Functional Servicing and Stormwater Management Report

5688 Main Street

June 2025 — Project No. 100319
Hyson Properties Inc.

TYLin

Contents

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1. Introduction

TYLin has been retained by Hyson Properties Inc. to prepare a detailed Functional Servicing and Stormwater Management Report along with a corresponding grading and servicing design in support of the Zoning By-law Amendment (ZBA) application for the proposed development. The subject property is located at the north-west corner of Main Street and Palmwood gate at municipal address 5688 Main Street in the Town of Whitchurch-Stouffville, Ontario (refer to **Figure 1-1**).

This report will:

- Provide background information regarding the subject property;
- Summarize the existing site conditions;
- Provide information regarding the proposed development conditions;
- Outline the proposed grading for the development; and
- Outline the existing and proposed municipal servicing.

The recommended servicing has been developed in accordance with the applicable design criteria and requirements of the Town of Whitchurch-Stouffville (the Town), the Regional Municipality of York (the Region) and Lake Simcoe Region Conservation Authority (LSRCA).

Figure 1-1 Location Plan

1.1. PROJECT BACKGROUND

The subject property is 4,022 m^2 in area at municipal address 5688 Main Street in the Town of Whitchurch-Stouffville. The site is presently occupied by a single commercial building and a parking lot.

The subject site is bound by Main Street to the south, future residential development to the west, residential to the north and Palmwood Gate to the east. The site is located in an area that is well established and serviced by a network of municipal infrastructure including roads, sewer, watermains, and other services and utilities.

The existing topography of the site is generally flat with gentle sloping from north to south. Existing site drainage primarily is captured by internal catchbasins which are connected and discharged to existing adjacent municipal storm infrastructure. No external drainage enters the site.

1.2. PROPOSED DEVELOPMENT

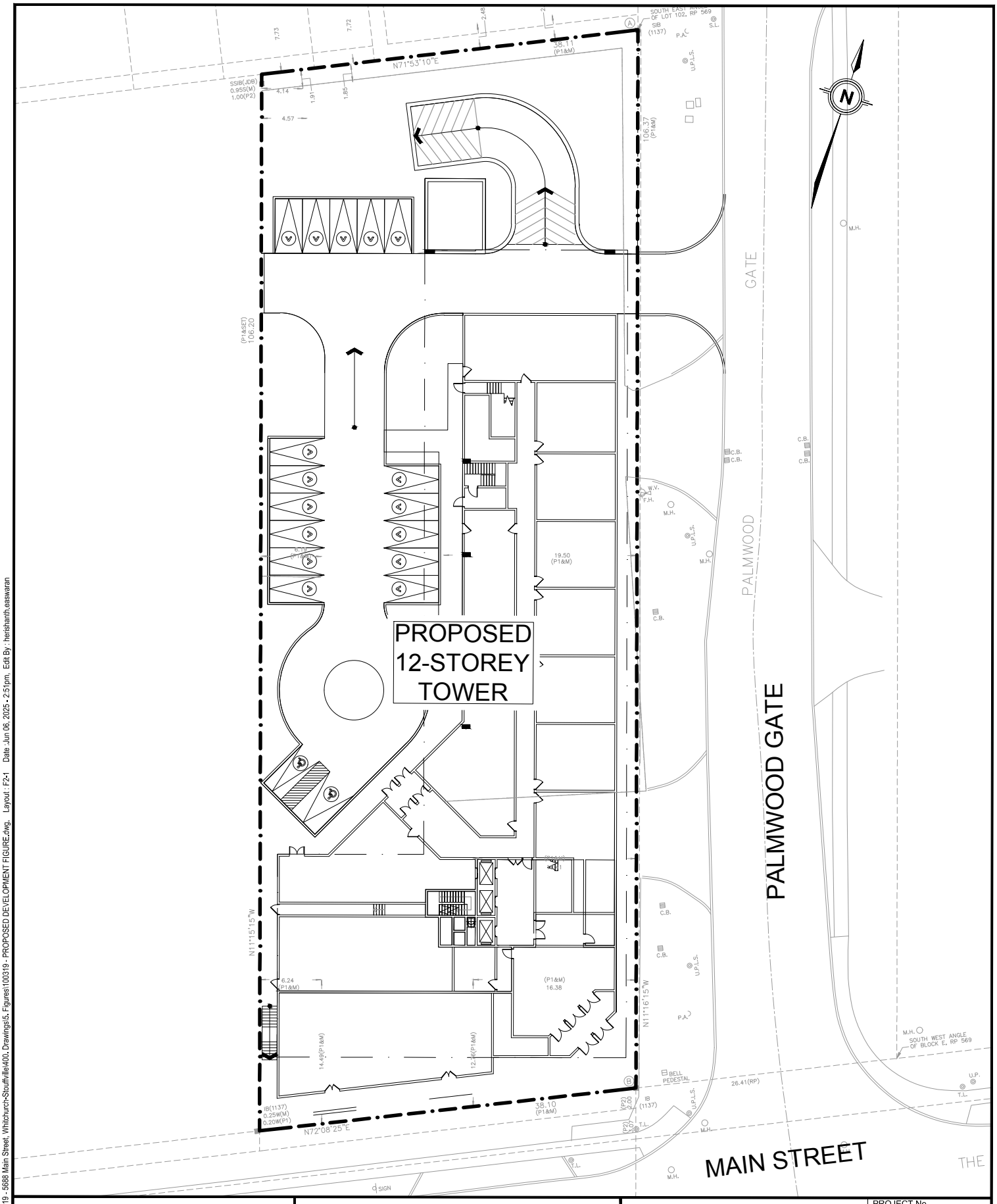
The proposed development includes the demolition of the existing buildings and the construction of a 12-storey mixed-use building with a 6-storey podium totalling 220 residential units. The building will utilize a two-level underground parking structure which will cover most of the subject site. Refer to **Figure 1.2** for the proposed development plan.

1.3. SITE ACCESS

The site's main vehicular access will be through an entrance along the east side off Palmwood Gate with pedestrian access along the east and south sides of the property. Site loading and underground parking structure ramp access will be along the north side of the building. The proposed site vehicular access to the site will require the removal of existing curb and gutter and construction of a new vehicular entrance.

1.4. UTILITIES

As this site is a redevelopment of an existing property within a developed area of Town of Whitchurch-Stouffville, all utilities including telephone, cable, electricity and gas are readily available to service the subject property.



TYLin
3381 STEELES AVENU EAST,
Suite 315
TORONTO, ON
M2H 3S7
p: 905.738.5700
f: 905.738.0065

5688 MAIN STREET
HYSON PROPERTIES INC.
PROPOSED DEVELOPMENT PLAN

SCALE:	
DATE:	JUNE 2025
DESIGNED BY:	H.E.
CHECKED BY:	B.D.

PROJECT No. 100319

FIGURE No. 1-2

2. Stormwater Management

2.1. Existing Stormwater Management

The existing topography of the site is generally flat with gentle sloping from north to south. Existing site drainage primarily drains towards catchbasins along the east side of the site within the municipal boulevard. Based on review of existing record drawings it appears that these catchbasins are then connected and discharge out towards the Palmwood Gate right-of-way existing municipal storm sewers, which then flow into the storm sewers along Main Street. Under existing conditions, it appears that external drainage enters the site from the neighbouring property on the north, and that there are no stormwater management quantity or quality controls exist on site. Refer to **Figure 2.1** for the **Existing Drainage Area Plan**.

The existing site servicing details obtained from The Town of Whitchurch-Stouffville engineering plan and profiles and a topographical survey completed of the area, indicate that there is an existing 900mm storm sewer on the west side of Palmwood Gate adjacent to the subject site. It appears that the subject site catchbasins are connected to this sewer in existing conditions. It appears that the catchbasins in the adjacent Main Street and Palmwood Gate rights-of-ways also connect to this storm sewer. The 900mm storm sewer flows south down Palmwood Gate and connects to the storm sewer along Main Street. The existing sewer infrastructure is shown on **Servicing Plan (S1)**.

2.1.1. Stormwater Management Design Criteria

The proposed stormwater management design is based on the MOE 2003 Stormwater Management Planning & Design (SWMPD), The Town of Whitchurch-Stouffville "Design Guidelines and Standard Drawings" (April 2021), and The Toronto and Region Conservation Authority "Stormwater Management Criteria" (August 2012).

The subject site is within the Rouge River Watershed. The subject site drainage flows south through municipal storm infrastructure on Main Street, which ultimately discharges into the Rouge River and subsequently Lake Ontario.

Stormwater Quantity Control

- The design of the storm sewer drainage system shall provide controls to match the existing capacity of the adjacent storm sewer, which is designed to the 2-year storm event. All site flows up to and including the post development 100-year storm event will be captured and controlled to the existing 5-year design flow rate.

Stormwater Quality Control

- A minimum of "Normal" level of water quality treatment, as defined in the MOE design guidelines (2003) is required for all SWM facilities. This is equivalent to a 70% TSS reduction.

Stormwater Water Balance

- As per the SWM Design Manual (MOE, 2003), water balance impacts should be evaluated during the design of a site stormwater management system. All efforts should be made to match pre- and post-development infiltration volumes in order to maintain groundwater recharge.
- A minimum of 5mm for all storm events will be retained through infiltration, evapotranspiration and/or rainwater reuse.

Construction Erosion and Sediment Control

- All applicants must include an Erosion and Sediment Control plan demonstrating that fish habitat and water quality are not affected by sediment from the property during or following site construction.
- Guidelines and strategies to develop Erosion and Sediment Control plans can be found in the *Erosion and Sediment Control Guidelines for Urban Construction* manual (GGHA CA, 2006).

2.1.2. Proposed Stormwater Outlet Connection

The proposed storm connection will be made to the existing 900mm storm sewer adjacent to the south-east corner of the site via a 300mm storm service connection at 1.0% within Palmwood Gate. Based on the review of the existing record drawings, it appears that the 900mm storm sewer in Palmwood Gate currently receives drainage from the subject property. In order to discharge to this storm sewer, the proposed development will be required to match the post development storm flows to the existing development flows.

The proposed sewer infrastructure is shown on the **Servicing Plan (S1).**

2.1.3. Stormwater Management Design Strategy

Since the subject proposed development has nearly full coverage underground parking structure, the proposed stormwater management will need to be located within the building parking structure. It is expected that the vast majority of the quantity storage will be contained with a stormwater tank on the P1 level of the building. For water quality an Oil-grit-separator will be required for treatment of the surface runoff upstream from the stormwater tank. The tank will have a re-use chamber to retain clean stormwater run-off for site landscape irrigation purposes. The storm control maintenance hole will have an orifice to control site flows to the existing development flows. It is anticipated that the proposed design will have a net improvement on the downstream storm sewer network and the Rouge River watershed.

2.1.4. Stormwater Quantity Control

The subject site stormwater management design criteria are based on The Town of Whitchurch-Stouffville "Design Guidelines and Standard Drawings" (April 2021). The design of the storm sewer drainage system shall provide controls to match the existing capacity of the adjacent storm sewer, which is designed to the 2-year storm event. All site flows up to and including the post development 100-year storm event will be captured and controlled to the existing 2-year design flow rate.

The existing allocation for the allowable release rate has been determined based the exiting site topography and area land use. Under proposed conditions the site will be required to control storm water runoff to the 2-year rate which is currently discharging to the 900mm storm sewer in Palmwood Gate. All stormflows greater than the 2-year event which exceed the capacity of the sewer will be controlled on site through a proposed stormwater management tank. The existing site area is a mix of landscaping, rooftop, and asphalt. Based on these areas a composite runoff coefficient was determined.

The stormwater flows were determined using a time of concentration 10 minutes and a composite runoff coefficient of 0.78 for existing and 0.70 for proposed, which includes the external drainage form the north. Town of Stouffville design guidelines were used in conjunction with pre and post site condition data to compute the storm water management design. See **Figure 2-1 and 2-2** for area type breakdown and catchment areas.

The total required stormwater storage to achieve the allowable post development flows is 59.2m^3. This will be achieved through a storm vault storage on the P1 level. The tank will be equipped with a 225mm outlet orifice plate which will control peak 100-year storm discharge to 94.56L/s, which is less than the existing 2-year allowable release rate of 96.59L/s and therefore achieving the stormwater quantity criteria objective.

2.1.5. Stormwater Quality Control

Based on the requirements of the MOE and The Town of Whitchurch-Stouffville, stormwater quality is required to achieve an average of 70% long-term removal of total suspended solids based on an annual loading basis from all runoff leaving the site.

Most of the site is rooftop or pedestrian hardscape and landscape. Runoff from rooftop areas is considered "clean" water and does not require quality control. Asphalt pavement driveways and vehicular loading areas of the proposed development area will have the potential to generate contaminated runoff and will require treatment to achieve the water quality objective. An analysis was completed to determine the TSS removal rate would achieve a 61% removal rate without any additional controls. In order to achieve the requirement, an Oil Grit Separator is proposed which will increase overall treatment of TSS removal to be 88%, achieving the TSS removal requirement.

2.1.6. Stormwater Water Balance

The site has been designed so that at minimum, the 5mm storm event can be retained on site through infiltration. Based on a total developed area of 4,022m^2, the 5mm volume required to be retained on site is 20.1m^3 (4,022m^2 x 5mm).

The first step in the analysis of water balance is initial abstraction. The initial abstraction of water depends on the surface with which the water lands. For example, a landscaped area with permeable soils has an initial abstraction of 5mm whereas an impervious surface like an asphalt road has an initial abstraction of 1mm. The initial abstraction for the is 11.0m^3 for the total site area therefore the remaining 9.1m^3 of water will need to be retained and reused on site.

2.2. CONSTRUCTION EROSION & SEDIMENT CONTROL

Details for erosion and sedimentation control during construction will be subject to the Town of Whitchurch-Stouffville approval prior to issuance of Building Permit. During the site grading and servicing works, there is potential for sediment-laden runoff to be directed toward the adjoining properties, municipal streets, and existing storm infrastructure. Therefore, prior to any grading activity, sediment control fencing and hoarding must be installed along the site perimeter. Additional measures will include construction of an entrance "mud-mat' on the access to be used during construction to minimize mud tracking offsite. Material stockpiles are to be located in appropriate locations. Inlet sediment control devices are to be used on existing catchbasins in municipal right-of-ways that may be affected by the construction of this site. The sequencing of the implementation of the above and additional erosion and sediment control measures is summarized in the following table.

Table 2-1: Erosion Control Sequencing

Activity	Erosion Control Practice
Area Grading	• Construct and maintain entrance “mud-mat”. • Construct and maintain sediment control fencing around the downstream perimeter of the site. • Locate stockpiles away from sensitive areas.
Servicing and Asphalt Works	• Limit open trench lengths to minimize erosion potential of excavated material. • Prevent erosion of material stockpiles. • During work stoppages or inclement weather, plug ends of open sewers to prevent downstream sedimentation. • Protect catchbasin inlets with Terrafix Silt Sack.
Maintenance	• Remove accumulated sediments when depth exceeds 0.30 m. • Maintain and repair sediment control fencing as required. • Maintain and repair catchbasin sediment controls as required.

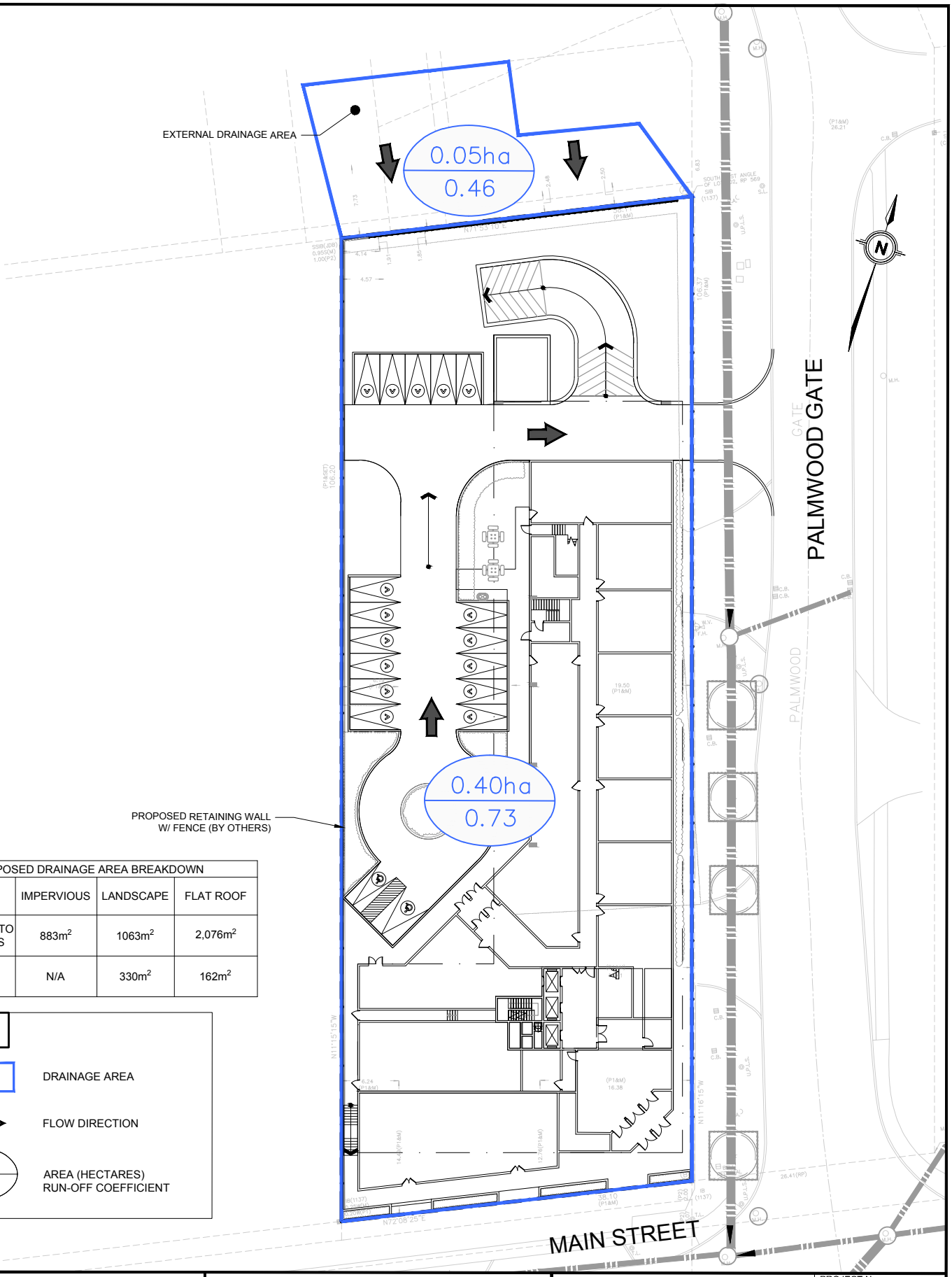
TYLin
3381 STEELES AVENU EAST,
Suite 315
TORONTO, ON
M2H 3S7
p: 905.738.5700
f: 905.738.0065

5688 MAIN STREET
HYSON PROPERTIES INC.
EXISTING DRAINAGE PLAN

SCALE:	N.T.S.
DATE:	JUNE 2025
DESIGNED BY:	H.E.
CHECKED BY:	B.D.

PROJECT No. 100319

FIGURE No. 2-1



PROPOSED DRAINAGE AREA BREAKDOWN			
TYPE	IMPERVIOUS	LANDSCAPE	FLAT ROOF
CONTROLLED TO AREA DRAINS	883m^2	1063m^2	2,076m^2
EXTERNAL DRAINAGE	N/A	330m^2	162m^2

LEGEND

- DRAINAGE AREA
- FLOW DIRECTION
- 0.8HA / XXX — AREA (HECTARES) / RUN-OFF COEFFICIENT

TYLin
3381 STEELES AVENU EAST,
Suite 315
TORONTO, ON
M2H 3S7
p: 905.738.5700
f: 905.738.0065

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PROPOSED DRAINAGE PLAN

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FIGURE No. 2-2

3. Sanitary Servicing

3.1. Existing Sanitary Servicing

The existing site servicing details obtained from The Town of Whitchurch-Stouffville engineering plan and profiles and a topographical survey completed of the area indicate that there is sanitary sewer infrastructure in the vicinity of the site. The following sanitary infrastructure is adjacent to the subject site;

- A 200mm diameter sanitary sewer in Palmwood Gate flowing south. This sewer conveys sanitary flow north of the site towards Main Street and then connects into a 200mm sanitary sewer which flows west on Main Street.
- A 200mm diameter sanitary sewer in Main Street flowing west.

The site is currently occupied by a single commercial building and a parking lot. Based on the Town of Whitchurch-Stouffville design flow rate of 350L/d/capital and population density of 80 person/hectare, the total peak sanitary flow for the existing condition (including infiltration allowance) has been calculated as 0.18L/s. Refer to **Appendix B** for the sanitary calculations and **Servicing Drawing (S1)** for the existing sanitary sewer infrastructure and proposed sanitary service design.

3.2. Proposed Sanitary Servicing

The average flows and densities for the various areas of the site and building types was obtained from the Town of Whitchurch-Stouffville *Design Guidelines and Standard Drawings*. The total peak sanitary flow for the proposed development (including the infiltration allowance) has been calculated as 6.99L/s. This is an estimated peak increase of 6.81L/s from the existing sanitary flow rate of 0.18 L/s. This flow rate would represent 24.8% of the capacity of the existing 200mm sanitary sewer main on Main Street. Refer to **Appendix B** for details of the calculations.

The subject site's proposed sanitary sewer outlet will be to the existing 200mm sanitary sewer along Main Street. The subject site sanitary sewer will connect directly into the Main Street sanitary sewer via a 200mm storm service connection at 1.0% slope into a proposed maintenance hole. Refer to **Servicing Drawing (S1)** for the location of the proposed sanitary infrastructure.

4. Water Servicing

4.1. Existing Water Servicing

The existing site servicing details obtained from The Town of Whitchurch-Stouffville engineering plan and profiles and a topographical survey completed of the area, indicate that there is watermain infrastructure in the vicinity of the site. The following watermain infrastructure is adjacent to the subject site;

- A 250mm diameter watermain on the west side of Palmwood Gate,
- A 250mm diameter watermain on the north side of Main Street,

Refer to the **Servicing Drawing (S1)** for the location of the existing watermain infrastructure.

4.2. Proposed Water Servicing

The proposed water service connection will be made to the 250 mm diameter watermain located within the Main Street right-of-way just south of the site. The connection will consist of a proposed 200mm fire line connection with 150mm domestic watermain as per Town of Whitchurch-Stouffville standard drawing WS-614. The water service will have a backflow preventer and meter located in the mechanical room within the building's P1 level. Refer to **Servicing drawing (S1)** for additional details.

Under proposed conditions the development is anticipated to have a maximum required fire flow demand of 150L/s based on the Town standard. The maximum day, minimum hour, and peak hour domestic flow demands for the development under proposed conditions has been calculated as 2.95L/s, 1.58L/s, and 4.43L/s, respectively.

A hydrant flow test was completed on November 9, 2023 in order to verify that the watermain has adequate flow and pressure to service the development. In accordance with the Fire Underwriters Survey (FUS), fire flows for residential areas will not be less than 4,800 L/min (80L/s) for a 2-hour duration in addition to maximum daily domestic demand, delivered with a residual pressure of not less than 140kPa (20.3psi). With a maximum day demand + fire flow of 72.5L/s, accounting for major and minor losses in the system from the residual hydrant from the flow test, the residual pressure is above the minimum requirement of 20.3psi.

Refer to **Appendix C** for fire and domestic flow demand calculations and the proposed and existing watermain infrastructure are shown on the **Servicing Drawing (S1)**.

4.3. Fire Hydrant Coverage

There is one main existing fire hydrant located within the proximity of the proposed development:

- An existing fire hydrant at the east side of the site on Palmwood Gate, located approximately 60m north of Main Street.

Due to the height and size of the proposed development there will be a siamese connection required which will need to be serviced within 45m of a fire hydrant. The siamese connection will be next to the primary entrance of the proposed development.

5. Conclusion

The proposed development will see the construction of a 220-unit mixed-use development at 5688 Main Street in the Town of Whitchurch-Stouffville. The proposed development can be serviced utilizing the existing and proposed infrastructure outlined in the **Servicing Drawing (S1)**. Our conclusions and recommendations for servicing of the proposed development is summarized as follows:

Stormwater Servicing

- The proposed development will match 100-year post-development peak flows to existing development peak 2-year flows.
- The proposed development site stormwater drainage will have a net improvement to the downstream sewer infrastructure.
- Stormwater quality will be achieved by the high percentage of rooftop, landscape coverage, and the installation of the proposed oil-grit-separator.
- The proposed development will be serviced by a new 300mm storm sewer with a slope of 1.0%, connecting to the existing 900mm storm sewer within the Palmwood Gate.
- Under post-development conditions it is expected that stormwater runoff will have had an improvement in quality and quantity as compared with existing development condition.
- A stormwater storage vault will be constructed within the first level of the underground parking facility. The vault will be designed with a 225mm orifice plate, restricting flows and achieving a total storage volume of 59.2m^3 to control the 100-year post-development flows to the allowable release rate of 96.59L/s.

Sanitary Servicing

- The anticipated peak sanitary peak flow for the proposed development is 6.81L/s.
- It is expected that this additional loading will not have a negative impact on the existing municipal sanitary sewer system and will sufficiently handle the increased loading.
- The new service connection will consist of 200 mm diameter connection at a 1.0% slope and will be made to the existing 200mm sanitary sewer within Main Street.

Water Servicing

- The fire flow demand due to the proposed development is 150L/s.
- The calculated maximum day, peak hour, and minimum hour domestic demands are 2.95L/s, 4.43L/s, and 1.58L/s, respectively.
- The proposed development will be serviced by the proposed fire and domestic service connections provided off of the 250mm diameter watermain on Main Street.
- Under fire flow demand loading condition, water pressure will remain at approximately 72.5 psi, which is above the minimum required pressure of 20.3 psi.
- Additional confirmation of the fire and domestic branch sizing and fire flow requirements should be provided by the Mechanical Consultant at the Building Permit stage of approval.

Recommendations

In summary, the site can be adequately serviced in respect to water supply, sanitary drainage, stormwater drainage, and stormwater management. The stormwater quantity and quality controls can be implemented in accordance with The Toronto Region Conservation Authority "Stormwater Management Criteria" (August 2012).

Accordingly, we hereby recommend the adoption of this report as it relates to the provision of servicing works, and for the purposes of site plan application, and building permit application approvals. We trust that this Functional Servicing and Stormwater Management Report is sufficient for your purposes. If you have any questions or comments, please do not hesitate to contact the undersigned.

Sincerely,

TYLin

Prepared by:

Herishanth Easwaran, E.I.T.

Urban Development

Reviewed by:

Ben Davies, P.Eng

Director, Urban Development

Appendix A

STORMWATER MANAGEMENT CALCULATIONS

TYLin	Project:	**5688 Main Street**	Prepared by:	**H.E.**
	Task:	**Runoff Coefficients**	Checked by:	**B.D.**
	Date:	**June 6, 2025**	Project no.:	**100319**

Pre-Development Site Statistics

Subject Site		**Area (m^2)**	**Runoff C**
	Landscape	500	0.25
	Paved	3522	0.90
	Total	4022	
	Subject Site Runoff C =		0.82
	% Imperviousness =		88%

External Drainage		**Area (m^2)**	**Runoff C**
	Landscape	330	0.25
	Roof	162	0.90
	Total	493	
	External Area Runoff C =		0.46
	% Imperviousness =		33%

Total Pre-Dev		**Area (m^2)**	**Runoff C**
	Subject Site	4022	0.82
	External Drainage	493	0.46
	Total	4514	
	External Area Runoff C =		0.78
	% Imperviousness =		82%

Post-Development Site Statistics - Controlled Flow

Subject Site - Controlled Flow

	Area (m^2)	Runoff C			
		2-yr - 10 yr	**25-yr**	**50-yr**	**100-yr**
Landscape	1063	0.25	0.28	0.30	0.31
Impervious	883	0.90	0.99	1.00	1.00
Roof	2076	0.90	0.99	1.00	1.00
Total	4022				
Total Combined Runoff C =		0.73	0.80	0.82	0.82
% Imperviousness =		74%			

External Drainage

	Area (m^2)	Runoff C			
		2-yr - 10 yr	**25-yr**	**50-yr**	**100-yr**
Landscape	330	0.25	0.28	0.30	0.31
Roof	162	0.90	0.99	1.00	1.00
Paved	0	0.90	0.99	1.00	1.00
Total	493				
Total Combined Runoff C =		0.46	0.51	0.53	0.54
% Imperviousness =		33%			

Total Post-Dev Controlled

	Area (m^2)	Runoff C			
		2-yr - 10 yr	**25-yr**	**50-yr**	**100-yr**
Subject Site	4022	0.73	0.80	0.82	0.82
External Drainage	493	0.46	0.51	0.53	0.54
Total	4514				
Total Combined Runoff C =		0.70	0.77	0.78	0.79
% Imperviousness =		69%			

TYLin	5688 Main Street 100319 6/6/2025	Prepared By: **H.E.** Checked By: **B.D.**

Pre Development Flow / Allowable Release Rate

Pre-Development Flows

The pre-development flows from the site to the Palmwood Gate sewer shall be calculated as per Regional 2-year storm IDF parameters with a time of concentration of 10 minutes.

$$i = 3454/(T+20)$$

where; i = Rainfall Intensity in millimeters per hour
T = Time of Concentration in minutes

Storm Event	Area (ha)	C	i (mm/h)	Q (L/s)
2-year	0.45	0.78	98.7	96.59

Therefore, the allowable release rate from the site to the Palmwood Gate storm sewer is 96.59L/s.

TYLin

Project:	**5688 Main Street**	Prepared by:	**H.E.**
Task:	**TSS / Quality Control Calculations**	Checked by:	**B.D.**
Date:	**June 6, 2025**	Project no.:	**100319**

Jellyfish TSS Removal = 80%

Land Type	Treated / Untreated	Area (m^2)	TSS Rem. (A)	TSS Rem. with Oil Grit Separator (R)
Roof	Treated	2,076	80%	98%
Landscape	Treated	1,393	80%	100%
Impervious	Treated	1,045	0%	50%
TOTAL		4,514	**61%**	**88%**

NJDEP Calculation for TSS removal rates for BMP in Series:

R = A + B - [(AxB)/100]

A = TSS Removal rate from First (Upstream BMP)

B = TSS Removal rate from Second (Downstream BMP)

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Project: **5688 Main Street**
Task: **Orifice Sizing Calculations**
Date: **June 6, 2025**

Prepared by: **H.E.**
Checked by: **B.D.**
Project no.: **100319**

Orifice Equation: $Q = C \times A \times \sqrt{2gh}$

HWL =	261.64	
Pipe Invert =	260.89	
Orifice Size =	**225**	**mm**
Orifice Area =	0.0398	m^2
Allowable Release Rate =	96.59	L/s
Discharge Coefficient =	0.62	
Head =	0.75	m
Orifice Flow =	0.095	m3/s
	94.56	L/s
Storage Requirement =	**59.2**	**m^3**
Minimum Tank Area Required =	78.9	m^2
Tank Area Provided =	79.2	m^2
Storage Provided =	**59.4**	**m^3**

TYLin

Project:	**5688 Main Street**	Prepared by:	**H.E.**
Task:	**100 Year Storage Required**	Checked by:	**B.D.**
Date:	**June 6, 2025**	Project no.:	**100319**

			Total Site	
100 Year		Runoff Coeff. (C):	0.79	
a	2051.707	Drainage Area (A):	0.45	ha
b	6.23	Rooftop Control	42.00	L/s/ha
c	0.86	Rooftop Area	0.21	ha
		Rooftop Flow	8.72	L/s
			0.0087	m^3/s
		Orifice Flow :	94.6	L/s
			0.095	m^3/s

Storm Duration	i	Inflow	Flow	Max Storage	
	100-year	CIA/360	Stored	Required	
minutes	(mm/hr)	(m^3/s)	(m^3/s)	(m^3)	
5	256.3	0.262	0.167	50.2	max
6	238.2	0.244	0.149	53.8	
7	222.6	0.229	0.134	56.3	
8	209.1	0.215	0.121	58.0	
9	197.2	0.204	0.109	58.9	
10	186.7	0.193	0.099	59.2	
11	177.4	0.184	0.089	59.0	
12	169.0	0.176	0.081	58.4	
13	161.4	0.168	0.074	57.4	
14	154.5	0.161	0.067	56.1	
15	148.2	0.155	0.061	54.5	
20	123.6	0.131	0.036	43.5	
25	106.4	0.114	0.019	28.9	
30	93.6	0.101	0.007	11.9	
35	83.8	0.091	0.000	0.0	
40	75.9	0.084	0.000	0.0	
45	69.5	0.077	0.000	0.0	
50	64.1	0.072	0.000	0.0	
55	59.6	0.068	0.000	0.0	
60	55.7	0.064	0.000	0.0	

TYLin	Project:	**5688 Main Street**	Prepared by:	**H.E.**
	Task:	**Water Balance**	Checked by:	**B.D.**
	Date:	**6/6/2025**	Project no.:	**100319**

Retention Criteria

The Town of Stoufville water balance objectives require that controls be in place such that the 5mm storm can be retained on site through infiltration, evapotranspiration and/or water reuse.

Site Area	=	4021.8	m^2
Storm Event to be Captured	=	5.0	mm
Storage Volume Required	=	20.1	m^3

Initial Abstraction Calculation

	Depth (mm)	Area (m^2)	IA (m^3)
TOTAL		**4022**	**11.0**
Landscape	5	1062.9	5.3
Impervious	0.6	882.7	0.5
Rooftop	2.5	2076.2	5.2

Initial Abstraction	=	11.0	m^3
maning Retention Volume Required	**=**	**9.1**	**m^3**

Retention Storage Provided

Retention Section Area =	79.20	m^2
Retention Volume Provided =	**11.54**	**m^3**
Sump Height =	0.15	m
tion Volume Requirement/72 hours =	11.54	m^3

(per calculation provided by EXP Services Inc. Dec 2024)

Appendix B

SANITARY CALCULATIONS

Project Name : **5688 Main Street**
Project # : **100319**
Sanitary Servicing Analysis

TYLin

Prepared by: H.E.
Checked by: B.D.
Date: June 6, 2025

Standards = Stouffville

Formulas
Peaking Factor (Harmon) = $1+14/[4+(P/1000)^{1/2}]$
Peak Flow = p(q)M(unit conversion) + infiltration

Existing Sanitary Design Flow

Land Type	Area (m^2)	# of Units /Floor Area	Density	Population (p)	Average Flow (q)	Peaking Factor (M)	Peak Flow (Q) (L/s)
Infiltration Allowance	4021.77				0.26 L/s/ha		0.10
Commercial - 1 Storey	571.12		0.008 Persons/m2	5	350 L/day/person	4.00	0.07
Total	**571.12**						**0.18**

Proposed Sanitary Design Flow

Land Type	Area (m^2)	# of Units /Floor Area	Density	Population (p)	Average Flow (q)	Peaking Factor (M)	Peak Flow (Q) (L/s)
Infiltration Allowance	4021.77				0.26 L/s/ha		0.10
Residential (1Bedroom)		48 Units	2.2 Persons/Unit	106	350 L/day/person	3.50	1.50
Residential (2 Bedroom)		150 Units	2.2 Persons/Unit	330	350 L/day/person	3.50	4.68
Residential (3 Bedroom)		22 Units	2.2 Persons/Unit	48	350 L/day/person	3.50	0.69
Commercial	201		0.008 Persons/m2	2	350 L/day/person	4.00	0.03
Total	**201**						**6.99**

Summary

Existing Sanitary Design Flow =	0.18	L/s
Proposed Sanitary Design Flow =	6.99	L/s
Increased Flow =	6.81	L/s

Service Connection	Diameter (m)	Slope (%)	Velocity (m/s)	Full Flow Capacity (L/s)	Spare Capacity (L/s)	Usage Increased (%)	Total Usage (%)
Service	200	1.0	1.04	32.80	25.81	-	21.3%
Ex. Main	200	0.7	0.90	28.21	21.22	24.1%	24.8%

Notes

1. The proposed development is an increase of 6.81 L/s of peak sanitary flow to the downstream sanitary sewer system.
2. This increase is equal to 24.1% of the total pipe capacity of the existing 200mm municipal sanitary sewer.
3. This flow is equal to 21.3% of the total pipe capacity of the proposed 200mm diameter service connection.

Appendix C

WATER DEMAND CALCULATIONS

FIRE HYDRANT FLOW TEST (BRUCEFIRE ENGINEERING)

TYLin

5688 Main Street
100319
Required Fire Flow

Prepared by: **HE**
Checked by: **BD**
Date: **6/6/2025**

as per Fire Underwriters Survey Water Supply for Public Fire Protection, 2020

1. Initial Required Fire Flow (Step A, B, C)

Construction Type =	Type II Noncombustible Construction	
Construction Coefficient, C =	0.8	
Total Effective Area, A =	2808.935	m^2
Required Fire Flow, RFF =	9327.89	LPM
RFF, rounded =	**9000**	**LPM**

2. Occupancy and Contents Adjustment Factor (Step D)

Contents =	Noncombustible contents	
Adjustment Factor =	-25%	
RFF =	**6750**	**LPM**

3. Automatic Sprinkler Protection (Step E)

Sprinkler Design	**Designed**	**Building Coverage**	**Credit**
Automatic sprinkler protection designed and installed in accordance with NFPA 13	Yes	100%	30%
Water supply is standard for both the system and Fire Department hose lines	Yes	100%	10%
Fully supervised system	Yes	100%	10%
	Total Sprinkler Credit =		50%

Reduction = 3375 LPM

4. Exposure Adjustment Charge (Step F)

Direction	Distance	Charge
North	20.1m to 30m	10%
South	Greater than 30m	0%
East	Greater than 30m	0%
West	20.1m to 30m	10%
	Total Charge =	20%
	Charge =	**1350 LPM**

5. Final Required Fire Flow (Step G)

RFF =	6750	LPM
Reduction =	3375	LPM
Charge =	1350	LPM
RFF =	4725	LPM

Final RFF, rounded =	5000	LPM
	1321	GPM
	83	L/s
Town of Whitchurch-Stouffville Minimum Fire Flow =	**150**	**L/s**

TYLin

5688 Main Street
100319
Domestic Demand

Prepared by: **HE**
Checked by: **BD**
Date: **6/6/2025**

as per York Region Design Guidelines

Population =	486	
Per Capita Demand =	350	L/cap/day
Average Daily Demand =	170100	L/day
	1.97	L/s

	Average Day	Minimum Hour	Peak Hour	Maximum Day	
Peaking Factor	n/a	0.80	2.25	1.50	
Demand	**1.97**	**1.58**	**4.43**	**2.95**	**L/s**
	31.21	24.96	70.21	46.81	GPM

TYLin

5688 Main Street
100319
Pressure (Max Day+Fire)

Prepared by: **HE**
Checked by: **BD**
Date: **6/6/2025**

Fire Flow = 150.0 L/s
Max Day Flow = 2.95 L/s
Total Flow = **153.0 L/s**

Domestic

Diameter	Area (m^2)	Length (m)	Velocity (m/s)	Hydraulic Radius	S	Headloss (m)	Headloss (psi)
150	0.0177	3.4	0.2	0.0375	0.00	0.00	0.001
					Total major loss (psi) =		**0.001**

Fire

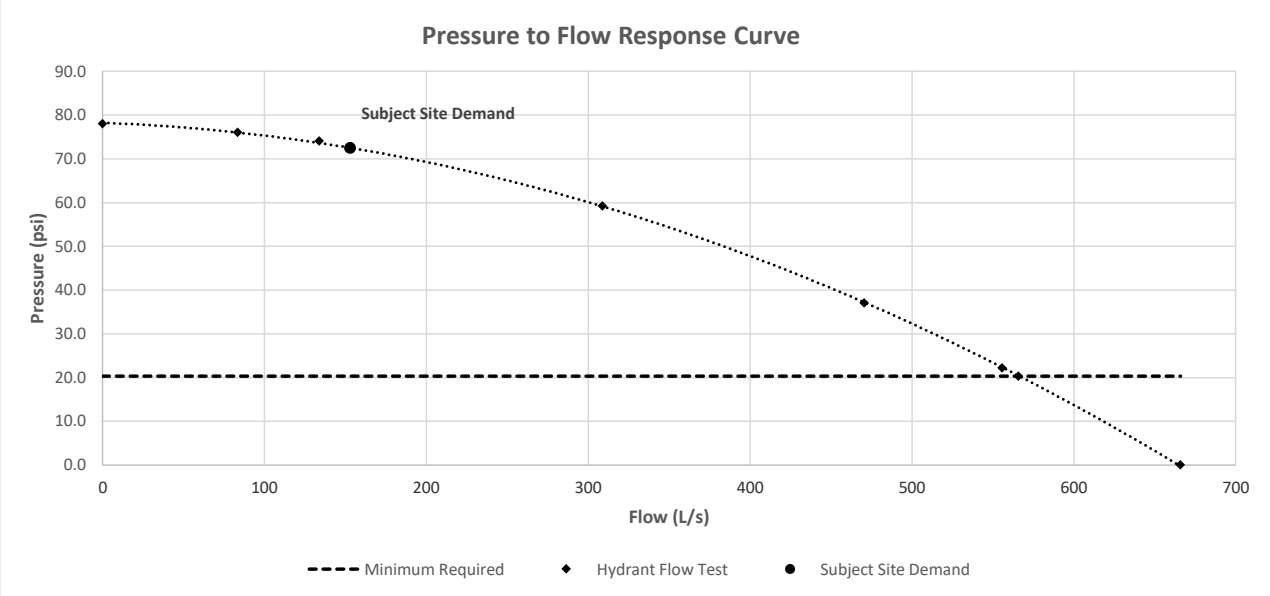
Diameter	Area (m^2)	Length (m)	Velocity (m/s)	Hydraulic Radius	S	Headloss (m)	Headloss (psi)
200	0.0314	3.4	0.1	0.05	0.00	0.00	0.000
					Total major loss (psi) =		**0.000**

Total Headloss = **0.002 psi**

Flow Test Results & Servicing Hydraulic Analysis

Pressure (psi)	*Flow (L/s)*	
78	0	*Static Pressure*
76	83.4	
74	133.9	

Flow Requirement =	***153.0***	L/s
Theoretical Pressure =	***72.5***	psi
With Pressure Losses =	***72.5***	psi
Minimum Required =	***20.3***	psi



"Fire Protection with Intelligence"
BRUCE Fire Engineering

Bruce Fire Engineering Ltd.

400 Applewood Crescent, Suite 100
Vaughan, Ontario
L4K 0C3

Phone: 905 482 4678
Fax: 905 581 3203
Toll Free Phone/Fax: 1 800 260 0187

Email: artem@brucefire.ca

Professional Engineers Ontario

HYDRANT FLOW TEST REPORT

TEST DATE: **Nov 9, 2023.** **TIME:** **1:30 pm**

LOCATION: **5688 Main St, Whitchurch-Stouffville, ON L4A 2T1**

TESTED BY: **Artem Matthew – Bruce Fire Engineering**

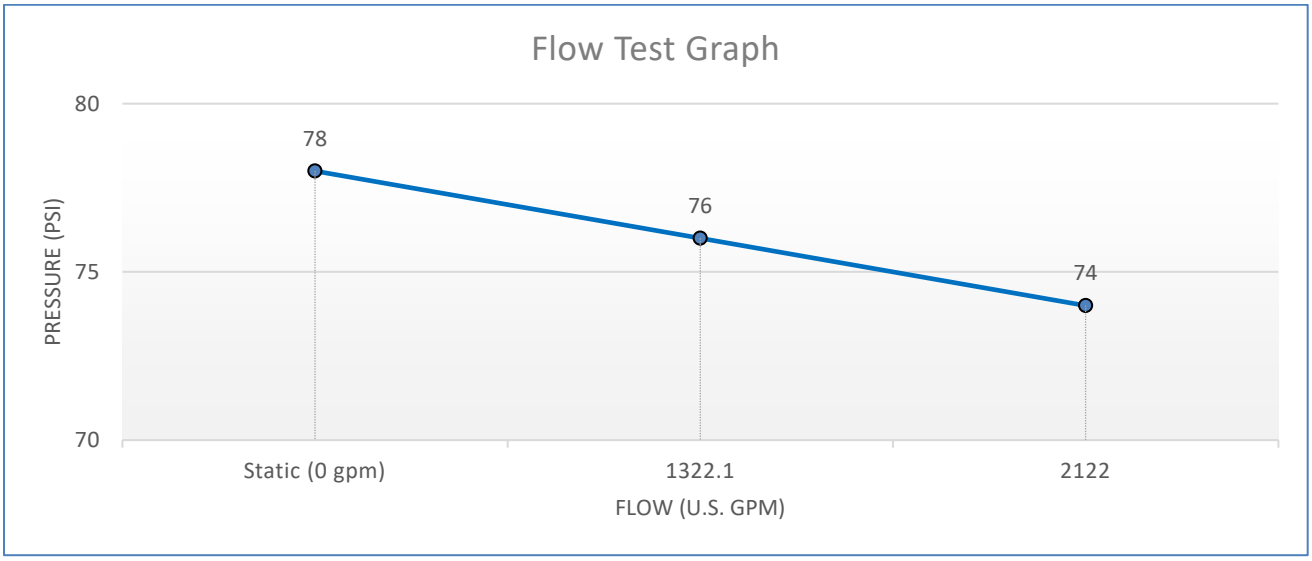
TEST RESULTS:

STATIC PRESSURE (psi)	78

TEST NO.	NO. OF NOZZLES	NOZZLE DIAMETER (inch)	DISCHARGE COEFFICIENT	RESIDUAL PRESSURE (psi)	PITOT PRESSURE (psi)	DISCHARGE (gpm)
1	1	2½"	0.9	76	62	1322.1
2	2	2½"	0.9	74	38/38	2124

Flow test done as per NFPA 291 recommendations.

Calculated Flow 9002 gpm @ 20 psi



AREA MAP


Rupert Ave
Service Rd
Palmwood Gate
Service Rd
Palmwood Gate
Tokyo Smoke Stouffville Main
Reesor's Market & Bakery
Shoppers Drug Mart
LCBO
Let Us Shop For You Today
Leggat Stouffville Ford
Car dealer
STATIC AND RESIDUAL HYDRANT
Main St
Main St
FLOW HYDRANT
Main St
Main St
Main St
Palmwood Gate
Firehouse Subs Stouffville
Sandwich · $$
Firehouse Subs Stouffville
Order Firehouse Subs Today
East Side Mario's
All-You-Can-Eat
The Beer Store
CIBC Branch with
One Plant Cannabis Dispensary - Stouffville
Mostar St
Starbucks
A New Spin On Festive Flavours