EXISTING THREE-STOREY MULTI-UNIT RESIDENTIAL BUILDING RENOVATIONS 246 WESTHAVEN CRESCENT CITY OF OTTAWA

SERVICEABILITY BRIEF

REPORT No. R-823-124

T. L. MAK ENGINEERING CONSULTANTS LTD.

MARCH 2024

REF. FILE No. 823-124

1.) INTRODUCTION

The owner of the said residential property is proposing to renovate the existing 3-unit three-storey apartment building consisting of (2) [3-bedroom + office] units and (1) [2-bedroom + office] units and convert it to a 6-unit multi-unit building. Application to the City of Ottawa for residential re-zoning from R3R to R4UC is being made for further development of this site.

From the City of Ottawa's recent review comments, one of the requirements to complete this application is a serviceability brief and in particular for providing the water demands for the site (Avg. Day, Max. Day, Peak Hour and Fire Flow).

The existing residential building at 246 Westhaven Crescent is a three-storey slab on grade low-rise building. This existing building is to be re-configured to house a total of 6 apartment units consisting of two (2) 3-bedrooms, one (1) 2-bedrooms, two (2) 1-bedroom and one (1) bachelor unit. Each floor covers an area of approximately 292.0 m^2 for a gross floor area of 879.0 m^2.

T.L. Mak Engineering Consultants Ltd. has been retained to prepare a "Serviceability Brief" for this site as a supplement to the re-zoning application process for the proposed re-development at this property.

2.) EXISTING SITE CONDITIONS AND SERVICING

Presently, a three-storey low-rise residential building occupies the site. For details of the site's pre-restructuring conditions, refer to the Google image (2020) and aerial photography from (GeoOttawa 2022) in Appendix A.

Presently, the existing (3) residential units at this residential building is serviced by a 38mm dia. copper water service pipe which is connected to the existing City watermain system at Westhaven Crescent. The building's existing 150mm dia. PVC sanitary lateral is currently discharging and outletting to the City's 225mm dia. sanitary sewer. Because this is a slab on-grade building, there are no weeping tiles in placed for this building and therefore, no storm lateral was required by the developer and his Architects under the regulations of the Ontario Building Code in 2015.

As for the availability of underground municipal services, there are existing municipal services along Westhaven Crescent in front of this property consisting of a 225mm dia. concrete sanitary sewer and a 150mm dia. U.C.I. watermain for any re-development of this property.

Existing grading and drainage of the lot is primarily sloped from a back to front (west to east) direction. Refer to the approved lot grading plan (Dwg. 815-53, G-1 Rev. No. 2) attached in Appendix B for additional details.

Currently, there exists an asphalt driveway and a parking area located at the front of the building that will be re-configured with soft landscaping material to be placed north of the existing parking area in order to reduce the amount of asphalt area at the front of the building.

3.) POTABLE WATER

From discussions with the owner and the owner's architects, the existing building will not have a sprinkler system. Our analysis will be based on a non-sprinklered building.

The building located within Pressure Zone 1W at 246 Westhaven Crescent is a 3-storey multi-unit residential building with no basement. The building contains six (6) total units, namely two (2) 3-bedroom, one (1) 2-bedroom, two (2) 1-bedroom and one (1) bachelor unit.

Each floor covers an area of around 292.0 m^2, for a gross floor area of 879.0 m^2. The building is to be serviced by the 150 mm diameter watermain along Westhaven Crescent. The ground elevation along Westhaven Crescent is approximately 79.4 m.

3a.) DEMAND PROJECTIONS

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 280 L/cap/d was used to estimate average day demands (AVDY). Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines.

Following discussions with the City, peaking factors are to be estimated from Table 3-3 of the MECP Design Guidelines for Drinking-Water Systems, given that the proposed development population is less than 500 people. Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 9.5. Peak hour (PKHR) demands were calculated by multiplying AVDY by a factor of 14.3. **Table 1** shows the estimated domestic demands of the proposed building.

Table 1: Estimated Domestic Demand

Unit Type	Unit Count	PPU	Consumption	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 3-Bedroom	2	3.1	280	1,736	0.02	16,492	0.19	24,825	0.29
Apartment, 2-Bedroom	1	2.1		588	0.01	5,586	0.06	8,408	0.10
Apartment, 1-Bedroom	2	1.4		784	0.01	7,448	0.09	11,211	0.13
Apartment, Bachelor	1	1.4		392	0.00	3,724	0.04	5,606	0.06
Total	**6**			***3,500***	***0.04***	***33,250***	***0.38***	***50,050***	***0.58***

The City had previously indicated that the City's Fire Marshall and various City departments are currently reviewing fire flow requirements for low- and mid-rise buildings. As per the City of Ottawa's Water Design Guidelines, the FUS method is to be used for fire flow requirements affecting watermain sizing; with regards to fire protection on private property and not requiring new watermains, these are covered by the Ontario Building Code (OBC). As such, the fire flow requirement was calculated using the OBC's Office of the Fire Marshal (OFM) method.

The proposed building will be of wood frame construction, where floors are fire separations, but without fire-resistance ratings. It is understood that the building won't be equipped with

sprinklers. The Resulting required fire flow is 4,500 L/min (75 L/s) for a duration Of 40 minutes. Details are provided in the attached **Fire Flow Calculations** in Appendix C. Furthermore, **Figure 1** attached in Appendix C provides separation distances from the street for the OFM calculations. The Proposed **Site Plan** attached in Appendix C was used to determine distances from the proposed building to the property lines.

In summary, the estimated water demands for the updated building are as follows:

- AVDY = 3,500 L/d (0.04 L/s);
- MXDY = 33,250 L/d (0.38 L/s);
- PKHR = 50,050 L/d (0.58 L/s); and
- Fire Flow = 4,500 L/min (75 L/s).

3b.) BOUNDARY CONDITIONS

The hydraulic gradeline (HGL) boundary conditions for 246 Westhaven Crescent, as presented in **Table 2**, were provided by the City on February 29, 2024 (see attached **Water Boundary Conditions Email** in Appendix C).

Table 2: Boundary Conditions

Demand Scenario	Head (m)	Flow (L/s)
Minimum HGL (Peak Hour)	108.6	
Maximum HGL (Average Day)	114.4	
Available Fire Flow @ Residual 20 psi		55[1]

[1] From the 152 mm dia. watermain on Westhaven Cresent, only.

However, the City indicated that 111.8 L/s (6,700 L/min) can be met from the local hydrants flowing simultaneously (see attached **Multiple Hydrant Analysis Email** in Appendix C). This value was considered in the hydraulic analysis to compare to the fire flow requirement for the proposed building.

3c.) HYDRAULIC ANALYSIS

PEAK HOUR & AVERAGE DAY

During peak hour demands, the resulting minimum hydraulic gradeline of 108.6 m corresponds to a peak hour pressure of 286 kPa (42 psi). This value is above the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. Adding 5 psi per floor above two stories, to account for headloss due to elevation and pipe losses, a minimum pressure of 310 kPa (45 psi) would be required for the third floor. The peak hour pressure at ground level is slightly

below this objective but is still within reasonable range for peak hour conditions. As such, it is deemed acceptable.

During average day demands, the resulting maximum hydraulic gradeline of 114.4 m corresponds to a maximum pressure of 343 kPa (50 psi). This value is less than the maximum pressure objective of 552 kPa (80 psi) and therefore considered acceptable. **Supporting hydraulic calculations** are attached in Appendix C.

MAXIMUM DAY + FIRE FLOW

The reported available fire flow at a residual pressure of 20 psi is 55 L/s (3,330 L/min). This is less than the RFF of 4,500 L/min, as per OFM. However, the City indicated that 6,700 L/min can be met from the local hydrants flowing simultaneously. Hydrant coverage and classes in the vicinity of the proposed building are illustrated in **Figure 2** attached in Appendix C.

Based on Table 1 of Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02 and a desktop review (i.e., Google Street View) to confirm hydrant class, the combined hydrant flow coverage for the building is estimated to be 13,300 L/min, which exceeds the OFM RFF value of 4,500 L/min. Note that the hydrant coverage exceeds the available watermain flow per the City's boundary condition. As such, fire flows are limited to the reported available fire flow noted above. A breakdown of the hydrant coverage is summarized in **Table 3** below.

Table 3: Fire Hydrant Coverage

Building	Fire Flow Demand (L/min)	Fire Hydrants					Combined Hydrant Flow Coverage (L/min)
		Hydrant Class	Within 75 m		Between 75 m and 150 m		
			Quantity	Max Contrib. to RFF	Quantity	Max Contrib. to RFF	
246 Westhaven Crescent	4,500 L/min (OFM)	AA	1	5,700			13,300*
		A	2	3,800			
		B					
		C					

** The hydrant coverage exceeds the available watermain flow per the City's boundary condition. As such, fire flows are limited to the reported available fire flow noted above (i.e., 6,700 L/min).*

The existing incoming 38 mm (1 ½ inch) dia. water service line was access based on the current floor plans and water fixtures proposed for the renovations. Approximately 102 fixture units need to be considered based on the Ontario Building Code (specifically, Table 7.6.3.2.A.). At a length of 20.5 m, the existing water service line can serve a maximum of approximately 116 fixture units according to Table A-2.6.3.1.(2)-A of the National Plumbing Code 2015, under peak hour water pressure of 286 kPa (42 psi). Since the total fixture units for the building are below the maximum value specified by Table A-2.6.3.1.(2)-A, we can conclude that the existing 1 ½ inch water service line is adequate to service the building.

3d.) CONCLUSIONS

In conclusion, based on the boundary conditions provided, the local watermain network in the vicinity of the proposed building at 246 Westhaven Crescent provides adequate fire flow capacity as per the OBC's Office of the Fire Marshal (OFM) method. Anticipated demand flows meet the pressure objectives during average demand conditions, as per the City of Ottawa's Drinking Water Design Guidelines. During peak hour conditions, the anticipated minimum pressure at ground level meets the pressure objectives for residential buildings up to two storeys. However, the minimum peak hour pressure is slightly below the objective when considering the 3rd floor (accounting for additional headloss due to elevation and pipe losses). Nonetheless, the minimum pressure is still within reasonable range at the 3rd floor for peak hour conditions and is deemed acceptable.

4.) SANITARY FLOW

Peak sanitary flow for the proposed renovation of the existing residential apartment building is estimated at Q = 0.16 L/s with an infiltration rate of 0.02 L/s. (See Appendix D Page 2 of 2 for details.) This flow will enter the existing 225mm diameter sanitary sewer via a 150 mm diameter PVC sanitary lateral sloped at 1.0% (min.).

The existing peak sanitary flow estimated for this lot prior to the proposed building conversion is Q = 0.13 L/s with a infiltration rate of 0.02 L/s. (See Appendix D Page 1 of 2 for details.) Therefore, the estimated net increase in peak flow from this proposed residential building renovation is 0.03 L/s.

In view that the existing sanitary sewer size is 225 mm diameter in front of this property, an increase in sanitary flow to the existing sewer system by 0.03 L/s from this site is not expected to negatively impact the existing Westhaven Crescent sanitary sewer.

The existing 150mm dia. sanitary service lateral currently servicing this proposed multi-unit building was CCTV and the 150mm dia. PVC sanitary lateral video report recently completed at this building were reviewed and appears to be in good condition and meeting current pipe material standards. Therefore, the existing 150mm diameter PVC sanitary lateral meets the current pipe size and material standards. Refer to Appendix E for further details on the sanitary lateral CCTV report carried out by Aqua Drain dated March 13, 2024. This CCTV report in digital format was sent to the City on March 21, 2024 for their records.

5.) STORM FLOW

The existing (3)-storey slab on-grade residential building do not have any weeping tiles or discharge mechanism in place because there are no basement occupancies in this building.

The current lot drainage on-site is primarily graded to surface drain across the site from west to east or (rear to front) whereupon most of (±75.0%) surface stormwater outlets to the City's road right of way on Westhaven Crescent.

From the site modification works proposed (as per architect's site plan) and to comply with re-zoning requirements, the applicant is proposing to remove portions of the existing asphalt parking area currently located at the front of the building and reinstating it with soft landscaping. See Site Plan with Landscape Plan details shown in Appendix C. This newly added landscape feature will help promote storm water infiltration on-site from current condition and thus reduce storm water loading into the existing road right of way.

6.) CONCLUSIONS

In conclusion, based on the water boundary conditions provided, the local watermain network along Westhaven Crescent and the vicinity of the building provides adequate fire flow capacity as per the OBC's office of the Fire Marshall (OFM) method, as well as anticipated demand flows within the pressure objectives during peak demand and basic demand conditions as per the City of Ottawa's Drinking Water Design Guidelines.

The existing incoming 38mm dia. copper water service and 150mm dia. sanitary service lateral at the existing (3)-storey building was installed in 2015 meets City of Ottawa pipe material standards for the proposed renovation of the apartment building.

PREPARED BY T. L. MAK ENGINEERING CONSULTANTS LTD.

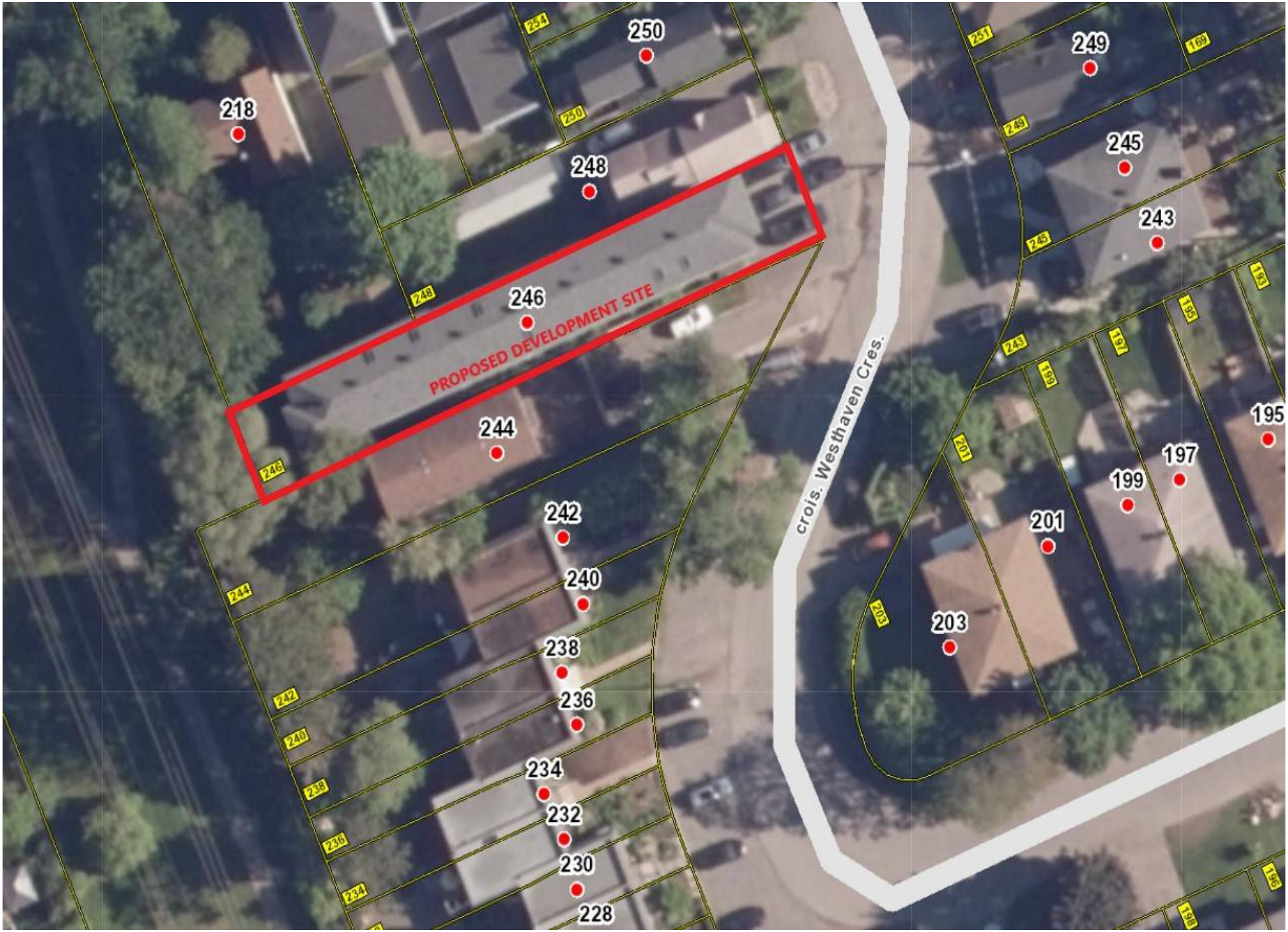
TONY L. MAK, P. ENG.

EXISTING THREE-STOREY MULTI-UNIT RESIDENTIAL BUILDING RENOVATIONS 246 WESTHAVEN CRESCENT CITY OF OTTAWA

APPENDIX A

SITE PRE-DEVELOPMENT CONDITION GOOGLE IMAGE (2020) AND AERIAL PHOTOGRAPHY 2022 (GeoOTTAWA)

2020


PROPOSED DEVELOPMENT SITE
croiss. Westhaven Cres.
218
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195
203

2022


PROPOSED DEVELOPMENT SITE
crois. Westhaven Cres.
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243
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189
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218

2022

EXISTING THREE-STOREY MULTI-UNIT

RESIDENTIAL BUILDING

RENOVATIONS

246 WESTHAVEN CRESCENT

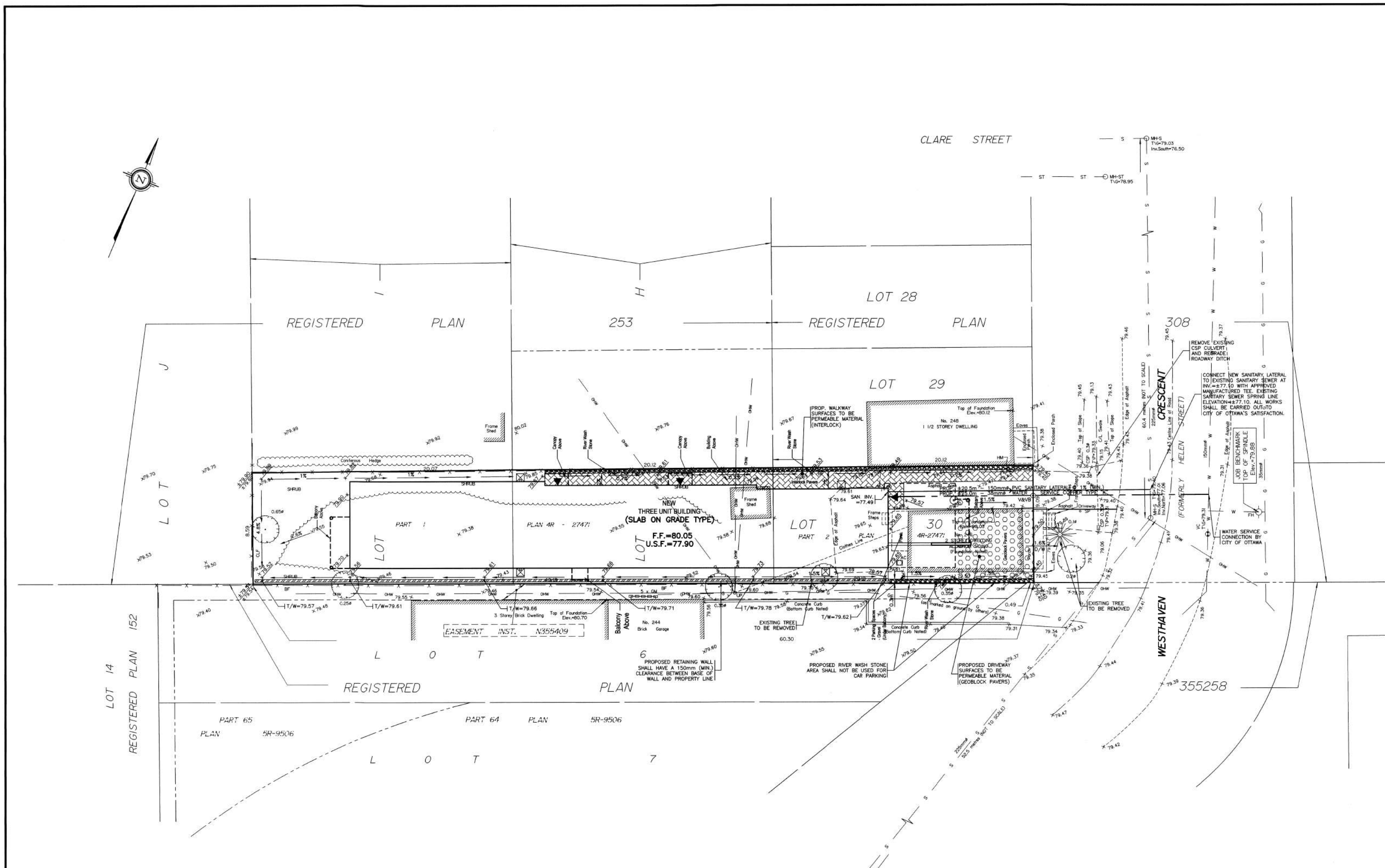
CITY OF OTTAWA

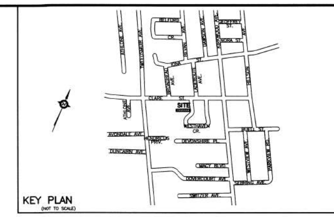
APPENDIX B

APPROVED LOT GRADING PLAN

(DWG. No. 815-53, G-1 Rev. 2

DATED 06/16/15)





NOTES:

1. EXISTING SERVICES AND UTILITIES SHOWN ON THIS DRAWING WERE TAKEN FROM THE BEST AVAILABLE RECORDS BUT ARE NOT COMPLETE. CONTRACTOR IS REQUIRED TO CHECK IN THE FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH AUTHORITIES AND UTILITIES TO HIS SATISFACTION BEFORE DIGGING.

2. CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS AS DEEMED NECESSARY. PRIOR TO POURING OF CONCRETE FOOTING AND FOUNDATION, THE OWNER AND/OR CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE SUBGRADE ON THIS LOT IS SUFFICIENT TO SUPPORT THE PROPOSED RESIDENTIAL BUILDING.

3. SITING DETAILS FOR THE PROPOSED DWELLING WERE PROVIDED BY SUSAN D. SMITH ARCHITECT AS DETAILED ON THE SITE PLAN (JOB No. 1459) DWG. No. A1 REV. 1 RECEIVED ON JUNE 2, 2015. THE (F.F.) FINISHED GROUND FLOOR ELEVATION AND (U.S.F.) UNDERSIDE OF FOOTING ELEVATION FOR THIS PROPOSED SLAB ON GRADE STRUCTURE WERE ESTABLISHED BASED ON THE OWNER'S ARCHITECT'S CROSS SECTIONAL PLAN (DWG. No. A6 REV. 0).

4. EXISTING HORIZONTAL AND VERTICAL SURVEY DATA SHOWN ON THIS PLAN INCLUDING SITE BENCHMARK, ROAD ELEVATIONS AND TOPOGRAPHICAL INFORMATION OF THE LOT WERE PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. AS DEPICTED ON THEIR TOPOGRAPHICAL PLAN OF SURVEY (JOB No. 15443-15 DATED APRIL 30, 2015). T.L. MAK ENGINEERING CONSULTANTS LTD. DOES NOT TAKE ANY RESPONSIBILITY FOR THE SURVEY INFORMATION SHOWN HERE.

5. LOCATION OF WESTHAVEN CRESCENT ROADWAY SANITARY AND WATERMAIN WERE TAKEN FROM THE CITY OF OTTAWA "AS-BUILT" PLAN AND PROFILE DRAWING ENTITLED "HELEN ST. CLARE ST. TO WESTHAVEN DR." PLAN No. 7-C-d DATED MAY 29/57.

6. ALL GRADES SHOWN ARE GEODETIC AND METRIC. ALL GRADING SHALL BE DONE TO THE SATISFACTION OF THE CITY OF OTTAWA.

7. ALL WATERWORKS SHALL BE CONSTRUCTED TO CITY OF OTTAWA'S LATEST REVISED STANDARDS ON APPROVAL BY THE CITY.

8. CONSTRUCT ALL SANITARY PIPES IN ACCORDANCE WITH CITY OF OTTAWA'S LATEST REVISED STANDARD OTHERWISE AS PER OPSS AND OPSD SPECIFICATIONS.

9. ALL WORKS CONSTRUCTED BY THE CONTRACTOR SHALL MEET CITY OF OTTAWA'S CURRENT ENGINEERING STANDARDS AND AS PER CITY'S REQUIREMENTS.

10. THE CONTRACTOR SHALL CONSTRUCT AND ENSURE THAT THE 38mmø WATER SERVICE ON THIS LOT SHALL HAVE A MINIMUM OF 2.4m OF GROUND COVER. OTHERWISE INSULATE WITH RIGID S/M STYROFOAM IN ACCORDANCE WITH THE SITE SOILS ENGINEER'S REQUIREMENTS. THE WATER SERVICE INSTALLATION SHALL BE COPPER TYPE "K" AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST CITY OF OTTAWA STANDARDS.

11. ROOF EAVESTROUGHS SHALL BE INSTALLED; ROOF DOWNSPOUTS MUST BE DIRECTED TO OUTLET DISCHARGE TO THE FRONT YARD AND NOT TO THE SIDE YARDS OR REAR YARD WHERE POSSIBLE. SEE ARCHITECT'S SITE PLAN FOR ROOF EAVESTROUGH DOWNSPOUT LOCATIONS.

12. ALL WATERMAIN SERVICE AND FITTINGS SHALL CONFORM TO APPROVED AWWA AND/OR CSA STANDARDS.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS TO COMPLETE THE WORKS.

14. EXISTING LOCATION OF WESTHAVEN CRESCENT WATERMAIN AND SANITARY SEWER SHOWN ON THIS PLAN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY IN THE FIELD TO CONFIRM ITS EXACT LOCATION PRIOR TO EXCAVATION. (SEE NOTE #23 ALSO).

15. PROPOSED SURFACE GRADE SHALL BE 7% (MAX.) WHERE THE GROUND DROPS OFF STEEPLY. TERRACE THE GROUND AT 3H TO 1V (MAX.) AS NECESSARY TO MEET THE CITY'S GRADING REQUIREMENTS.

16. WATER SERVICE CONNECTION ON WESTHAVEN CRESCENT SHALL BE DONE BY THE CITY. ALL CONNECTIONS AND OTHER RELATED WORKS TO WATERMAIN SHALL BE MADE BY THE CITY, EXCAVATION, BACKFILLING AND REINSTATEMENTS BY CONTRACTOR. ALL WATERWORKS SHALL BE CARRIED OUT TO THE CITY'S SATISFACTION.

17. IF WATER SERVICE IS LESS THAN 2.4m FROM SEWER, MANHOLE OR CATCH BASIN, CONTRACTOR IS REQUESTED TO INSULATE BETWEEN THEM WITH S/M RIGID INSULATION (AS PER CITY DETAIL W23).

18. PIPE SIZES SHOWN ON THIS PLAN ARE METRIC.

19. WATER SERVICE AND WATERMAIN TRENCH DETAILS AS PER CITY W17 DETAIL.

20. PROPOSED SANITARY SERVICE LATERAL SHALL BE PVC DR-28 OR EQUIVALENT.

21. SANITARY SERVICE BENDS AND RISERS USED MUST BE CONSTRUCTED TO THE CITY'S SATISFACTION.

22. BEDDING FOR SEWERS AND WATERMAIN INSTALLATION SHALL BE TYPE 'B' COMPACTED TO 95% DRY PROCTOR DENSITY. FOR THE SEWER LATERALS USE 300mm THICK APPROVED GRANULAR COVER MATERIAL COMPACT TO 95% DRY PROCTOR DENSITY. TRENCH BACKFILL WITH NATIVE MATERIAL AND COMPACT TO 95% DRY PROCTOR DENSITY MINIMUM. NO FROZEN MATERIALS ARE TO BE USED AS BACKFILL IN THE SERVICING TRENCHES.

23. DETAILS OF THE EXISTING SEWER AND WATERMAIN SHOWN ON WESTHAVEN CRESCENT FROM THE CITY MAY NOT BE CURRENT. THE CONTRACTOR SHALL REFER TO THE CITY'S SEWER AND WATERMAIN DRAWINGS FOR DETAILS BEFORE DIGGING. THE CONTRACTOR IS ADVISED TO EXCAVATE AND INVESTIGATE THE SEWER ELEVATIONS IN FRONT OF THIS PROPERTY FIRST TO ENSURE THAT 1% (MIN.) PIPE SLOPE OF THE SANITARY LATERAL CAN BE ACHIEVED USING THE PROPOSED UNDERSIDE OF CONCRETE FOOTING ELEVATION. IF 1% (MIN.) SLOPE IS NOT POSSIBLE FROM THE HOUSE TO THE SEWER, THEN THE CONTRACTOR SHOULD INFORM THE OWNER'S PROJECT MANAGER AND THE CITY ACCORDINGLY FOR FURTHER DIRECTION.

24. FOR DEVELOPMENT OF THIS LOT, THE CONTRACTOR MUST FIRST CONSTRUCT THE UNDERGROUND SANITARY AND WATER SERVICES FROM SEWER AND WATERMAIN TO THE PROPERTY, PRIOR TO HOUSE CONCRETE FOUNDATION POURING. THE CONTRACTOR SHALL VERIFY SEWER DEPTHS TO ENSURE THAT THE SEWER LATERAL CAN ACHIEVE A SLOPE OF 1% (MIN.) AND STILL BE BELOW PROPOSED UNDERSIDE OF CONCRETE FOOTING ELEVATION. IF THIS IS FOUND NOT POSSIBLE, THE CONTRACTOR SHALL CONTACT THE OWNER AND HIS OR HER PROJECT MANAGER TO REPORT THE FINDING IN ORDER TO ADJUST HOUSE FOUNDATION GRADES PRIOR TO CONCRETE POURING.

25. INSULATE THE HOUSE SERVICE LATERALS WITHIN THE PRIVATE PROPERTY AND ROAD RIGHT OF WAY WHERE GROUND COVER FOR FROST PROTECTION IS LESS THAN 2.4m FOR WATER SERVICE AND 2.0m FOR SANITARY AND STORM GRAVITY SEWERS. MINIMUM GROUND COVER OVER THE HOUSE SERVICE PIPES SHALL NOT BE LESS THAN 2m. EXACT INSULATION THICKNESS SHALL BE DETERMINED BY THE CITY INSPECTOR ON SITE AND/OR OWNER'S SOILS ENGINEER. ALL INSULATION WORKS SHALL BE CARRIED OUT AS PER CITY'S CURRENT ENGINEERING STANDARDS.

26. WHERE FROST COVER FROM UNDERSIDE OF HOUSE CONCRETE FOOTING TO PROPOSED FINISHED GROUND ELEVATION IS LESS THAN 1.6m, IT IS RECOMMENDED THAT INSULATION (100mm THICK) MINIMUM BE INSTALLED AT THE BUILDING FOOTING AND FOUNDATION OF THE HOUSE TO PROVIDE SUFFICIENT FROST COVER FOR THE FOUNDATION STRUCTURES. THE INSULATION REQUIREMENTS SHALL BE REVIEWED AND RECOMMENDED BY THE OWNER'S SOILS ENGINEER. EXACT INSULATION REQUIREMENTS SHALL BE CONFIRMED BY THE OWNER'S ARCHITECT AND THE SITE SOILS ENGINEER TO THE CONTRACTOR PRIOR TO INSTALLATION.

27. IT IS RECOMMENDED THAT A FULL PORT BACKWATER VALVE BE INSTALLED FOR THE SANITARY SERVICE LATERAL PROPOSED TO SERVICE THE NEW DWELLING UNDER THE CURRENT REGULATION OF THE ONTARIO PLUMBING CODE.

28. HOUSE WATER SERVICE, STORMWATER FORCEMAIN TO OUTLET BASEMENT SUMP PIT WATER AND SANITARY SEWER LATERAL ARE THE RESPONSIBILITY OF THE OWNER'S PLUMBER FROM 1m OUTSIDE THE FOUNDATION WALL INTO THE PROPOSED DWELLING UNIT UNDER THE LATEST REVISION OF THE ONTARIO PLUMBING CODE.

29. THE OWNER'S ARCHITECT AND PLUMBER SHALL CHECK THE CURRENT ONTARIO PLUMBING CODE FOR REQUIREMENTS FOR A BACKWATER VALVE IN THE BUILDING AND AS PER THE MECHANICAL ENGINEER'S DRAWINGS AT THE SANITARY SEWER SERVICE LINES.

30. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REINSTATEMENT OF ALL AREAS DISTURBED DURING CONSTRUCTION AND SUCH REINSTATEMENT MUST BE UNDERTAKEN IN ACCORDANCE WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.

31. THE CONTRACTOR SHALL CONTACT ALL THE UTILITY COMPANIES REGARDING LOCATION OF THE EXISTING OVERHEAD UTILITY WIRES FOR RELOCATION AND POSSIBLE CONFLICT CLEARANCE PRIOR TO CONSTRUCTION.

32. EXISTING HOUSE LATERALS AND WATER SERVICE PIPING HAVE BEEN AND/OR SHALL BE ABANDONED. THE WATER SERVICE SHALL BE BLANKED AND CAPPED AT THE MAIN AS PER CITY'S REQUIREMENTS. THE SEWER LATERAL(S) SHALL BE CAPPED AND/OR PLUGGED AT THE FRONT PROPERTY LINE. ALL WATER AND SEWER LATERAL WORKS SHALL BE CARRIED OUT TO THE CITY'S SATISFACTION.

33. 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 SEDIMENT BARRIERS ON ALL CATCH BASIN AND MAINTENANCE HOLES AND A SILT FENCE BARRIER (AS PER OPSD 219.110 AND ASSOCIATED SPECIFICATIONS) ALONG THE PROPERTY LIMITS OF THE PROPOSED DEVELOPMENT AND ALL OTHER AREAS THAT SHEET DRAIN OFF SITE. MAINTENANCE HOLE SEDIMENT BARRIERS TO BE AMOCO 4555 NONWOVEN GEOTEXTILE OR APPROVED EQUIVALENT.

34. THIS LOT GRADING DESIGN PLAN WAS PREPARED FOR THE OWNERS FOR THE PURPOSE OF ASCERTAINING A BUILDING PERMIT ONLY. ALL WORKS CONSTRUCTED BY THE CONTRACTOR SHALL MEET CITY OF OTTAWA'S CURRENT ENGINEERING STANDARDS AND PER CITY'S REQUIREMENTS. THIS GRADING PLAN SHALL NOT BE USED FOR BUILDING CONSTRUCTION LAYOUT PURPOSES. REFER TO THE APPROVED SITE PLAN FOR EXACT DIMENSIONS REGARDING BUILDING LOCATION LAYOUT.

35. AT THE TIME OF CONSTRUCTION OF DRIVEWAY FOR THE NEW HOUSE, REGRADE ROADWAY BOULEVARD TO OUTLET INTO EXISTING STORM OUTLET TO THE CITY'S SATISFACTION AND REQUIREMENTS.

36. THE CONTRACTOR, UPON COMPLETION OF THE NEW DRIVEWAY, SHALL RESTORE THE EXISTING WESTHAVEN CRESCENT ROADWAY BOULEVARD DISTURBED BY CONSTRUCTION WORKS ON THIS PROPERTY. ADDITIONALLY, THE ROADWAY GRADING SHALL BE RESTORED AND REGRADED TO DRAIN POSITIVELY TO EXISTING STORMWATER OUTLET AS REQUIRED BY THE CITY INSPECTOR.

37. THE CONTRACTOR SHALL REFER TO THE OWNER'S ARCHITECT'S FINAL PLANS FOR DETAILS OF ANY PROPOSED HOUSE FOUNDATION CHECK DOWNS PRIOR TO CONCRETE POURING.

38. THE RETAINING WALL TO BE CONSTRUCTED AND MATERIAL TYPE SHALL BE SPECIFIED BY THE OWNER'S ARCHITECT AND/OR HIS STRUCTURAL ENGINEER. ANY RETAINING WALLS BUILT ON THIS LOT EXCEEDING 1.0m IN HEIGHT FROM PROPOSED FINISHED GROUND ELEVATION WILL BE REQUIRED TO BE PREPARED AND CERTIFIED BY THE OWNER'S STRUCTURAL ENGINEER AND APPROVED BY THE CITY PRIOR TO CONSTRUCTION. DURING CONSTRUCTION OF THE SITE RETAINING WALL, THE OWNER'S GEOTECHNICAL ENGINEER SHALL APPROVE SUBGRADE, BACKFILLING, COMPACTION WORK, ETC. IN ACCORDANCE WITH THE APPROVED STRUCTURAL AND GEOTECHNICAL DESIGN.

39. NO EXCESS DRAINAGE, DURING AND AFTER CONSTRUCTION, WILL BE DIRECTED TOWARDS THE NEIGHBOURS' PROPERTIES.

40. ALL TREES ON THE RIGHT-OF-WAY ARE TO BE MAINTAINED BEFORE AND AFTER CONSTRUCTION AND ALL TREES WITHIN THE PROPERTY SHALL BE PROTECTED AS PER THE 'MUNICIPAL TREES AND NATURAL AREAS PROTECTION BY-LAWS' AND THE 'URBAN TREES CONSERVATION BY-LAW' AS AMENDED FROM TIME TO TIME.

41. THERE WILL BE NO ALTERATION TO THE EXISTING GRADE AND DRAINAGE PATTERN ON THE PROPERTY LINES.

42. ROOF WATER DOWNSPOUT TO DISCHARGE STORMWATER TO THE FRONT OF THE LOT AT A DISTANCE OF 1.5m FROM PROPERTY LINE.

LEGEND

Symbol	Description
79.70	PROPOSED ELEVATION
x79.43	EXISTING ELEVATION
F.F.	PROPOSED TOP OF GROUND FLOOR ELEVATION
U.S.F.	PROPOSED UNDERSIDE OF CONCRETE FOOTING ELEVATION
D/W	PROPOSED DRIVEWAY
— S —	EXISTING SANITARY SEWER
— W —	EXISTING WATERMAIN
———	PROPOSED 150mmø PVC SANITARY LATERAL SERVICE @ 1% (MIN.) SLOPE
— - —	PROPOSED 38mmø WATER SERVICE (COPPER TYPE "K")
○ MH-S	EXISTING SANITARY MANHOLE
VC	EXISTING VALVE CHAMBER (WATERMAIN)
FH	EXISTING FIRE HYDRANT
○ UP	EXISTING UTILITY POLE
— OHW —	EXISTING OVERHEAD WIRES
⊙	PROPOSED V&VB
→	PROPOSED GENERAL DIRECTION OF LOT GRADING AND SURFACE FLOW
⊓⊓⊓	PROPOSED TERRACING 3H (MAX.) TO 1V
☒	PROPOSED ROOF EAVESTROUGH DOWNSPOUT DISCHARGE LOCATION AND CONCRETE SPLASH PAD LOCATION PER ARCHITECT'S SITE PLAN
▨	PROPOSED RETAINING WALL
T/W	PROPOSED TOP OF RETAINING WALL ELEVATION

NO.	REVISION	DATE	BY
2	REVISIONS AS PER CITY'S COMMENTS OF JUNE 15, 2015	06/16/15	TLM
1	REVISIONS AS PER CITY'S COMMENTS OF MAY 22, 2015 AND REVISED SITE PLAN OF JUNE 2, 2015	06/11/15	TLM

06/16/15

SCALE: 1:150 HORIZONTAL; VERTICAL

DESIGN: T.L.M.
CHECKED: T.L.M.
DRAWN BY: J.M.
CHECKED: T.L.M.
APPROVED: T.L.M.

PROJECT: 246 WESTHAVEN CRESCENT
PART OF LOTS H AND I
REGISTERED PLAN 253
and
ALL OF LOT 30
REGISTERED PLAN 308
CITY OF OTTAWA

DRAWING TITLE: PROPOSED LOT GRADING PLAN

T.L. MAK ENGINEERING CONSULTANTS LTD.
CONSULTING ENGINEERS

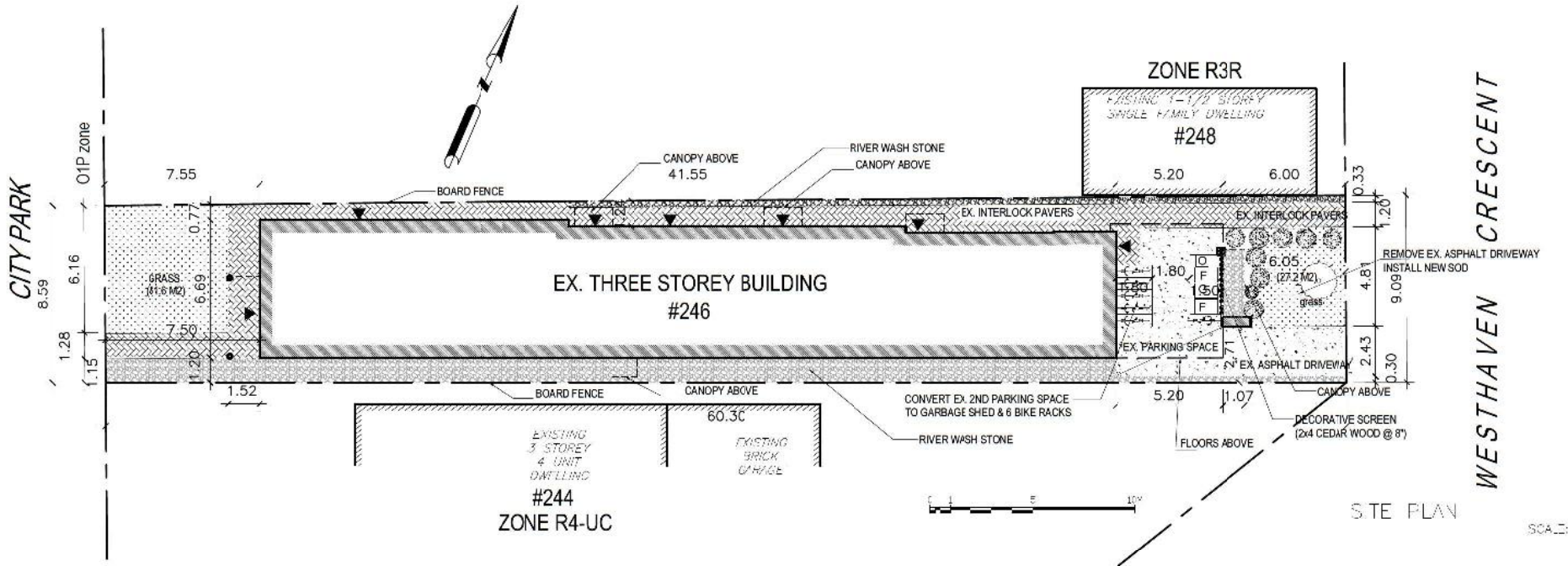
PROJECT No.	DATE	DRAWING No.
815-53	MAY 2015	G-1

EXISTING THREE-STOREY MULTI-UNIT RESIDENTIAL BUILDING RENOVATIONS 246 WESTHAVEN CRESCENT CITY OF OTTAWA

APPENDIX C

- SITE PLAN / ARCHITECTURAL DRAWINGS
- WATER BOUNDARY CONDITIONS
- MULTI-HYDRANT ANALYSIS E-MAIL
- FUS FIRE FLOW CALCULATION
- OFM EXPOSURE DISTANCE (FIGURE 1)
- SUPPORTING HYDRAULIC CALCULATIONS
- HYDRANT SPACING (FIGURE 2)

ATTACHMENT 1 : SITE PLAN / ARCHITECTURAL DRAWINGS



City of Ottawa Zoning By-law No. 2008-250 and Revised By-law No. 2015-228		
REZONE: FROM R3R TO R4-UC WITH EXCEPTIONS		
LOWRISE APARTMENT 3 STOREY, 6 UNIT	REQUIRED	PROPOSED
MINIMUM LOT WIDTH	10 m	9.1m (EXCEPTION)
MINIMUM LOT AREA	300m²	532.8m²
MAXIMUM BUILDING HEIGHT	11m	11m
MINIMUM FRONT YARD SETBACK	4.5m	6m
MINIMUM CORNER SIDEYARD SETBACK	3m	N/A
MINIMUM REAR YARD SETBACK	7.5m	7.5m
MINIMUM INTERIOR SIDEYARD SETBACK	1.5m	NORTH SIDE: 0.77m (EXCEPTION) SOUTH SIDE: 1.2m (EXCEPTION)
MINIMUM LANDSCAPE AREA	30%	43% (232.9 m²)
SOFT LANDSCAPE		
FRONT YARD	35% (19.1 m²)	50% (27.2m²)
REAR YARD	50%(32.3m²)	80% (51.6m²)
FENESTRATION ON FRONT WALL	25%	30%
RECESS ON FRONT WALL	20%	30%
BICYCLE PARKING (0.5/UNIT)	3 spaces	6 spaces
VEHICLE PARKING	0	1 spaces

LEGAL DESCRIPTION: PART OF LOT H&I
REGISTERED PLAN 253 & ALL OF LOT 30
REGISTERED PLAN 308 CITY OF OTTAWA
Base on survey prepared by Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

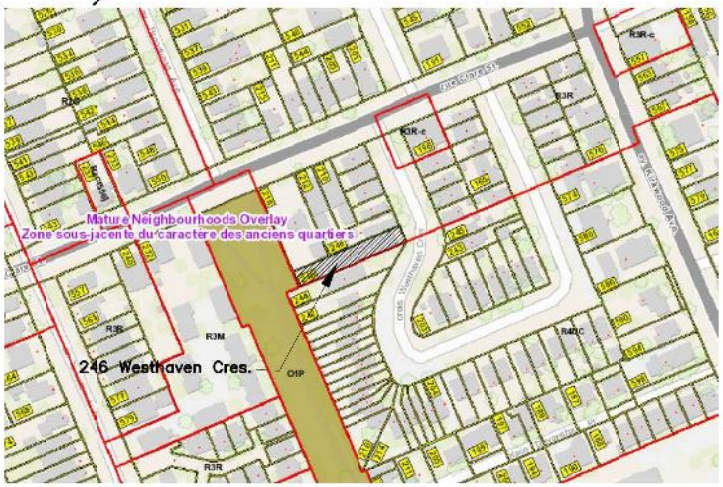
DEVELOPMENT DATA:

Current Zoning Designation: R3R
Site area: 532.8 m²
Frontage as per survey: 9.09 m.
Depth as per survey: 60.30 m.
Existing Building Area (Footprint): 266.85 m² (47% lot coverage)
Gross Floor Area : 875.14 m²
Application for rezoning to R4-UC
Application for building permit to conversion of existing 3 unit to 6 unit apartment

LEGEND:

- ENTRANCE
- PROPERTY LINE
- SETBACK LINE
- EXISTING BULDING
- SOFT LANDSCAPE
- INTERLOCKING WALKWAY
- ASPHALT DRIVEWAY

UNIT	#BEDROOM	AREA (m²)
A	3	243
B	2	193
C	3	217.8
D	1	70
E	0	41.7
F	1	97.5



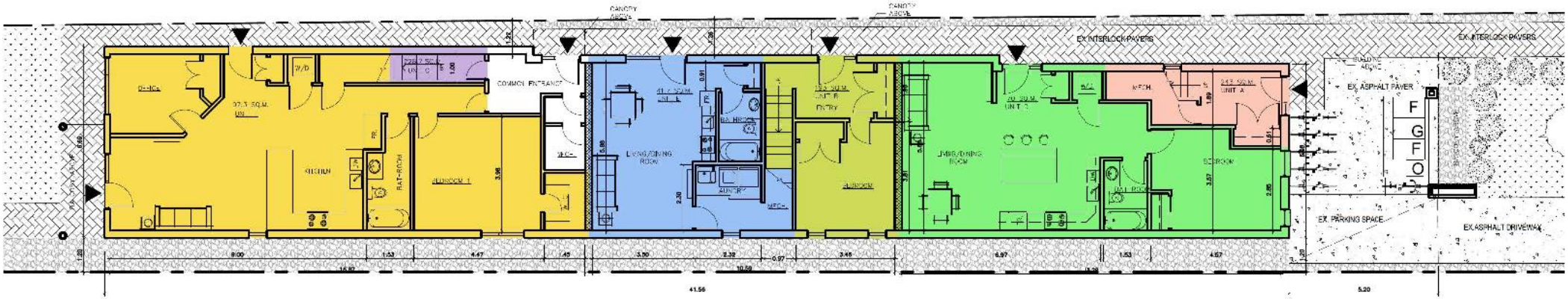
LOCATION PLAN

REZONING
THREE STOREY BUILDING
246 Westhaven Cres. OTTAWA, ONT.

CLIENT:
MIKE BARCOO
485 KIRKWOOD AVE. OTT. K1Z 5W8
613-864-2323

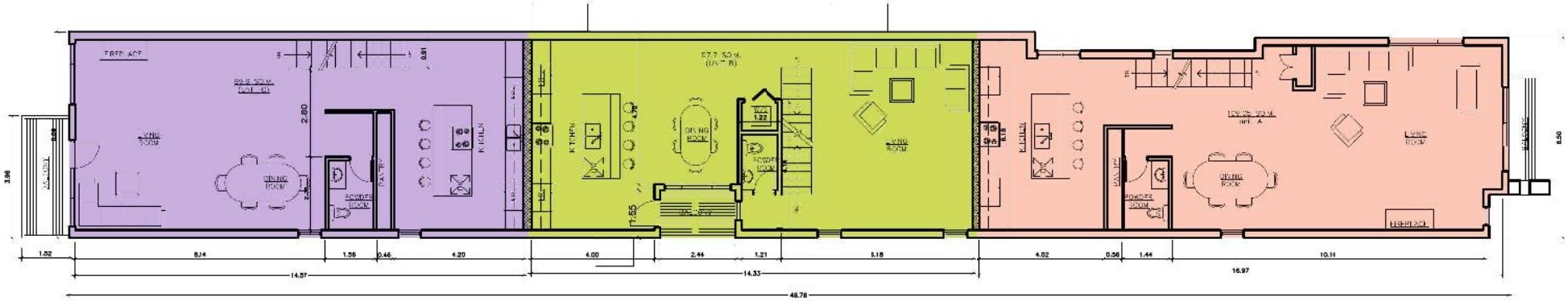
SUSAN D. SMITH ARCHITECT
941 Merivale Road
s.smith@sdsarch.ca
613-722-5327 or 291-3777

SITE PLAN
DATE: OCT/18 2023
DRAWING BY: ID & VW
SCALE: 1/200
JOB #: 2338
SP1



GROUND FLOOR PLAN
(266.67 SQ.M)

UNIT	#BEDROOM	AREA (M²)
A	3	243
B	2	193
C	3	217.8
D	1	70
E	0	41.7
F	1	97.3



SECOND FLOOR PLAN
(306.04 SQ.M)

No.	Date	Revision	By
1			
0	05/02/15	ISSUED FOR REZONING	TD

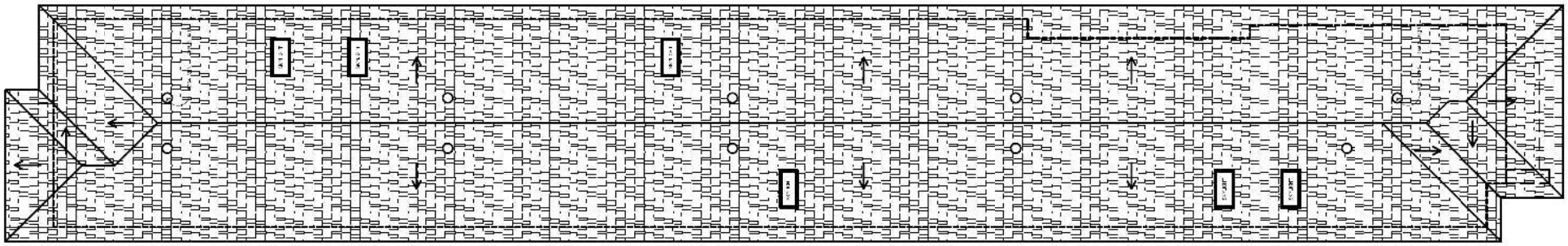
SUSAN D. SMITH ARCHITECT
941 Merivale Rd
Ottawa, Ontario
K1Z 6A1
613-722-5327
s.smith@sdsarch.ca

Project Title:
RENOVATION
NEW 6 UNIT DWELLING
246 WESTHAVEN CRESCENT
OTTAWA, ON K1Z 7G3

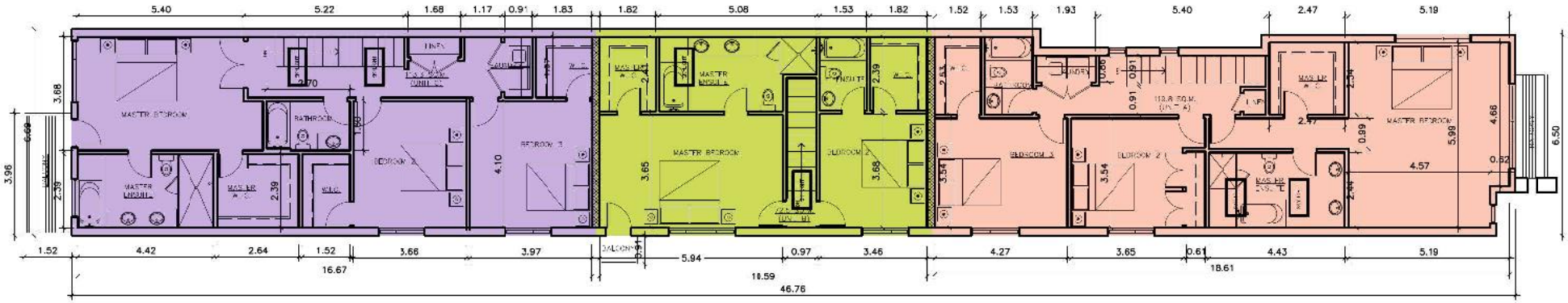
Drawing Title:
GROUND FLOOR &
SECOND FLOOR PLANS

Scale	3/32"=1'-0"
Date	OCT 2023
Drawn	YW & TD
Checked	
Job No.	1459

Drawing No.
A1



ROOF PLAN



THIRD FLOOR PLAN
(306.04 SQ.M)

No.	Date	Revision	By
1			
0	05/02/15	ISSUED FOR REZONING	TD

SUSAN D. SMITH ARCHITECT
941 Merivale Rd
Ottawa, Ontario
K1Z 6A1
613-722-5327
s.smith@sdsarch.ca

Project Title: RENOVATION
NEW 6 UNIT DWELLING
246 WESTHAVEN CRESCENT
OTTAWA, ON K1Z 7G3

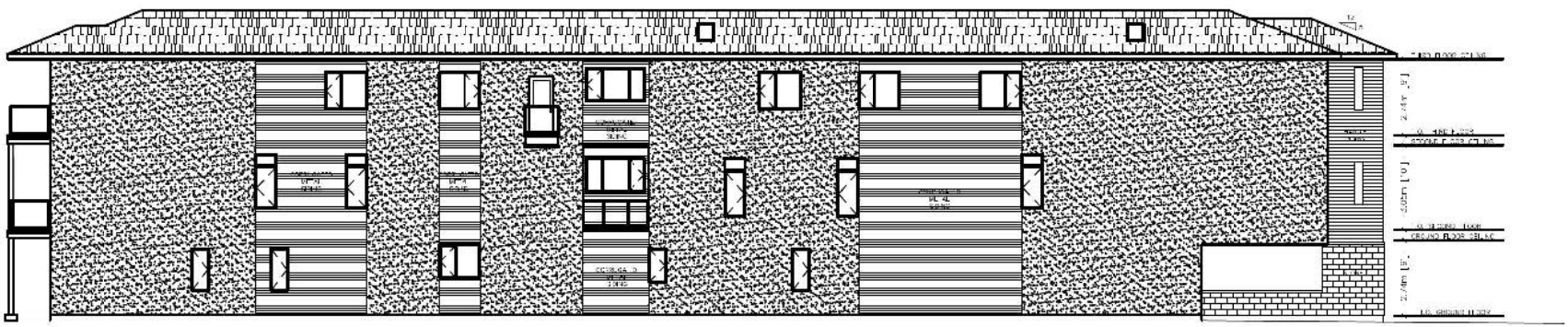
Drawing Title:
THIRD FLOOR &
ROOF PLANS

Scale	3/32"=1'-0"
Date	OCT 2023
Drawn	VW & TD
Checked	
Job No.	1459

Drawing No. A2

CLIENT :

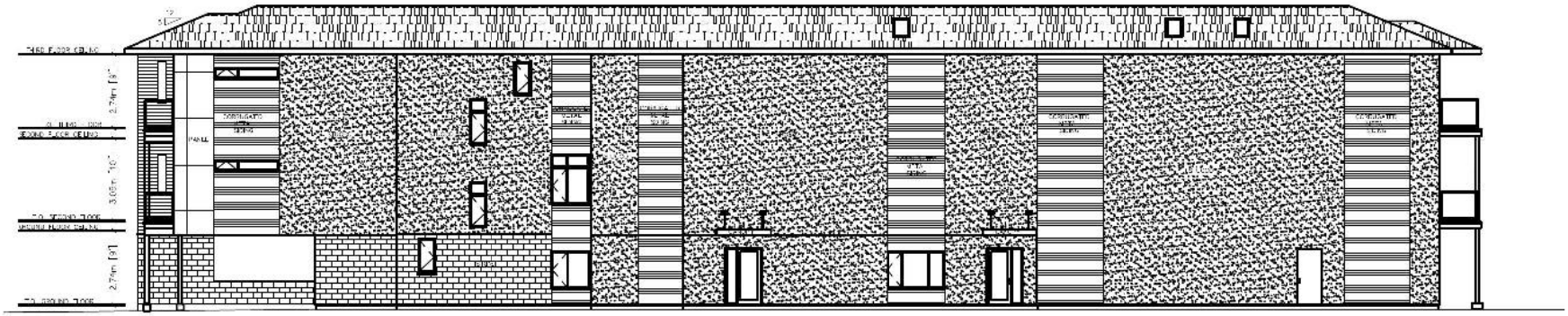
MICHEL BAROUD
455 KIRKWOOD AVE. OTT.
K1Z 5W8
6138642523



SOUTH ELEVATION

EAST ELEVATION

WEST ELEVATION



SOUTH ELEVATION

DRAWINGS SHOW EXISTING
OTHERWISE NOTED

SUSAN D. SMITH ARCHITECT
941 Merivale Rd
Ottawa, Ontario
K1Z 6A1
613-722-5327
s.smith@sdsarch.ca

No.	Date	Revision	By
1			
0	06/02/16	ISSUED FOR PERMITS	TD

Project Title:

RENOVATION

NEW 6 UNIT DWELLING
246 WESTHAVEN CRESCENT
OTTAWA, ON K1Z 7G3

Drawing Title:

EXISTING ELEVATIONS

Scale	3/32"=1'-0"	Drawing No.
Date	OCT 2023	
Drawn	VV & TD	
Checked		
Job No.	1459	

ATTACHMENT 2 : WATER BOUNDARY CONDITIONS

Mineault-Guitard, Alexandre

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Thursday, February 29, 2024 10:14 AM
To: Mineault-Guitard, Alexandre
Cc: Alemany, Kevin
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request
Attachments: 246 Westhaven Cres February 2024.pdf

Hi Alex,

Attached please find the Water Boundary Conditions received from the City today for your calculation use.

Thank you,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

From: Duquette, Vincent [mailto:Vincent.Duquette@ottawa.ca]
Sent: February 29, 2024 9:29 AM
To: TL MaK
Cc: Wu, John
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Hi Tony,

See below results of the water boundary conditions. The requested fireflow is not available. Onsite mitigation measures will be required lower the fire flow demand.

The following are boundary conditions, HGL, for hydraulic analysis at 246 Westhaven Crescent (zone 1W) assumed to be connected to the 152mm watermain on Westhaven Crescent (see attached PDF for location).

Minimum HGL: 108.6 m

Maximum HGL: 114.4 m

Available Fire Flow at 20 (psi): 55.0 L/s, assuming ground elevation of 79.4 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.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: TL MaK <tlmakecl@bellnet.ca>
Sent: February 27, 2024 10:50 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Hi Vincent,

We are following-up on our e-mail of January 31, 2024 requesting for water boundary conditions for development of this site. Could you please update us on this request at your earliest convenience.

Thank you for your help in this matter.

Regards,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

From: Duquette, Vincent [mailto:Vincent.Duquette@ottawa.ca]
Sent: January 31, 2024 7:04 PM
To: TL MaK
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Thanks for revising the calculations. I have requested boundary conditions for both fire flow conditions.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: TL MaK <tlmakecl@bellnet.ca>
Sent: January 31, 2024 3:03 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Hi Vincent,

Here is the updated boundary condition request for the 246 Westhaven Crescent multi-unit residential building.

The building located within Pressure Zone 1W at 246 Westhaven Crescent is a 3-storey multi-unit residential building with no basement. The building contains six (6) total units, namely two (2) 3-bedroom, one (1) 2-bedroom, two (2) 1-bedroom and one (1) bachelor unit. Each floor covers an area of around 292 m^2, for a gross floor area of 879 m^2. The building is to be serviced by the 150 mm diameter watermain along Westhaven Crescent.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 280 L/cap/d was used to estimate average day demands (AVDY). Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. Following discussions with the City, peaking factors are to be estimated from Table 3-3 of the MECP Design Guidelines for Drinking-Water Systems, given that the proposed development population is less than 500 people. Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 9.5. Peak hour (PKHR) demands were calculated by multiplying AVDY by a factor of 14.3. Table 1 shows the estimated domestic demands of the existing building.

Table 1: Estimated Domestic Demand

Unit Type	Unit Count	PPU	Consumption	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 3-Bedroom	2	3.1	280	1,736	0.02	16,492	0.19	24,825	0.29
Apartment, 2-Bedroom	1	2.1		588	0.01	5,586	0.06	8,408	0.10
Apartment, 1-Bedroom	2	1.4		784	0.01	7,448	0.09	11,211	0.13
Apartment, Bachelor	1	1.4		392	0.00	3,724	0.04	5,606	0.06
Total	***6***			***3,500***	***0.04***	***33,250***	***0.38***	***50,050***	***0.58***

The City had previously indicated that the City's Fire Marshall and various City departments are currently reviewing fire flow requirements for low- and mid-rise buildings. As per the City of Ottawa's Water Design Guidelines, the FUS method is to be used for fire flow requirements affecting watermain sizing; with regards to fire protection on private property and not requiring new watermains, these are covered by the Ontario Building Code (OBC). As such, the fire flow requirement was calculated by both the FUS and the OBC's Office of the Fire Marshal (OFM) method.

The proposed building will be of wood frame construction, where floors are fire separations, but without fire-resistance ratings. It is understood that the building won't be equipped with sprinklers. First, the resulting required fire flow, based on the FUS calculation, is 14,000 L/min (233 L/s) for a duration of 3 hours. Secondly, based on the OFM calculation, the resulting required fire flow is 4,500 L/min (75 L/s) for a duration of 40 minutes.

In summary:

- AVDY = 3,500 L/d (0.04 L/s);
- MXDY = 33,250 L/d (0.38 L/s);
- PKHR = 50,050 L/d (0.58 L/s);
- Fire Flow (FUS) = 14,000 L/min (233 L/s) and,
- Fire Flow (OFM)= 4,500 L/min (75 L/s).

The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and the two (2) Fire Flow conditions indicated above.

Thank you for your help.

Regards,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

From: Duquette, Vincent [mailto:Vincent.Duquette@ottawa.ca]
Sent: January 31, 2024 12:21 PM
To: TL MaK
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Hi Tony,

For populations of less than 500, the peaking factors used must be from Table 3.3 of the MOE Design Guidelines for Drinking-Water Systems. See table below. Please revise the max day and peak hour demand accordingly. Note that the peak hour demand is obtained by multiplying average day demand by only the peak hour factor.

Table 3-3: Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People

DWELLING UNITS SERVICED	EQUIVALENT POPULATION	NIGHT MINIMUM HOUR FACTOR	MAXIMUM DAY FACTOR	PEAK HOUR FACTOR
10	30	0.1	9.5	14.3
50	150	0.1	4.9	7.4
100	300	0.2	3.6	5.4
150	450	0.3	3.0	4.5
167	500	0.4	2.9	4.3

Lastly, seeing as the calculated OBC fire flow demand is less than 9000L/min, the OBC fire flow demand (4500L/min) will be used in the in the boundary condition request.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: TL MaK <tlmakecl@bellnet.ca>
Sent: January 31, 2024 10:44 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: 246 Westhaven Crescent - Water Boundary Conditions Request

Hi Vincent,

Regarding this site, we are requesting for water boundary conditions from the City of Ottawa to be provided for our hydraulic analysis. The particulars are as follows:

The building located within Pressure Zone 1W at 246 Westhaven Crescent is a 3-storey multi-unit residential building with no basement. The building contains six (6) total units, namely two (2) 3-bedroom, one (1) 2-bedroom, two (2) 1-bedroom and one (1) bachelor unit. Each floor covers an area of around 292 m^2, for a gross floor area of 879 m^2. The building is to be serviced by the 150 mm diameter watermain along Westhaven Crescent.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 280 L/cap/d was used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (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 existing building.

Table 1: Estimated Domestic Demand

Unit Type	Unit Count	PPU	Consumption	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 3-Bedroom	2	3.1	280	1,736	0.02	4,340	0.05	9,548	0.11
Apartment, 2-Bedroom	1	2.1		588	0.01	1,470	0.02	3,234	0.04
Apartment, 1-Bedroom	2	1.4		784	0.01	1,960	0.02	4,312	0.05
Apartment, Bachelor	1	1.4		392	0.00	980	0.01	2,156	0.02
Total	***6***			***3,500***	***0.04***	***8,750***	***0.10***	***19,250***	***0.22***

The City had previously indicated that the City's Fire Marshall and various City departments are currently reviewing fire flow requirements for low- and mid-rise buildings. As per the City of Ottawa's Water Design Guidelines, the FUS method is to be used for fire flow requirements affecting watermain sizing; with regards to fire protection on private property and not requiring new watermains, these are covered by the Ontario Building Code (OBC). As such, the fire flow requirement was calculated by both the FUS and the OBC's Office of the Fire Marshal (OFM) method.

The proposed building will be of wood frame construction, where floors are fire separations, but without fire-resistance ratings. It is understood that the building won't be equipped with sprinklers. First, the resulting required fire flow, based on the FUS calculation, is 14,000 L/min (233 L/s) for a duration of 3 hours. Secondly, based on the OFM calculation, the resulting required fire flow is 4,500 L/min (75 L/s) for a duration of 40 minutes.

In summary:

- AVDY = 3,500 L/d (0.04 L/s);
- MXDY = 8,750 L/d (0.10 L/s);
- PKHR = 19,250 L/d (0.22 L/s);
- Fire Flow (FUS) = 14,000 L/min (233 L/s) and,
- Fire Flow (OFM)= 4,500 L/min (75 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.

Have a good day.

Regards,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

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'

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Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

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'

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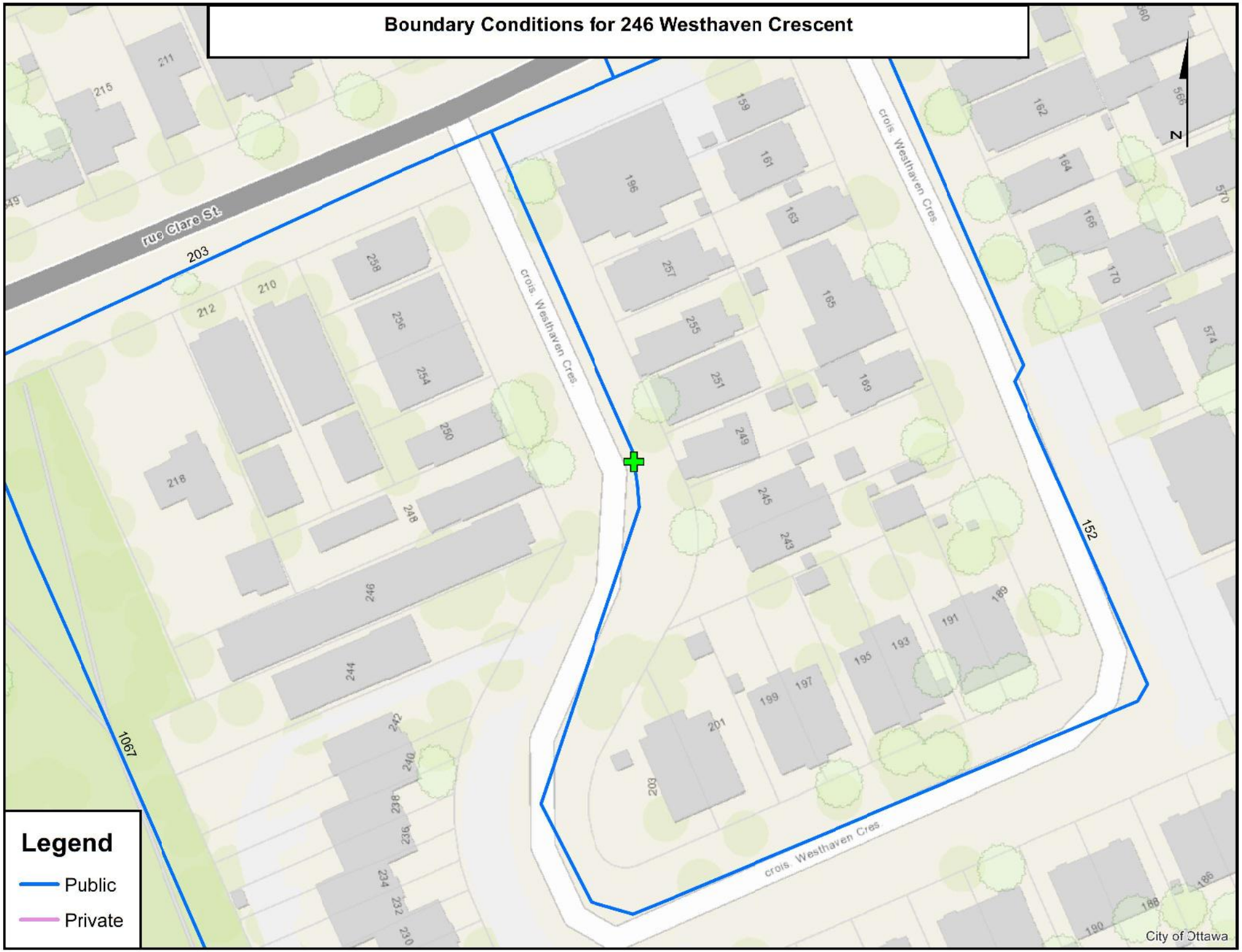
'


Boundary Conditions for 246 Westhaven Crescent
rue Clare St.
203
crois. Westhaven Cres.
crois. Westhaven Cres.
crois. Westhaven Cres
152
1067
N
Legend
Public
Private
City of Ottawa

ATTACHMENT 3 : MULTI-HYDRANT ANALYSIS E-MAIL

Mineault-Guitard, Alexandre

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Monday, March 11, 2024 10:49 AM
To: Mineault-Guitard, Alexandre
Cc: TL MaK; Wu, John
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request
Attachments: 246 Westhaven Cres Multi-Hydrant Analysis March 2024.pdf

Hi Alexandre,

Please see below the results from the requested multi-hydrant analysis. Please note that we allow the use of the OBC fireflow calculation method for individual buildings without a private watermain and where the fireflow demand (as per OBC) is less than 9000L/min (150L/s).

The following are boundary conditions, HGL, for hydraulic analysis at 246 Westhaven Crescent (zone 1W) assumed to be connected to the 152mm watermain on Westhaven Crescent (see attached PDF for location).

Minimum HGL: 108.6 m
Maximum HGL: 114.4 m
Available Fire Flow at 20 (psi): 55.0 L/s, assuming ground elevation of 79.4 m

A multi-hydrant analysis was performed with three existing hydrants within 150 m of the property. The total aggregate flow, assuming hydrants running simultaneously, provides **111.8 L/s** of Fire flow for the site.

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.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Duquette, Vincent
Sent: March 01, 2024 1:33 PM
To: Mineault-Guitard, Alexandre <Alexandre.Mineault-Guitard@stantec.com>

Cc: TL MaK <tlmakecl@bellnet.ca>
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Hi Alexandre,

The multi-hydrant analysis request for three hydrants has been submitted. I will keep you posted on the results.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Mineault-Guitard, Alexandre <Alexandre.Mineault-Guitard@stantec.com>
Sent: March 01, 2024 9:48 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: TL MaK <tlmakecl@bellnet.ca>
Subject: RE: 246 Westhaven Crescent - Water Boundary Conditions Request

Good morning Vincent,

I hope this email finds you well.

Based on the Water Boundary Conditions provided for this project, it appears that there is limited fire flow capacity along Westhaven Crescent. To address this, we recommend considering flow from multiple hydrants (as per ISTB-2018-02) to assess whether the distribution network can deliver the required fire flow.

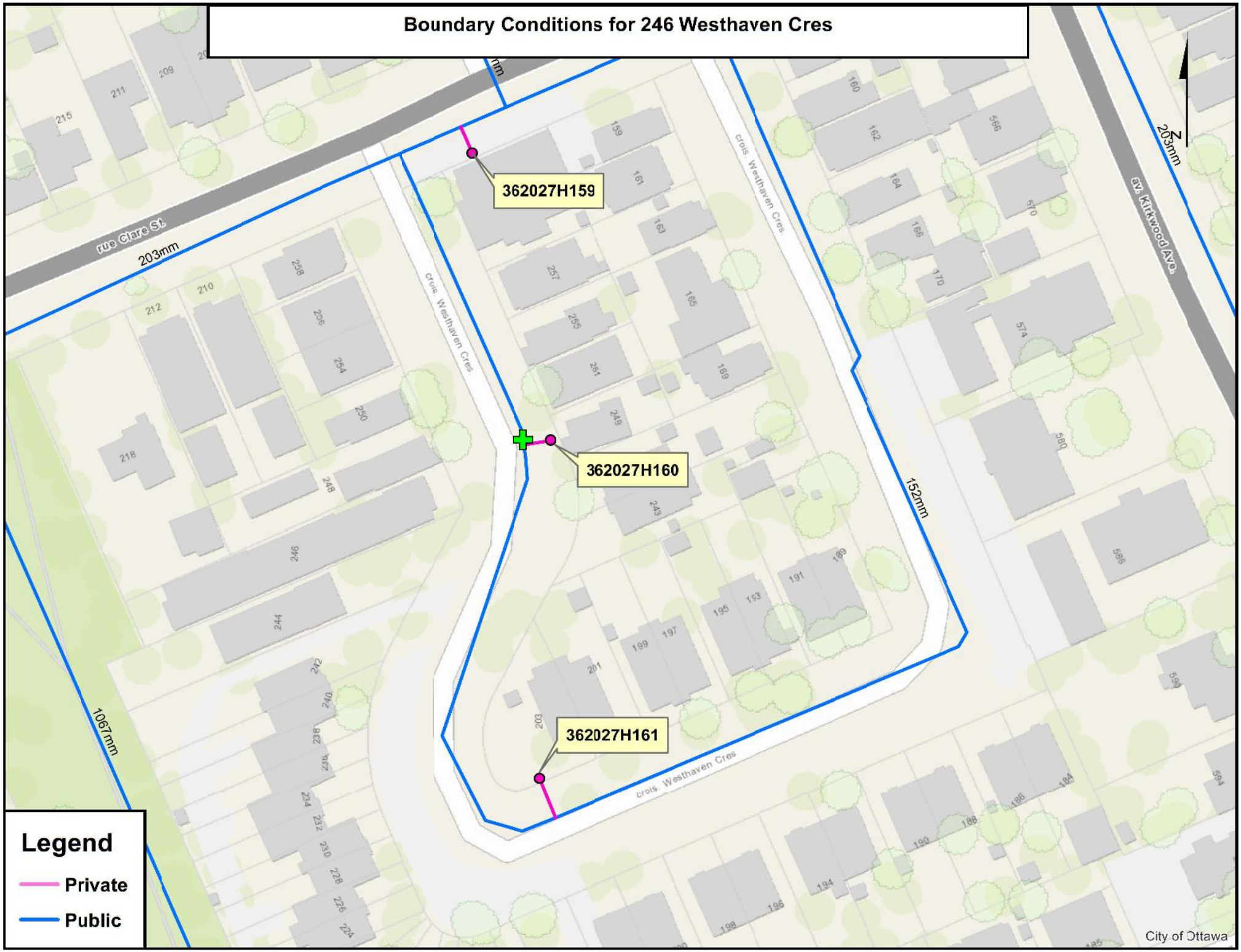
Our desktop review, which included Google Street view, identified two (2) Class A hydrants within 75 metres of the proposed building. Additionally, there is an extra Class AA hydrant also located within the same distance from the building. The attached figure, extracted from GeoOttawa, provides a visual representation of these hydrants.

Given this information, we kindly request a multi-hydrant analysis from the City. This analysis will help confirm the hydrant flow coverage at the proposed location. The results will be compared to the previously identified fire flow demand of 75 L/s to determine if any additional mitigation measures are necessary.

Please feel free to reach out if you have any questions or would like to discuss this further.

Kind regards,

Alexandre Mineault-G, M.A.Sc., ing., P.Eng.
Water Resources Engineer


Boundary Conditions for 246 Westhaven Cres
362027H159
362027H160
362027H161
rue Clare St.
203mm
croiss. Westhaven Cres
croiss. Westhaven Cres
croiss. Westhaven Cres
av. Kirkwood Ave.
203mm
152mm
1067mm
Legend
Private
Public
City of Ottawa

ATTACHMENT 4 : FUS FIRE FLOW CALCULATION

Fire Flow Calculations as per the Ontario Building Code (OBC)

Stantec

OFM Fire Flow Calculation

Calculations based on *Fire Protection Water Supply Guideline for Part 3 in the Ontario Building Code* by the Office of the Fire Marshal (OFM 1999)

Stantec Project #: 163401084
Project Name: 246 Westhaven Crescent Water Servicing Analysis
Date: January 31, 2024
Data inputted by: Hamidreza Mohabbat, MASc.
Data reviewed by: Alexandre Mineault-Guitard, P.Eng, Ing.

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

Office of the Fire Marshal Determination of Required Fire Protection Water Supply								
Step	**Task**	**Term**	**Options**	**Multiplier Associated with Option**	**Choose:**	**Value Used**	**Unit**	
1	**General Building Details**							
1.1	Enter Number of Storeys	Number of Floors/Storeys in the Unit (incl. basement):			3	3	Storeys	
1.2	Choose Type of Housing (If TH, Enter Number of Units Per TH Block)	Type of Housing	Single Family	0	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	0				
			Other (Comm, Ind, Apt etc.)	6				
1.3	Choose Presence of Sprinklers	Sprinklers?			None	None	N/A	
1.4	Choose Presence of Firewalls	Firewall separations?			None	None	N/A	
1.5	Choose Presence of Stand-Pipe System	Stand-pipe system?			None	None	N/A	
2	**Determining Water Supply Coefficient K**							
2.1	Choose Type of Construction	**Type of Construction**						
		Type of Construction	Non-combustible construction + fire separations + fire-resistance ratings in accordance with Section 3.2.2 of OBC	Type I	Type IV	N/A	N/A	
			Non-combustible construction + fire separations + no fire-resistance rating	Type II				
			Combustible construction + fire separations + fire-resistance ratings in accordance with Section 3.2.2 of OBC	Type III				
			Combustible construction + fire separations + no fire-resistance rating	Type IV				
2.2	Choose Classification	**Building Classification**						
		Occupancy Classification (OBC)	A-2, B-1, B-2, B-3, C, D	23	C	A-2, B-1, B-2, B-3, C, D	N/A	
			A-4, F-3	28				
			A-1, A-3	32				
			E, F-2	39				
			F-1	53				
2.3	Water Supply Coefficient (K)	Water Supply Coefficient K				23	N/A	
3	**Determining Building Volume V**							
3.1	Enter Ground Floor Area of One Unit	**Floor Space Area**						
		Average Floor Area (A) :			293 Square Metres (m2)	293	Area in Square Meters (m^2)	
3.2	Building Height (h)	**Building Height**						
		Bottom Elevation :			0.0 Meters (m)	10.4	Height in Meters (m)	
		Top Elevation :			10.4 Meters (m)			
3.3	Building Volume (V)	Building Volume V = A * h				3,050	Volume in Meters Cube (m^3)	
4	**Determining Spatial Coefficient S**							
4.1	Choose Exposure Distances from Building to Property Line	Exposure Distance from Building to Property Line in Meters (m)	North Side	0.8	0.50	1.25	Distance in Meters (m)	
			Property Line to Street Centreline (Street Facing)	0				
			Total Exposure Distance	0.8				
			East Side	6.0	0.00			
			Property Line to Street Centreline (Street Facing)	9.6				
			Total Exposure Distance	15.6				
			South Side	1.2	0.50			
			Property Line to Street Centreline (Street Facing)	0				
			Total Exposure Distance	1.2				
			West Side	7.6	0.25			
			Property Line to Street Centreline (Street Facing)	0				
			Total Exposure Distance	7.6				
4.2	Total Spatial Coefficient	Total Spatial Coefficient $S_{tot} = 1 + \Sigma S_x$				2.00	N/A	
5	**Determining Required Minimum Supply of Water Q and Fire Flow**							
5.1	Obtain Required Fire Volume, Flow & Duration	*Minimum Supply of Water, rounded to nearest 1,000 L; $Q = K*V*S_{tot}$*				140,000 L		
		Required Minimum Water Supply Flow Rate (L/min)				4,500 L/min		
		Required Minimum Water Supply Flow Rate (L/s)				75 L/s		
		Required Minimum Duration of Fire Flow (min)				40 min		

ATTACHMENT 5 : FIGURE 1 – OFM EXPOSURE DISTANCE

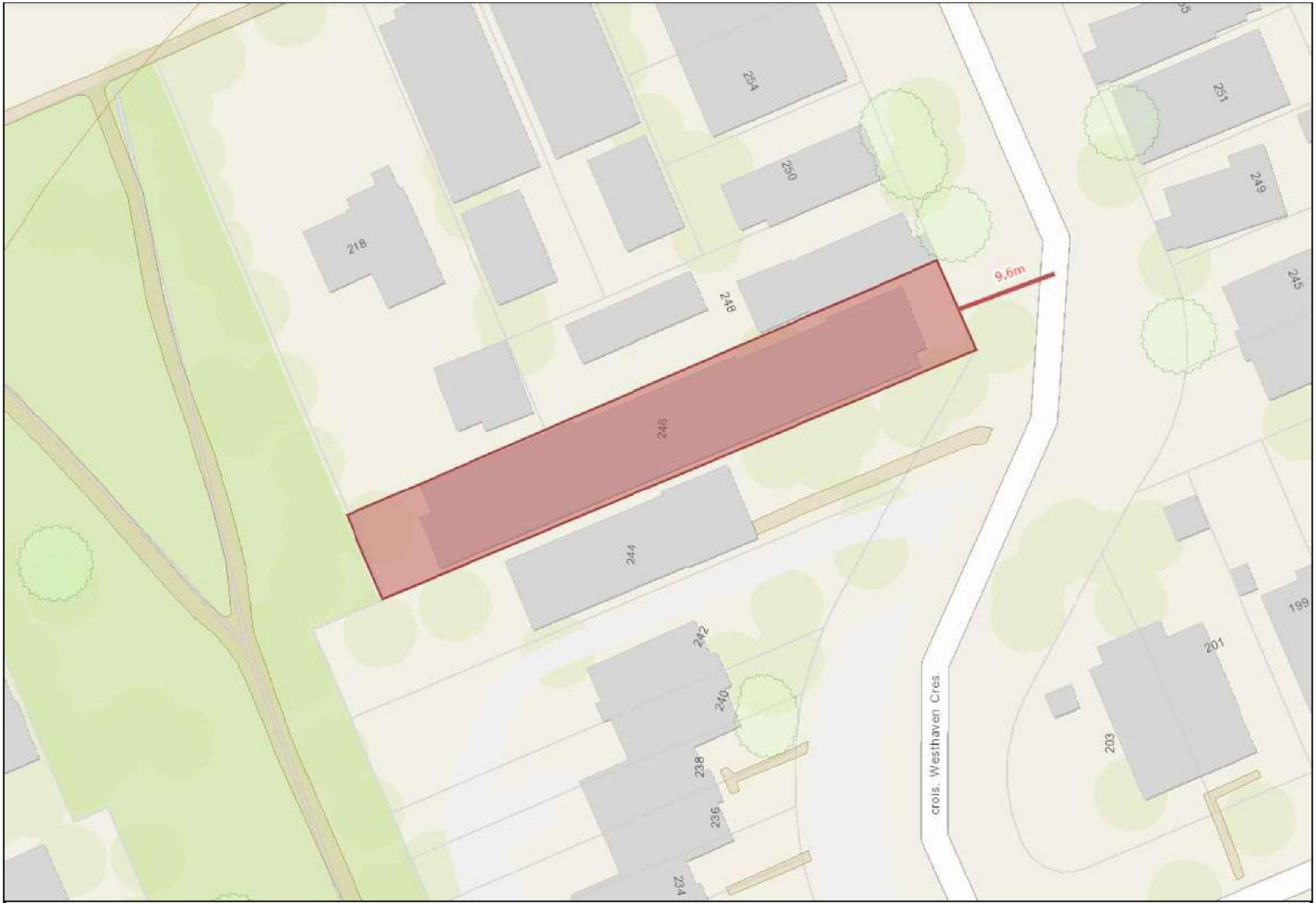


Figure 1: OFM Exposure Distances (Property Line to Street)

Source: geoOttawa 2024; *Contains information licensed under the Open Government Licence – City of Ottawa.*

ATTACHMENT 6 : SUPPORTING HYDRAULIC CALCULATIONS

Stantec

Supporting Hydraulic Calculations

Stantec Project #: 163401084
Project Name: 246 Westhaven Crescent
Date: March 1, 2024
Data inputted by: Alexandre Mineault-Guitard, M.A.Sc., P.Eng.
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 108.6 m;
Scenario 2: Average Day (Max HGL): 114.4 m; and
Scenario 3: Maximum Day plus Fire Flow: 93.5 m.

Sample Calculations

$HGL\ (m) = hp + hz$ *(1)*

where: hp = Pressure Head (m); and hz = Elevation Head (m), estimated from topography.

For Scenario 1, we have:

HGL(m) = 108.6 and hz (m) = 79.4.

Rearranging Equation 1, we can calculate the Pressure Head (hp) as follow:

$hp\ (m) = HGL - hz$

$\therefore$ hp = 108.6 - 79.4 m = 29.2 m.

To convert from Pressure Head (m) to a pressure value (kPa), the following equation can be used:

$P\ (kPa) = (\rho * g * hp) / 1000$ *(2)*

where: ρ = density of water = 1000 kg/m^3; and g = gravitational acceleration = 9.81 m/s^2.

Using Equation 2, we can calculate the Pressure Head (hp) as follow:

P (kPa) = (1000 * 9.81 * 29.2) / 1000

$\therefore$ P = 286 kPa.

Considering that 1 kPa = 0.145 psi, the pressure under Scenario 1 is equal to:

P = 42 psi.

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:
Scenario 2: P = 50 psi; and Scenario 3: P = 20 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 286 kPa (42 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 343 kPa (50 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 138 kPa (20 psi)

ATTACHMENT 7 : FIGURE 2 – HYDRANT SPACING

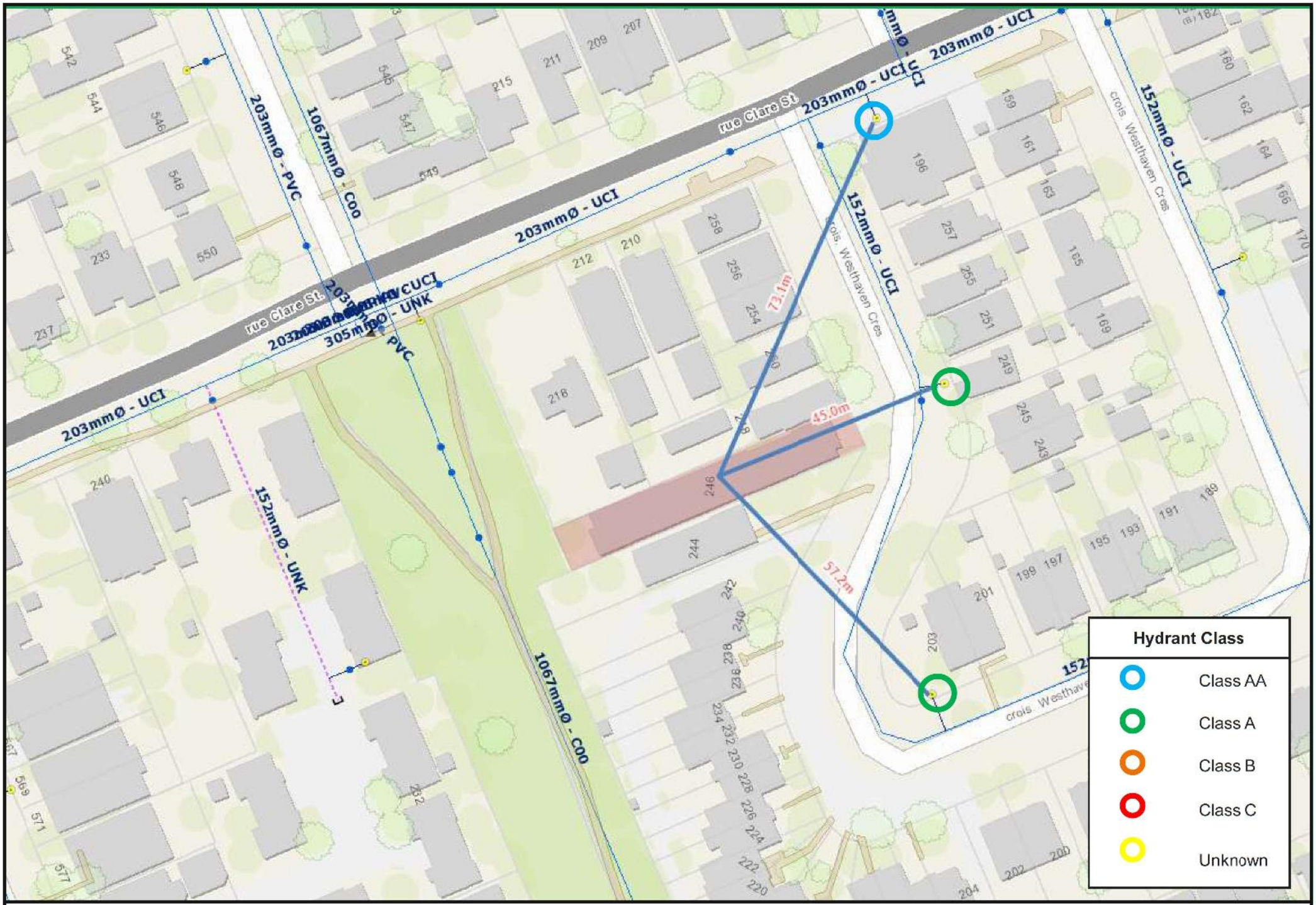


Figure 2: Hydrant Spacing

Source: geoOttawa 2024; *Contains information licensed under the Open Government Licence – City of Ottawa.*

EXISTING THREE-STOREY MULTI-UNIT

RESIDENTIAL BUILDING

RENOVATIONS

246 WESTHAVEN CRESCENT

CITY OF OTTAWA

APPENDIX D

SANITARY SEWER DESIGN SHEET

PAGE 1 OF 2

AND

PAGE 2 OF 2

SANITARY SEWER DESIGN SHEET

q = average daily per capita flow (280 L/cap. d)
I = unit of peak extraneous flow (0.33 L/ha. s)
M = peaking factor
Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow

DENSITY
- 3 BEDROOM = 3.1 PPU
- 2 BEDROOM = 2.1 PPU
- 1 BEDROOM / BACHELOR = 1.4 PPU

$M = 1 + \frac{14}{4 + \sqrt{P}} \times K$ where P population in 1000's K = 0.8

$Q(p) = \frac{PqM}{86.4}$ (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)
246 WESTHAVEN CRESCENT	SITE	EX-225Ø CONC SAN SWR	9.3	0.05	9.3	0.05	3.53	0.11	0.02	0.13	20.5	150	PVC	1.0 (min.)	19.8	1.12	

LICENSED PROFESSIONAL ENGINEER
03/20/24
TONY L.M. MAK
PROVINCE OF ONTARIO

FILE # 023-124

DESIGN	TLM
CHECKED	TLM
DATE	MARCH, 2024

PROJECT 246 WESTHAVEN CRESCENT
EXISTING THREE STOREY LOW-RISE RESIDENTIAL BLDG - OTTAWA

SHEET No. 1 of 2

SANITARY SEWER DESIGN SHEET

q = average daily per capita flow (280 L/cap. d)
I = unit of peak extraneous flow (0.33 L/ha. s)
M = peaking factor
Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow

DENSITY
- 3 BEDROOM = 3.1 PPU
- 2 BEDROOM = 2.1 PPU
- 1 BEDROOM/BACHELOR = 1.4 PPU

$M = 1 + \frac{14}{4 + \sqrt{P}} \times K$ where P population in 1000's, K = 0.8

$Q(p) = \frac{PqM}{86.4}$ (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)
246 WESTHAVEN CRESCENT	SITE	EX. 225Ø SANITARY SEWER	12.5	0.05	12.5	0.05	3.52	0.14	0.02	0.16	20.5	150	PVC	1.0 (min.)	19.8	1.12	

LICENSED PROFESSIONAL ENGINEER
03/29/24
TONY L.M. MAK
PROVINCE OF ONTARIO

DESIGN	TLM	PROJECT	246 WESTHAVEN CRESCENT PROPOSED RENOVATION OF EXISTING THREE STOREY BUILDING - OTTAWA
CHECKED	TLM		
DATE	MARCH, 2024		

FILE # 923-124

SHEET No. 2 of 2

EXISTING THREE-STOREY MULTI-UNIT

RESIDENTIAL BUILDING

RENOVATIONS

246 WESTHAVEN CRESCENT

CITY OF OTTAWA

APPENDIX E

AQUA DRAIN

CCTV REPORT SUMMARY

DATED MARCH 13, 2024

W0105412 3

AQUA-DRAIN SEWER SERVICES INC

P.O. BOX 41081, Ottawa, Ontario K1G 5K9
Tel.: 613-731-5500 • Fax: 613-822-0463
1-866-809-1504 • www.aquadrain.ca

Need Report

CAMERA INSPECTION REPORT

CUSTOMER: C.O.D.
JOB NUMBER:
LOCATION: 246 Westhaven
RESIDENT'S TEL. #: 613-882-0977 - Mike
DATE: Mar. 13/24
OPERATOR: Jesse

START: OM
END:
C/O DISTANCE TO WALL:
SEWER TYPE: Sani
PIPE DIAMETER (S):
PIPE MATERIAL (S):
FLOW: Dawn
TAPE/CD #:
REPORT #: m.baroud2021@gmail.com

INSPECTION DONE ON PULLBACK: (YES) NO

DISTANCE	CODE	INSPECTION COMMENTS
OM	C/O	
3.9	SC	2' O'CLOCK
8.8	SC	2 O'CLOCK
20.6	LBL	
20.8	LBR	
24.5	LBD	
26.2	city	

CODE - DESCRIPTION

CRC -	CIRCULAR CRACK
LGC -	LONGITUDINAL CRACK BEG/ENG
FRC -	FRACTURE BEG/END
PFL -	PARTIAL COLLAPSE
CFL -	COLLAPSE
PUN -	PUNCTURE
MSP -	MISSING PIPE BEG/END
BSG -	START OF SAG
ESG -	END OF SAG
OPJ -	OPEN JOINT
OFJ -	OFFSET JOINT
BKJ -	BROKEN JOINT
EXG -	EXPOSED GASKET
EXR -	EXPOSED REBAR
LBL -	LINE BENDS LEFT
LBR -	LINE BENDS RIGHT
LBD -	LINE BENDS DOWN
DEF -	PIPE DEFORMAT'N/OVAL
SC 3 -	CONNECTION AT 3 O'CLOCK
WYE 3 -	WYE CONNECTION AT
PSC -	PROTRUDING CONNECTION AT
AIF -	ACTIVE INFILTRATION
EIF -	EVIDENCE OF INFILTRATION
CAL -	CALCITE, LT/MED/HVY
DEB -	DEBRIS, LT/MED/HVY
GRS -	GREASE, LT/MED/HVY
RTS -	ROOTS, LT/MED/HVY
DC -	PIPE DIAMETER CHANGE FROM _____ TO _____
MC -	PIPE MATERIAL CHANGE FROM _____ TO _____
OBS -	OBSTRUCTION IN PIPE
C/O -	CLEAN-OUT
MAIN -	MAIN SEWER IN BLDG.
CITY -	CITY SEWER
FD -	FLOOR DRAIN
MH -	MANHOLE