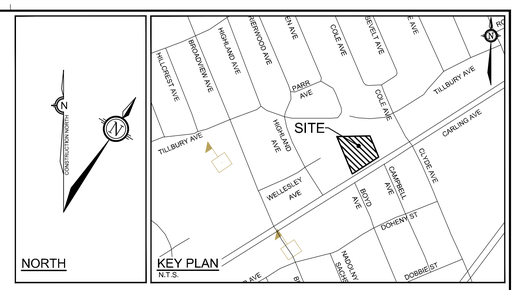
INLET CONTROL DEVICE FOR AREA A-4 @ CB 1					
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	*STORAGE REQUIRED (m³)
1:2 YEAR	TEMPEST LMF 60	250	4.2	1.68	1.19
1:5 YEAR	TEMPEST LMF 60	250	4.3	1.83	2.36
1:100 YEAR	TEMPEST LMF 60	250	4.5	1.97	7.81

150mmØ WATERMAIN TABLE - CONNECTION A			
STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
0+000	±76.56	74.16	CONNECTION TO EXISTING 150mmØ WATERMAIN (EX. ELEVATION TBC IN FIELD)
0+007.0	76.60	74.20	VALVE AND VALVE BOX AT PROPERTY LINE
0+040.4	77.18	74.78	22.5° HORIZONTAL BEND
0+040.8	77.18	74.78	11.25° HORIZONTAL BEND
0+047.0	77.65	74.71	CROSSING PROPOSED STORM SEWER (0.5 CLEARANCE)
0+063.0	77.80	75.40	CAP 1.0m FROM FOUNDATION WALL

150mmØ WATERMAIN TABLE - CONNECTION B			
STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
1+000	±76.65	74.25	CONNECTION TO EXISTING 150mmØ WATERMAIN (EX. ELEVATION TBC IN FIELD)
1+006.2	77.96	75.56	22.5° HORIZONTAL BEND
1+006.9	77.96	75.56	VALVE AND VALVE BOX AT PROPERTY LINE
1+042.4	78.92	76.52	45° HORIZONTAL BEND
1+044.1	78.82	76.42	45° HORIZONTAL BEND
1+046.7	78.82	76.42	11.25° HORIZONTAL BEND
1+055.0	78.65	75.65	CROSSING PROPOSED STORM SEWER (0.5 CLEARANCE)
1+062.4	78.45	76.05	11.25° HORIZONTAL BEND
1+077.4	78.09	75.69	11.25° HORIZONTAL BEND
1+082.2	78.00	75.60	22.5° HORIZONTAL BEND
1+095.0	77.92	75.52	CONNECTION TO PROPOSED 150mmØ WATERMAIN

PIPE CROSSING TABLE			
CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE
①	250mmØ STM OBV=75.15	300mmØ STM INV=75.45	±0.3m
②	250mmØ SAN OBV=73.12	300mmØ STM INV=75.45	±2.3m
③	250mmØ SAN OBV=72.09	150mmØ WM INV=74.00	±1.9m
④	150mmØ T/WM=74.10	300mmØ STM INV=74.45	±0.35m





LEGEND

- PROPERTY LINE
- PROPOSED CURB
- DC — PROPOSED DEPRESSED CURB
- MC — PROPOSED MOUNTABLE CURB
- PROPOSED RETAINING WALL
- V&VB — PROPOSED VALVE AND VALVE BOX
- PROPOSED CAP
- PROPOSED WATER METER
- PROPOSED REMOTE METER
- PROPOSED SANITARY SERVICE c/w MANHOLE
- PROPOSED STORM SEWER AND MANHOLE
- PROPOSED WATERMAIN
- PROPOSED BUILDING ENTRANCE
- DIRECTION OF FLOW
- PROPOSED LANDSCAPE DRAIN
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- SIAMESE CONNECTION
- *EXISTING UTILITY POLE C/W GUY WIRES*
- *EXISTING WATERMAIN C/W VALVE & VALVE CHAMBER*
- *EXISTING HYDRANT C/W VALVE & LEAD*
- *EXISTING SANITARY MANHOLE & SEWER*
- *EXISTING STORM MANHOLE & SEWER*
- *EXISTING CATCHBASIN*
- *EXISTING GAS MAIN*
- *EXISTING OVERHEAD WIRES*
- *EXISTING BELL LINE*

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL (IF ANY) SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC. THE SITE BENCHMARK IS THE TOP OF SPINDLE ON THE HYDRANT ON THE NORTH SIDE OF CARLING AVENUE (ELEV.= 80.56). REFER TO ANNIS, O'SULLIVAN VOLLEBEKK LTD. TOPOGRAPHIC PLAN OF PART OF LOT 30 CONCESSION 1.
8. REFER TO GEOTECHNICAL REPORT PG4423-1, DATED FEB 16, 2018, PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECTS AND LANDSCAPE ARCHITECTS DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT**(R-2018-059)** PREPARED BY NOVATECH.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT.
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES AND GRADING PLAN INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATION, T/WM ELEVATIONS, ANY ALIGNMENT CHANGES, AND ALL SURFACE ELEVATION AS-BUILT GRADES.
13. REFER TO CITY OF OTTAWA ROAD REINSTATEMENT DETAIL R10 FOR ALL REQUIRED ROAD REINSTATEMENTS.

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200Ø)	701.010	OPSD
STORM / SANITARY MANHOLE (1500Ø)	701.011	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME	S25	CITY OF OTTAWA
SANITARY COVER	S24	CITY OF OTTAWA
STORM COVER (CLOSED)	S24.1	CITY OF OTTAWA
STORM COVER (OPEN)	S28.1	CITY OF OTTAWA
SEWER TRENCH	S6 & S7	CITY OF OTTAWA
STORM SEWER	PVC DR 35	CITY OF OTTAWA
SANITARY SEWER	PVC DR 35	CITY OF OTTAWA
ELBOW CB	S31	CITY OF OTTAWA
TEE CB	S30	CITY OF OTTAWA
THERMAL INSULATION	1109.030	OPSD

2. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
3. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
4. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL), THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
5. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN.
6. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
7. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.
8. INSULATE ALL STORM AND SANITARY SEWERS THAT HAVE LESS THAN 2.0m OF COVER.
9. BACK FLOW VALVES FOR STORM SERVICE CONNECTIONS ARE REQUIRED. REFER TO MECHANICAL DRAWINGS.

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN	PVC DR 18	

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE MINIMUM 0.30m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
2.	REVISED PER CITY COMMENTS	AUG 8/18	CJR
1.	SITE PLAN APPLICATION	APR 20/18	CJR

SCALE 1:300 (1:300, 0 3 6 9 12)

DESIGN AJL | CHECKED CJR | DRAWN AJL | CHECKED CJR | APPROVED SG

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER C.J. RUDDLE ISSUED FOR REVIEW Aug 8/18 PROVINCE OF ONTARIO

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

LOCATION
1705 CARLING AVE, CITY OF OTTAWA
THE FOUNDERS RESIDENCES WESTBORO

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 117216-00
REV REV # 2
DRAWING No. 117216-GP

D07-12-18-0062

PLAN NO. 17662

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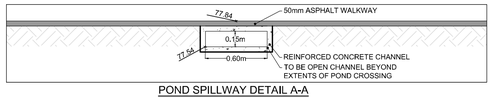

POND SPILLWAY DETAIL A-A
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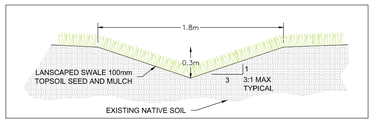

TYPICAL SWALE CROSS SECTION DETAIL
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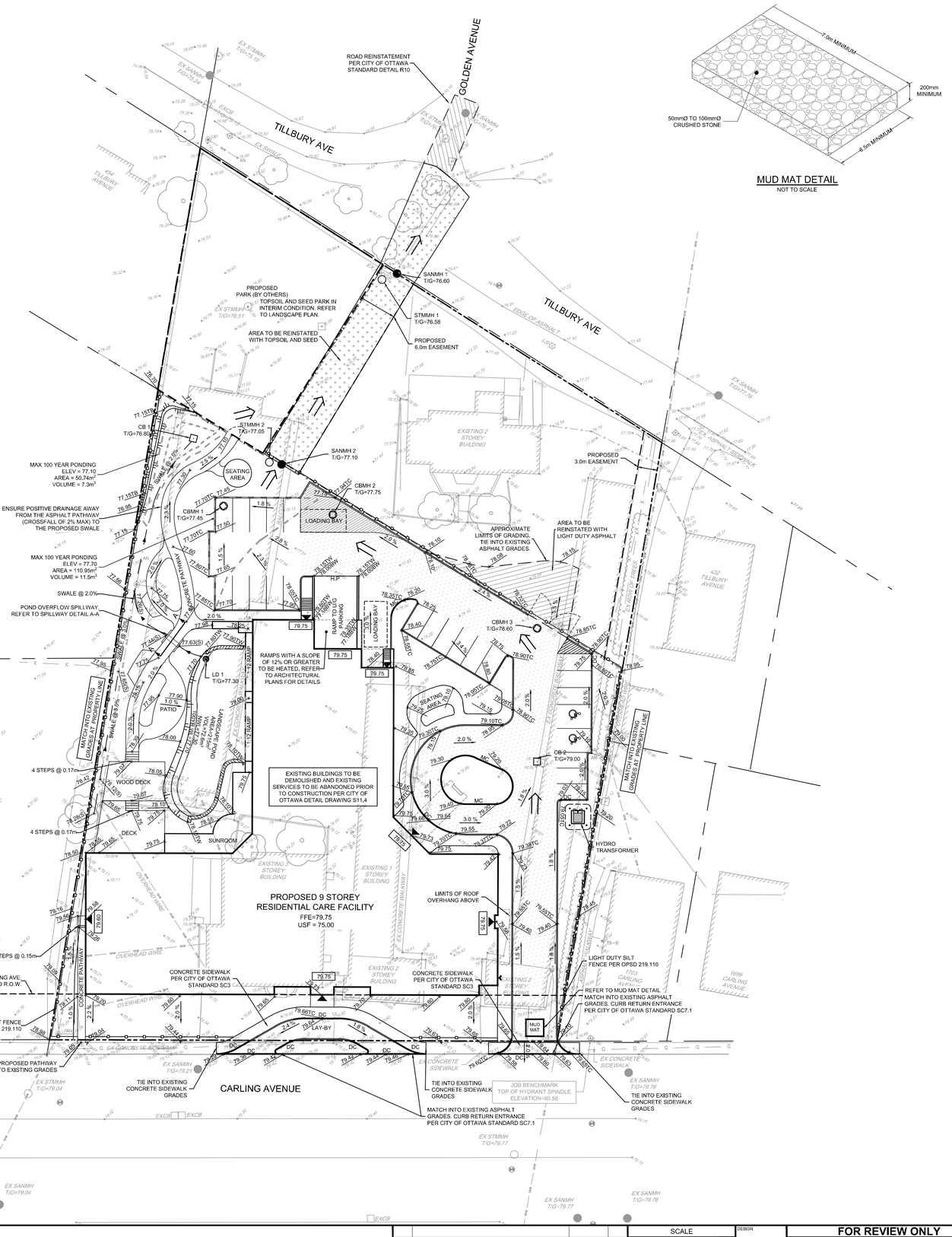
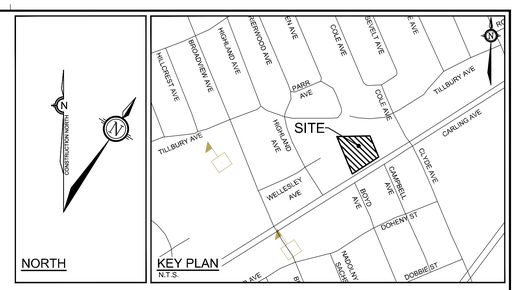


MUD MAT DETAIL
NOT TO SCALE



LEGEND

- PROPERTY LINE
- PROPOSED RETAINING WALL
- PROPOSED CURB
- PROPOSED DEPRESSED CURB (DC)
- PROPOSED MOUNTABLE CURB (MC)
- PROPOSED SWALE ELEVATION (77.40(S))
- PROPOSED ELEVATION (78.00)
- PROPOSED TOP OF CURB ELEVATION (78.15TC)
- PROPOSED TOP OF BERM (77.15TB)
- PROPOSED TOP OF WALL (79.60TW)
- PROPOSED BOTTOM OF WALL (78.18BW)
- EXISTING ELEVATION (x 77.73)
- PROPOSED BUILDING ENTRANCE
- SLOPE AND DIRECTION (2.0%)
- DIRECTION OF MAJOR OVERLAND FLOW
- PROPOSED LANDSCAPE DRAINS
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED SANITARY MANHOLE (SAN MH)
- PROPOSED STORM MANHOLE (STM MH)
- EXISTING VALVE & VALVE BOX (VALVE)
- EXISTING HYDRANT
- EXISTING SANITARY MANHOLE (SAN MH)
- EXISTING STORM MANHOLE (STM MH)
- EXISTING CATCHBASIN (CB)
- EXISTING HEDGE
- EXISTING GAS METER (GAS)
- EXISTING UTILITY POLE (UP)
- PROPOSED FENCELINE (x x)
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED) (H.P.)
- PROPOSED HIGH POINT
- SWALE c/w SUBDRAIN AND DIRECTION OF FLOW
- PROPOSED FINISHED FLOOR ELEVATIONS AT BUILDING ENTRANCES/EXITS (79.00)
- PROPOSED MUD MAT (M M)
- LIGHT DUTY SILT FENCE (OPSD 219.110)
- SAWCUT
- ROAD REINSTATEMENT
- REINSTATEMENT
- 5 YR PONDING EXTENTS
- 100 YR PONDING EXTENTS

PAVEMENT STRUCTURE:

LIGHT DUTY
50mm HL3 OR SUPERPAVE 12.5
ASPHALTIC CONCRETE
150mm GRAN "A"
300mm GRAN "B" TYPE II

HEAVY DUTY
40mm HL3 OR SUPERPAVE 12.5
ASPHALTIC CONCRETE
50mm HL8 OR SUPERPAVE 19.0
ASPHALTIC CONCRETE
150mm GRAN "A"
450mm GRAN "B" TYPE II

GENERAL NOTES:

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2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
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4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $2,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
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6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL (IF ANY) SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
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8. REFER TO GEOTECHNICAL REPORT PG4423-1, DATED FEB 16, 2018, PREPARED BY PATERSON GROUP INC. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT**(R-2018-059)** PREPARED BY NOVATECH.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT.
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES AND GRADING PLAN INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATION, T/WM ELEVATIONS, ANY ALIGNMENT CHANGES, AND ALL SURFACE ELEVATION AS-BUILT GRADES.
13. REFER TO CITY OF OTTAWA ROAD REINSTATEMENT DETAIL R10 FOR ALL REQUIRED ROAD REINSTATEMENTS.

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4.
5. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
6. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
7. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
8. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
9. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
10. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES:

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
2. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
3. THE CONTRACTOR SHALL PLACE FILTER CLOTH UNDER THE CATCHBASIN AND MANHOLE GRATES FOR THE DURATION OF CONSTRUCTION AND WILL REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION. FILTER CLOTH SHALL BE NON-WOVEN, POYPROPYLENE, CLASS I PER OPSS 1860.
4. SILT FENCING FOR ENTIRE PERIMETER OF SITE, SHALL BE UTILIZED TO CONTROL EROSION FROM THE SITE DURING CONSTRUCTION. GEOTEXTILE FOR SILT FENCE SHALL BE ACCORDING TO OPSS 1860, TABLE 3.
5. PROVIDE MUD MATS AT ALL CONSTRUCTION ACCESS POINTS TO MINIMIZE SEDIMENT TRANSPORT OFFSITE.

NOTE:
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NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
2.	REVISED PER CITY COMMENTS	AUG 8/18	CJR
1.	SITE PLAN APPLICATION	APR.20/18	CJR

SCALE 1:300 (1:300, 0 3 6 9 12)

DESIGN AJL
CHECKED CJR
DRAWN AJL
CHECKED CJR
APPROVED SG

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — C.J. RUDDLE — ISSUED FOR REVIEW — Aug 8/18 — PROVINCE OF ONTARIO

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

LOCATION
1705 CARLING AVE, CITY OF OTTAWA
THE FOUNDERS RESIDENCES WESTBORO

DRAWING NAME
GRADING, EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 117216-00
REV REV # 2
DRAWING No. 117216-GR

D07-12-18-0062

PLAN NO. 17662

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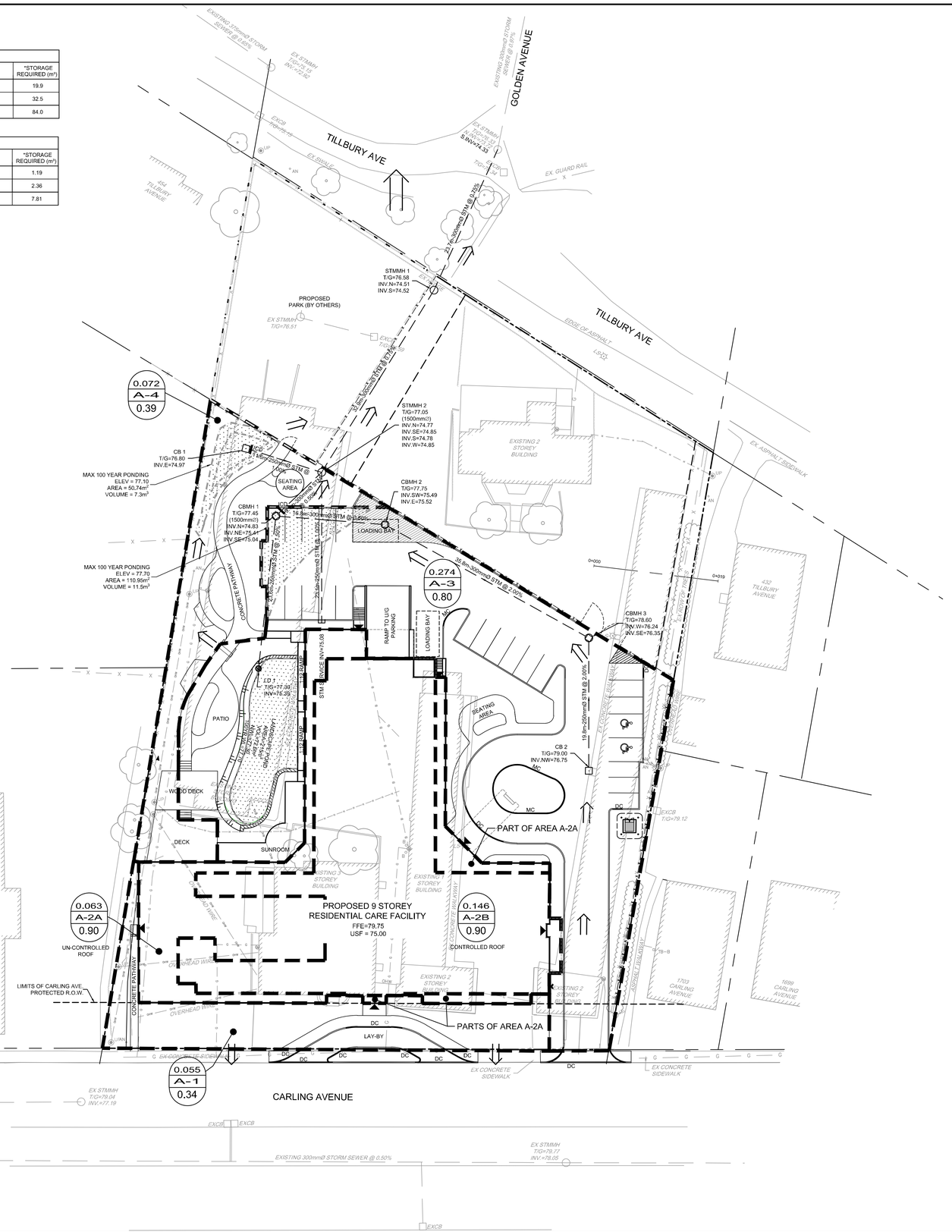
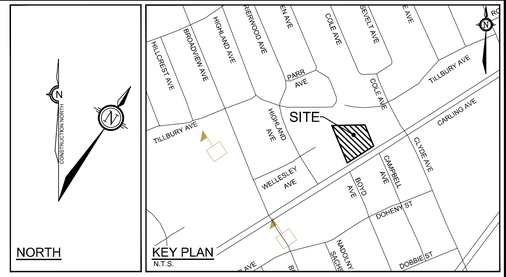
INLET CONTROL DEVICE FOR AREA A-3 @ CBMH 1					
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	*STORAGE REQUIRED (m³)
1:2 YEAR	TEMPEST LMF 105	300	15.6	2.55	19.9
1:5 YEAR	TEMPEST LMF 105	300	15.8	2.58	32.5
1:100 YEAR	TEMPEST LMF 105	300	16.6	2.85	84.0

INLET CONTROL DEVICE FOR AREA A-4 @ CB 1					
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	*STORAGE REQUIRED (m³)
1:2 YEAR	TEMPEST LMF 60	250	4.2	1.68	1.19
1:5 YEAR	TEMPEST LMF 60	250	4.3	1.85	2.36
1:100 YEAR	TEMPEST LMF 60	250	4.5	1.97	7.81





LEGEND

- PROPERTY LINE
- PROPOSED RETAINING WALL
- PROPOSED CURB
- DC — PROPOSED DEPRESSED CURB
- MC — PROPOSED MOUNTABLE CURB
- 2.0% — SLOPE AND DIRECTION
- STMMH 1 — PROPOSED STORM MANHOLE & SEWER
- VALVE — EXISTING VALVE & VALVE BOX
- EXISTING HYDRANT
- STM MH — EXISTING STORM MANHOLE & SEWER
- CB — EXISTING CATCHBASIN
- EXISTING HEDGE
- GM — EXISTING GAS METER
- UP — EXISTING UTILITY POLE

0.055 / A-1 / 0.34 — DRAINAGE AREA (hectares); AREA I.D.; RUNOFF COEFFICIENT

STORM DRAINAGE AREA

ICD — PROPOSED INLET CONTROL DEVICE

5 YR PONDING EXTENTS

100 YR PONDING EXTENTS

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1.	SITE PLAN APPLICATION	APR 20/18	CJR

SCALE 1:300 (1:300, 0 3 6 9 12)

DESIGN AJL | CHECKED CJR | DRAWN AJL | CHECKED CJR | APPROVED SG

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LOCATION
CITY OF OTTAWA
THE FOUNDERS RESIDENCES WESTBORO

DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 117216-00
REV. REV # 2
DRAWING No. 117216-SWM

D07-12-18-0062

PLAN NO. 17662

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