

**PROPOSED 27-STOREY PURPOSE-BUILT RENTAL
APARTMENT BUILDING
50 SPEERS RD
TOWN OF OAKVILLE**

PROJECT No.: 22211

**FUNCTIONAL SERVICING &
STORMWATER MANAGEMENT REPORT**

Prepared For:

HELBERG PROPERTIES LIMITED

Prepared By:

The Odan/Detech Group Inc.

Version 1: August 25th, 2022 Issued for Rezoning

TABLE OF CONTENTS

DESCRIPTION	page
1.0 INTRODUCTION.....	3
2.0 SCOPE OF WORK	3
3.0 SANITARY SEWERS.....	4
i) <i>Existing Condition</i>	4
ii) <i>Proposed Condition</i>	4
iii) <i>Downstream Sanitary Sewer Capacity</i>	6
4.0 WATER DISTRIBUTION.....	10
i) <i>Existing Condition</i>	10
ii) <i>Proposed Condition</i>	10
5.0 STORM WATER MANAGEMENT	14
i) <i>Existing Infrastructure & Drainage</i>	14
ii) <i>Design Criteria</i>	16
iii) <i>Allowable Discharge Flow Rate</i>	16
iv) <i>Post Development Flow Analysis</i>	17
v) <i>Water Quality</i>	21
vi) <i>Erosion Control</i>	21
6.0 CONCLUSIONS.....	22
7.0 REFERENCES.....	23

LIST OF FIGURES

Figure 1 - Visual OTTHYMO Model (Showing Flows in 100-Year Storm)	20
---	----

LIST OF TABLES

Table 1 – Proposed Sanitary Flows	5
Table 2 - Sanitary Flow Calculations	6
Table 3 – Total Water Demand	11
Table 4 – Allowable Flows	16
Table 5 – Catchment Characteristics for the site Post-Development	17
Table 6 – Summary of Flows from Site	19
Table 7 – Stormwater Storage	19
Table 8 – TSS Removal Summary	20
Table 9 – Summary	21

APPENDIX A

Existing Site	Aerial view of Site and surrounding area
Site Plan & Statistics	by BDP. Quadrangle Architects Limited

APPENDIX B

Pre-Development Sanitary Sewer Catchment Plan
Post-Development Sanitary Sewer Catchment Plan

APPENDIX C

Visual OTTHYMO Model Output – (5-Year & 100-Year storms)
Sanitary & Storm Sewer Video Inspection Report by Aquaflow Technology

APPENDIX B

Functional Servicing Plan
Functional Grading & Drainage Plan

1.0 INTRODUCTION

The subject of this report is a 0.418 Ha (1.033 acre) parcel of land bound by the following.

- To the east: There is a Public School (Oakwood Public School) and residential properties.
- To the south: There is Bartos Drive, residential properties and residential apartment.
- To the west: There is Speers Road.
- To the north: There is a residential apartment.

Presently the site is occupied by an existing 7-storey Apartment building with underground parking and an above grade parking lot on the south side.

The site has municipal address 50 Speers Road and postal code L6K 2E5.

There is an easement in favour of the Town of Oakville for underground services within the adjacent property at 80 Speers Road. The easement abuts the subject site and has instrument # 194536.

Refer to the Key Plan in Appendix A for the site's layout and adjacent properties.

It is proposed to construct a 27-Storey (plus mechanical penthouse) Apartment building. A three-level below-grade parking structure is proposed beneath. The Development has frontage to Speers Road and Bartos Drive to the south. Access to the below-grade parking structure is from a driveway connecting to Speers Road.

Refer to the architectural site plan in Appendix A for the proposed development's layout.

For detailed topography of the existing site conditions, as of August 23, 2022, refer to the topographic survey prepared by J. D. Barnes Limited.

This report evaluates the serviceability of the site with respect to sanitary waste water, water and storm water management (SWM) and will implement the servicing criteria identified by Region of Halton and Town of Oakville.

2.0 SCOPE OF WORK

THE ODAN/DETECH GROUP INC. was retained by **Helberg Properties Limited** to review the Site, collect data, evaluate the Site for the proposed use and present the findings in a Functional Servicing and Storm Water Management Report in support of an OPA and Rezoning application. The scope of work in brief involves the following:

- a) Collecting existing servicing drawings from the TOWN in order to establish availability and feasibility of Site servicing;
- b) Meetings/conversations with TOWN Engineers and Design Team.
- c) Evaluation of the data and presentation of the findings in a Functional Servicing and Storm Water Management Report in support of an OPA and Rezoning application.

3.0 SANITARY SEWERS

i) *Existing Condition*

There is an existing 200 diameter sanitary sewer on Bartos Drive, south of the property, which flows southeasterly towards Stewart St. and eventually flows to the 900mm Trunk sewer on Rebecca Street.

The existing 7 storey apartment bldg. is connected to this existing sewer in an easement along 80 Speers Road via 150mm sanitary lateral connections. There is also an existing 200mm sanitary sewer inside the subject site which is used to service the adjacent Apartment building at 30 Speers Road (refer to Appendix D for the Servicing Plan). Currently there is no easement for the 30 Speers sewer running through the subject site. A solution on moving/adjusting the existing 200mm sanitary (inside the subject site) is under investigation. The existing 200mm sanitary and lateral connection was verified through a video inspection by Aquaflow Technology, see Appendix C for the full report.

ii) *Proposed Condition*

The site will propose a 5m 200mm sanitary @ 2% to extend the existing sanitary sewer on Bartos Drive along the adjacent easement. A 150mm diameter lateral @ 2% will be used to capture the flow from the proposed 27 storey apartment building.

The proposed development will consist of 28 studios, 147 1-bedroom units, 107 2-bedroom units, 32 3-bedroom units and a mechanical penthouse. There will be 3 level of underground parking in total.

The above statistics were compiled by BDP. Quadrangle Architects Limited. Refer to the Site Statistics and the Site Plan by BDP. Quadrangle Architects Limited in Appendix A for further details.

The sanitary sewer design criteria and unit flow is provided in the Regional Municipality of Halton's *Water and Wastewater Linear Design Manual* (July 2017). The following information is provided in Section 3.2 of the foregoing manual.

- Unit flow: q = average daily residential per capita dry weather unit flow = 0.275 m³/cap/day
- I/I = Unit of peak inflow/infiltration = 0.286 L/s/ha

Peaking Factor (Residential)

$$M = 1 + \frac{14}{4 + \sqrt{P}}$$

The peak sanitary flow from the proposed development is thus calculated as follows:

- 1.0 persons/bed x 485 beds = 485 persons
- TOTAL population P of 485 persons
- Site Area = 0.418 ha

Peaking factor (Harmon)

$$PF = 1 + [14 / (4 + (P/1000)^{0.5})] = 3.98$$

Total extraneous flow:	$0.418 \times 0.286 = 0.12 \text{ L/sec.}$
Population, average flow:	$275 \times 485 \div (24 \times 3600) = 1.54 \text{ L/sec.}$
Population, Peak Flow:	Average flow $\times$ PF = 6.13 L/sec.
Total Peak Flow: $6.13 + 0.12 =$	6.25 L/sec.

The Peak sanitary flow from this Site (27 storey apartment bldg.) is **6.25 L/sec.**

See Table 1 below for a summary of the proposed sanitary flows.

TABLE 1 – Proposed Sanitary Flows

	Population (P)	Average Flow (L/s)	Peak Factor	Peak Sanitary (L/s)	Infiltration Allowance (L/s)	Total Flow (L/s)
27-Storey Apartment Bldg.	485	1.54	3.98	6.13	0.12	6.25

A 150mm @ 2.0% sanitary sewer connection is proposed to the 200mm sanitary sewer beneath the easement on 80 Speers Rd. which drains towards Bartos Drive. The proposed 150mm sanitary lateral pipe has a capacity of 22 L/s, which is adequate to convey the above post-development sanitary flow of 6.25 L/s. Refer to the Site Servicing Plan for the waste water servicing scheme.

iii) Downstream Sanitary Sewer Capacity

Region engineering staff have stated that an independent downstream sanitary sewer analysis is required to confirm the capacity of the receiving sanitary sewers to receiving flows from the subject development.

The following downstream sanitary sewer analysis shows that the receiving sanitary sewers have capacity for the proposed development and no offsite infrastructure improvements are necessary to accommodate the flows from the proposed development.

The Odan/Detech Group subsequently prepared an original analysis. The methodology for the analysis is as follows.

- 1) The Pre & Post downstream sewer catchment plan on Appendix B was prepared to show the tributary catchment areas for sanitary flow, path of the sewer pipe, etc. down to the 900mm Trunk sewer on Rebecca Street.
- 2) Population density and unit flow was established as given in Tables 3-1 and 3-2 in the Regional Municipality of Halton's Water and Wastewater Linear Design Manual (July 2017).
- 3) Downstream sewer design sheets were prepared in pre-development and post-development scenarios as shown on pages 8 & 9.

Pre-development Conditions

Under pre-development conditions, the existing 200mm Sanitary Sewer on Bartos Drive is subjected to flows from the 7-storey apartment building on #50 Speers Rd. and the adjacent apartment buildings on #30 & #80 Speers Rd. Which then flows southeasterly towards Stewart St. and eventually flows to the 900mm sanitary trunk sewer on Rebecca Street. See Appendix B for the Pre-Development sanitary sewer catchment plan, and page 8 for the Pre-Development sanitary sewer design sheet.

Post-Development Conditions

As explained in Section ii above, sanitary calculations for the proposed 27 storey apartment building will follow the equivalent residential population method. A total population of 485 persons shall be used for this catchment area. See Appendix B for the Post-Development sanitary sewer catchment plan, and page 9 for the Post-Development sanitary sewer design sheet.

Table 2 below shows a summary of the existing and proposed sanitary flow calculations.

TABLE 2 - Sanitary Flow Calculations

	Existing	Proposed
Area (Ha)	0.418	0.418
Population Density (per/Ha)	285	N/A
Equivalent Population	120	485 (1Person/Bed)

Unit Sewage Flow	275 L/pc/d	275 L/pc/d
Dry Weather Flow (L/s)	0.38	1.54
Peaking Factor	4.22	3.98
Peak Flow (L/s)	1.60	6.13
Infiltration (L/s)	0.12	0.12
Total Flow = Peak Flow + Infiltration (L/s)	1.72	6.25
Sanitary Flow before the 900mm Trunk sewer on Rebecca St. (L/s)	157.47	160.48
% of Capacity Used before the 900mm Trunk sewer on Rebecca St. (L/s)	45.10%	45.96%

Existing flows in the 200mm sanitary on Bartos Drive down to the 450mm sanitary sewer on Forsythe St. (just before the trunk sanitary sewer on Rebecca St.) were calculated based on Halton Region's equivalent population densities.

As per the sanitary design sheets on pages 10 and 11, the following comments are provided;

- 1) Pre-development, the last segment of pipe before the trunk sewer on Rebecca St. is flowing 45.10% of its capacity.
- 2) Post-development, with the additional flow from the subject development, the flow on the last segment of pipe before the trunk sewer on Rebecca St. is only increase by 0.86% from 45.10% to 45.96% of its capacity.
- 3) All flow from the downstream pipes up to the 450mm Sanitary on Forsythe Street are less than 65% of their capacity, therefore no infrastructure improvements are necessary to service the subject development.

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT



EXISTING DWF SANITARY SEWER DESIGN

PROJECT:	Proposed Residential					Peaking Factor:		M = 1 + 14/(4+(P/1000 ^{0.5}))		Residential Only		Mannings Equation:							
PROJECT No.:	22211					Infiltration Unit Factor		0.286				Q _{cap} =(D/1000) ^{2.667} *(S/100) ^{0.5} /(3.211 ⁿ)*1000(L/s)							
LOCATION:	50 Speers Rd					Q Avg (l/s)		Residential		275		L/cap/day		S: slope (grade) of pipe (%)					
MUNICIPALITY:	City of Oakville													n = roughness coefficient (0.013)					
Date:	18-May-22																		
STREET NAME	AREA	FROM MANHOLE	TO MANHOLE	POP. DENSITY	AREA (hect.)	CUM. AREA (hect.)	POP. INCR.	CUM. POP.	PEAKING FACTOR	Q. AVG L.P.S.	Q. PEAK L.P.S.	Q. INFIL. L.P.S.	TOTAL FLOW L.P.S.	DIAMETER (mm)	GRADE PER CENT	CAPACITY L.P.S	VELOCITY M.P.S.	% OF CAP USED	
# 50 Speers Rd.	Subject Site				0.418		120												
# 30 Speers Rd.					0.805		230												
# 80 Speers Rd.					0.527		150												
Bartos Dr		1A	2A	N/A	1.750	1.75	500.0	500	3.97	1.59	6.31	0.50	6.81	200	1.50	40.17	1.28	16.95	
Bartos Dr		2A	3A	N/A	0.700	2.45	29.0	529	3.96	1.68	6.65	0.70	7.35	200	1.50	40.17	1.28	18.30	
Bartos Dr		3A	4A	N/A	0.860	3.31	36.0	565	3.95	1.80	7.11	0.95	8.06	200	1.50	40.17	1.28	20.06	
Bartos Dr		4A	5A	N/A	0.950	4.26	38.0	603	3.93	1.92	7.55	1.22	8.77	200	0.56	24.54	0.78	35.74	
Bartos Dr																			
Bartos Dr		5A	6A	N/A	3.19	7.45	277	880	3.84	2.80	10.75	2.13	12.88	200	0.56	24.54	0.78	52.49	
Stewart St		6A	7A	N/A	0.66	8.11	30	910	3.83	2.90	11.11	2.32	13.43						
UPSTREAM @ Stewart St.		6A	7A	N/A	12.400	12.40	1146.0	1146	3.76	3.65	13.72	3.55	17.27						
Stewart St.		6A	7A	N/A		20.51		2056	3.58	6.54	23.41	5.87	29.28	300	0.30	52.97	0.75	55.28	
Stewart St.		7A	8A	N/A	0.810	21.32	33.0	2089	3.57	6.65	23.74	6.10	29.84	300	0.30	52.97	0.75	56.33	
Queen Mary Dr		8A	9A	N/A	0.980	22.30	47.0	2136	3.56	6.80	24.21	6.38	30.59						
UPSTREAM @ Queen Mary Dr		8A	9A	N/A	17.140	17.14	1656.0	1656	3.65	5.27	19.24	4.90	24.14						
Queen Mary Dr		8A	9A	N/A		39.44		3792	3.35	12.07	40.43	11.28	51.71	300	1.50	118.43	1.68	43.66	
Queen Mary Dr		9A	10A	N/A	0.960	40.40	40.0	3832	3.35	12.20	40.87	11.55	52.42						
UPSTREAM @ Washington Avenue		9A	10A	N/A	12.400	12.40	1146.0	1146	3.76	3.65	13.72	3.55	17.27						
Queen Mary Dr		9A	10A	N/A		52.80		4978	3.25	15.84	51.48	15.10	66.58	300	1.50	118.43	1.68	56.22	
Queen Mary Dr		10A	11A	N/A	0.520	53.32	20.0	4998	3.25	15.91	51.71	15.25	66.96						
UPSTREAM @ Florence Dr		10A	11A	N/A	1.870	1.87	100.0	100	4.24	0.32	1.36	0.53	1.89						
Queen Mary Dr		10A	11A	N/A		55.19		5098	3.24	16.23	52.59	15.78	68.37	300	1.50	118.43	1.68	57.73	
Queen Mary Dr		11A	12A	N/A	0.700	55.89	29.0	5127	3.23	16.32	52.71	15.98	68.69	525	0.41	275.37	1.27	24.94	
UPSTREAM @ Normandy Pl		12A	13A	N/A	5.470	5.47	608.0	608	3.93	1.94	7.62	1.56	9.18						
Queen Mary Dr		12A	13A	N/A		61.36		5735	3.19	18.25	58.22	17.55	75.77	525	0.13	155.06	0.72	48.86	
Queen Mary Dr		13A	14A	N/A	0.450	61.81	15.0	5750	3.19	18.30	58.38	17.68	76.06	525	0.50	304.10	1.40	25.01	
PUMP @ Riverside Dr		23A	22A	N/A									73.00	450	0.50	201.60	1.27	36.21	
Riverside Dr		22A	14A	N/A	0.570	0.57	25.0	25	4.37	0.08	0.35	0.16	73.51	450	0.50	201.60	1.27	36.46	
Queen Mary Dr		14A	15A	N/A	0.430	62.81	17.0	5792	3.19	18.44	58.82	17.96	149.78	600	0.42	397.92	1.41	37.64	
Queen Mary Dr		15A	16A	N/A	0.590	63.40	14.0	5806	3.18	18.48	58.77	18.13	149.90	600	0.19	267.64	0.95	56.01	
Queen Mary Dr		16A	17A	N/A	1.000	64.40	272.0	6078	3.17	19.35	61.34	18.42	152.76	600	0.19	267.64	0.95	57.08	
Queen Mary Dr		17A	18A	N/A	1.770	66.17	405.0	6483	3.14	20.63	64.78	18.92	156.70	600	0.18	260.50	0.92	60.15	
Forsythe St		18A	19A	N/A	0.640	66.81	24.0	6507	3.14	20.71	65.03	19.11	157.14	450	1.50	349.18	2.20	45.00	
Forsythe St		19A	20A	N/A	0.490	67.30	20.0	6527	3.14	20.77	65.22	19.25	157.47	450	1.50	349.18	2.20	45.10	
Forsythe St		20A	21A	N/A	0.000	67.30	0.0	6527	3.14	20.77	65.22	19.25	157.47	450	1.50	349.18	2.20	45.10	

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT



PROPOSED DWF SANITARY SEWER DESIGN

PROJECT:	Proposed Residential	Peaking Factor:	M = 1 + 14/(4+(P/1000 ^{0.5}))	Residential Only	Mannings Equation:
PROJECT No.:	22211	Infiltration Unit Factor	0.286		$Q_{cap} = (D/1000)^{2.667} \times (S/100)^{0.5} / (3.211 \times n) \times 1000 (L/s)$
LOCATION:	50 Speers Rd	Q Avg (l/s)	275	L/cap/day	D: pipe size (mm)
MUNICIPALITY:	City of Oakville				S: slope (grade) of pipe (%)
Date:	22-Aug-22				n = roughness coefficient (0.013)

STREET NAME	AREA	FROM MANHOLE	TO MANHOLE	POP. DENSITY	AREA (hect.)	CUM. AREA (hect.)	POP. INCR.	CUM. POP.	PEAKING FACTOR	Q. AVG L.P.S.	Q. PEAK L.P.S.	Q. INFIL. L.P.S.	TOTAL FLOW L.P.S.	DIAMETER (mm)	GRADE PER CENT	CAPACITY L.P.S.	VELOCITY M.P.S.	% OF CAP USED
# 50 Speers Rd.	Subject Site	PROP MH2	1A		0.418	0.418	485	485	3.98	1.54	6.13	0.12	6.25	200	2.00	46.38	1.48	13.48
# 30 Speers Rd.					0.805		230											
# 80 Speers Rd.					0.527		150											
Bartos Dr		1A	2A	N/A	1.750	1.75	865.0	865	3.84	2.75	10.56	0.50	11.06	200	1.50	40.17	1.28	27.53
Bartos Dr		2A	3A	N/A	0.700	2.45	29.0	894	3.83	2.85	10.92	0.70	11.62	200	1.50	40.17	1.28	28.93
Bartos Dr		3A	4A	N/A	0.860	3.31	36.0	930	3.82	2.96	11.31	0.95	12.26	200	1.50	40.17	1.28	30.52
Bartos Dr		4A	5A	N/A	0.950	4.26	38.0	968	3.81	3.08	11.73	1.22	12.95	200	0.56	24.54	0.78	52.77
Bartos Dr																		
Bartos Dr		5A	6A	N/A	3.19	7.45	277	1245	3.74	3.96	14.81	2.13	16.94	200	0.56	24.54	0.78	69.03
Stewart St		6A	7A	N/A	0.66	8.11	30	1275	3.73	4.06	15.14	2.32	17.46					
UPSTREAM @ Stewart St.		6A	7A	N/A	12.400	12.40	1146.0	1146	3.76	3.65	13.72	3.55	17.27					
Stewart St.		6A	7A	N/A		20.51		2421	3.52	7.71	27.14	5.87	33.01	300	0.30	52.97	0.75	62.32
Stewart St.		7A	8A	N/A	0.810	21.32	33.0	2454	3.52	7.81	27.49	6.10	33.59	300	0.30	52.97	0.75	63.41
Queen Mary Dr		8A	9A	N/A	0.980	22.30	47.0	2501	3.51	7.96	27.94	6.38	34.32					
UPSTREAM @ Queen Mary Dr		8A	9A	N/A	17.140	17.14	1656.0	1656	3.65	5.27	19.24	4.90	24.14					
Queen Mary Dr		8A	9A	N/A		39.44		4157	3.32	13.23	43.92	11.28	55.20	300	1.50	118.43	1.68	46.61
Queen Mary Dr		9A	10A	N/A	0.960	40.40	40.0	4197	3.31	13.36	44.22	11.55	55.77					
UPSTREAM @ Washington Avenue		9A	10A	N/A	12.400	12.40	1146.0	1146	3.76	3.65	13.72	3.55	17.27					
Queen Mary Dr		9A	10A	N/A		52.80		5343	3.22	17.01	54.77	15.10	69.87	300	1.50	118.43	1.68	59.00
Queen Mary Dr		10A	11A	N/A	0.520	53.32	20.0	5363	3.22	17.07	54.97	15.25	70.22					
UPSTREAM @ Florence Dr		10A	11A	N/A	1.870	1.87	100.0	100	4.24	0.32	1.36	0.53	1.89					
Queen Mary Dr		10A	11A	N/A		55.19		5463	3.21	17.39	55.82	15.78	71.60	300	1.50	118.43	1.68	60.46
Queen Mary Dr		11A	12A	N/A	0.700	55.89	29.0	5492	3.21	17.48	56.11	15.98	72.09	525	0.41	275.37	1.27	26.18
UPSTREAM @ Normandy Pl		12A	13A	N/A	5.470	5.47	608.0	608	3.93	1.94	7.62	1.56	9.18					
Queen Mary Dr		12A	13A	N/A		61.36		6100	3.16	19.42	61.37	17.55	78.92	525	0.13	155.06	0.72	50.90
Queen Mary Dr		13A	14A	N/A	0.450	61.81	15.0	6115	3.16	19.46	61.49	17.68	79.17	525	0.50	304.10	1.40	26.03
PUMP @ Riverside Dr		23A	22A	N/A									73.00	450	0.50	201.60	1.27	36.21
Riverside Dr		22A	14A	N/A	0.570	0.57	25.0	25	4.37	0.08	0.35	0.16	73.51	450	0.50	201.60	1.27	36.46
Queen Mary Dr		14A	15A	N/A	0.430	62.81	17.0	6157	3.16	19.60	61.94	17.96	152.90	600	0.42	397.92	1.41	38.42
Queen Mary Dr		15A	16A	N/A	0.590	63.40	14.0	6171	3.16	19.64	62.06	18.13	153.19	600	0.19	267.64	0.95	57.24
Queen Mary Dr		16A	17A	N/A	1.000	64.40	272.0	6443	3.14	20.51	64.40	18.42	155.82	600	0.19	267.64	0.95	58.22
Queen Mary Dr		17A	18A	N/A	1.770	66.17	405.0	6848	3.12	21.80	68.02	18.92	159.94	600	0.18	260.50	0.92	61.40
Forsythe St		18A	19A	N/A	0.640	66.81	24.0	6872	3.11	21.87	68.02	19.11	160.13	450	1.50	349.18	2.20	45.86
Forsythe St		19A	20A	N/A	0.490	67.30	20.0	6892	3.11	21.94	68.23	19.25	160.48	450	1.50	349.18	2.20	45.96
Forsythe St		20A	21A	N/A	0.000	67.30	0.0	6892	3.11	21.94	68.23	19.25	160.48	450	1.50	349.18	2.20	45.96

4.0 WATER DISTRIBUTION

i) Existing Condition

There is an existing 200mm dia. watermain along the existing easement inside 80 Speers Road which connects to 200mm dia. watermain on Bartos Drive and 300mm dia. watermain located on Speers Road.

The existing 7 storey apartment building is serviced by a 100mm dia to the 200mm dia watermain along the adjacent existing easement on 80 Speers Road.

There are existing fire hydrants located in front of #413 Bartos Drive (south side of the property), and two fire hydrants along Speers Road on the north side of the property. These existing fire hydrants will sufficiently cover the entire property.

ii) Proposed Condition

It is proposed to connect the site to the existing 200mm dia. watermain located along the existing easement on #80 Speers Road. Refer to the Site Servicing Plan for the location of the 200mm fire service and 150mm domestic water service connection to the above main.

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure in line were established from the Region Design Manual Standards. The pressures and volumes must be sufficient for peak hour conditions and under fire conditions as established by the Ontario Building Code 2006. The minimal residual pressure under fire conditions is 140 kpa. (or 20.3 psi).

Fire flow demand is calculated using the Fire Underwriters' Survey Fire Flow calculation, on page 12.

The allowable pressures are as follows:

Condition	Allowable Pressures (kpa)	
	min.	max.
1) Min. Hour	275	700
2) Peak Hour	275	700
3) Peak Day + Fire Flow	140	700

The water demand for the building is calculated as follows:

a)	Average Day domestic demand -	using 275 L/cap/day (485 persons, from sanitary calculations)	1.54 L/s
b)	Peak day demand -	2.25 x average daily demand	3.46 L/s
c)	Fire flow as per FUS 1999 manual		133 L/s

TABLE 3 – Total Water Demand

	L/sec	USGM
Peak Domestic Flow Demand	3.46	55
Fire Flow Demand (FUS)	133	2113
Total Water Demand	136.46	2168
Available Flow at 20 PSI Residual Pressure	381	6042

The following assumptions were made in the Fire Underwriters' Survey fire flow calculation:

- The building will be of non-combustible construction.
- The contents will be limited-combustible (residences).
- The building will be sprinklered as per NFPA 13 and the sprinklers fully monitored.

A hydrant flow test was prepared by Flowmetrix (2022) to the NFPA 291 standard. The flow test report is on the following page. The hydrant flow test shows that there is a flow rate of 6,042 USGM available at residual pressure 20 psi, which is greater than the development's water demand (2168 USGM) therefore it follows that ***the existing main is sufficient to provide fire protection to the subject development and no infrastructure improvements are necessary to service the subject development.***

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

WATER SUPPLY FOR PUBLIC FIRE PROTECTION , FIRE UNDERWRITERS SURVEY
GUIDE FOR DETERMINATION OF REQUIRED FIRE FLOWS

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

Where:

F = required fire flow in liters per minute
C= Coefficient related to the type of construction
A = the total floor area in square meters
(excluding basements) in the building
considered

Coefficient related to type of construction	
1.5	Wood Frame
1	Ordinary
0.8	Non combustible
0.6	Fire Resistive

LOCATION:	50 Speers Road
OBC OCCUPANCY:	Residential
BUILDING FOOT PRINT (m2):	3674
# OF STOREYS	27

PROJECT: 50 Speers Road

PROJECT No:22211

Contents	Charge
Non-Combustible	-25%
limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Buring	25%

CONSTRUCTION CLASS:

Fire Resistive

AUTOMATED SPRINKLER PROTECTION

NFPA 13 sprinkler standard
Standard Water Supply
Fully Supervised System

	Credit	Total
yes	10%	
yes	30%	50%
yes	10%	
	50%	

CONTENTS FACTOR:

limited combustible

CHARGE: -15%

EXPOSURE 1 (south) Ex. Residential

Distance to Exposure Building (m)
Length - Height

8.32	20%
34.83	5%
43.62	5%
50	0%
Total:	30%

Separation	Charge
0-3 m	25%
3.1 -10 m	20%
10.1 - 20 m	15%
20.1 - 30 m	10%
30.1 - 45	5%
> 45 m	0%

EXPOSURE 2 (east) Ex. Residential

Distance to Exposure Building (m)
Length - Height

EXPOSURE 3 (west) Ex. Residential

Distance to Exposure Building (m)
Length - Height

EXPOSURE 4 (north) Ex. Residential

Distance to Exposure Building (m)
Length - Height

no more than 75%

ARE BUILDINGS CONTIGUOUS:

NO

FIRE RESISTANT BUILDING

Are vertical openings and exterior vertical communications protected with a minimum one (1) h

No

CALCULATIONS

C = 0.6
A = 8504 m2 (2 largest floors + 50% floors above)

F = 12173 L/min
F = 12000 L/min must be > 2000 L/min

Round to Nearest 1000 L/min

CORRECTION FACTORS:

OCCUPANCY -1800 L/min
FIRE FLOW ADJUSTED FOR OCCUPANCY 10200 L/min
REDUCTION FOR SPRINKLER -5100 L/min
EXPOSURE CHARGE 3060 L/min

REQUIRED FIRE FLOW

F = 8160 L/min
Round to Nearest 1000 L/min
F = 8000 L/min 2113 usgm
F = 133 L/sec

STOREY AREAS m2	
2049	G
2111	L2
1403	L3
1403	L4
1403	L5
1403	L6
769	L7
769	L8
769	L9
769	L10

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

Fire Flow Testing Report



SCG

FLOWMETRIX
INDU-TECH
PROCESS

Residual Hydrant # **Residual Hydrant**
NFPA Colour Code **BLUE**



RESIDUAL HYDRANT INFO.

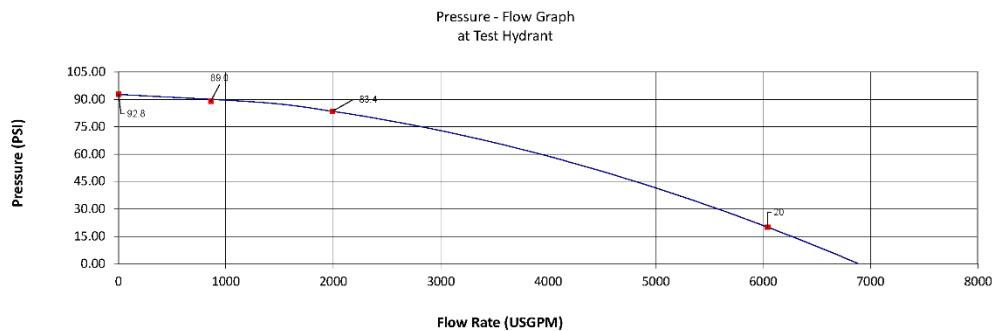
HYDRANT #	Residual Hydrant	
N.F.P.A. COLOUR CODE	BLUE	
STATIC PRESSURE	92.8	psi
RESIDUAL PRESSURE - ONE PORT OPEN	89.0	psi
RESIDUAL PRESSURE - TWO PORTS OPEN	83.4	psi
PRESSURE DROP	9.3	psi
% PRESSURE DROP	10.1	%
Flow on Water Main At Test Hydrant	20 psi	6042 USGPM

DATE	April 19, 2022
TIME	11:00 AM
ADDRESS	50 Speers Road Oakville, ON L6K 2E5
SIZE-inches/mm	8 200
MATERIAL	PVC
CONTACT INFO	Kevin Osinga The Odan/Detech Group Inc. (905) 632-3811 ext.1275 kevin@odandetech.com

FLOW HYDRANT(S) INFO.

HYDRANT ASSET ID	HYD. # PORTS	OUTLET DIAMETER (INCHES)	NOZZLE COEFFICIENT	DIFFUSER TYPE	DIFFUSER COEFFICIENT	PITOT READING (psi)	PITOT FLOW (USGPM)	FLOW METER (USGPM)
Flow Hydrant	1	2.5	Round	LPD250	0.90	68.4	1249	0
Flow Hydrant	2	2.5	Round	LPD250	0.90	43.5	1993	0
		2.5	Round	LPD250	0.90	43.5		0

FIRE FLOW CHART



COMMENTS

OPERATOR
OPERATOR
OPERATOR

FMX
Ryan Ritchie
Halton Region

5.0 STORM WATER MANAGEMENT

i) Existing Infrastructure & Drainage

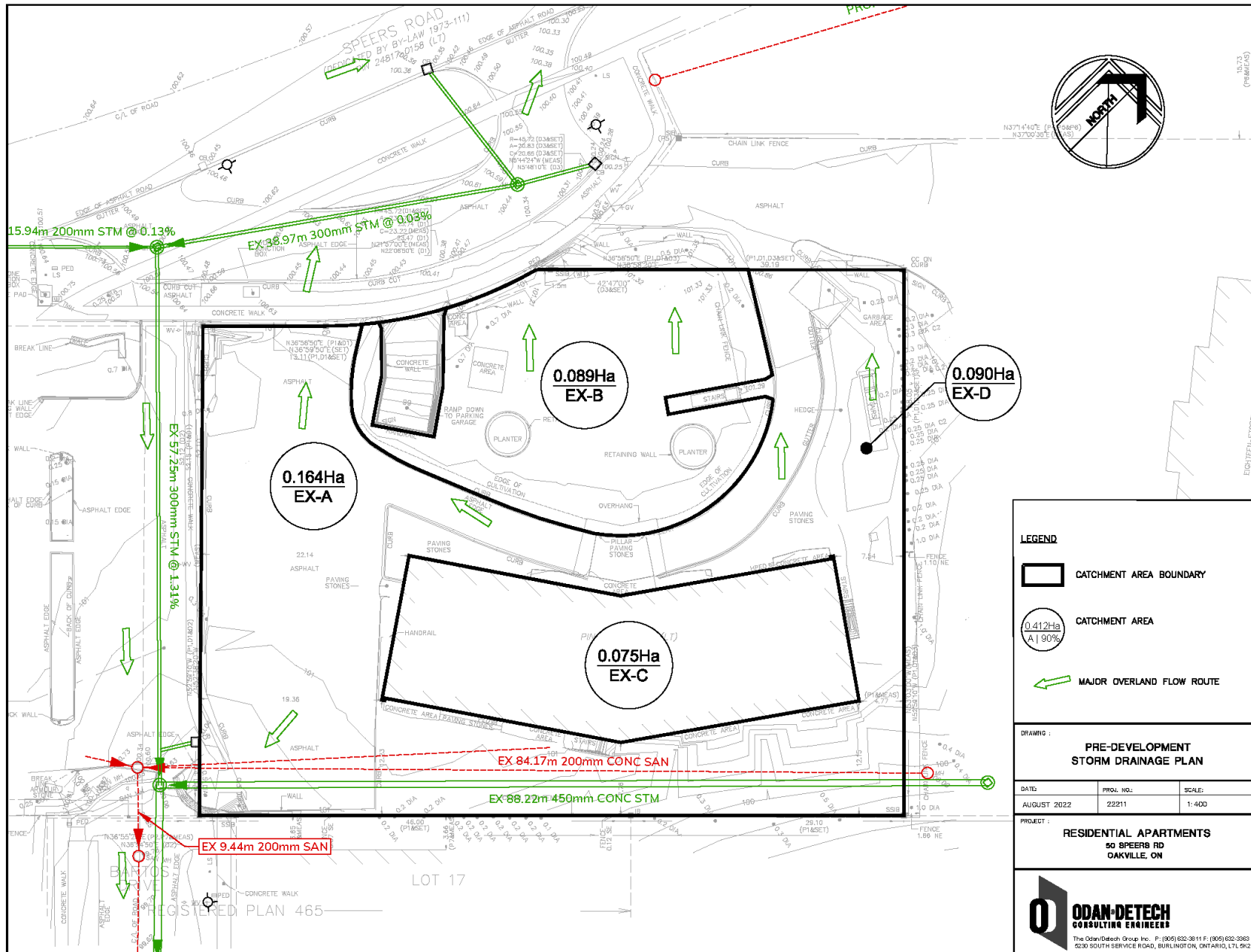
There is an existing 300mm storm sewer on the west side of the property and a 450mm on the east side, which both flows towards the existing 525mm storm on Bartos Drive. The 450mm is used to service the storm lateral on 30 Speers Road (adjacent apartment building). This was verified through a video inspection by Aquaflow Technology, see Appendix C for the full report. Similar to the sanitary a relocation is being investigated.

Existing drainage patterns are identified on the Pre-Development Drainage Plan on the following page. Presently the site comprises existing 7 storey apartment building with related asphalt parking areas, etc. Overland flow routes are identified on the Pre-Development Drainage Plan.

Pre-development storm drainage patterns are described as follows.

- Catchment Ex-A: comprises paved ground-level areas which drain to the existing 300mm storm on the west side of the property and eventually drain to the 525mm storm sewer on Bartos Drive.
- Catchment Ex-B: comprises landscape areas which drain to the existing 300mm storm on the west side of the property and eventually drain to the 525mm storm sewer on Bartos Drive.
- Catchment Ex-C: comprises roofs of the existing buildings on the site which drain to the existing 300mm storm on the west side of the property and eventually drain to the 525mm storm sewer on Bartos Drive.
- Catchment Ex-D: comprises grassed areas which drain to the adjacent property on #30 Speers Road and #357 Bartos Drive.

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT



ii) Design Criteria

Storm water management for the proposed development will follow the requirements as specified by the Town of Oakville.

The allowable post-development peak flow for the site up to the 100 year storm event will be set to match the allocated flow rate for the 5 year storm event. Section 3.1.3.07 of the Town of Oakville's *Development Engineering Procedures and Guidelines Manual* specifies a minimum runoff coefficient (C) of 0.80 for the existing site usage (condo/highrise). But since the existing site has a significant landscape, a runoff coefficient (C) of 0.60 will be used to determine the target flow rate.

Design storm data for the Town of Oakville 5 year and 100 year storms are shown below. Using Visual Otthymo 2.3.2 to perform stormwater runoff analysis, these storms will be used to show that the storm drainage up to the 100 year event will be accommodated on-site. The 100 year storm will be used to determine the total ponding achieved on orifice controlled areas.

5 Year Storm:	$I_5 = 1170 / (T + 5.8)^{0.843}$	where: I = intensity (mm/hr)
		T = time of concentration (min)
100 Year Storm:	$I_{100} = 2150 / (T + 5.7)^{0.861}$	

iii) Allowable Discharge Flow Rate

Allowable discharge from the site will be determined by calculating the allocated flow for the 5 year design storm using the rational method. As mentioned about a runoff coefficient of 0.60 will be used to determine the allowable flow for the storm outlet. Please refer to Figure 1 in Appendix A for the pre-development storm tributary area of sit

The allowable release rate is therefore taken as 80 L/s, as follows.

TABLE 4 – Allowable Flows

Design Storm	Run-off Coefficient	Rainfall Intensity (mm/hr)	Area of Development (ha)	Site Allowable Flow (L/s)
5 Year	0.60	114.21	0.418	80

iv) Post Development Flow Analysis

The proposed development will control the post development flows to the allowable flow rate calculated above; on-site storage will be required.

The adjacent properties have self-contained storm drainage and runoff from the adjacent properties does not enter the subject site based on pre-development drainage patterns. Refer to the Pre-Development Drainage Plan for pre-development drainage patterns.

The site's storm drainage and stormwater quantity controls will be provided as follows:

- Storm runoff from all above-grade open-to-above surfaces will drain uncontrolled by mechanical storm drains to the 100-year storm tank located in the P1 level.
- The following is a summary of the quantity controls: Stormwater Pump and Orifice Device (To be designed at the SPA stage) provides attenuation in the 100-Y Storm Detention tank.
- Stormwater will be attenuated by the pump and orifice device and back up inside the above tank. It will not be possible to control storm flows with only a gravity-driven orifice tube because the existing 300mm storm sewer is too shallow (cover on the service connection is approximately 1.5m – refer to Cross Section A-A on the Functional Servicing Plan). The tank would be impracticably shallow if it were gravity-driven, therefore a pumped tank will be required. The tank will be designed at the SPA stage.
- Controlled discharge will thereafter drain by a proposed 200mm @ 2.0% storm sewer connection to the adjacent existing 300mm Storm sewer along the existing easement which eventually drain to the 525mm storm sewer on Bartos Drive.

Visual OTTHYMO 2.3.2. will be used to model and determine the detention volume required. For drainage areas with significant imperviousness the calculation of effective rainfall in Visual OTTHYMO is accomplished using the “Standhyd” method. This method is used in urban watersheds to simulate runoff by combining two parallel standard unit hydrographs resulting from the effective rainfall intensity over the pervious and impervious surfaces. For pervious surfaces, losses are calculated using the SCS modified CN method.

The following table summarizes the parameters used in Visual OTTHYMO to characterize the post development catchment areas. Refer to the Post-Development Visual OTTHYMO Model in Fig. 3, below, and the output in Appendix C.

Post-Development catchment areas appear in the Post-Development Catchment plan, below.

TABLE 5 - Catchment Characteristics for the site Post-Development

Area I.D.	Area (ha)	Hydrograph Method	% impervious	imperviousness directly connected %	Loss Method for Pervious Area	CN for Pervious Area	Initial Abstraction for Pervious (mm)	Time to peak (T _p)
Catchment A – Green & Regular Roof	0.225	StandHYD	74	74	SCS	80	5	-
Catchment B – Planters and Paved Areas	0.193	StandHYD	80	80	SCS	80	5	-

PROPOSED 27-STORY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

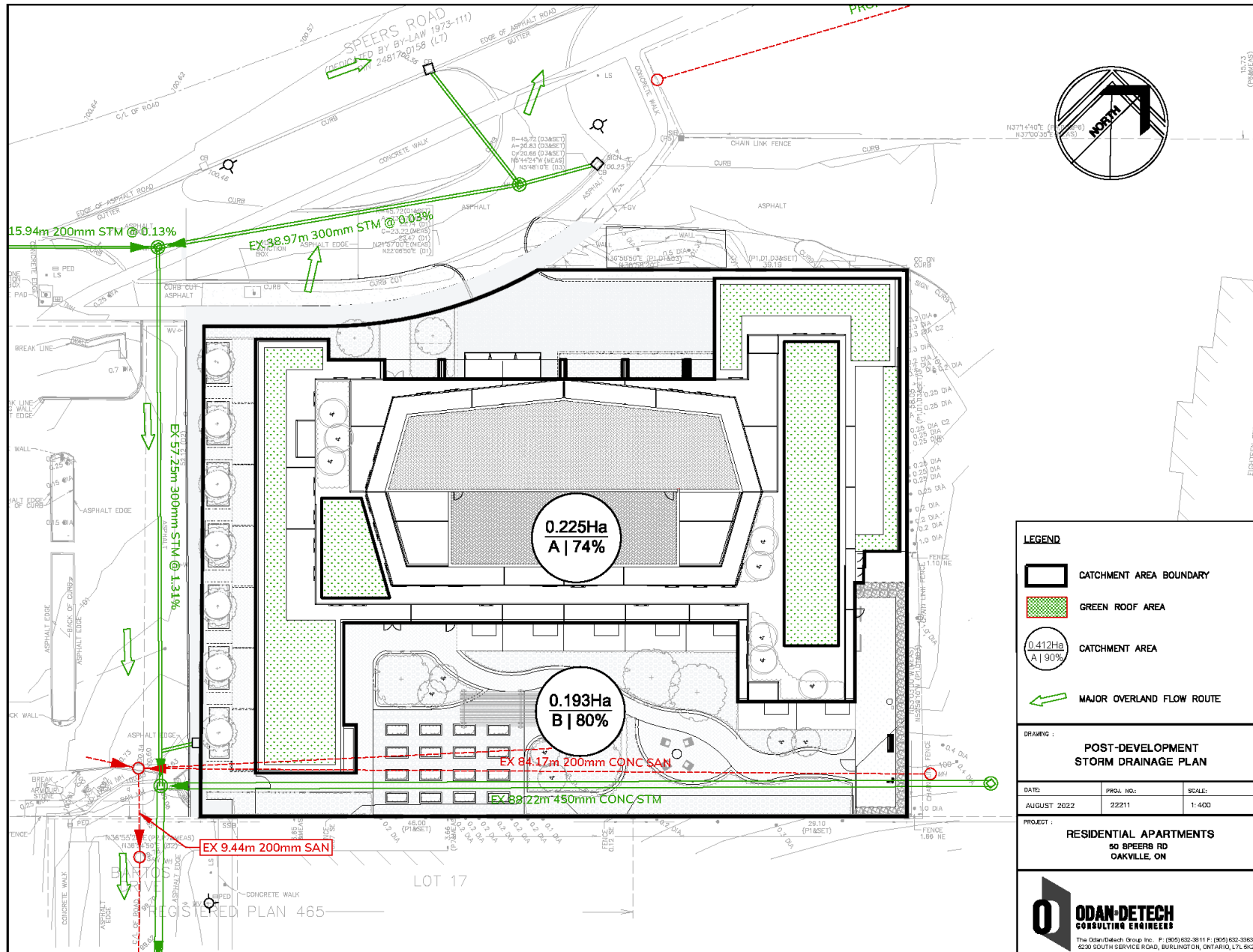
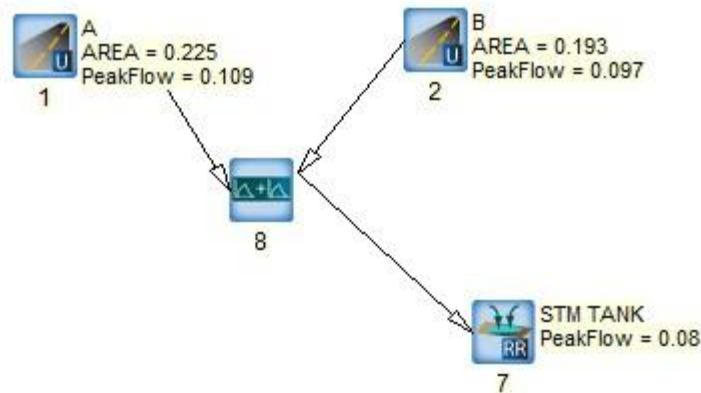


Figure 1 - Visual OTTHYMO Model (Showing Flows in 100-Year Storm)



As shown above, the 100-year storm flows are controlled to 80 L/s. The post-development flows are summarized as follows.

TABLE 6 - Summary of Flows from Site

	5 Yr. Storm (L/s)	100 Yr. Storm (L/s)
Total Controlled Flow	80	80
<i>Allowable Flow Rate</i>	80	

The stormwater storage that occurs in 5-year and 100-year storms is as follows. Refer to the Visual OTTHYMO Output in Appendix C for the storage volume calculation

TABLE 7 - Stormwater Storage

	5 Yr. Storm (m³)	100 Yr. Storm (m³)
Required Storage Volume	30	82
Provided Volume (100-Y Storm tank)	90	

The proposed stormwater quantity control is such that the controlled discharge in a 100-year storm is equal-to the allowable release rate. The stormwater storage is provided such that the volume provided is greater than the required 100-year storm volume.

Refer to the Functional Servicing Plan for the location of the storm tank, storm connection and control manhole.

v) Water Quality

The City of Oakville's *Development Engineering Procedures & Guidelines Manual* states in Section 6.2.4, *Storm Drainage Criteria*, that:

Quality treatment of stormwater is required. The level of treatment is to be determined per the receiving system (see Halton Conservation). Wet Ponds, Oil/Grit Separators and Landscape Filter Strips are acceptable methods.

Since the majority of the site area consists of roof and landscape area, an OGS unit is not required. The table below provides a summary of the surface types and associated TSS removal.

TABLE 8 – TSS Removal Summary

Surface Type	Initial Abstraction	TSS Removal	Ronoff Coefficient
Impervious roof	1mm	80%	0.90
Asphalt pavement	1mm	0%	0.90
Landscape	5mm	80%	0.25
Green Roof	7mm max for intensive roofs otherwise 5mm	80%	0.45-0.5
Permeable Pavers	5mm	80% with storage bed otherwise 50%	0.40
Concrete pavers	1mm	0%	0.9
Grassed swale	5mm	50% for a min length of 16m	0.25

vi) Erosion Control

Erosion and sediment control will be implemented on-site prior to construction and be maintained through the entire duration of construction. Erosion control measures to be implemented are:

- silt fence around the entire site
- sediment socks within existing and proposed catchbasins
- entrance mud mat for trucks
- daily cleaning and weekly washing of roads

6.0 CONCLUSIONS

From the foregoing investigation, the site is serviceable utilizing existing storm, sanitary sewer and watermain infrastructure adjacent to the site. Storm water management can be accommodated with on-site storage as described in this report.

The following table summarizes the SWM and Servicing components of the proposed development.

Table 9 - Summary

	<i>Proposed Building</i>
Peak Sanitary Discharge(L/s)	6.25
Proposed Sanitary Service	150mm @ 2.0%
Receiving Sanitary Sewer	Bartos Drive 200mm Sanitary sewer
Development Water Demand (Fire + Domestic)	2168 USGM
Available Flow Rate	6042 USGM
Proposed Fire Service	200mm
Proposed Domestic Service	150mm
Allowable release rate from site	80 L/s
Proposed release rate from site (100-year storm)	80 L/s
Required Storage Tank Volume	82 m ³
Provided Volume (100Y Storm Tank)	90 m ³
Quantity Control	Pump & Orifice (to be design in SPA)

7.0 REFERENCES

1. Town of Oakville *Development Engineering Procedures and Guidelines Manual* (May 2005).
2. Storm water Management Planning and Design Manual, Ontario Ministry of the Environment, March 2003.
3. Visual OTTHYMO v2.0 Reference Manual, July 2002

Respectfully Submitted;
The Odan Detech Group Inc.

August 25, 2022



John Krpan, M.S.C.E. P.Eng.
(Civil)

A handwritten signature of Harold Ortal in black ink.

Harold Ortal, E.I.T.

APPENDIX A

Existing Site
Site Plan & Statistics

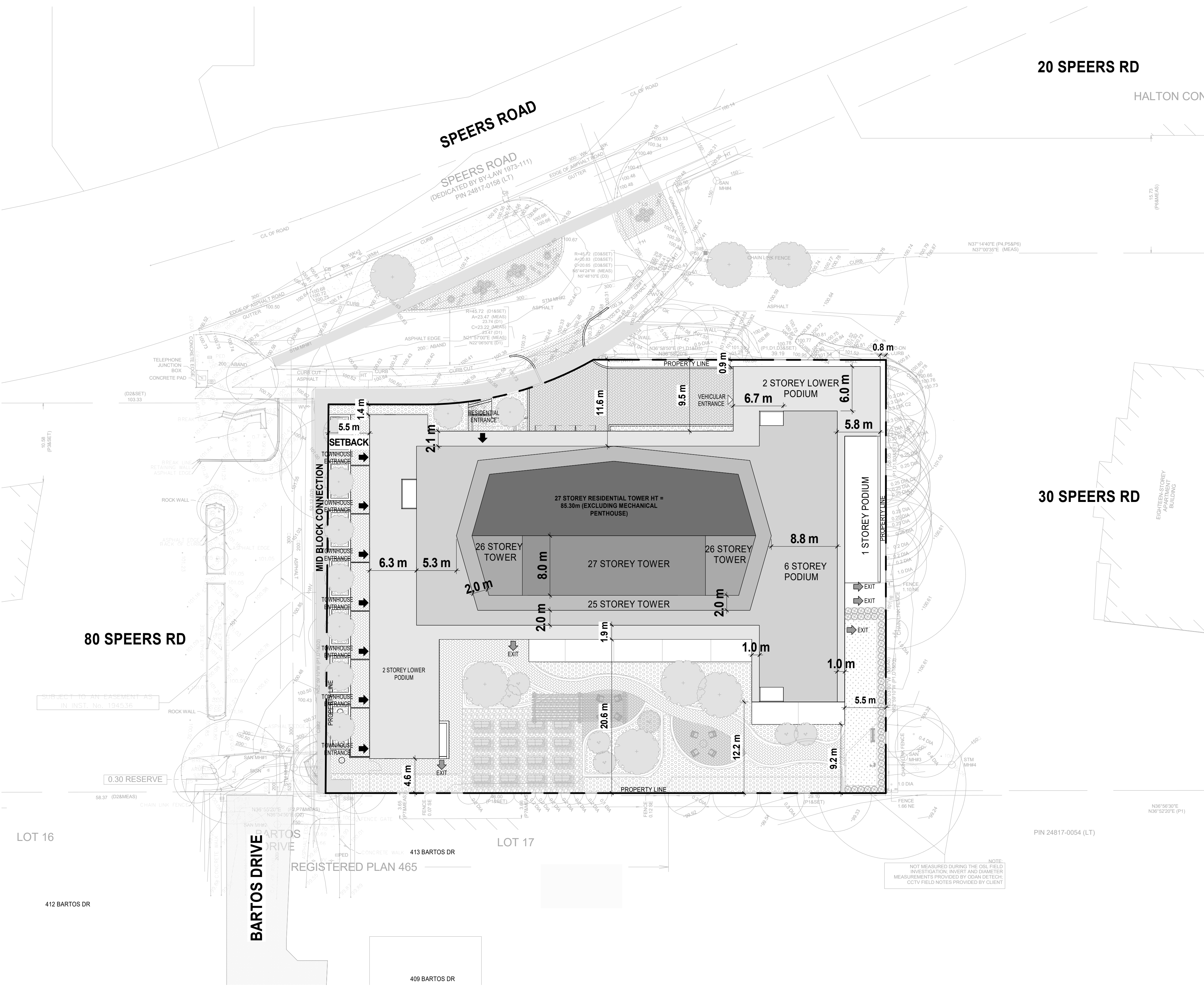
Aerial view of Site and surrounding area
by BDP. Quadrangle Architects Limited

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT





5 Context Plan



4 SITE PLAN
SCALE: 1:300

	Floor	Residential Floor Area	014/014 Floor Area (sqm)	Calville By-Law 2014.014	Unit Breakdown					Total Units	Rsa Rentable Area (sf)	Notes:
					Bach	1B	2B	3B	3B-2ST			
TOWER PODIUM	Mech Penthouse	520	520	0	0	0	0	0	0	4	2,790	
	27	504	79	420	0	0	4	0	0	4	2,790	
	26	597	72	525	0	2	6	0	0	8	5,359	
	25	735	79	656	0	2	6	1	0	9	6,805	
	24	735	79	656	0	2	6	1	0	9	6,805	
	23	735	79	656	0	2	6	1	0	9	6,805	
	22	735	79	656	0	2	6	1	0	9	6,805	
	21	735	79	656	0	2	6	1	0	9	6,805	
	20	735	79	656	0	2	6	1	0	9	6,805	
	19	769	79	691	2	6	4	0	0	12	7,172	
	18	769	79	691	2	6	4	0	0	12	7,172	
	17	769	79	691	2	6	4	0	0	12	7,172	
	16	769	79	691	2	6	4	0	0	12	7,172	
	15	769	79	691	2	6	4	0	0	12	7,172	
	14	769	79	691	2	6	4	0	0	12	7,172	
	13	769	79	691	2	6	4	0	0	12	7,172	
	12	769	79	691	2	6	4	0	0	12	7,172	
	11	769	79	691	2	6	4	0	0	12	7,172	
	10	769	79	691	2	6	4	0	0	12	7,172	
	9	769	79	691	2	6	4	0	0	12	7,172	
	8	769	79	691	2	6	4	0	0	12	7,172	
	7	769	85	692	0	4	2	0	0	6	3,745	
	6	1,390	119	1,271	1	13	2	3	0	19	13,510	
	5	1,390	119	1,271	1	13	2	3	0	19	13,510	
	4	1,390	119	1,271	1	13	2	3	0	19	13,510	
	3	1,390	119	1,271	1	13	2	3	0	19	13,510	
	2	2,111	145	1,966	0	5	3	0	0	8	17,330	
	Ground	2,042	691	1,450	0	0	0	0	14	14	8,000	
BELOW GRADE	P1	3,674	3,674.1	0.0								
	P2	3,674	3,674.1	0.0								
	P3	3,674	3,674.1	0.0								
TOTALS	Above Grade	25,752 sqm	22,365 sqm	28	147	107	18	14	314		218,213 sqm	
		277,197 sqm	240,736 sqm		9%	47%	34%	6%	4%	100%	% of Unit Type	
Site Area & FSU	Gross Site Area		4,180 sqm		439	676	775	1023	1232		Average Unit Size by Unit Type (SF)	
	Lot Coverage %		51%		Total Below-Grade GBA=						11,022 sqm	
	FSU (Net Floor Area / Gross Site Area)		5.4		Total Above + Below-Grade GBA=						36,774 sqm	

Floor Area: means the aggregate area of a building contained within the exterior walls, but does not include attic or basement space
Residential Floor Area: means the aggregate area of a residential building containing a dwelling measured from the exterior of the outside walls, but shall not include a private garage, basement, or attic.
Net Floor Area: means the total area of all floors of a building measured from the interior faces of the exterior walls or demising walls, but does not include the area of stair wells, elevators, escalators, ventilation shafts, attics, concourses, restrooms, attached enclosed and covered loading docks and related enclosed corridors used for loading purposes, above and below grade parking structures, storage rooms, rooms for garbage containment and mechanical rooms.
NOTE: All open to below areas are included in Floor Area and Net Floor Area, unless otherwise indicated in the Notes column above.

Building Statistics

VEHICULAR PARKING			
		Required	Provided
Refer to Traffic Report prepared by BA Group, for additional information.			
Residential (0.75 space/unit <75m NFA)	0.75 x 264	198	236
Residential (1.25 space/unit >75m NFA)	1.25 x 50	63	
Visitor (0.25 space/unit <75m NFA)	0.25 x 264	66	
Visitor (0.25 space/unit >75m NFA)	0.25 x 50	13	78
Accessible Parking Spaces (included in Total Parking)		2	3
TOTAL PARKING		340	314

BICYCLE PARKING			
		Required	Provided
Residential (Long-term) (0.75/unit)			
		75 x 314	236
Visitor (Short-term) (0.25/residential total)			
		0.25 x 314	78
TOTAL BICYCLES		314	314

LOADING / GARBAGE	
Loading Spaces	Provided
Refer to Traffic Report prepared by BA Group, for additional information.	
Residential (Loading Space 3.5m x 12m, 4.2m vertical clearance)	1
TOTAL LOADING SPACES	1
Garbage Room Size	80
Bulk Waste Storage Room	10
Garbage Staging Area	30

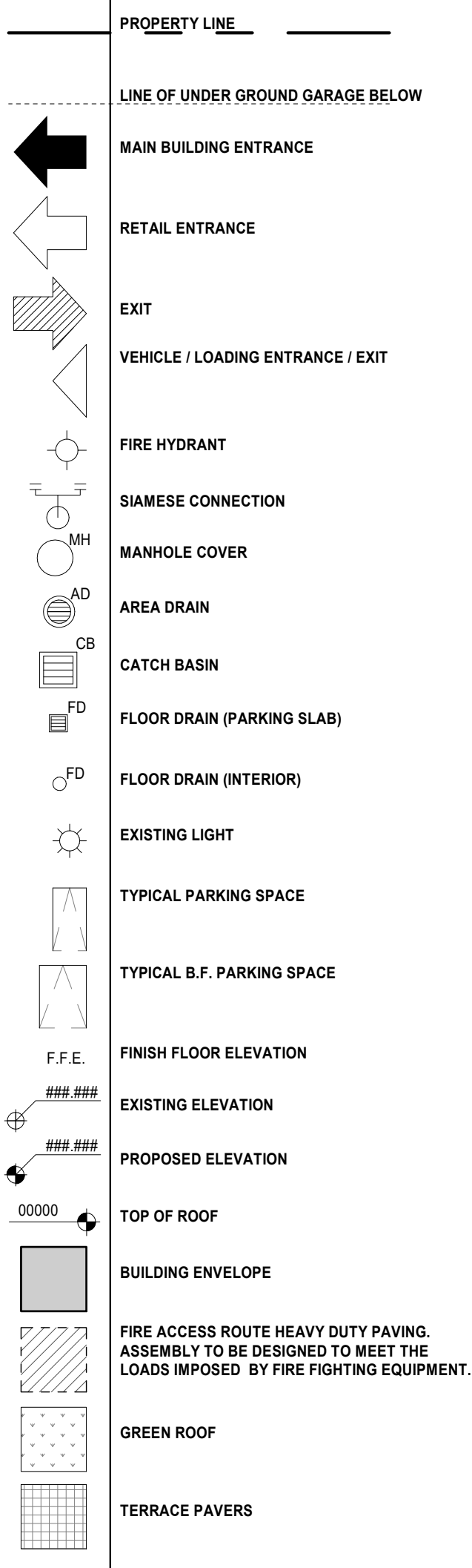
AMENITY AREA	
	Provided
Indoor Amenity	
	600 sqm
Outdoor Amenity	
Level 6F	1,060 sqm

Parking and Amenity Stats

AB Air barrier	FIN Finish	PS Passage set
AC Air conditioner	FL Floor	PT Paint, painted
AD Area drain	FLUOR Fluorescent	PVC Polyvinyl chloride
AFF Above finish floor	FP Fireplace	(R) Reclined
AL Aluminum	FPL Flush pull	R Radius
AX Anodized	FRGD Fire Rated Ceramic Glass	RB Resilient base
AD Automatic door operator	FRR Fire resistance rating	RC Roller catch
AP Acoustic panel	FSI Floor space index	RD Roof drain
APC Architectural precast concrete	GA Gauge	REF Reference
APPROX Approximate	GB Galvanized	REV Revision
AS Acoustic seal	GB Gypsum board	RF Resilient flooring
AST Astasag	GFA Gross floor area	RFLM Recessed floor mat
ASTM American Society for Testing Materials	GFI Ground fault interrupter	RH Rangoon
AT Acoustic ceiling tile	GK Gasket	RM Room
AVB Antivapour barrier	GL Glazing, glass	RO Rough opening
AVG Average	GLB Glass - back painted	RR Remote release
BF Barrier free	GLL Glass - laminated	RVR Reverse
BLDG Building	GLT Glass - tempered	RWL Rain water leader
BOLF Boland, fixed	GLT Glass - tempered and frosted	SAB Sound attenuation fire blankets
BOLR Boland, fixed	GLS Glass - safety	SB Site bulletin
BR Brick	GLFC Glass - fire-rated ceramic	SBO Supplied by others, contractor installed
CACF Central Alarm Control Facility	GRB Grab bar	SC Solid core
CA Catch basin	GRG Gypsum wire glass	SCD Scupper drain
CCMPA Can. Concrete Masonry Producers Assoc.	H Height	SI Site instruction
CCN Contemplated change notice	HB Hollow slab	SG Spandrel glass
CG Corner gasket	HC Hollow core	SM Sinter
CH Coat hook	HCC Honeycomb core	SK Skin coat
CHD Clear inside dimension	HDF High density fibroboard	SL Sealer, seal
CHP Cast-in-place	HG Hinge	SP Spandrel panel
CJ Construction joint	HGPC Hinge, centre pivot	SP Spray texture
CL Closer	HGPD Hinge, offset pivot	SS Stainless steel
CLR Clear finish	HM Hollow metal	SSM Solid surface material
CLG Ceiling	HP High point	ST Stone
CLT Closet	HR Hour	STC Sound transmission classification
CLM Concrete masonry unit	HSS Hollow steel section	STD Stained, stain
COL Column	HTP Heat pump	STL Steel
CONC Concrete	ID Interior design	STRUC Structural
CP Communications panel	INSUL Insulation/insulating	T Tile
CPT Carpet	INT Interior	TB Tack board
CR Card reader	JAN Janitor	TBD To be determined
CSA Canadian Standards Association	KP Kick plate	TC Traffic coating
CT Ceramic tile	L Length/long	TD Terrace drain
CW Complete with	LA Latch	TEL Telephone
CTL Cylinder	LAV Lavatory	TEMP Temporary
D Depth/Deep	LEV Low emitting vehicle	TER Terrazzo
DB Dead bolt	LIN Linen closet/shelves	TER Terrace
DC Door contact	LP Low point	TH Threshold
DA Diameter	LS Lock set	TKN Thick
DM Dimension	LV Louvre	TOP Top of finish
DN Down	MAG Magnetic lock	TOFR Top of finished roof
DP Door pull - recessed	MAX Maximum	TOP Top of grade
DD Door stop - door mounted	HDF Medium density fibreboard	TOP Top of parapet
DSF Door stop - floor mounted	MECH Mechanical	TOS Top of slab/steel
DSO Door stop - overhead recessed	MFR Manufacturer	TOW Top of wall
DSW Door stop - wall mounted	MN Minimum	TRE Temperature rise rating
DW Dishwasher	MISC Miscellaneous	TT Thumb turn
DWG Drawing	MILL Millwork	TYP Typical
ED Exit device	MIR Mirror	UH Unit heater
EFS Exterior insulating finish system	MO Masonry opening	UR Urinal
EJ Expansion joint	MP Metal panel	US Underside
ELEC Electrical	MRR Moisture resistant gypsum board	USC Underwriter's Laboratories of Canada
ELEV Elevator	MTL Metal	UNO Unless noted otherwise
EOS Edge of slab	MV Microwave	VB Vapour barrier
EP Electrical panel	N New	VCT Vinyl composite tile
ESP Escalation plate	NA Not applicable	VEST Vestibule
EQ Equal	NBC National Building Code	VFI Vinyl-faced insulation
EV Electrical vehicle	NIC Not in contact	VG Vision glass
EVE Electrical vehicle supply equipment	NTS Not to scale	VGF Vinyl graphic film
EQUIP Equipment	OC Ontario Building Code	VNR Veneer
ES Electric strike	OC On centre	VPR Visitor's parking
(E) Existing	OP Overlap panel	W Washbasin
(ER) Existing/relocated	OSB Oriented strand board	WB White board
EXT Exterior	OSD Overflow scupper drain	WC Water closet
FC Fan coil	PS Push button	WCV Wall covering
FD Floor drain	PCT Porcelain tile	WD Wood
FFE Fire fighter's elevator	PERF Perforated	WID Washer/Dryer
FFH Fire fighter's handset	PLAM Plastic laminate	WIC Walk-in closet
FFL Finished floor level	PLY Plywood	WPS Waterproof surface
FG Fixed glazing	PNL Panel	WR Waste receptacle
FH Fire hydrant	PP Push plate	WS Wastewater piping
FHC Fire hose cabinet	PQ Parquet flooring	WT Window treatment

1 Abbreviations

SITE PLAN LEGEND



Date	No.	Description
REVISION RECORD		

2022-10-12	Rezonning & Official Plan Amendment
ISSUE RECORD	

BDP Quadrangle

Quadrangle Architects Limited
901 King Street West, Suite 701 Toronto, ON M5V 3H5
416.598.1240 www.bdpquadrangle.com

50 Speers Road

Oakville, ON

for Helberg Properties Limited

20023 PROJECT SCALE ED AT DRAWN REVIEWED

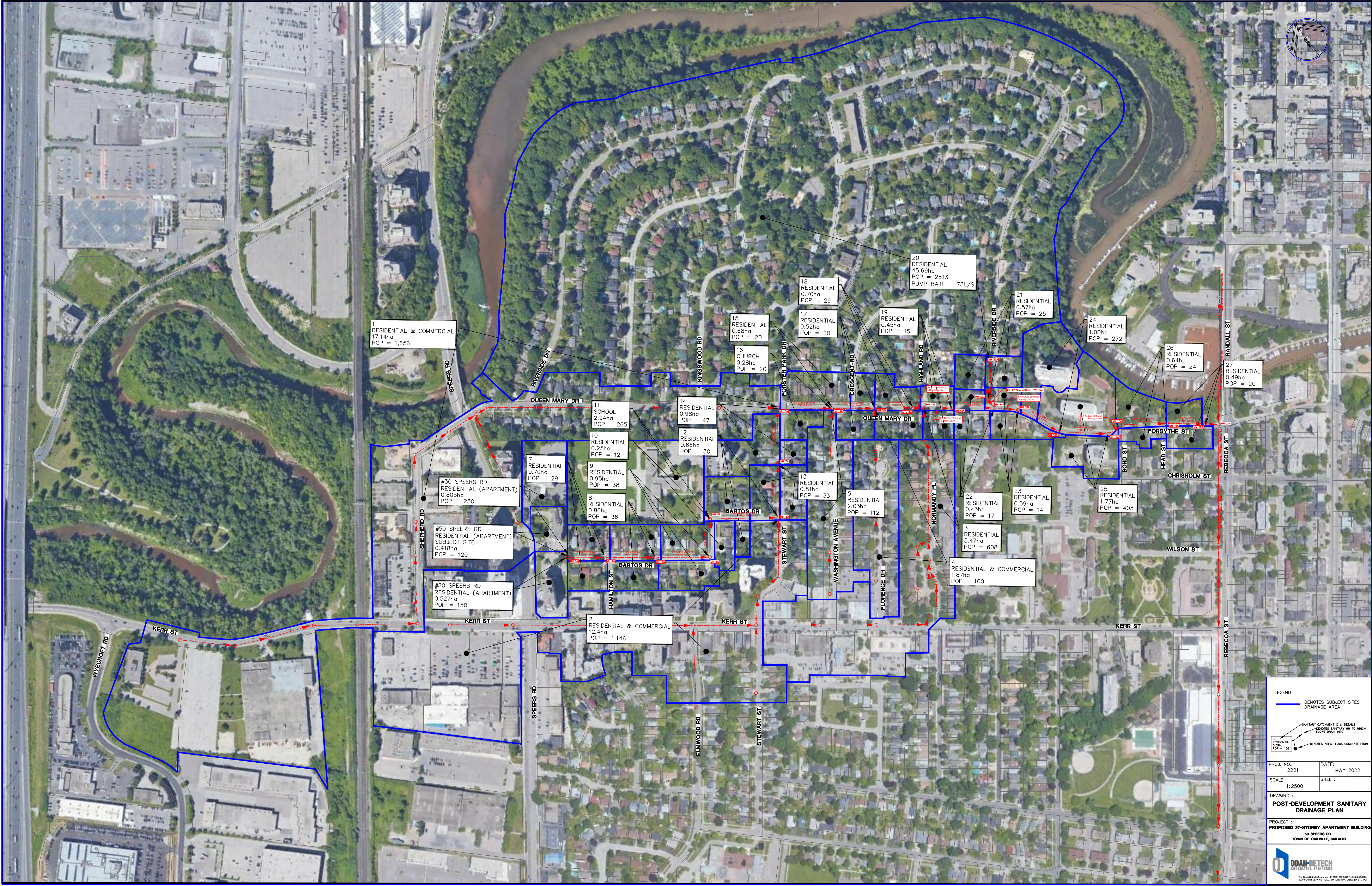
Context, Site Plan & Statistics

A101.S

Note: This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect. The Contractor is responsible for checking and verifying all measurements and dimensions and shall report all discrepancies to the Architect and obtain correction prior to commencing work.

APPENDIX B

Pre-Development Sanitary Sewer Catchment Plan
Post-Development Sanitary Sewer Catchment Plan



LEGEND

- DENOTES SUBJECT SITES DRAINAGE AREA
- SANITARY CATCHMENT ID & DETAILS
- DENOTES SANITARY WH TO WHICH FLOWS DRAIN INTO
- DENOTES AREA FLOWS ORIGINATE FROM

PROJ. NO.: 22211 DATE: MAY 2022

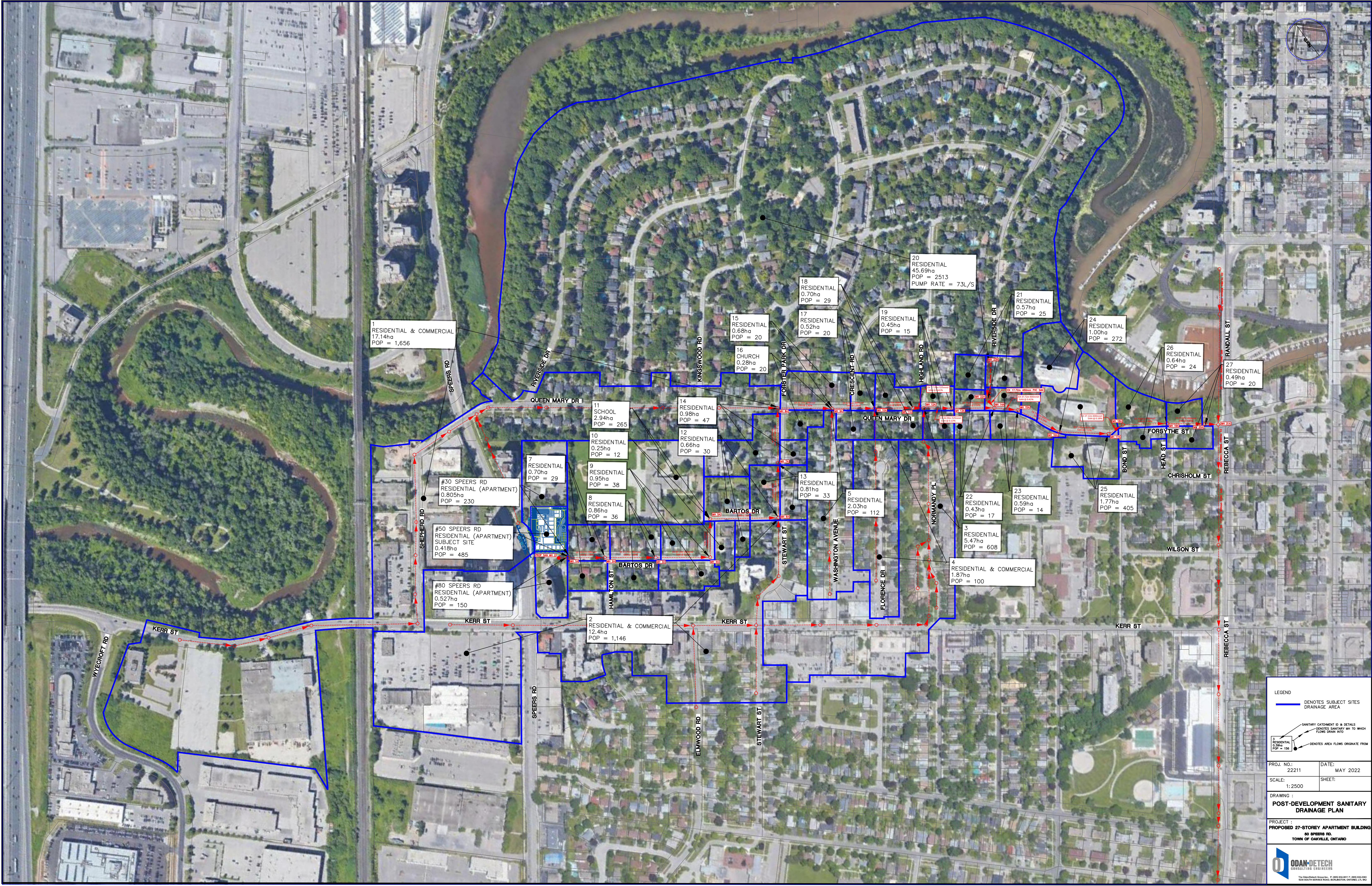
SCALE: 1:2500 SHEET:

DRAWING : **POST-DEVELOPMENT SANITARY DRAINAGE PLAN**

PROJECT : **PROPOSED 27-STORY APARTMENT BUILDING**
60 SPEERS RD.
TOWN OF OAKVILLE, ONTARIO

ODAN-DETECH
CONSULTING ENGINEERS

The Olan-Detech Group Inc. P. 0416-622-0111 F. 0416-622-0402
2700 SOUTH BRIDGE STREET, WILLOWDALE, ONTARIO, M2H 3C9



LEGEND

- DENOTES SUBJECT SITES DRAINAGE AREA
- SANITARY CATCHMENT ID & DETAILS
- DENOTES SANITARY WH TO WHICH FLOWS DRAIN INTO
- DENOTES AREA FLOWS ORIGINATE FROM

PROJ. NO.: 22211 DATE: MAY 2022

SCALE: 1:2500 SHEET:

DRAWING : **POST-DEVELOPMENT SANITARY DRAINAGE PLAN**

PROJECT : **PROPOSED 27-STORY APARTMENT BUILDING**
60 SPEERS RD.
TOWN OF OAKVILLE, ONTARIO

ODAN-DETECH
CONSULTING ENGINEERS

The Olan-Detech Group Inc. P. 0416-622-0111 F. 0416-622-0403
2700 SOUTH BRIDGE STREET, WILLOWDALE, ONTARIO, M2H 3C9

APPENDIX C

Visual OTTHYMO Model Output – (5-Year & 100-Year storms)
Sanitary & Storm Sewer Video Inspection Report by Aquaflow Technology

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

Visual OTTHYMO Output (5-year & 100-year storm)

```
V V I SSSSS U U A L
V V I SS U U A A L
V V I SS U U A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLL

OOO TTTT TTTT H H Y Y M M OOO
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
OOO T T H H Y M M OOO
```

Developed and Distributed by Clarifica Inc.
Copyright 1996, 2007 Clarifica Inc.
All rights reserved.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.3\voindat
Output filename: \\server\F\Autocad\public\2022\22211\Design and Reports\Computer Analysis\Post
Development.out
Summary filename: \\server\F\Autocad\public\2022\22211\Design and Reports\Computer Analysis\Post
Development.sum

DATE: 10/5/2022 TIME: 10:53:41 AM

USER:

COMMENTS: _____

** SIMULATION NUMBER: 1 **

| CHICAGO STORM | IDF curve parameters: A=1170.000
| Ptotal= 45.17 mm | B= 5.800
C= .843
used in: INTENSITY = A / (t + B)^C
Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	2.32	1.17	24.01	2.17	6.09	3.17	2.81
.33	2.70	1.33	114.21	2.33	5.07	3.33	2.59
.50	3.24	1.50	32.30	2.50	4.35	3.50	2.40
.67	4.08	1.67	15.74	2.67	3.82	3.67	2.24
.83	5.57	1.83	10.30	2.83	3.41	3.83	2.10
1.00	8.96	2.00	7.65	3.00	3.08	4.00	1.98

| CALIB |
| STANDHYD (0002) | Area (ha)= .19
| ID= 1 DT= 5.0 min | Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.15	.04
Dep. Storage (mm)=	1.00	1.00
Average Slope (%)=	1.00	2.00
Length (m)=	35.90	40.00
Mannings n =	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.083	2.32	1.083	24.01	2.083	6.09	3.08	2.81
.167	2.32	1.167	24.01	2.167	6.09	3.17	2.81
.250	2.70	1.250	114.21	2.250	5.07	3.25	2.59
.333	2.70	1.333	114.21	2.333	5.07	3.33	2.59
.417	3.24	1.417	32.30	2.417	4.35	3.42	2.40
.500	3.24	1.500	32.30	2.500	4.35	3.50	2.40
.583	4.08	1.583	15.74	2.583	3.82	3.58	2.24
.667	4.08	1.667	15.74	2.667	3.82	3.67	2.24
.750	5.57	1.750	10.30	2.750	3.41	3.75	2.10
.833	5.57	1.833	10.30	2.833	3.41	3.83	2.10
.917	8.96	1.917	7.65	2.917	3.08	3.92	1.98
1.000	8.96	2.000	7.65	3.000	3.08	4.00	1.98

Max.Eff.Inten.(mm/hr)=	114.21	42.13
over (min)	5.00	10.00
Storage Coeff. (min)=	1.31 (ii)	5.15 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	.33	.16

PEAK FLOW (cms)=	.05	.00	.052 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	44.17	18.12	38.95
TOTAL RAINFALL (mm)=	45.17	45.17	45.17
RUNOFF COEFFICIENT =	.98	.40	.86

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0001)		Area (ha)=	.22
ID= 1 DT= 5.0 min		Total Imp(%)=	74.00 Dir. Conn.(%)= 74.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.17		.06
Dep. Storage (mm)=	1.00		1.00
Average Slope (%)=	1.00		2.00
Length (m)=	38.70		40.00
Mannings n =	.013		.250
Max.Eff.Inten.(mm/hr)=	114.21	42.13	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.37 (ii)	5.77 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	.33	.15	
		TOTALS	
PEAK FLOW (cms)=	.05	.01	.057 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	44.17	18.12	37.38
TOTAL RAINFALL (mm)=	45.17	45.17	45.17
RUNOFF COEFFICIENT =	.98	.40	.83

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0008)				
1 + 2 = 3		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
				R.V.
				(mm)
ID1= 1 (0002):	.19	.052	1.33	38.95
+ ID2= 2 (0001):	.22	.057	1.33	37.38
=====				
ID = 3 (0008):	.42	.109	1.33	38.11

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| RESERVOIR (0007) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW          | STORAGE | OUTFLOW          | STORAGE |
| (cms)            | (ha.m.) | (cms)            | (ha.m.) |
| .0000            | .0000   | .0798            | .0080   |
| .0795            | .0020   | .0799            | .0100   |
| .0796            | .0040   | .0800            | .0120   |
| .0797            | .0060   | .0000            | .0000   |
|
| AREA             | QPEAK      | TPEAK           | R.V.      |
| (ha)             | (cms)      | (hrs)           | (mm)      |
| INFLOW : ID= 2 (0008) .418 .109 1.33 38.11
| OUTFLOW: ID= 1 (0007) .418 .080 1.33 38.10
|
| PEAK FLOW REDUCTION [Qout/Qin] (%) = 72.73
| TIME SHIFT OF PEAK FLOW (min) = .00
| MAXIMUM STORAGE USED (ha.m.) = .0030
|-----
```

```
*****
** SIMULATION NUMBER: 2 **
*****
```

```
-----
| CHICAGO STORM    | IDF curve parameters: A=2150.000
| Ptotal= 75.20 mm | B= 5.700
|                   | C= .861
|                   | used in: INTENSITY = A / (t + B)^C
|
| Duration of storm = 4.00 hrs
| Storm time step   = 10.00 min
| Time to peak ratio = .33
|
| TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
| hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
| .17 3.49 | 1.17 39.75 | 2.17 9.50 | 3.17 4.26
| .33 4.08 | 1.33 200.80 | 2.33 7.85 | 3.33 3.91
| .50 4.93 | 1.50 54.01 | 2.50 6.70 | 3.50 3.62
| .67 6.26 | 1.67 25.55 | 2.67 5.85 | 3.67 3.37
| .83 8.66 | 1.83 16.41 | 2.83 5.19 | 3.83 3.15
| 1.00 14.21 | 2.00 12.04 | 3.00 4.68 | 4.00 2.96
|-----
```

```
-----
| CALIB            |
| STANDHYD (0002) | Area (ha)= .19
| ID= 1 DT= 5.0 min | Total Imp (%) = 80.00 Dir. Conn. (%) = 80.00
|-----|
| IMPERVIOUS      | PERVIOUS (i)
| Surface Area    | (ha)= .15 .04
| Dep. Storage    | (mm)= 1.00 1.00
| Average Slope   | (%) = 1.00 2.00
| Length          | (m) = 35.90 40.00
| Mannings n      | = .013 .250
|-----
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
| TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
| hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
| .083 3.49 | 1.083 39.75 | 2.083 9.50 | 3.08 4.26
| .167 3.49 | 1.167 39.75 | 2.167 9.50 | 3.17 4.26
| .250 4.08 | 1.250 200.80 | 2.250 7.85 | 3.25 3.91
| .333 4.08 | 1.333 200.80 | 2.333 7.85 | 3.33 3.91
| .417 4.93 | 1.417 54.01 | 2.417 6.70 | 3.42 3.62
| .500 4.93 | 1.500 54.01 | 2.500 6.70 | 3.50 3.62
| .583 6.26 | 1.583 25.55 | 2.583 5.85 | 3.58 3.37
| .667 6.26 | 1.667 25.55 | 2.667 5.85 | 3.67 3.37
| .750 8.66 | 1.750 16.41 | 2.750 5.19 | 3.75 3.15
| .833 8.66 | 1.833 16.41 | 2.833 5.19 | 3.83 3.15
| .917 14.21 | 1.917 12.04 | 2.917 4.68 | 3.92 2.96
| 1.000 14.21 | 2.000 12.04 | 3.000 4.68 | 4.00 2.96
|-----
```

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

Max.Eff.Inten.(mm/hr)=	200.80	103.62	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.05 (ii)	4.11 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	.34	.24	
			TOTALS
PEAK FLOW (cms)=	.09	.01	.097 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.33
RUNOFF VOLUME (mm)=	74.20	39.99	67.34
TOTAL RAINFALL (mm)=	75.20	75.20	75.20
RUNOFF COEFFICIENT =	.99	.53	.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
STANDHYD (0001)		Area (ha)=	.22		
ID= 1 DT= 5.0 min		Total Imp(%)=	74.00	Dir. Conn.(%)=	74.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	.17	.06		
Dep. Storage (mm)=	1.00	1.00		
Average Slope (%)=	1.00	2.00		
Length (m)=	38.70	40.00		
Mannings n =	.013	.250		
Max.Eff.Inten.(mm/hr)=	200.80	103.62		
over (min)	5.00	5.00		
Storage Coeff. (min)=	1.09 (ii)	4.61 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	.34	.23		
			TOTALS	
PEAK FLOW (cms)=	.09	.02	.109 (iii)	
TIME TO PEAK (hrs)=	1.33	1.33	1.33	
RUNOFF VOLUME (mm)=	74.20	39.99	65.30	
TOTAL RAINFALL (mm)=	75.20	75.20	75.20	
RUNOFF COEFFICIENT =	.99	.53	.87	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0008)				
1 + 2 = 3		AREA	QPEAK	TPEAK
		(ha)	(cms)	(hrs)
ID1= 1 (0002):	.19	.097	1.33	67.34
+ ID2= 2 (0001):	.22	.109	1.33	65.30
ID = 3 (0008):	.42	.206	1.33	66.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0007)				
IN= 2---> OUT= 1				
DT= 5.0 min				
	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	.0000	.0000	.0798	.0080
	.0795	.0020	.0799	.0100
	.0796	.0040	.0800	.0120
	.0797	.0060	.0000	.0000
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0008)	.418	.206	1.33	66.24

PROPOSED 27-STOREY APARTMENT BUILDING – 50 SPEERS RD
FSR REPORT

OUTFLOW: ID= 1 (0007)	.418	.080	1.42	66.24
-----------------------	------	------	------	-------

PEAK FLOW REDUCTION	[Qout/Qin] (%)=	38.65
TIME SHIFT OF PEAK FLOW	(min)=	5.00
MAXIMUM STORAGE USED	(ha.m.)=	.0082

FINISH
=====



**226 WILKINSON ROAD, BRAMPTON, ONTARIO L6T 4N7
(905) 792-8169**

SANITARY & STORM SEWER VIDEO INSPECTION REPORT

**150 MM & 200 MM DIAMETER SANITARY SEWERS
&
450 MM DIAMETER STORM SEWER**

FOR

50 SPEERS ROAD

**TOWN OF OAKVILLE
REGION OF HALTON**

DVD # 22145

**CONSULTING ENGINEER: THE ODAN/DETECH GROUP INC.
CONSULTING ENGINEER'S REPRESENTATIVE: KEVIN OSINGA
DEVELOPER: COLLAGE WORKS
DEVELOPER'S REPRESENTATIVE: ALI SANEINEJAD**

FRIDAY, JUNE 17TH, 2022

INDEX:

- 1. TITLE PAGE AND INDEX**
- 2. SUMMARY REPORT AND CONCLUSIONS**
- 3. SKETCH OF SEWERS INSPECTED**
- 4. SEWER INSPECTION REPORT**

**SEWER CLEANING, VIDEO INSPECTION, INSITU REPAIRS &
MUNICIPAL ENGINEERING SERVICES**

2. SUMMARY REPORT AND CONCLUSIONS:

The video inspection of the sanitary and storm sewers for 50 Speers Road was carried out by Steven Lostracco, P.Eng. of Aquaflow Technology Inc., and was authorized by Kevin Osinga of The Odan/Detech Group Inc. All sanitary and storm sewers were power flushed immediately prior to the video inspection. The video inspections were carried out on Friday, June 17th, 2022.

SANITARY & STORM SEWERS INSPECTED:

DVD # 22145:	150 mm & 200 mm diameter Sanitary sewers inspected	140.6 m
	450 mm diameter Storm sewer inspected	<u>30.0 m</u>

TOTAL LENGTH OF SEWERS VIDEO INSPECTED: 170.6 M.

Pipes are old and showing signs of age, they are currently functioning in satisfactory condition. However, pipes do require rehabilitation or repairs to continue working reliably in the future. For detailed comments on each sewer run, please refer to the attached sewer video Inspection reports.

1. SAN-CO-50 to MH SAN-1, 150 mm dia. A.C. sanitary lateral. Root infiltration was observed at a joint, hardened grease buildup on the sides of the pipe and light ponding was observed (survey #1).

2. MH SAN-1 to SAN-2, 200 mm conc. sanitary sewer. Sewer main for adjacent building #30. Both manholes SAN-1 + SAN-2 require re-benching to allow proper sewage flow. Root infiltration was observed at multiple joints, grease buildup observed in pipe, and 2 breaks were observed, (survey #2). It is recommended to either re-line the entire pipe or replace it.

3. MH SAN-2 to SAN-BLDG-30, 150 mm Cast Iron sanitary sewer. Pipe services #30 Speers Road apartment building, sanitary pipe is visible hung inside the underground parking garage (survey #3).

4. MH STM-1 to STM-2-BURIED, 450 mm conc. storm. Pipe services #30 Speers Road apartment building, likely a buried manhole next to MH SAN-2. 200 mm dia. storm pipe connects to the building #30 Speers Road apartment, it is visible hung inside the underground parking garage, confirmed connection to the 450 mm sewer. Heavy accumulation of sand debris throughout 450 mm storm sewer, camera blocked at 9.2 metres, debris continues throughout entire line. Extra flushing required to CCTV the entire line. Note, root infiltration and calcite buildup observed in line.



1. 50 Speers Road



2. 50 Speers Road



3. 50 Speers Road, SAN-CO-50



4. 30 Speers Road, MH SAN-2
(Likely buried MH STM-2-BURIED)



5. 80 Speers Road, MH SAN-1, STM-1



6. 80 Speers Road, MH SAN
(Requires re-benching)



7. 30 Speers Road, SAN + STM laterals

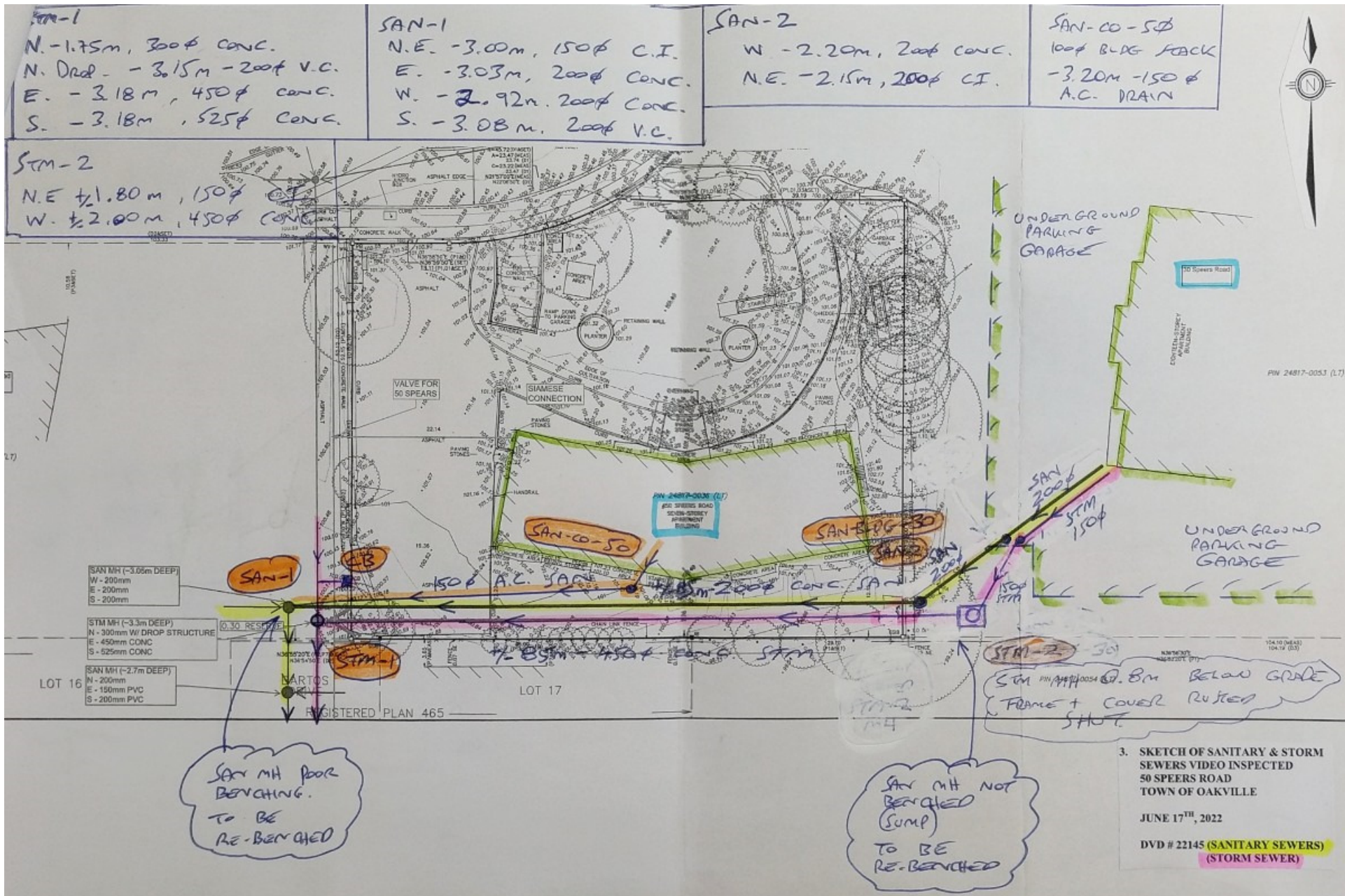


8. 30 Speers Rd, Hung SAN + STM laterals in parking garage

Report Prepared by:

A handwritten signature in black ink, appearing to read "S. Lostracco", written over a horizontal line.

Steven Lostracco, P. Eng.



Index of pipes

4 items

Inspected length : 170.60

Total length : 225.00

Pipe	Start/End	Direction	Road	Date	Inspected	Total	Page
SAN-1_SAN-2	SAN-1 --> SAN-2	Against flow	50 SPEERS ROAD - SANITARY	17/06/2022 9:36 AM	84.6	85	4
SAN-2_SAN-BLDG-30	SAN-2 --> SAN-BLDG-30	Against flow	50 SPEERS ROAD - SANITARY	17/06/2022 10:22 AM	10	10	5
SAN-CO-50_SAN-1	SAN-CO-50 --> SAN-1	Direction of flow	50 SPEERS ROAD - SANITARY	17/06/2022 8:14 AM	46	45	6
STM-1_STM-2-BURIED	STM-1 --> STM-2-BURIED	Against flow	50 SPEERS ROAD - STORM	17/06/2022 11:17 AM	30	85	7

Structural rating

4 items

5 - Most significant defect grade (1 of 4 items)

Score	Quick	Index	Pipe	Start/End	Direction	Road	Page
11	5211	3.7	SAN-1_SAN-2	SAN-1 --> SAN-2	Against flow	50 SPEERS ROAD - SANITARY	4

2 - Minor to Moderate (1 of 4 items)

Score	Quick	Index	Pipe	Start/End	Direction	Road	Page
2	2100	2	STM-1_STM-2-BURIED	STM-1 --> STM-2-BURIED	Against flow	50 SPEERS ROAD - STORM	7

0 - No Defects (2 of 4 items)

Score	Quick	Index	Pipe	Start/End	Direction	Road	Page
0	0000	0	SAN-2_SAN-BLDG-30	SAN-2 --> SAN-BLDG-30	Against flow	50 SPEERS ROAD - SANITARY	5
0	0000	0	SAN-CO-50_SAN-1	SAN-CO-50 --> SAN-1	Direction of flow	50 SPEERS ROAD - SANITARY	6

O&M rating

4 items

3 - Moderate defect grade (2 of 4 items)

Score	Quick	Index	Structural	Pipe	Start/End	Direction	Road	Page
55	3B21	2.8	2	STM-1_STM-2-BURIED	STM-1 --> STM-2-BURIED	Against flow	50 SPEERS ROAD - STORM	7
11	3312	2.2	5	SAN-1_SAN-2	SAN-1 --> SAN-2	Against flow	50 SPEERS ROAD - SANITARY	4

0 - No Defects (2 of 4 items)

Score	Quick	Index	Structural	Pipe	Start/End	Direction	Road	Page
0	0000	0	0	SAN-2_SAN-BLDG-30	SAN-2 --> SAN-BLDG-30	Against flow	50 SPEERS ROAD - SANITARY	5
0	0000	0	0	SAN-CO-50_SAN-1	SAN-CO-50 --> SAN-1	Direction of flow	50 SPEERS ROAD - SANITARY	6

Pipe summary and condition details

Pipe identification

Pipe:	SAN-1_SAN-2	Direction of inspection:	SAN-1 --> SAN-2
Direction of flow:	SAN-2 --> SAN-1	Direction:	Against flow
Road:	50 SPEERS ROAD - SANITARY	Material:	Concrete Pipe (non-reinforced)
City:	OAKVILLE	Size:	200
Date:	17/06/2022 9:36 AM	Inspected length:	84.6
Surveyed by:	OWEN	Purpose:	
Weather:	Dry	Additional information:	

Observations

#	Distance	Description
1	0.00 m	AMH - Manhole, SAN-1
2	0.00 m	MWL - Water Level, 5%
3	0.00 m	MGO - General Observation, MH SAN-1, DETERIORATED BENCHING, TO BE RE-BENCHED
4	0.00 m	MGO - General Observation, 150 MM SAN TO BLDG
5	0.00 m	MGO - General Observation, 200 MM PIPE TO THE EAST
6	0.00 m	MGO - General Observation, 200 MM CLAY OUTLET PIPE
7	0.00 m	MGO - General Observation, SEWAGE COLLECTS, MH TO BE RE-BENCHED
8	5.90 m	MGO - General Observation, OLD 1.0 M SECTIONS OF NON REINFORCED PIPE
9	6.40 m	CC - Crack Circumferential, from 7 o'clock to 12 o'clock
10	6.40 m	RMJ - Roots Medium Joint, at joint, from 10 o'clock to 12 o'clock, 10%, ROOTS GROWIN THRU CRACK IN PIPE
11	7.00 m	MWL - Water Level, 10%
12	7.40 m	RMJ - Roots Medium Joint, at joint, from 10 o'clock to 12 o'clock, 10%
13	8.80 m	RFJ - Roots Fine Joint, at joint, at 11 o'clock
14	10.90 m	MWL - Water Level, 20%
15	17.60 m	MWL - Water Level, 10%
16	39.10 m	B - Broken, from 4 o'clock to 10 o'clock, BOTTOM + SIDES OF PIPE BROKEN
17	39.90 m	TF - Tap Factory, at 9 o'clock, Dim.1=150, CAPPED
18	44.80 m	MGO - General Observation, HOLE IN PIPE COVERED WITH BUILDING MATERIALS
19	45.90 m	RFJ - Roots Fine Joint, at joint, at 9 o'clock
20	48.20 m	MGO - General Observation, ROOTS AT MULTIPLE JOINTS IN LINE
21	58.30 m	MWL - Water Level, 20%
22	65.90 m	MWL - Water Level, 10%
23	70.00 m	RMJ - Roots Medium Joint, at joint, from 11 o'clock to 5 o'clock, 20%
24	74.50 m	MWL - Water Level, 30%
25	78.10 m	MGO - General Observation, HEAVY PONDING IN LINE - GREASE ON TOP OF PIPE
26	81.90 m	MWL - Water Level, 10%
27	82.00 m	B - Broken, from 10 o'clock to 2 o'clock, BREAK IN TOP OF PIPE - PIECE OF CLAY PIPE COVERING HOLE
28	84.60 m	MGO - General Observation, VIEW OF PIPE TO ADJACENT BLDG
29	84.60 m	MGO - General Observation, SUMP MH - SEWAGE COLLECTS - TO BE RE-BENCHED
30	84.60 m	AMH - Manhole, SAN-2

Pipe summary and condition details

Pipe identification

Pipe:	SAN-2_SAN-BLDG-30	Direction of inspection:	SAN-2 --> SAN-BLDG-30
Direction of flow:	SAN-BLDG-30 --> SAN-2	Direction:	Against flow
Road:	50 SPEERS ROAD - SANITARY	Material:	Cast Iron
City:	OAKVILLE	Size:	150
Date:	17/06/2022 10:22 AM	Inspected length:	10
Surveyed by:	OWEN	Purpose:	
Weather:	Dry	Additional information:	

Observations

#	Distance	Description
1	0.00 m	AMH - Manhole, SAN-2
2	0.00 m	MWL - Water Level, 10%
3	0.00 m	MGO - General Observation, SUMP MH - SEWAGE COLLECTS - TO BE RE-BENCHED
4	0.00 m	MWL - Water Level, 20%
5	10.00 m	MGO - General Observation, INSIDE PARKING GARAGE OF BLDG #30
6	10.00 m	MGO - General Observation, RE-CCTV AS BACKING OUT
7	10.00 m	AMH - Manhole, SAN-BLDG-30

Pipe summary and condition details

Pipe identification

Pipe:	SAN-CO-50_SAN-1	Direction of inspection:	SAN-CO-50 --> SAN-1
Direction of flow:	SAN-CO-50 --> SAN-1	Direction:	Direction of flow
Road:	50 SPEERS ROAD - SANITARY	Material:	Asbestos Cement
City:	OAKVILLE	Size:	150
Date:	17/06/2022 8:14 AM	Inspected length:	46
Surveyed by:	OWEN	Purpose:	
Weather:	Dry	Additional information:	

Observations

#	Distance	Description
1	0.00 m	ACOM - Cleanout Mainline, SAN-CO-50
2	0.00 m	MWL - Water Level, 5%
3	0.00 m	MGO - General Observation, BUILDING CLEANOUT ON SOUTH SIDE - 100MM A.C. STACK
4	3.30 m	MGO - General Observation, WYE INTO MAIN DRAIN
5	4.50 m	MGO - General Observation, HEAVY ROOTS AT PIPE JOINT
6	6.00 m	MGO - General Observation, SOLID GREASE ON SIDE OF PIPE
7	7.00 m	MWL - Water Level, 10%
8	15.00 m	MWL - Water Level, 15%
9	23.00 m	MWL - Water Level, 10%
10	46.00 m	MGO - General Observation, POOR BENCHING IN MH, TO BE RE-BENCHED
11	46.00 m	MGO - General Observation, RE-CCTV AS BACKING OUT
12	46.00 m	AMH - Manhole, SAN-1

Pipe summary and condition details

Pipe identification

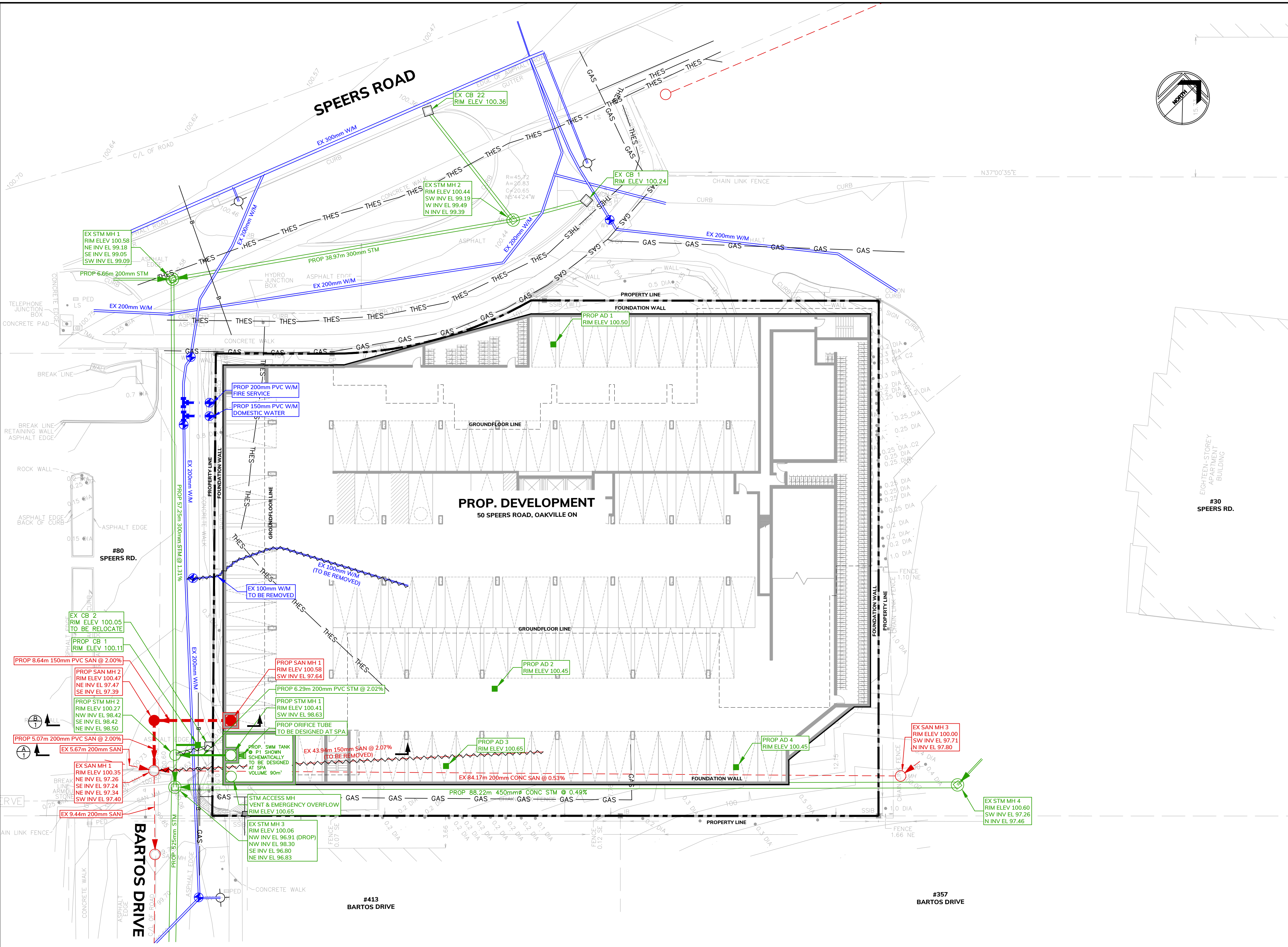
Pipe:	STM-1_STM-2-BURIED	Direction of inspection:	STM-1 --> STM-2-BURIED
Direction of flow:	STM-2-BURIED --> STM-1	Direction:	Against flow
Road:	50 SPEERS ROAD - STORM	Material:	Reinforced Concrete Pipe
City:	OAKVILLE	Size:	450
Date:	17/06/2022 11:17 AM	Inspected length:	30
Surveyed by:	OWEN	Purpose:	
Weather:	Dry	Additional information:	

Observations

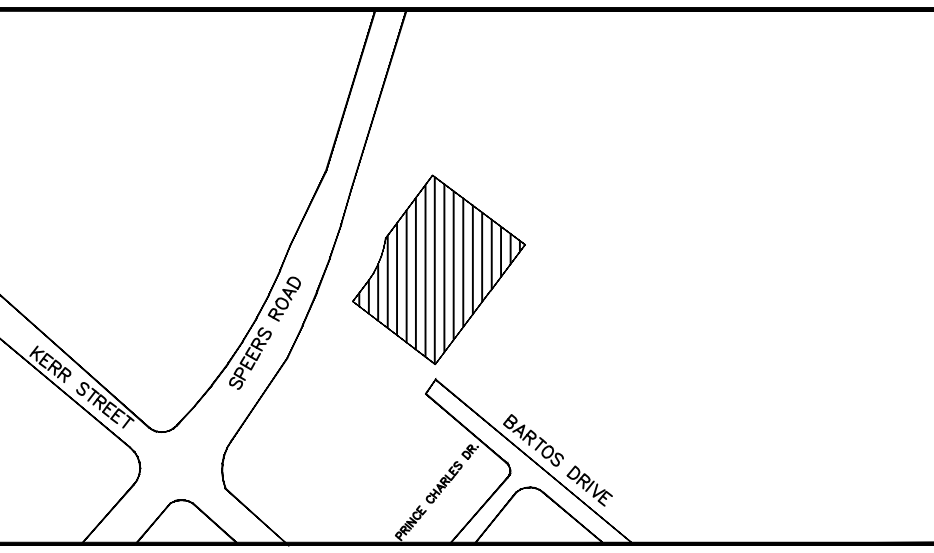
#	Distance	Description
1	0.00 m	AMH - Manhole, STM-1
2	0.00 m	MWL - Water Level, 5%
3	2.50 m	DAE - Deposits Attached Encrustation, from 4 o'clock to 8 o'clock, 5%, CALCITE BUILDUP AT JOINT
4	3.00 m	CL - Crack Longitudinal, at 12 o'clock
5	3.00 m	MGO - General Observation, LIFT HOLE AT TOP OF PIPE
6	3.40 m	MWL - Water Level, 10%
7	4.20 m	RFJ - Roots Fine Joint, at joint, at 4 o'clock
8	7.70 m	RMJ - Roots Medium Joint, at joint, at 8 o'clock, 10%
9	7.70 m	(S01) DSF - Deposits Settled Fine, from 5 o'clock to 7 o'clock, 20%
10	9.20 m	RMJ - Roots Medium Joint, at joint, at 4 o'clock, 10%
11	9.20 m	MGO - General Observation, BLOCKED BY HEAVY SAND DEBRIS
12	9.20 m	MGO - General Observation, ZOOM IN VIEW AHEAD
13	30.00 m	RFJ - Roots Fine Joint, at joint, at 4 o'clock
14	30.00 m	MGO - General Observation, DEBRIS THROUGHOUT ENTIRE LINE
15	30.00 m	MGO - General Observation, LIKELY BURIED MANHOLE STM-2
16	30.00 m	MGO - General Observation, CONFIRMED STM CONN'N FROM #30 CONNECTS TO THIS LINE
17	30.00 m	MGO - General Observation, EXTRA FLUSHING REQUIRED TO CLEAN OUT HEAVY DEBRIS FROM LINE
18	30.00 m	(F01) DSF - Deposits Settled Fine, from 5 o'clock to 7 o'clock, 20%
19	30.00 m	MSA - Abandoned Survey, BLOCKED

APPENDIX D

Functional Servicing Plan
Functional Grading & Drainage Plan



- SERVICING LEGEND:**
- DENOTES EXISTING STORM MANHOLE
 - DENOTES EXISTING CATCH BASIN
 - DENOTES EXISTING CATCH BASIN
 - DENOTES EXISTING STORMCEPTOR
 - DENOTES EXISTING INLET CONTROL DEVICE (ICD)
 - DENOTES EXISTING STORM SEWER
 - DENOTES EXISTING STORM SEWER
 - DENOTES EXISTING SANITARY MANHOLE
 - DENOTES EXISTING SANITARY MANHOLE
 - DENOTES EXISTING SANITARY SEWER
 - DENOTES EXISTING HYDRANT
 - DENOTES EXISTING HYDRANT
 - DENOTES EXISTING WATER VALVE & BOX
 - DENOTES EXISTING WATER VALVE & BOX
 - DENOTES EXISTING WATER METER
 - DENOTES EXISTING WATER MAIN
 - DENOTES EXISTING WATER MAIN
 - DENOTES EXISTING F/D CONNECTION
 - DENOTES EXISTING CAP FOR SANITARY, STORM, AND/OR WATER AS NOTED
 - DENOTES EXISTING ENTRANCE LOCATION
 - DENOTES EXISTING LIMIT OF CONSTRUCTION
 - DENOTES EXISTING BACK FLOW PREVENTOR
 - DENOTES EXISTING DOMESTIC WATER METER
 - DENOTES EXISTING DETECTOR CHECK VALVE



KEY PLAN
Scale : N.T.S.

SUBJECT LANDS

NOTES:
THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND UNDERGROUND AND ABOVE GROUND UTILITIES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING THE WORK, THE CONTRACTOR SHALL CONFIRM OF THE EXACT LOCATION OF ALL UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS ON THE JOB AND REPORT ANY DISCREPANCY TO THE ARCHITECTS/ENGINEERS BEFORE PROCEEDING WITH THE WORKS.

ALL DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND THE PROPERTY OF THE ENGINEER WHICH MUST BE RETURNED AT THE COMPLETION OF WORK.

THIS DRAWING IS NOT TO BE SCALED. CONTRACTOR TO USE DIGITAL FILES FOR LAYOUT PROVIDED BY ENGINEER. THIS PLAN MUST NOT BE USED TO SITE THE PROPOSED BUILDINGS.

THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNER'S CONTRACTOR FROM OBTAINING, BUT NOT LIMITED TO THE FOLLOWING PERMITS: ROAD CUT, SEWER PERMITS, RELOCATION OF SERVICES, ENCROACHMENT AGREEMENTS, APPROACH APPROVAL PERMITS, ETC.

EXISTING TOPOGRAPHICAL INFORMATION SUPPLIED BY J.D. BARNES LTD. ON JUNE 08, 2022.

ELEVATION NOTE:
ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78, AND ARE DERIVED FROM GNSS OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HTZ.0

BEARING NOTE:
BEARING ARE UTM GRI, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

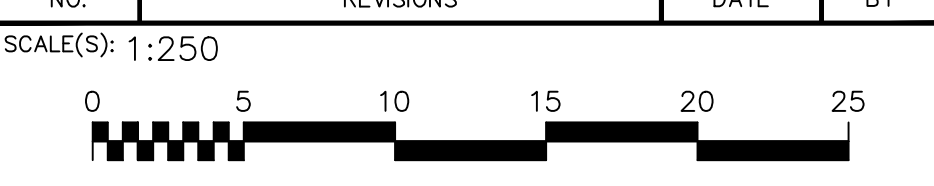
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999727.

FOR BEARING COMPARISONS, A ROTATION OF 0°50'10" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON D1, D2, D3, P1, P4, P5 & P6.

FOR BEARING COMPARISONS, A ROTATION OF 2°04'40" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON P2 & P7.

METRIC NOTE:
DISTANCES AND ELEVATIONS ON THIS PLAN ARE TYPICALLY SHOWN IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

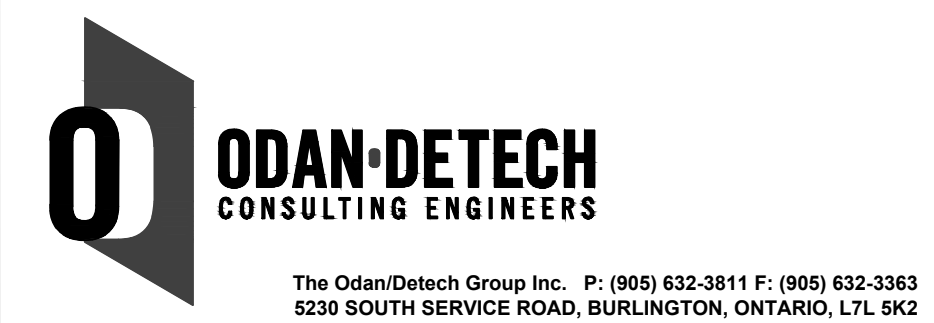
NO.	REVISIONS	DATE	BY
1	ISSUED FOR REZONING	AUG. 25, 2022	HO



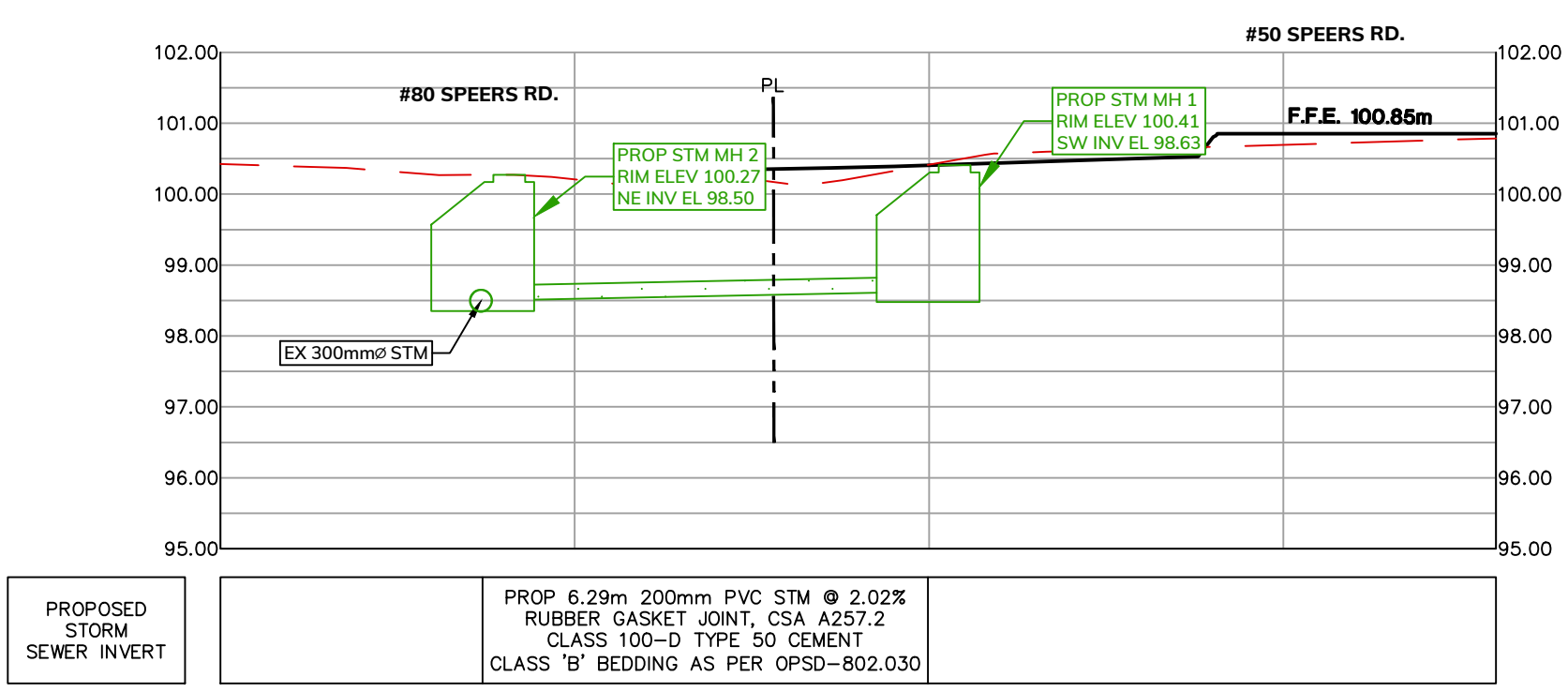
DRAWING TITLE:
FUNCTIONAL SERVICING PLAN

PROJECT:
PROPOSED 27-STOREY APARTMENT BUILDING
50 SPEERS ROAD
OAKVILLE, ON

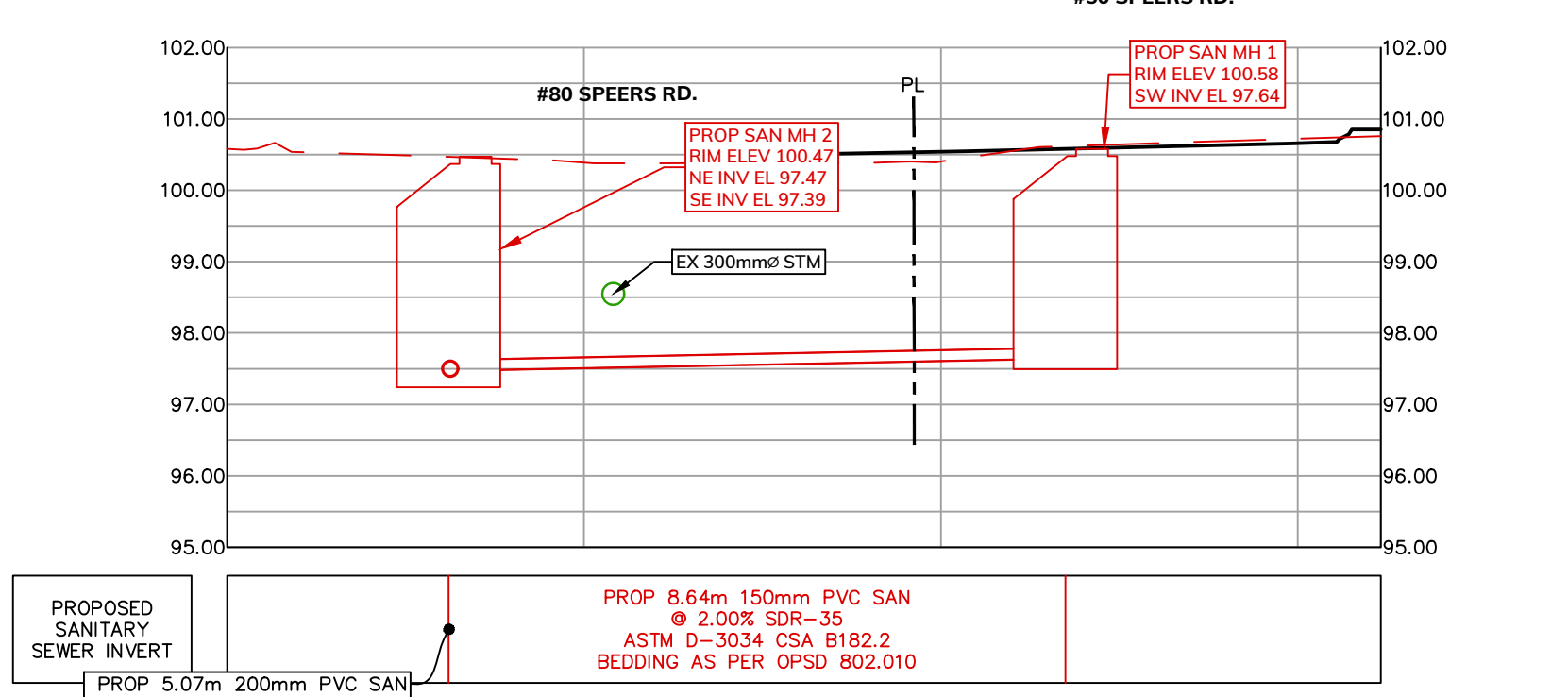
CLIENT:
HELBURG PROPERTIES LIMITED



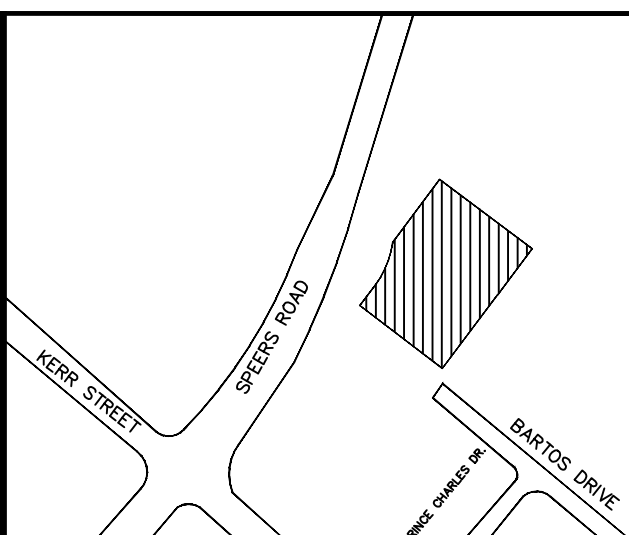
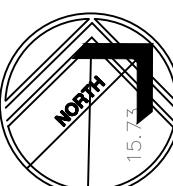
DESIGNED BY:	PROJECT NO.:
HO	22211
DRAWN BY:	
HO	
CHECKED BY:	DATE:
KO	AUG 2022
APPROVED BY:	DRAWING NO.:
JK	1 OF 2



SECTION A-A
PROP. STORM CONNECTION
SCALE 1:100



SECTION B-B
PROP. SANITARY CONNECTION
SCALE 1:100



SUBJECT
LANDS

METRIC NOTE:
DISTANCES AND ELEVATIONS ON THIS PLAN ARE TYPICALLY SHOWN IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

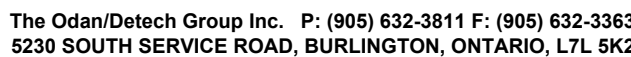
SCALE(S): 1:250



A horizontal graphic scale bar with tick marks at 0, 5, 10, 15, 20, and 25. The segment between 0 and 5 is divided into five equal squares, alternating black and white. The segments between 5 and 10, 10 and 15, 15 and 20, and 20 and 25 are solid black.

FUNCTIONAL GRADING & DRAINAGE PLAN

PROPOSED 27-STOREY APARTMENT BUILDING
50 SPEERS ROAD
OAKVILLE, ON

HELBERG PROPERTIES LIMITED

	DESIGNED BY:	PROJECT No.:
	HO	22211
	DRAWN BY:	
	HO	
	CHECKED BY:	DATE:
	KO	AUG 2022
ENGINEER	APPROVED BY:	DRAWING No.:
	JK	2 OF 2