UNITED PROPERTY RESOURCE CORPORATION

NORVAL UNITED CHURCH
FUNCTIONAL SERVICING REPORT

JULY 10, 2023



NORVAL UNITED CHURCH

FUNCTIONAL SERVICING REPORT

UNITED PROPERTY RESOURCE CORPORATION

FUNCTIONAL SERVICING REPORT

PROJECT NO.: 221-05336
DATE: JULY 10, 2023

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1 INTRODUCTION

1.1 INTRODUCTION

This report has been prepared for the United Property Resource Corporation for the Norval United Church located at 14015 Danby Road (hereinafter referred to as the "Site") in the Town of Georgetown, to identify any servicing and/or grading constraints and to identify how the site may be developed. The current development concept, as represented in the site plan drawings and development statistics prepared by KPMB Architects, has been enclosed with this submission. The development is bordered by Danby Road to the northeast and southeast, 8th Line to the southwest, and Gellert Community Park to the northwest. The location of the development block is identified on Figure 1. The existing site conditions are shown on Figure 2 and illustrates the Site Limits and the neighboring properties.

The purpose of this report is to describe the existing services in the vicinity of the Site to determine how these lands will be serviced by storm, sanitary and water in support of the proposed Official Plan and Zoning Bylaw Amendment Applications. The report also reviews the site grading at a preliminary level to determine drainage boundaries and grading constraints. A separate Stormwater Management Report, also prepared by WSP Canada Inc, speaks to the Storm Water Management strategies including Water Quantity Control, Low Impact Development (LIDs) and Water Quality Control.

1.2 SITE DESCRIPTION

The Site is currently occupied by the existing church structure and associated parking areas, with a total area of 2.00 ha (4.94 acres). The general topography of the site currently slopes from the northwest to the southeast with localized low points to collect drainage. Presently, overland flow is directed to Danby Road. The existing elevations of the site are shown on Figure 2, Pre-Development Topographic Survey. The topographic survey was completed by Speight, Van Nostrand & Gibson Limited, dated September 20, 2022.

1.3 PROPOSED DEVELOPMENT

The current development proposal consists of a 6-storey residential building with associated underground parking structure, located west of the existing church structure. The property required for the proposed residential building will be severed from the existing church property. The existing church structure is to remain, and the existing parking area will be altered to provide additional parking. The proposed development and limit of severance is illustrated on Figure 3, Post Development Preliminary Site Plan.

The proposed residential building will contain seventy-two (72) 1-bedroom units, sixty-nine (69) 2-bedroom units and sixteen (16) 3-bedroom units for a total of 157 units. The proposed development plan is shown on Figure 3.

1.4 REPORT OUTLINE

For the purpose of this report a number of preliminary figures have been prepared to clarify the preliminary servicing and grading issues and potential solutions. The Site limits are identified in Figure 1 and was discussed in Section 1.2 of this report. The development block is identified by the Topographic Survey in Figure 2. The Conceptual Site Plan is shown in Figure 3 outlining the conceptual layout. The Preliminary Site Grading section of this report outlines the issues encountered with the existing grade and solutions to control the major and minor overland flow, as shown in Figure 4. The Preliminary Site Servicing outlines the proposed watermain, sanitary, and storm connections for the Site, and schematically lays out the proposed on-site servicing, and can be seen in Figure 5.



CLIENT

KPMB ARCHITECTS

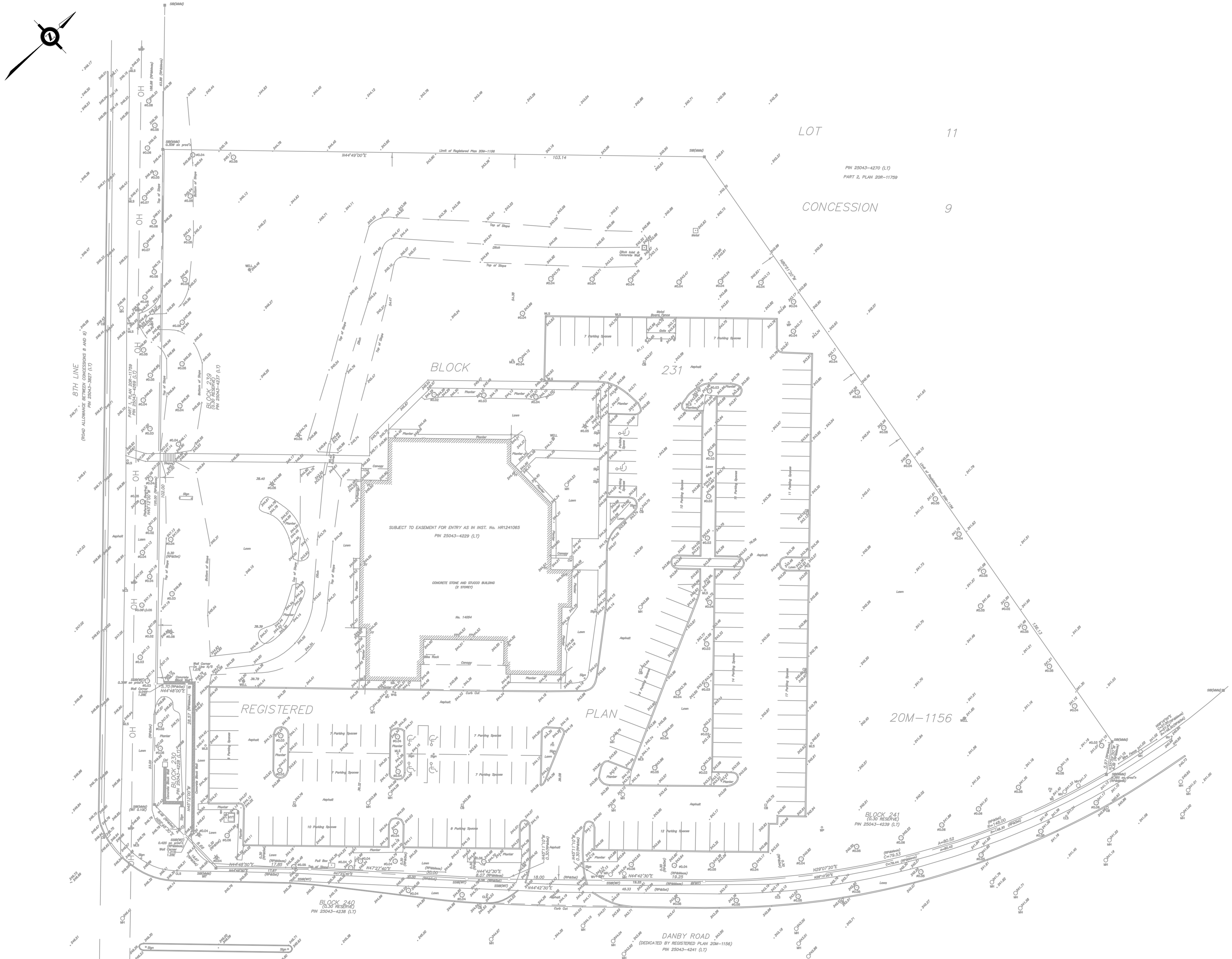
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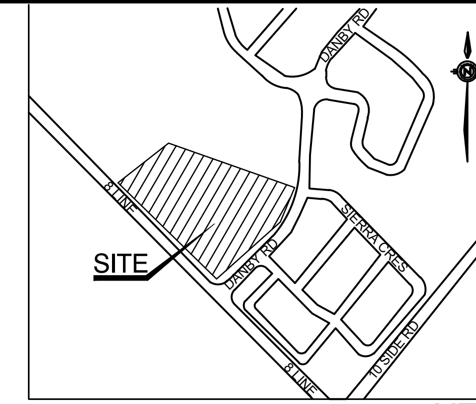
NORVAL UNITED CHURCH

LOCATION PLAN

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Scale NTS	Figure No. 1





KEY PLAN NTS

NOTE: TOPOGRAPHIC SURVEY PREPARED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. SURVEY TAKEN SEPT. 20, 2022.

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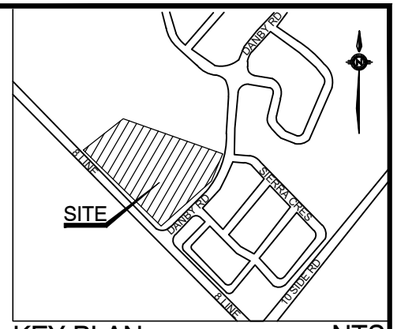
TITLE
14015 DANBY ROAD
PRE–DEVELOPMENT TOPOGRAPHIC SURVEY

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KEY PLAN NTS

LEGEND

SITE BOUNDARY

SEVERANCE LINE

NOTE: SITE PLAN PREPARED BY KPMB ARCHITECTS.

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TITLE

14015 DANBY ROAD

POST-DEVELOPMENT PRELIMINARY SITE PLAN

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2 SITE GRADING

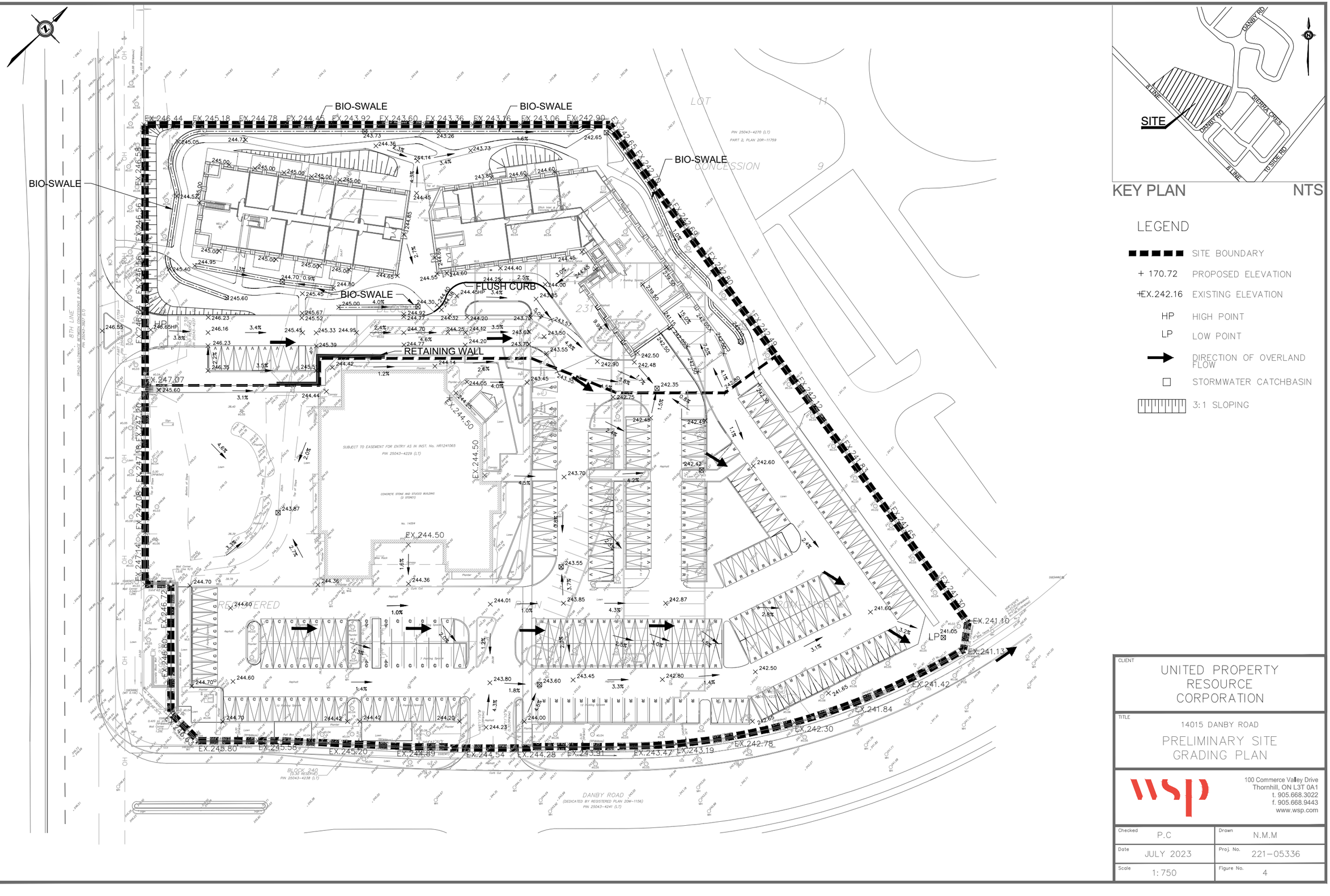
2.1 SITE GRADING

Site grading will be designed in accordance with the Town of Halton Hill's Storm Sewer Servicing and Roads grading criteria with respect to minimum and maximum grades. The Site's pre-development overland flow is directed southeast towards Danby Road; refer to **Figure 2** (Pre-Development Topographic Survey). Minor storm flows are currently collected by various on-site catchbasins and directed towards a proposed service connection leading to existing storm sewers on Danby Road.

The proposed development will be graded to direct all storm drainage to localized on-site catchbasins, and the overland flow route to Danby Road will be maintained.

Preliminary internal elevations are shown on **Figure 4**. Access to the site will be provided by two entrances, the first from Danby Road, and the second off 8th Line. Based on the existing and preliminary proposed elevations, road grades will generally vary between 1.0% and 5.0%. The minor flows will be captured in catchbasins and directed to a stormwater detention and retention facility located under the proposed parking space. The major flow in excess of the 100-year storm will be directed to Danby Road at the southeast corner of the site as indicated by the overland flow route arrows on **Figure 4**. Overland flows in the post-development condition will maintain the existing pre-development overland flow routes and outlet to Middle Sixteen Mile Creek located southeast of the site.

The proposed site grading will maintain the existing grades along all property lines and along the sides of the existing church building which is scheduled to remain.



KEY PLAN NTS

LEGEND

- SITE BOUNDARY
- + 170.72 PROPOSED ELEVATION
- +EX.242.16 EXISTING ELEVATION
- HP HIGH POINT
- LP LOW POINT
- DIRECTION OF OVERLAND FLOW
- STORMWATER CATCHBASIN
- 3:1 SLOPING

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TITLE
14015 DANBY ROAD
PRELIMINARY SITE GRADING PLAN

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C:\Users\CANA076622\ACCDocs\WSP Canada projects (AMER)\1201\Files\221-05336 Norval United Church\MAN\FSR\Fig4.dwg - tab:FIG 4

3 STORMWATER MANAGEMENT

3.1 MINOR STORM SYSTEM

As noted above, stormwater runoff will be intercepted by an internal minor storm sewer system. The minor storm sewer system has been designed to convey the 5-year post development flows in accordance with Town of Halton Hills Design Criteria. The storm sewer design sheet is attached in Appendix C. These minor storm flows are to be directed to a stormwater management system located beneath the proposed parking area. The schematic location of the stormwater management facility is shown in **Figure 5** (Preliminary Site Servicing Plan). The stormwater management facility will provide water quantity, conservation, erosion and sediment control and water balance requirements set out by the Town of Halton Hills. Water quality control for the site runoff will be provided by a proposed oil-grit separator (OGS) unit which will be installed immediately upstream of the proposed stormwater management facility. Details of the Stormwater Management Facility and Strategy are provided in the Stormwater Management Report, also prepared by WSP Canada Inc.

3.2 MAJOR STORM SYSTEM

As part of the Stormwater Management Strategy, the 100-year post development run-off will be contained and attenuated on-site. Flows and runoff in excess of the 100-year event will be directed overland to Danby Road. The direction of overland flow is illustrated on **Figure 4** (Preliminary Grading Plan).

4 SANITARY DRAINAGE

4.1 INTRODUCTION

For the purposes of this report, it has been assumed that there is available capacity within the existing sanitary sewer on Danby Road. A site utility investigation is pending and will confirm existing capacities. The proposed servicing layout and connection locations are illustrated on **Figure 5** and should be referenced with the sections below.

4.2 PRE- AND POST-DEVELOPMENT FLOWS

The estimated pre- and post-development sanitary sewage flows are estimated based on the Region of Halton Sanitary design criteria.

In the pre-development condition, the property contains 1 single storey institutional building with a combined GFA of approximately 1490m^2. Based on an average flow rate of 112m^3/ha/d (including infiltration and peaking factor) the peak sanitary flow from the site in the existing condition is 0.19L/s.

In the post-development condition, the development is proposed to contain 157 condominium units. Based on unit counts and floor areas and the Region of Halton Design Criteria the peak post-development sanitary flow from the site, including infiltration is 6.43L/s. Therefore, the development of the site will increase the sanitary flow by approximately 6.24L/s.

For a detailed breakdown of the pre- and post-development flow calculations see **Appendix A**.

4.3 PROPOSED SANITARY CONNECTION

The proposed development will have one 200mm diameter connection to the existing sanitary sewer on Danby Road in the southeast corner of the site. This connection will have a control manhole immediately inside the property line and will be designed per the Region of Halton design criteria. The existing sanitary service connection from the site will be located and maintained. Within the private site the proposed residential units will have a sanitary service connection to a common element sewer which is proposed to flow to the control manhole and ultimately the municipal sanitary sewer system. The proposed sanitary servicing for the site is shown on **Figure 5**.

5 WATER SUPPLY

5.1 WATER SUPPLY

There is an existing watermain on 8th Line. Existing connection to the church will be maintained. The site was pre-stubbed with a 200mm water service. The proposed development will have separate connections. The proposed development will have one 100mm diameter domestic connection and one 150mm diameter fire connection to the existing watermain on Danby Road. The domestic and fire lines will be connected to a combined water meter and backflow prevention device room as per Region of Halton Standards and Specifications.

Within the site the domestic and fire lines will be connected to a common water meter room. Furthermore, the fire line will have 1 proposed hydrant to provide fire protection for the development. The domestic and fire servicing within the individual buildings is to be designed by the mechanical consultant.

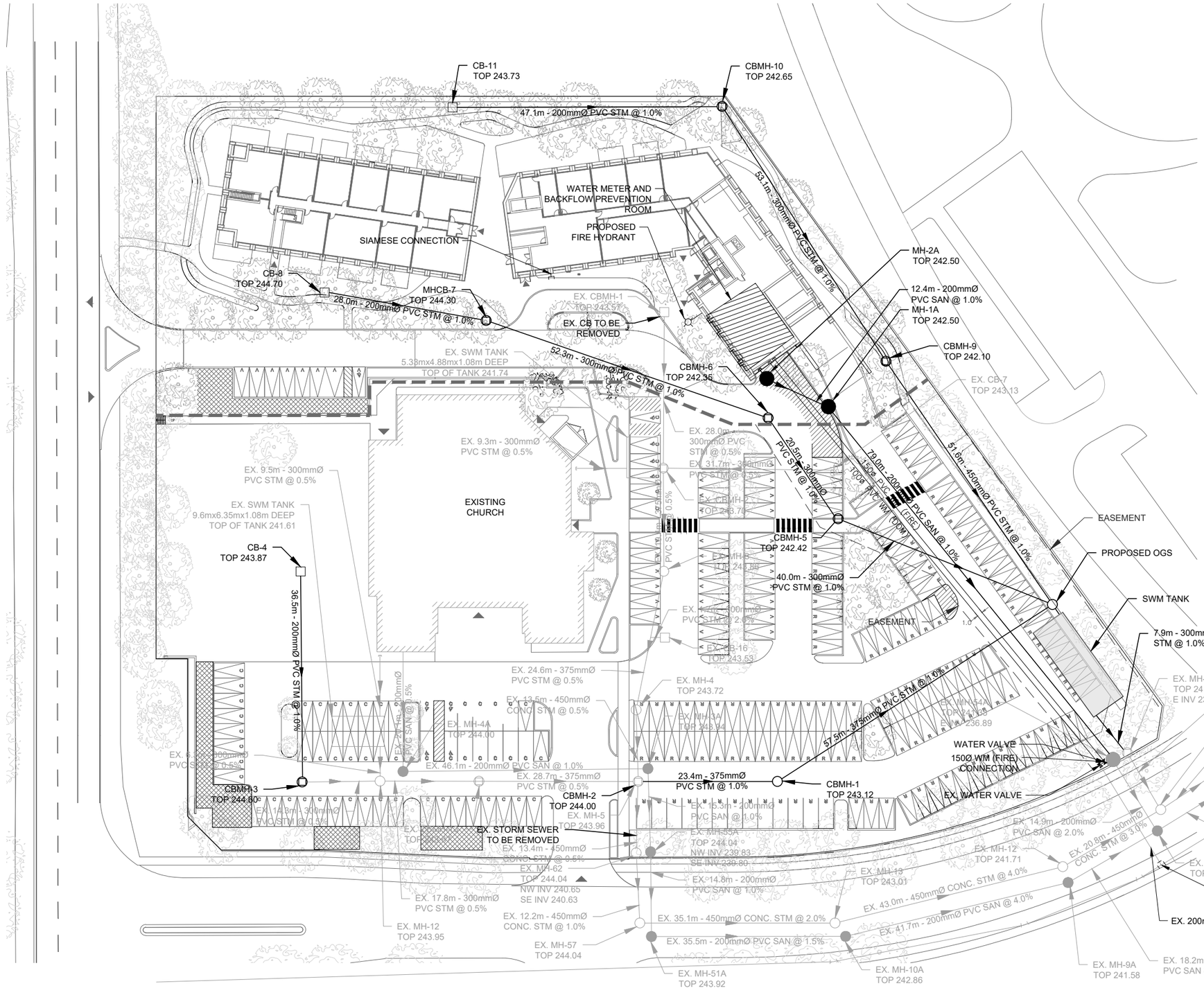
A detailed fire flow calculation has been prepared using the recommendations of the Water Supply for Public Fire Protection, 1999 – Fire Underwriters Survey (FUS). The fire flow calculation indicates that the recommended fire flow for this proposed development is 10,975 L/min (equates to 2,896 US GPM). The results of these calculations are included in **Appendix B**.

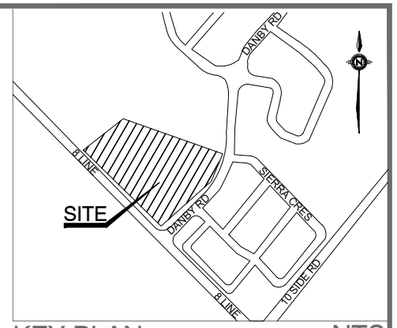
The proposed water servicing layout for the site is shown in **Figure 5**.

5.2 HYDRANT FLOW TEST

There are two (2) existing hydrants in the vicinity of the proposed development. There are two hydrants on Danby Road opposite the existing parking lot entrance. The first hydrant is east of the site and is located on the south side of Danby Road. The second hydrant is south of the site is located on the south side of Danby Road.

The maximum estimated fire flow demand for the proposed development is 2,896 US GPM as noted above. A hydrant flow test has been scheduled and results will be provided when available.





KEY PLAN NTS

LEGEND

- SITE BOUNDARY
- SANITARY MANHOLE
- HYDRANT
- CATCHBASIN MANHOLE
- STORMWATER CATCHBASIN
- EXISTING STORM MANHOLE

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TITLE

14015 DANBY ROAD

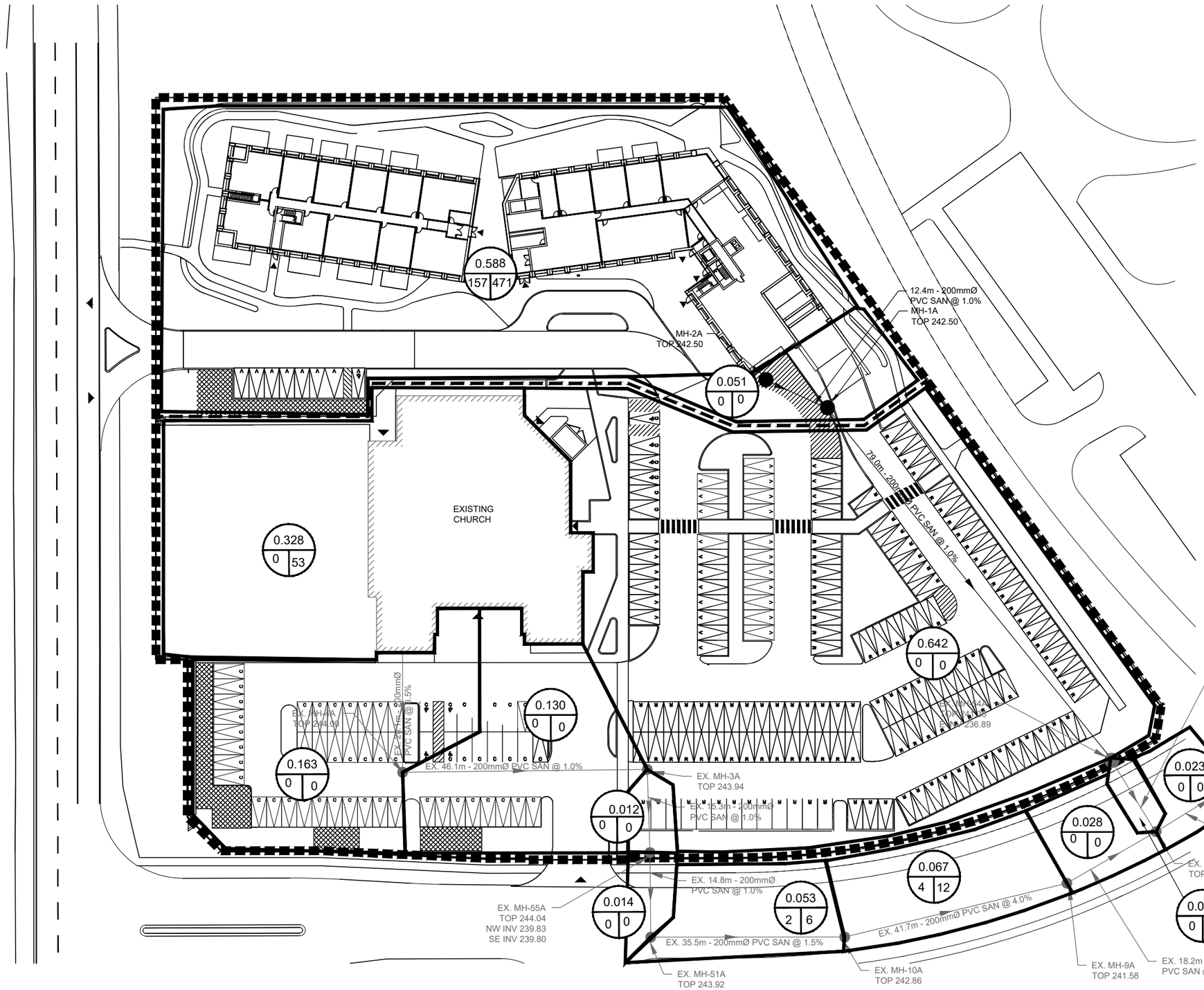
CONCEPTUAL SERVICING PLAN

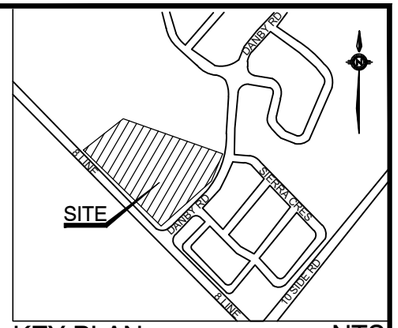
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Scale 1:750	Figure No. 5

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KEY PLAN NTS

LEGEND

- SITE BOUNDARY
- SEVERANCE LINE

NOTE: SITE PLAN PREPARED BY KPMB ARCHITECTS.

- DRAINAGE AREA (ha)
- EQUIVALENT POPULATION
- NUMBER OF UNITS
- PROP. DRAINAGE BOUNDARY
- PROP. SANITARY MANHOLE
- PROP. SANITARY SEWER
- EX. SANITARY MANHOLE
- EX. SANITARY SEWER

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TITLE
14015 DANBY ROAD
SANITARY DRAINAGE PLAN

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6 CONCLUSIONS

The following point form list summarizes the opportunities for the servicing and grading of the proposed development at 14015 Danby Road in Georgetown, Ontario.

- Boundary grades will generally be matched.
- Road grades will generally range between 1.0% and 5.0%.
- Storm flows from the site will be directed to on-site drains and directed to a stormwater management facility under the proposed park. The stormwater management facility will provide quantity, quality, erosion and water balance requirements.
- The overland flows for the 100-year storm event will be detained internally on site using the various water retention methods described in the SWM report. All overland flows over this regulated volume will continue to approximately follow the existing travelled path to the south of the site flowing and discharging adjacent to Danby Road, ultimately contributing to Middle Sixteen Mile Creek.
- Sanitary Flows from the site will be discharged though a new connection into the existing sanitary sewer located on Danby Road.
- There is an existing watermain of the south side of Danby Road. Domestic and Fire Lines will be extended from this existing watermain to provide water service for the site. The water system within the proposed residential building will be designed by the mechanical consultant to meet the Ontario Building Code.

APPENDIX

A PRE- AND POST-DEVELOPMENT SANITARY FLOWS

SANITARY FLOW GENERATION

Project: **NORVAL UNITED CHURCH - 14015 DANBY ROAD, HALTON REGION**
Job No.: **221-05336**

Existing Sanitary Flows

Unit Type	GFA (m^2)	GFA (ha)	Per Capita Flow (m^3/ha/day)	Peak Flow (L/s)
Institutional	1490	0.15	112	0.19

Proposed Sanitary Flows

Unit Type	GFA (m^2)	GFA (ha)	Per Capita Flow (m^3/ha/day)	Peak Flow (L/s)
Institutional	1490	0.15	112	0.19

Unit Type	Unit Count	Population Density (ppl/unit)	Equivalent Population	Per Capita Flow (L/cap/day)	Average Daily Flow (L/s)	Peaking Factor	Peak San Flow (L/s)	Infiltration Allowance[2] (L/s/ha)	Infiltration Flow (L/s)	Peak Flow (L/s)
Residential	157	3	471	275	1.50	3.99	5.98	0.26	0.26	6.24
TOTAL										**6.43**

Notes:

1. Proposed infiltration allowance, per capita flows, unit population equivalent and peaking factor are as per the regional municipality of Halton 'Water and Wastewater Linear Design Manual (April 2019)'.
2. Instituational design flow includes infiltration and peaking effect.

TOWN OF HALTON HILLS

14015 DANBY ROAD

SANITARY SEWER DESIGN SHEET

Assumptions:

Residential Peaking Factor: Harmon Formula

$$PF = 1+(14/(4+(P/1000)^{1/2}))$$

Proposed Commercial/Residential Flows : 360 L/cap/d

Existing Commercial/Industrial Flows : 250 L/cap/d

Infiltration rate: 0.26L/s/ha

Design Sheet No: 1 of 1

Assess. Sheet No:

Subdiv. File No: 221-05336

Designed By: N.M | **Checked By: P.C** | **Date:** 10-Jul-23

Block	MANHOLE FROM	MANHOLE TO	Land Use	Site Area (ha) Local (ha)	Site Area (ha) Cumm. (ha)	Institutional Population Local (people)	Institutional Population Cumm. (people)	Residential Units	Residential Area (m^2)	Residential Population Local (people)	Residential Population Cumm. (people)	CALCULATED FLOW: Peaking Factor (Harmon)	Residential Average Day Flow (L/s)	Res. Peak Flow (L/s)	Park Flow (L/s)	Commercial Average Day Flow (L/s)	Comm. Peak Flow (L/s)	Infiltration Flow (L/s)	Total Flow (L/s)	SEWER DATA: PIPE LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAP. (L/s)	FULL FLOW VEL. (m/s)	% OF PIPELINE UTILIZED	Actual Velocity (m/s)
SITE (EXISTING CHURCH)	STUB	MH4A	Institutional	0.16	0.16	53	53	0	0.0	0	0	2.26	0.00	0.00	0.00	0.17	0.38	0.04	0.42	20.1	200	0.5	23.19	0.74	2%	0.28
	MH4A	MH3A	Institutional	0.13	0.29	0	53	0	0.0	0	0	2.26	0.00	0.00	0.00	0.17	0.38	0.08	0.88	46.1	200	1.0	32.80	1.04	3%	0.45
	MH3A	MH55A	Institutional	0.01	0.31	0	53	0	0.0	0	0	2.26	0.00	0.00	0.00	0.17	0.38	0.08	1.34	15.3	200	1.0	32.80	1.04	4%	0.51
	MH55A	MH51A	Institutional	0.01	0.32	0	53	0	0.0	0	0	2.26	0.00	0.00	0.00	0.17	0.38	0.08	1.81	14.8	200	1.0	32.80	1.04	6%	0.56
SITE (NEW DEVELOPMENT)	MH2A	MH1A	Residential	0.05	0.05	0	0	157	6,845.0	471	471	1.46	1.50	2.19	0.00	0.00	0.00	0.01	2.20	12.1	200	1.0	32.80	1.04	7%	0.59
	MH1A	MH54A	Residential	0.64	0.69	0	0	0	0.0	0	471	1.46	1.50	2.19	0.00	0.00	0.00	0.18	4.57	79.0	200	1.0	32.80	1.04	14%	0.73
	MH54A	MH50A	Residential	0.01	0.70	0	0	0	0.0	0	471	1.46	1.50	2.19	0.00	0.00	0.00	0.18	6.94	14.9	200	2.0	46.38	1.48	15%	1.06
DANBY ROAD	MH51A	MH10A	Mixed Use	0.05	0.05	0	53	2	13150.0	6	59	2.21	0.19	0.42	0.00	0.17	0.37	0.01	2.61	35.5	200	1.5	40.17	1.28	6%	0.72
	MH10A	MH9A	Mixed Use	0.07	0.12	0	53	4	13150.0	12	71	2.13	0.23	0.48	0.00	0.17	0.36	0.03	3.48	41.7	200	4.0	65.60	2.09	5%	1.11
	MH9A	MH50A	Mixed Use	0.03	0.15	0	53	0	13150.0	0	71	2.13	0.23	0.48	0.00	0.17	0.36	0.04	4.36	18.2	200	4.0	65.60	2.09	7%	1.18
	MH50A	MH8A	Mixed Use	0.02	0.02	53	53	6	1480.0	542	542	1.42	1.73	2.45	0.00	0.17	0.24	0.01	14.00	17.7	200	1.0	32.80	1.04	43%	1.00

Notes:
1. *Residential Densities of 3.0 people/unit.*
2. *Site Density of 135 people/ha assumed as per Regional Municipality of Halton Water and Wastewater Linear Design Manual, April 2019, page 21.*

APPENDIX

B FIRE UNDERWRITERS SURVEY

APPENDIX B

FIRE FLOW CALCULATIONS
EXISTING CHURCH - FRONTING DANBY ROAD

Project: Norval United Church
Job No.: 221-05336

Fire flow required for a given area based on Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (1999)

$$F = 220\ C\sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

Calculations per FUS

1. *Estimate of Fire Flow*
C = 1.0 for fire resistive construction
A = 1510 m^2 (total floor area of all storeys minus basements at least 50% below grade)

F = 8,549 Lpm

2. *Occupancy Reduction*
15% reduction for "Limited Combustible" Occupancy

15% reduction of 8549 Lpm = 1,282 Lpm
F = 8549 - 1282 = 7,267 Lpm

3. *Sprinkler Reduction*
0% reduction for no Sprinkler System

0% reduction of 7267 Lpm = - Lpm
F = 7267 - 0 = 7,267 Lpm

4. *Separation Charge*

Face	Distance (m)	Charge
Northwest Side	50	0%
Northeast Side	23	10%
Southeast Side	50	0%
Southwest Side	50	0%
	Total	10%

of 7,267 = 727 Lpm

F = 7267 + 727
F = 7,993 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 2,109 US GPM

Notes

APPENDIX B

FIRE FLOW CALCULATIONS
CONDOMINIUM - FRONTING PROPOSED ROAD

Project: Norval United Church
Job No.: 221-05336

Fire flow required for a given area based on Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (1999)

$$F = 220\ C\sqrt{A}$$

where

F = Fire flow in Litres per minute (Lpm)
C = coefficient related to the type of construction
A = total floor area in square metres

Calculations per FUS

1. *Estimate of Fire Flow*
C = 1.5 for fire resistive construction
A = 4238 m^2 (total floor area of first floor plus 50% of two adjacent floors above)

F = 15,191 Lpm

2. *Occupancy Reduction*
15% reduction for "Limited Combustible" Occupancy

15% reduction of 15191 Lpm = 2,279 Lpm
F = 15191 - 2279 = 12,912 Lpm

3. *Sprinkler Reduction*
25% reduction for no Sprinkler System

25% reduction of 12912 Lpm = 3,228 Lpm
F = 12912 - 3228 = 9,684 Lpm

4. *Separation Charge*

Face	Distance (m)	Charge
Northwest Side	50	0%
Northeast Side	50	0%
Southeast Side	50	0%
Southwest Side	23	10%
	Total	10%

10% of 12,912 = 1,291 Lpm

F = 9684 + 1291
F = 10,975 Lpm (2,000 Lpm < F < 45,000 Lpm; OK)
F = 2,896 US GPM

Notes

C STORM SEWER DESIGN

WSP Canada Inc.

TOWN OF HALTON HILLS
STORM SEWER DESIGN

DESIGN INFORMATION

Design Storm Parameters			Design Storm
Tc = 10 mins	A=	946.46	n = 0.013
	B=	7	miv. v = 0.8 m/s
	C=	0.788	max. v = 3.65 m/s

Designed by: N.M
DATE: July 10, 2023

SITE: 14015 Danby Road

STREET	MANHOLE		TIME IN MINUTES			STORMWATER STUDY							PROPOSED STORM SEWER DESIGN					
	FROM	TO	ELAPSED UPPER END	FLOW IN SECTION	ELAPSED LOWER END	AREA (ha)	C	A x C	CUMM A x C	CUMM AREA (ha)	I_5 (mm/hr)	Q_5 (m^3/s)	LENGTH (m)	DIA. (mm)	GRADE (%)	CAPACITY (m^3/s)	VELOCITY (m/s)	% FULL
	CB11`	CBMH10	10.00	0.75	10.75	0.05	0.90	0.05	0.05	0.05	101.51	0.013	47.1	200	1.00	0.03	1.044	39.00%
	CBMH10	CBMH9	10.00	0.65	11.40	0.1	0.90	0.09	0.14	0.15	101.51	0.038	53.1	300	1.00	0.10	1.368	39.68%
	CBMH9	OGS	10.00	0.48	11.88	0.1	0.90	0.09	0.23	0.25	101.51	0.064	51.6	450	1.00	0.29	1.793	22.43%
	CB8	CBMH7	10.00	0.45	10.45	0.05	0.90	0.05	0.05	0.05	101.51	0.013	28.0	200	1.00	0.03	1.044	39.00%
	CBMH7	CBMH6	10.00	0.64	11.08	0.10	0.90	0.09	0.14	0.15	101.51	0.038	52.3	300	1.00	0.10	1.368	39.68%
	CBMH6	CBMH5	10.00	0.25	11.33	0.10	0.90	0.09	0.23	0.25	101.51	0.064	20.5	300	1.00	0.10	1.368	66.13%
	CBMH5	OGS	10.00	0.49	11.82	0.07	0.90	0.06	0.29	0.32	101.51	0.082	40.0	300	1.00	0.10	1.368	84.65%
	CB4	CBMH3	10.00	0.58	10.58	0.10	0.90	0.09	0.09	0.10	101.51	0.026	36.5	200	1.00	0.03	1.044	77.99%
	CBMH3	EX. MH12	10.00	0.25	10.83	0.04	0.90	0.04	0.13	0.14	101.51	0.036	14.3	300	0.50	0.07	0.967	52.37%
	EX. MH12	EX. CBMH13	10.00	0.31	11.14	0.03	0.90	0.03	0.15	0.17	101.51	0.043	17.8	300	0.50	0.07	0.967	63.60%
	EX. CBMH13	CBMH2	10.00	0.43	11.56	0.10	0.90	0.09	0.24	0.27	101.51	0.069	28.7	375	0.50	0.12	1.123	55.71%
	CBMH2	CBMH1	10.00	0.25	11.81	0.10	0.90	0.09	0.33	0.37	101.51	0.095	23.4	375	1.00	0.18	1.587	53.98%
	CBMH1	OGS	10.00	0.60	12.41	0.05	0.90	0.05	0.38	0.42	101.51	0.107	57.5	375	1.00	0.18	1.587	61.28%
	OGS	TANK	10.00	0.01	10.01	0.001	0.90	0.00	0.89	0.99	101.51	0.253	0.67	500	0.75	0.33	1.665	77.44%
	TANK	EX. MH61	10.00	0.10	10.10	0.01	0.90	0.01	0.90	0.99	101.51	0.085	7.9	300	1.00	0.10	1.368	87.90%

Note:
1) Design storm parameters as per Halton Hills Engineering Design Manual.