

PRELIMINARY FUNCTIONAL SERVICING REPORT

388 PHILLIP STREET RE-USE OF EXISTING BUILDING

Project Location:
388 Phillip Street, Waterloo, ON

Prepared for:
388 Phillip Inc.
156 Columbia Street West
Waterloo, ON N2L 3L3

Prepared by:
GRIT Engineering Inc.
133 Regent Street
Stratford, Ontario N5A 2W3

October 14, 2025
GRIT File No: GE25-1356-1-C-RPT-FSR-2025-10-14

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1.0 INTRODUCTION

GRIT Engineering Inc. (GRIT) was retained by 388 Phillip Inc. (Client) to complete a Preliminary Functional Servicing Report (FSR) for the property located at 388 Phillip Street, Waterloo, Ontario in support of an Official Plan Amendment and Zoning By-law Amendment applications to permit a food store to occupy 7,656 square metres of floor area within the Existing Building on the site. The subject site (Site) is approximately 9.62 hectares in size and is zoned as Business Employment Two-40 (E2-40), with a proposed zone change as part of this application. The Site is generally bound by existing commercial properties zoned as Business Employment (E2B-40, E1-20, and E2-40) and existing residential zoned as Mixed-Use Residential (RMU-20 and RMU-40) to the north, east and south and Phillip Street to the west. The Site is not part of the Grand River Conservation Authority (GRCA) regulatory area.

The existing Site includes a vacant former industrial/commercial building, landscaping, driveways and parking.

This FSR recommends sanitary, water and storm servicing strategies for the Site. This report will discuss the available municipal infrastructure and how the proposed development can be serviced.

2.0 SANITARY SERVICING

2.1 Sanitary Servicing

The sanitary design flow requirements are based on the City of Waterloo Comprehensive Engineering and Landscape Manual (CELM) (2024), the Region of Waterloo and Area Municipalities *Design Guidelines and Supplemental Specifications for Municipal Services* (DGSSMS) (2025) and the Ministry of Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems (DGDWS) (2008). The following criteria have been established:

- Average daily commercial flow of 0.5 litres per second per hectare (L/s/ha) (DGSSMS),
- Peaking Factor of 2.5 (DGSSMS), and
- Extraneous flow rate of 0.25 L/s/ha (CELM).

Based on the above criteria, the proposed sanitary peak flows from the site are summarized in Table 2.1 below.

Table 2.1 – Proposed Sanitary Flows

Area (ha)	Building Area (ha)	Per Area Flows (L/s/ha)	Infiltration (L/s/ha)	Comm. Peaking Factor	Average Flow (L/s)	Total Peak Flow (L/s)
9.62	1.30	0.50	0.25	2.5	3.06	4.03

Therefore, the existing 200 mm minimum diameter sanitary service is sufficient to service the proposed redevelopment. See Appendix B for the sanitary servicing design sheet.

3.0 WATER DISTRIBUTION

3.1 Design Approach

The water distribution requirements and performance criteria for the different demand conditions are based on the City of Waterloo CELM and the Region of Waterloo and Area Municipalities DGSSMS, MECP DGDWS, and National Fire Protection Association (NFPA) NFPA13. The design parameters used are:

- A commercial average daily domestic demand of 28 cubic meters per hectare per day (DGSSMS),
- Minimum water pressures of (DGSSMS):
 - 140 kPa (20 psi) for fire-flow plus maximum day demand,
 - 275 kPa (40 psi) for minimum hour demand,
 - 350 kPa (50 psi) for average day demand
 - 550 kPa (80 psi) for maximum day demand, and
 - 700 kPa (100 psi) maximum residual pressure.
- Peaking factors of 2 and 4 for maximum day and a maximum hour respectively for commercial (MECP),
- Water turnover less than 72 hours under average day demand for water quality (DGDWS), and
- Fire-Flow Demand per NFPA13 Fire Fighting Flow requirements.

The existing 150 mm diameter water service is sufficient for the Site. See Appendix C for all water demand calculations.

3.2 Domestic Water Demand

The domestic water demand was calculated based on the proposed site plan by GRIT Engineering, provided in Appendix A. The average and maximum day demands are summarized in the table below.

Table 3.1 – Domestic Water Demand

	Total Area (ha)	Building Area (ha)	Average Day (L/s)	Maximum Day (L/s)	Maximum Hour (L/s)
Commercial	9.62	1.30	0.421	0.843	1.685

3.3 Fire Flow Demand

The NFPA13 Fire-Fighting Flow requirements were used to calculate the fire-flow demand for the Site, as the proposed building will be equipped with sprinklers and/or a standpipe. As summarized in Table 3.2, the required fire-fighting flow rate is 1,164 L/min, and the maximum day domestic demand is 107.44 L/min, resulting in a combined total demand of 1,214.56 L/min. This demonstrates compliance with the requirements outlined in the DGSSMS.

Table 3.2 – Fire Flow Demand

Fire-fighting Required Flow Rate (L/min)	Domestic Max. Day Demand (L/min)	Fire Flow + Max. Day (L/min)
1,164	50.56	1,214.56

A hydrant flow test was conducted by Stumpf Fire Protection Limited on September 17, 2025, in the vicinity of 388 Phillip Street. The test results are summarized in Table 3.3 below. In addition, the flow rate at 20 psi (140 kPa) is calculated to be 16,125 L/min (4,260 USGPM). These results confirm that adequate pressure and flow are available to meet the fire-fighting demand. Fire flow calculations and hydrant test information are provided in Appendix A.

Table 3.3 – Hydrant Flow Test

	Pressure (psi)	Pressure (kPa)	Flow Rate (USGPM)	Flow Rate (L/min)
Static Pressure	50.00	344.74	0	0
Tested Flow Rate	48.00	330.95	987	3,736
Tested Flow Rate	44.00	303.37	1,680	6,359
Pressure at Required Flow Rate	49.30	339.93	321	1,215

The OBC states that fire hydrants shall be located within 45m of the building where a standpipe is required. The existing City hydrant in the vicinity of 388 Phillip Street is within 45 m of the Site. Therefore, an additional Site hydrant is not required for this site and the existing 150 mm water service is sufficient for the redevelopment.

4.0 STORMWATER MANAGEMENT AND STORM SERVICING

4.1 Stormwater Management Requirements

The City of Waterloo requires quantity and quality Stormwater Management (SWM) controls per the CELM. For SWM quantity control, 2- through 100-year post-development flows should be attenuated to predevelopment 2- through 100-year rates, respectively. To address SWM quality controls, MECP Enhanced Level water quality control is required on-site to the satisfaction of Engineering Services before site plan approval.

As there are no changes to the building footprint, parking surfaces, or landscaped areas, and the imperviousness of the site remains consistent with pre-development conditions. Consequently, no additional stormwater management measures are required.

4.2 Erosion and Sediment Control

Given that no changes are proposed to the building footprint, parking surfaces or landscaped areas, and construction work will be limited to interior renovations, no Erosion and Sediment Controls (ESC) are required.

5.0 CONCLUSIONS

The proposed re-use of the existing building can be serviced by the existing and proposed onsite infrastructure. The design and calculations in Sections 2 through 4 and the appendices of this report demonstrate compliance with the Approving Agency's design requirements and establish that the proposed re-use of the existing building can be adequately serviced with the existing connections to the existing municipal infrastructure. We trust that this report satisfies the Approving Agency's requirements. If there are any questions regarding this report, please do not hesitate to contact our office.

6.0 STATEMENT OF CONDITIONS AND LIMITATIONS

This document was prepared for *New Generation Design Wave (the Client)* and the Approving Agency and has been prepared in a manner consistent with that level of care and skill ordinarily exercised by other members of the engineering profession currently practicing in the same or similar locality, under the same or similar conditions, subject to the time limits and financial, physical, or other constraints applicable to the Services.

The recommendations and conclusions provided in this document are applicable only to the specific site, development, design objectives, and purposes that are described in the text and are based on the information that was available and provided to GRIT Engineering Inc. at the time this document was prepared. This document is not intended to be exhaustive in scope and it shall be recognized that the passage of time may alter the opinions, recommendations, and conclusions that are contained in this document. The design is limited to the documents reference and any other drawings or documents prepared by GRIT Engineering Inc. provided separately. GRIT Engineering Inc. accepts no responsibility or liability for the accuracy of any information provided by others.

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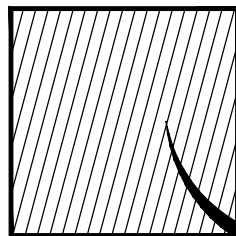
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FIGURES



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STREET NAME



STREET NAME

SITE

Project:

388 PHILLIP STREET
COMMERCIAL DEVELOPMENT

Figure Title:

SITE LOCATION MAP

Figure No:

1

APPENDIX A – SITE PLAN

388 Phillip Street - Proposed Floor Plan



GENERAL NOTES:
ALL DIMENSIONS, NOTES AND DETAILS MUST BE CHECKED AND VERIFIED ON THE JOBSITE BY THE CONTRACTOR PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES ARE TO BE IMMEDIATELY REPORTED TO THE ARCHITECT. ANY EXTRAS AND/OR CHANGES RESULTING FROM FAILURE TO DO SO WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
ALL DRAWINGS, DETAILS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECT. ANY UNAUTHORIZED USE OF THE DRAWINGS, DETAILS AND SPECIFICATIONS IS PROHIBITED.
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND DETAILS ISSUED FOR CONSTRUCTION OF THIS PROJECT.
THE CONTRACTOR SHALL READ ALL NOTES AND SPECIFICATIONS BEFORE BEGINNING WORK.
THE CONTRACTOR SHALL CAREFULLY STUDY AND COMPARE THE ARCHITECT'S DRAWINGS, THE PROJECT MANUAL AND ALL OTHER DISCIPLINES DRAWINGS, AND HE/SHE SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY INCONSISTENCIES OR OMISSIONS THAT HE MAY DISCOVER.
THE CONTRACTOR SHALL NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING WITH WORK.
THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IF ANY WORK INDICATED IN THE CONTRACT DOCUMENTS CAN NOT BE PERFORMED DUE TO EXISTING FIELD CONDITIONS.
CONTRACTOR TO VERIFY DELIVERY SCHEDULE OF ALL MATERIALS, FINISHES, LIGHT FIXTURES, SPECIALTY ITEMS AND ANY OTHER ITEMS SPECIFIED AND THE ARCHITECT IS TO BE NOTIFIED IMMEDIATELY IF ANY MATERIALS AND/OR FIXTURES CANNOT BE OBTAINED WITHIN THE REQUIRED CONSTRUCTION SCHEDULE.

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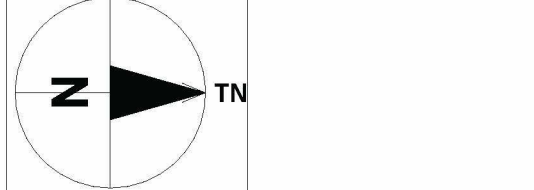
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PLOT DATE: 2025-07-16 4:58:01 PM

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LEGEND:

CLIENT:

CLIENT NAME

JOB TITLE:

PROJECT NAME

PROJECT ADDRESS

DRAWING TITLE:

DATA CENTER FLOOR PLAN

DRAWN BY: Author

CHECKED BY: Checker

PROJECT NUMBER:

DESIGNED BY: Designer

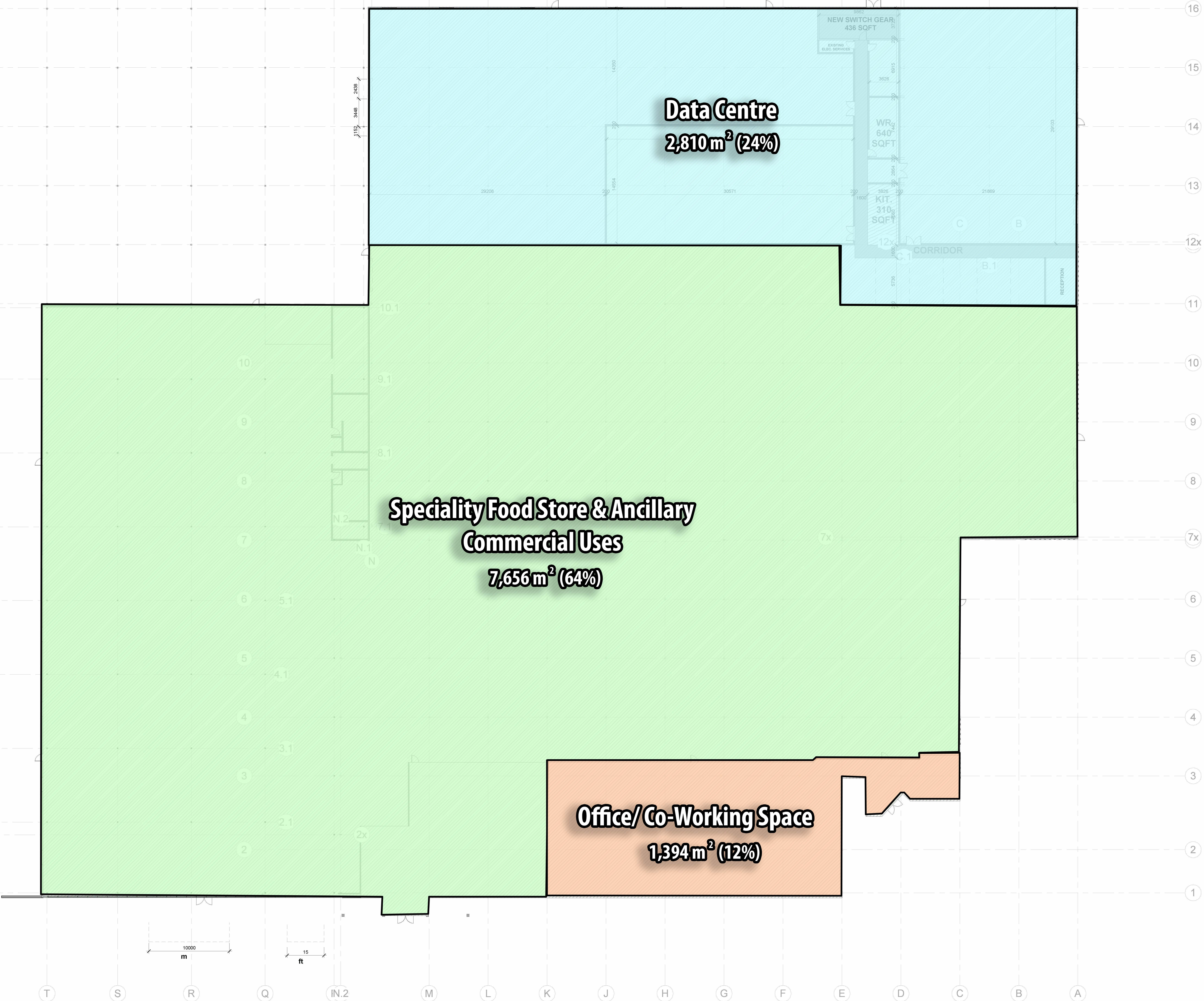
APPROVED BY: Approver

DATE: JAN 2020

SCALE: 1 : 200

DRAWING NUMBER: A-547

DIVISION NUMBER:



**APPENDIX B – SANITARY
CALCULATIONS**

388 PHILLIP STREET REDEVELOPMENT
EXTERNAL SANITARY SEWER DESIGN SHEET

Waterloo, Ontario

Date Calculated: September 19, 2025

DESIGN PARAMETERS

COMMERCIAL RATE = 0.50 l/s/ha
AVERAGE INFILTRATION RATE = 0.25 l/s/ha
n = 0.013
Vmax = 3.0 m/sec (peak flow)
Vmin = 0.8 m/sec (peak flow)

SHEET NO. 1 OF 1
JOB No.: GE25-1356
CALCULATED BY: Ann Gibson, MES, P.Eng.
CHECKED BY:
DATE: September 19, 202
FILE: GE25-1356-1-C-CALC-SAN-2025-09-19



LOCATION				COMMERCIAL				INFILTRATION <i>(0.25 L/s/ha)</i>			DESIGN						
STREET	AREA NO.	MANHOLE LOCATION		HECTARES AND FLOW OF EACH ZONING				AREA	ACCU M AREA	INFIL FLOW	TOTAL VOLUME FLOW	DIST	SLOPE	PIPE SIZE	CAPACITY	FULL FLOW VELOCITY	ACTUAL VELOCITY
				0.50 <i>L/s/ha</i>													
		FROM MH	TO MH	AREA	ACCU M AREA	PF	PEAK FLOW										
				<i>ha</i>	<i>ha</i>		<i>L/s</i>	<i>ha</i>	<i>ha</i>	<i>L/s</i>	<i>L/s</i>	<i>m</i>	<i>%</i>	<i>mm</i>	<i>L/s</i>	<i>m/s</i>	<i>m/s</i>
388 PHILLIP ST			MH	1.30	1.30	2.5	1.63	9.62	9.62	2.41	4.03	40.0	2.00	200	46.36	1.48	0.91

APPENDIX C – WATER DEMAND CALCULATIONS

Project	388 Phillip Street Redevelopment
Project Number	GE25-1356-1
Client	388 Phillip Inc.
Address	388 Phillip Street, Waterloo ON
Date	September 19, 2025

Domestic Water Demand

Average Day Demand = ¹	255	L/day/cap
Average Day Demand = ¹	0.0029514	L/s/cap
Maximum Day Peaking Factor = ²	2	
Maximum Hour Peaking Factor = ²	4	
Low Density Residential = ¹	3.3	p/unit
Medium Density Residential = ¹	2.1	p/unit
High Density Residential = ¹	1.6	p/unit
Commercial Area Allowance Average Flow= 28m3/(ha d) = ¹	28000.0	L/day/ha
Industrial Area Allowance Average Flow= 35m3/(ha d) = ¹	35000.0	L/day/ha

	Units	Area (ha)	Average Day (L/s)	Maximum Day (L/s)	Maximum Hour (L/s)
Commercial Area ³	N/A	1.30	0.421	0.843	1.685
Totals	0	1.30	0.421	0.843	1.685

Velocity Check in Service Pipe

Pipe Diameter (mm)	Demand (L/s)	Velocity (m/s)
150	1.685	0.10

Therefore, the maximum velocity of 0.1 m/s is less than the maximum allowable velocity of 3 m/s in the Maximum Hour Senerio.¹

Water Volume & Turnover Calculation

Pipe Size (mm)	Length (m)	Volume (L)
150	40.0	706.86
		0.00
	0.0	0.00
	0.0	0.00
Total Volume		706.86

Volume (L)	Average Day Demand (L/s)	Hours	Days
706.86	0.421	0.47	0.02

Therefore, the water turnover of 0.47 hours is less than the maximum allowable time of 72 hours.²

References

1. Region of Waterloo Design Guidelines and Supplemental Specifications for Municipal Services 2025
2. MECP Design Guidelines for Drinking Water Systems 2008
3. See Site Plan prepared by The Planning Partnership

NFPA13 Fire-Fighting Flow Requirements

Project	388 Phillip Street Redevelopment
Project Number	GE25-1356-1
Client	388 Phillip Inc.
Address	388 Phillip Street, Waterloo ON
Date	September 19, 2025

Maximum NFPA13 Fire-Fighting Flow Required¹

Hazard Level	Sprinkler Flow (L/min) Figure 19.2.3.1.1	Inside Hose Allowance (L/min) Section 19.1.6.3	Outside Hose / Hydrant Allowance (L/min) Table 19.2.3.1.2	Total Flow Required (L/min)
Light	784	190	190	1,164
Ordinary 1	1,517	380	570	2,467
Ordinary 2	2,257	380	570	3,207
Extra 1	3,767	380	1,520	5,667
Extra 2	5,673	380	1,520	7,573

Note: The maximum area for each Hazard Level and density for that area has been used to calculate the Sprinkler Flow, actual required flow may be less and will be determined by the Fire Protection Engineer at the time of Detailed Design.

Fire-Fighting Required Flow Rate=	1,164	L/min
Domestic Maximum Day Demand=	0.84	L/s
=	50.56	L/min
Total Required - Fire-Flow + Max. Day=	1,214.56	L/min

Fire-Fighting Available Flow @ Pressure

Static Pressure=	50.00	psi (344.74 kPa) @	0	USGPM (0.00 L/min)
Tested Supply Flow Rate=	48.00	psi (330.95 kPa) @	987	USGPM (3736 L/min)
Tested Supply Flow Rate=	44.00	psi (303.37 kPa) @	1,680	USGPM (6359 L/min)
Pressure @ Required Flow Rate=	49.30	psi (339.93 kPa) @	321	USGPM (1214.56 L/min)
Pressure Drop in System=	0.70	psi (4.81 kPa)		

The water supply pressure at the required flow rate of 1214.56 L/min is 339.93 kPa or 49.3 psi which is greater than minimum required pressure of 140 kPa (20 psi) that is required under the Fire-Flow + Maximum Day scenario.⁴

Velocity Check in Service Pipe

Pipe Diameter (mm)	Demand (L/min)	Velocity (m/s)
150	1,214.56	1.15

The velocity of 1.15 m/s is less than the maximum allowable velocity of 3 m/s in the Fire-Fighting + Maximum Day Scenario.⁴

References

1. National Fire Protection Association (NFPA) NFPA13. Relevant sections attached or referenced.
2. See *Domestic Water Demand Calculations* by GRIT Engineering Inc.
3. See Hydrant Flow Test by Stumpf Fire Protection, completed on September 15, 2025
4. Municipal Standards or MECP *Design Guidelines for Drinking Water Systems 2008*

the occupancy hazards of potential tenants and their likely storage needs.

The short period response parameter, S_p , is defined in 3.3.198. Additional information about S_p is provided in 18.5.9.

The intent of Section 4.2 is to provide the owner's certificate for all new systems and where there is a change of occupancy and/or building use. [See Figure A.28.1(b).]

A.4.2(4) Recycled or reclaimed water used in a sprinkler system should not have contaminants in the water that are combustible or that will have a detrimental effect on the sprinkler system performance or the life of the sprinkler system.

A.4.3 Occupancy examples in the listings as shown in the various hazard classifications are intended to represent the norm for those occupancy types. Unusual or abnormal fuel loadings or combustible characteristics and susceptibility for changes in these characteristics, for a particular occupancy, are considerations that should be weighed in the selection and classification.

The light hazard classification is intended to encompass residential occupancies; however, this is not intended to preclude the use of listed residential sprinklers in residential occupancies or residential portions of other occupancies.

A.4.3.1.4 Miscellaneous storage is intended to be storage that is ancillary to the primary function of the building. One example is a manufacturing facility where storage on the manufacturing floor is limited.

A.4.3.2 **Light hazard** occupancies include occupancies having uses and conditions similar to the following:

- (1) Animal shelters
- (2) Churches
- (3) Clubs
- (4) Eaves and overhangs, if of combustible construction with no combustibles beneath
- (5) Educational
- (6) Hospitals, including animal hospitals and veterinary facilities
- (7) Institutional
- (8) Kennels
- (9) Libraries, except large stack rooms
- (10) Museums
- (11) Nursing or convalescent homes
- (12) Offices, including data processing
- (13) Residential
- (14) Restaurant seating areas
- (15) Theaters and auditoriums, excluding stages and prosceniums
- (16) Unused attics

Note that it is not the committee's intent to automatically equate library bookshelves with ordinary hazard occupancies or with library stacks. Typical library bookshelves of approximately 8 ft (2.4 m) in height, containing books stored vertically on end, held in place in close association with each other, with aisles wider than 30 in. (750 mm) can be considered to be light hazard occupancies. Similarly, library stack areas, which are more akin to shelf storage or record storage, as defined in NFPA 232, should be considered to be ordinary hazard occupancies.

A.4.3.3 Class I, Class II, Class III, and Class IV commodities are considered to have moderate rates of heat release, while Group A plastics are considered to have high rates of heat release.

Stockpiles are considered to include display merchandise (e.g., mercantile stockpiles) and arrangements of combustibles ancillary to operations within the occupancy as opposed to dedicated storage areas where the fire loading is generally more severe.

A.4.3.3.1 **Ordinary hazard (Group 1)** occupancies include occupancies having uses and conditions similar to the following:

- (1) Automobile showrooms
- (2) Bakeries
- (3) Beverage manufacturing
- (4) Canneries
- (5) Dairy products manufacturing and processing
- (6) Electronic plants
- (7) Glass and glass products manufacturing
- (8) Laundries
- (9) Restaurant service areas
- (10) Porte cocheres
- (11) Mechanical rooms

A.4.3.3.2 **Ordinary hazard (Group 2)** occupancies include occupancies having uses and conditions similar to the following:

- (1) Agricultural facilities
- (2) Automobile parking garages
- (3) Barns and stables
- (4) Cereal mills
- (5) Chemical plants — ordinary
- (6) Confectionery products
- (7) Distilleries
- (8) Dry cleaners
- (9) Exterior loading docks (Note that exterior loading docks only used for loading and unloading of ordinary combustibles should be classified as OH2. For the handling of flammable and combustible liquids or hazardous materials, or where utilized for storage, exterior and interior loading docks should be protected based upon the actual occupancy and the materials handled on the dock, as if the materials were actually stored in that configuration.)
- (10) Feed mills
- (11) Horse stables
- (12) Leather goods manufacturing
- (13) Libraries — large stack room areas
- (14) Machine shops
- (15) Metal working
- (16) Mercantile
- (17) Paper and pulp mills
- (18) Paper process plants
- (19) Piers and wharves
- (20) Plastics fabrication, including blow molding, extruding, and machining; excluding operations using combustible hydraulic fluids
- (21) Post offices
- (22) Printing and publishing
- (23) Racetrack stable/kennel areas, including those stable/kennel areas, barns, and associated buildings at state, county, and local fairgrounds
- (24) Repair garages
- (25) Resin application area
- (26) Stages
- (27) Textile manufacturing
- (28) Tire manufacturing
- (29) Tobacco products manufacturing

- (30) Wood machining
- (31) Wood product assembly

A.4.3.4 **Extra hazard (Group 1)** occupancies include occupancies having uses and conditions similar to the following:

- (1) Aircraft hangars (except as governed by NFPA 409)
- (2) Combustible hydraulic fluid use areas
- (3) Die casting
- (4) Metal extruding
- (5) Plywood and particleboard manufacturing
- (6) Printing [using inks having flash points below 100°F (38°C)]
- (7) Rubber reclaiming, compounding, drying, milling, vulcanizing
- (8) Saw mills
- (9) Textile picking, opening, blending, garnetting, or carding, combining of cotton, synthetics, wool shoddy, or burlap
- (10) Upholstering with plastic foams

A.4.3.5 **Extra hazard (Group 2)** occupancies include occupancies having uses and conditions similar to the following:

- (1) Asphalt saturating
- (2) Flammable liquids spraying
- (3) Flow coating
- (4) Manufactured home or modular building assemblies (where finished enclosure is present and has combustible interiors)
- (5) Open oil quenching
- (6) Plastics manufacturing
- (7) Solvent cleaning
- (8) Varnish and paint dipping
- (9) Car stackers and car lift systems with 2 cars stacked vertically

A.4.3.7 Other NFPA standards contain design criteria for fire control or fire suppression (*see 4.3.7 and Chapter 2*). While these can form the basis of design criteria, this standard describes the design, installation, fabrication, calculation, and evaluation methods of water supplies that should be used for the specific design of the system.

Other NFPA standards contain sprinkler system design criteria for fire control or suppression of specific hazards. These other standards are referenced in Chapter 27.

A.4.4.1(3) Pipe schedule — 25,000 ft² (2320 m²).

A.4.4.6 Buildings adjacent to a primary structure can be protected by extending the fire sprinkler system from the primary structure. This eliminates the need to provide a separate fire sprinkler system for small auxiliary buildings. Items that should be considered before finalizing fire sprinkler design should include the following:

- (1) Actual physical distance between adjacent structures
- (2) Potential for the property to be split into separate parcels and sold separately
- (3) Square footage of both the primary and auxiliary structures
- (4) Difficulties in providing a separate water supply to the auxiliary structure
- (5) Occupancy/hazard of the auxiliary structure
- (6) Ability of emergency response personnel to easily identify the structure from which waterflow is originating

A.4.5.1.1 Alternative means of determining available water supplies should be considered where drought or other concerns are present.

A.4.6 Bacterial inhibitors and other chemicals that are listed and used for the prevention and mitigation of MIC and that do not adversely affect the fire-fighting properties of the water or the performance of the fire sprinkler system components are not prohibited.

A.4.8 Non-system components can adversely affect the operation and longevity of the fire sprinkler system. Objects connected to the sprinkler system can displace sprinkler system piping, causing obstruction to the spray pattern of sprinklers, delay the activation of a sprinkler, or cause chemical compatibility problems that can cause the failure of sprinkler system components.

A.4.9.1 The provisions of 4.9.1 do not require inherently noncombustible materials to be tested in order to be classified as noncombustible materials. [5000:A.7.1.4.1]

A.4.9.1.1(1) Examples of such materials include steel, concrete, masonry and glass. [5000:A.7.1.4.1.1(1)]

A.4.9.2 Material subject to increase in combustibility or flame spread index beyond the limits herein established through the effects of age, moisture, or other atmospheric condition is considered combustible. (*See NFPA 259 and NFPA 220.*) [5000:A.7.1.4.2]

A.5.1.3 For typical combined domestic/fire sprinkler demands, systems with 4 in. (100 mm) pipe or larger typically do not need to include the domestic demand in the calculations because it is such a small fraction of the total flow that it does not make a significant difference in the results. But for situations where 4 in. (100 mm) pipe is used for the combined domestic/fire sprinkler systems and the domestic demand is considerable, then the domestic demand should be included in the calculations. Generally, pipe that is 6 in. (150 mm) or larger can carry combined domestic/fire protection demand without any consideration for domestic demand being necessary.

A.5.1.4 Evaluation of the water supply and environmental conditions does not necessarily require a water sample analysis by a laboratory. Instead, general knowledge of the long-term condition of sprinkler systems with similar piping materials in similar environments on the same water supply can be a sufficient evaluation.

There are several options to address the effects of MIC on sprinkler systems. Some types of sprinkler pipe such as CPVC have not shown to be affected by MIC. Other types of pipe are being manufactured with a biofilm that resists the effects of MIC.

Where water supplies are treated with bacterial inhibitors, evaluation of the effects of the bacterial inhibitor on sprinkler system components (pipe, fittings, sprinklers, gaskets, valves, and seals) is just as important as evaluating the effect the bacterial inhibitor has on the organisms. Where water treatment is selected as the method to deal with MIC, all water entering the system during testing or flushing needs to be treated so that the organisms do not get a chance to establish themselves.

Since all of the conditions that can affect the growth of MIC are unknown, a plan to sample randomly selected interior positions in the system can be effective. The frequency and location

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GRIT
133 Regent Street
Stratford, Ontario

September 18, 2025

Attn: Ann Gibson – ann@gritengineering.ca

Re: Hydrant Flow Test For 388 Phillip Street - Waterloo

Hydrant flow test was completed for the above project on September 17, 2025 at approx. 11:00am

Static: 50 PSI

Test Hydrant: Hydrant #297
Flow Hydrant: Hydrant #299

Residual: 48 PS
Pitot: 28 PSI
Flow: 987 USGPM

Results are from (1) 2-1/2" hydrant port.

Residual: 44 PSI
Pitot: 20/20 PSI
Flow: 1668 USGPM (834 ea. Port)

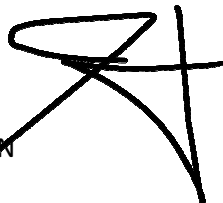
Results are from (2) 2-1/2" hydrant ports.

GPM's are from Table 4.10.1(a) of the NFPA 291, 2013 Edition.

If you any question, please feel free to call.

Sincerely

Jeff Hayhurst, Designer
STUMPF FIRE PROTECTION



Cc: Scott Donelle scott.donelle@waterloo.ca
Jeff Schultz jeff.schultz@waterloo.ca

