PROPOSED THREE-STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 8

R-PLAN 43586

33 HENEY STREET

CITY OF OTTAWA

SERVICEABILITY REPORT

REPORT No. R-817-6A

T. L. MAK ENGINEERING CONSULTANTS LTD.

JUNE 2017

REF. FILE No. 817-6A

1.) INTRODUCTION

The developer of the property under consideration is proposing to construct a three-storey residential apartment building on site. It is situated on the north side of Heney Street, east of Cobourg Street and west of Charlotte Street.

The three-storey apartment building will have basement apartments. Floor space for the various levels of the building are as follows: basement area (2,240.05 sq. ft.) consisting of three - (1) bedroom units; ground floor area (2,306.90 sq. ft.) comprising of two - (2) bedroom and one - (1) bedroom units; second floor area (2,978.35 sq. ft.) consisting of two bachelors and two - (2) bedroom units; third floor area (2,978.35 sq. ft.) comprising of two bachelors and two - (2) bedroom units.

Area of the development lot is ± 0.0608 ha. In addition to the apartment building, the other development features will comprise of an asphalt access laneway along the east side of the property, 3 rear yard asphalt parking spaces, landscape areas, etc., to meet City of Ottawa site plan requirements.

This report will serve to provide the City of Ottawa with our serviceability brief to address the proposed servicing scheme for this site.

2.) EXISTING SITE CONDITIONS AND SERVICING

Presently, the said development property houses a 2½ storey brick 10 unit apartment building with asphalt paved areas located along the east side of the property and a mix of paved and gravelled areas in the rear yard. Most of the front yard is currently grass covered except for the concrete front entrances. Hard surfaces predominantly consisting of rooftop, paved and gravelled surfaces cover most of the existing lot.

Terrain of the property is gently sloping from front to back or in a south to north direction across the site.

As for the availability of underground services, there are existing municipal services along the Heney Street road right of way consisting of the following main sizes: a 300 mm diameter storm sewer, a 300 mm diameter sanitary sewer and a 200 mm diameter watermain.

3.) PROPOSED RESIDENTIAL APARTMENT BUILDING SITE

One vehicle entrance located at the southeast corner of the site is proposed to serve this property along with an access roadway along the east property limit to direct vehicular traffic in and out of the site. Vehicle parking will be at the rear of the building where (3) parking spaces are proposed for this site.

A.) Water Supply

Based on previous discussions with the owner and his architect, the building will not be installed with a sprinkler system. The building is proposed to be serviced via a 38 mm diameter water service pipe copper type "K" and sized to minimize head losses to the building from the city main.

The following boundary conditions for 33 Heney Street which is to be connected to the 203mm diameter watermain along Heney Street were provided by the City on March 27, 2017. The ground elevation at this location is approximately 65.3 m.

- Minimum HGL = 106.4 m
- Maximum HGL = 118.3 m
- MXDY (0.24 L/s) + Fire Flow (200 L/s) = 101.9 m

The City has indicated that for the calculated Fire Underwriter Survey (FUS) fire flow of 200 L/s (attached) the resulting hydraulic grade line is 101.9 m. This corresponds to a residual pressure of 359 kPa (52 psi) at this location and is well above the minimum residual pressure requirement of 140 kPa (20 psi).

During peak hour flow conditions, the resulting minimum hydraulic grade line of 106.4 m corresponds to a peak hour pressure of 403 kPa (58 psi). This value is well above the minimum pressure objective of 276 kPa (40 psi).

With respect to the maximum pressure check during average day demands, the resulting maximum hydraulic grade line of 118.3 m corresponds to a pressure of 520 kPa (75 psi). This value is below the maximum pressure objective of 552 kPa (80 psi).

In conclusion, based on the boundary conditions provided, the 203 mm diameter watermain on Heney Street provides adequate fire flow capacity as per the Fire Underwriters Survey and provides anticipated demand flows.

B.) Sanitary Flow

Peak sanitary flow for this proposed development site is estimated at Q = 0.41 L/s with an infiltration rate of 0.02 L/s. This flow will enter the existing 300 mm diameter sanitary sewer via the proposed apartment building 150 mm diameter PVC sanitary service lateral sloped at 1% (min.). Refer to Appendix B for details.

The peak sanitary flow estimated for this lot currently housing a ten unit apartment dwelling unit is Q = 0.25 L/s with a residential rate of 0.02 L/s. Therefore, the estimated net increase in peak flow from this proposed development is 0.16 L/s.

In view that the existing sanitary sewer size is 300 mm diameter in front of this property, an increase in sanitary flow to the sewer system by 0.16 L/s from this residential site is not expected to negatively impact the existing Heney Street sanitary sewer.

C.) Storm Flow

Stormwater outlet for this proposed property will be the existing 300 mm diameter storm sewer located on Heney Street. The proposed residential apartment building will have a central portion of the rooftop that is flat and will be able to provide on-site stormwater management (SWM) storage. Roof water from the building will be drained and controlled by one roof drain in which it will have a release rate of 0.63 L/s (10 U.S. gal/min.) which then outlets directly into the existing 300 mm diameter storm sewer via the proposed 100 mm diameter PVC storm pipe.

On-site drainage shall be graded and drained into a catch basin, a catch basin manhole and underground stormwater piping of 200 mm and 375 mm diameter for SWM purposes.

Based on the site plan from the architect, the average post-development runoff coefficient is estimated at C = 0.72 and A = 0.0608 ha.

An estimation of the pre-development flow condition was carried out using the criteria accepted by the City of Ottawa.

Pre-development 5 year flow rate for this residential area is estimated to be approximately Q = 8.83 L/s using C = 0.5 (max.) runoff value and tc = 10 min. for this proposed development site in which flow ultimately outlets to a 300 mm diameter storm sewer on Heney Street.

Therefore, based on this calculation, on-site retention is required for this proposed development site.

Storage volume for the 5 year and up to 100 year event will be stored by means of rooftop, surface area of the rear yard, access laneway, underground storm pipes and drainage structures.

The maximum 5 year allowable release rate off-site was determined to be 8.83 L/s.

Based on the Proposed Grading, Servicing and Stormwater Management Plan and with rooftop storage, the estimated 5 year high water level of 64.73 m will provide stormwater storage volume of 5.31 m^3 which is greater than the estimated required storage volume of 3.89 m^3. The estimated 100 year high water level of 64.80 m will provide stormwater storage volume of 15.55 m^3 which is greater than the estimated required storage volume of 11.02 m^3.

Therefore by incorporating flat rooftop storage with a controlled roof drain at 0.63 L/s, grading the year yard surface area and installing the proposed underground drainage piping and structures as shown on the Proposed Grading, Servicing and Stormwater Management Plan Dwg. No. 817-6, G-1, the desirable 5 year storm event level of 64.73 m at detention volume of 5.31 m^3 will be available on-site as well as the 100 year storm event level of 64.80 m at detention volume of 15.55 m^3.

This proposed new three-storey residential apartment building will provide rooftop storage and by installing (1) roof drain at the location as depicted on Dwg. No. 817-6, G-1 at the designated attenuation roof area with a drain having a release rate of 0.63 L/s and constructing

the asphalt parking spaces and rear yard surfaces, storm pipes and drainage system as detailed, the allowable controlled off-site flow of 2.68 L/s can be achieved by incorporating the specified ICD in CB/MH #1 at the downstream 200 mm diameter outlet pipe.

Therefore an inlet control device (ICD) will be installed at the outlet of CB/MH #1 in the 200 mm diameter storm pipe (outlet pipe) to regulate the allowable controlled release rate off-site. The ICD type recommended is a Hydrovex Regulator (No. 50 VHV-1) or equivalent to control the allowable release rate of 2.68 L/s under a head of 1.48 m.

The building weeping tile drainage will be outletted via a separately proposed 125 mm diameter PVC storm lateral to be installed in the main trench of the building service laterals which will be connected to the existing City 300 mm diameter storm pipe. The roof drain outlet will be separate via a 100 mm diameter PVC storm pipe located at the southeast front corner of the building) which will be connected or "wyed" into the proposed 200 mm diameter storm pipe downstream of CB/MH #1. No storm pipe connections of any type from the building will be permitted into or upstream of CB/MH #1.

Water quality is required for this site because stormwater from this lot outlets to the Rideau River at Island Lodge Road. The Rideau Valley Conservation Authority (RVCA) typically requires water quality treatment for 80% removal (min.) of total suspended solids (TSS) for redevelopment of infill properties.

For 33 Heney Street, it is the Conservation Authority's position that stormwater quality control is required for this site. The storm sewer that services this site outlets to the Rideau River at Island Lodge Road (approximately 350 m to the west and north). The Rideau River is high quality aquatic habitat. As such, RVCA requires efforts be made to improve the quality of runoff leaving the site, particularly since in their opinion from review of the proposed site plan, there will be little vegetated areas left once the site is redeveloped. RVCA requires options be explored to use lot level controls or oil/grit separator technology to improve the quality of runoff from the site.

Therefore, to develop this site, a Stormceptor system is proposed to support the water quality improvement objective. Stormceptor (Model No. STC 300) was selected that will provide the water quality objective removal of over 80% TSS which is above the minimum requirement of 80% TSS removal. In addition to TSS removal, the Stormceptor system is also an oil and sediment separator.

4.) EROSION AND SEDIMENT CONTROL

The contractor shall implement Best Management Practices to provide for protection of the receiving storm sewer during construction activities. These practices are required to ensure no sediment and/or associated pollutants are released to the receiving watercourse. These practices include installation of a silt fence barrier (as per OPSD 219.110 and associated specifications) along Heney Street and all other areas that sheet drain off-site. Maintenance hole sediment barriers to be AMOCO 4555 nonwoven geotextile or approved equivalent.

Refer to Appendix C for summary of the Development Servicing Study Checklist applicable for this development.

PREPARED BY T. L. MAK ENGINEERING CONSULTANTS LTD.

TONY L. MAK, P. ENG.

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CITY OF OTTAWA

APPENDIX A

CITY OF OTTAWA

WATER DATA BOUNDARY CONDITIONS

AND

FUS FIRE FLOW CALCULATIONS

From: Wu, John
To: TL Mak ;
Subject: RE: 33 Heney Street
Date: Monday, March 27, 2017 10:47:16 AM
Attachments: 33 Heney March 2017.pdf

Here is the result:

The following are boundary conditions, HGL, for hydraulic analysis at 33 Heney St (zone 1W) assumed to be connected to the 203 mm on Heney St. (see attached PDF for location).

Minimum HGL = 106.4 m

Maximum HGL = 118.3 m

Max Day (0.24 L/s) + FireFlow (200 L/s) = 101.9 m

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.

John

From: TL Mak [mailto:tlmakecl@bellnet.ca]
Sent: Friday, March 24, 2017 1:47 PM
To: Wu, John
Subject: 33 Heney Street

Hi John,

The proposed residential building at 33 Heney Street is proposed to have a total of 14 unit comprised bachelor, 1-bedroom, 2-bedroom apartments. The building will be 3 storeys with a basement and is to be serviced from the 203mm diameter watermain along Heney Street. The total square footage of the building is approximately 10,597 sq ft (984 m^2).

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines where the residential consumption rate of 350 L/cap/d is used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY by a factor of 2.5. Peak hourly (PKHR) demands were calculated by multiplying MXDY by a factor of 2.2. Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. **Table 1** shows the estimated domestic demands of the configured building.

Table 1 - Estimated Domestic Demand

Floor	Unit Type	# of Units	PPU	BSDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Basement	1 Bedroom	3	1.4	1,470	0.017	3,675	0.043	8,085	0.094
1	1 Bedroom	1	1.4	490	0.006	1,225	0.014	2,695	0.031
	2 bedroom	2	2.1	1,470	0.017	3,675	0.043	8,085	0.094
2	Bachelor	2	1.4	980	0.011	2,450	0.028	5,390	0.062
	2 bedroom	2	2.1	1,470	0.017	3,675	0.043	8,085	0.094
3	Bachelor	2	1.4	980	0.011	2,450	0.028	5,390	0.062
	2 bedroom	2	2.1	1,470	0.017	3,675	0.043	8,085	0.094
	Total	14		***8,330***	***0.096***	***20,825***	***0.241***	***45,815***	***0.53***

The fire flow required was determined following the Fire Underwriter Survey (FUS) method and is provided in the attached spreadsheet. This building is assumed to be wood frame construction with building contents that are limited in combustibility. It is understood that the building will not have a sprinkler system. The resulting total required fire flow is 12,000 L/min (200 L/s) for a duration of 2 hours.

In summary:

AVDY = 8,330 L/d (0.096 L/s)
MXDY = 20,825 L/d (0.24 L/s)
PKHR = 45,815 L/d (0.53 L/s)
Fire Flow = 12,000L/min (200 L/s)

The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and Fire Flow conditions indicated above.

Thank you for your prompt attention to this matter. Please forward the boundary conditions as soon as possible.

Tony Mak
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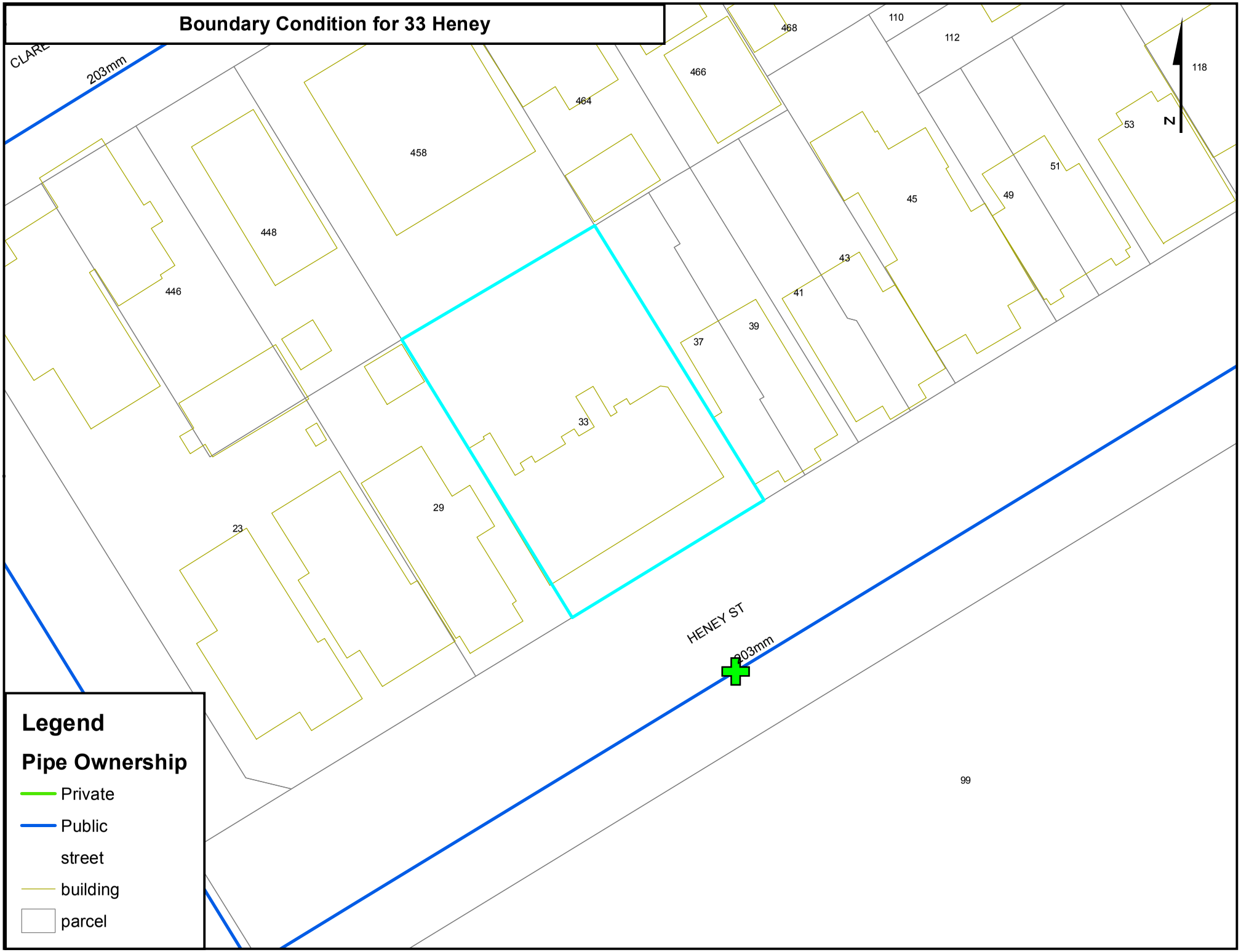
Ottawa, ON K1C 6Z7
Tel: 613 837-5516 | Fax: 613 837-5277
E-mail: tlmakecl@bellnet.ca


Boundary Condition for 33 Heney
CLARE
203mm
458
464
466
468
110
112
118
N
53
51
49
45
448
446
43
41
39
37
33
29
23
HENEY ST
203mm
99
Legend
Pipe Ownership
Private
Public
street
building
parcel

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 1634-01084
Project Name: 33 Heney Street
Date: March 21, 2017
Data input by: Valerie Hoang

Fire Flow Calculation #: 1
Building Type/Description/Name: Residential

Notes: Basement area not included as it is 50% below grade.

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (> 3 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	14	Units	
			Townhouse - indicate # of units	6				
			Other (Comm, Ind, Apt etc.)	14				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement):			3	3	Storeys	
3	Enter Ground Floor Area	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			2,770 Square Feet (ft2)	772	Area in Square Meters (m^2)	
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1000L/min						**9,000**
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	**7,650**
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	**0**
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	**0**
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	**0**
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	20.1 to 30.1m	0.1	0.6	m	**4,590**
			East Side	0 to 3.0m	0 25			
			South Side	45.1m or greater	0			
			West Side	0 to 3.0m	0 25			
6	Obtain Required Fire Flow, Duration & Volume	***Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:***						**12,000**
		Total Required Fire Flow (above) in L/s:						**200**
		Required Duration of Fire Flow (hrs)						**2.50**
		Required Volume of Fire Flow (m^3)						**1,800**

PROPOSED THREE-STOREY

RESIDENTIAL APARTMENT BUILDING SITE

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33 HENEY STREET

CITY OF OTTAWA

APPENDIX B

SANITARY SEWER DESIGN SHEET

PAGE 1 OF 1

SANITARY SEWER DESIGN SHEET

q = average daily per capita flow (350 L/cap. d)
I = unit of peak extraneous flow (0.28 L/ha. s)
M = peaking factor = 4
Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow

DENSITY
BACHELOR APT. = 1.4
1 BEDROOM APT. = 1.4
2 BEDROOM APT. = 2.1

$M = 1 + \frac{14}{4 + \sqrt{P}}$ where P population in 1000's
$Q(p) = \frac{PqM}{86.4}$ (L/s)
Q(i) = IA (L/s) where A = area in hectares
Q(d) = Q(p) + Q(i) (L/s)

LOCATION			INDIVIDUAL		CUMULATIVE		Peaking factor M	Pop. flow Q(p) (L/s)	Peak extraneous flow Q(i) (L/s)	Peak design flow Q(d) (L/s)	PROPOSED SEWER						
STREET	FROM	TO	Pop.	Area A (hectares)	Pop.	Area A (hectares)					Length (m)	Pipe size (mm)	Type of pipe	Grade %	Capacity (L/s) n = 0.013	Full flow velocity (m/s)	Actual velocity at Q(d)
				RESIDENTIAL													
33 HENEY	SITE	EX 300Ø SAN. SWR		(4x 1.4ppu) + (6x2.1 ppu) + (4x1.4ppu)													
			23.8	0.061	23.8	0.061	4	0.39	0.02	0.41	13.5	150	PVC	1.0% (min.)	19.8	1.12	

LICENSED PROFESSIONAL ENGINEER
05/05/17
TONY L.M. MAK
PROVINCE OF ONTARIO

(FILE # 817-6)

DESIGN	TLM
CHECKED	TLM
DATE	MAY 2017

PROJECT 33 HENEY STREET
PROPOSED THREE STOREY APARTMENT
BUILDING SITE - CITY OF OTTAWA

SHEET No. 1 of 1

PROPOSED THREE-STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 8

R-PLAN 43586

33 HENEY STREET

CITY OF OTTAWA

APPENDIX C

DEVELOPMENT SERVICING STUDY CHECKLIST

SUMMARY

4. Development Servicing Study Checklist

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

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

4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☐ 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.
- ☐ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☐ 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.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ 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).

☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.

☐ 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.

☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:

- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available

☒ Availability of public infrastructure to service proposed development

☒ Identification of system constraints

☒ Identify boundary conditions

☒ Confirmation of adequate domestic supply and pressure

☒ 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.

☒ 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.

☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design

☐ Address reliability requirements such as appropriate location of shut-off valves

☒ Check on the necessity of a pressure zone boundary modification.

☒ 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

☒ 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.

☐ 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.

☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

☒ 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).

☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.

☐ 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.

☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.

☐ 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)

☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.

☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.

☐ 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).

☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.

☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.

☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.

☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)

☐ Analysis of available capacity in existing public infrastructure.

☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.

☒ 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.

☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.

☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.

☐ Set-back from private sewage disposal systems.

☐ Watercourse and hazard lands setbacks.

☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.

☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.

- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ 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.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ 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.
- ☐ Identification of potential impacts to receiving watercourses
- ☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.
- ☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ 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.
- ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

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

☐ 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.

☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.

☐ Changes to Municipal Drains.

☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

☒ Clearly stated 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.

☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario