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The Village of Innis Landing

FUNCTIONAL SERVICING REPORT

Schlegel Villages Inc.

File 422426 | July 17, 2024

Document Control

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July 17, 2024

Prepared by:

Tatham Engineering Limited
645 Veterans Drive, Unit D
Barrie, Ontario L4N 9H8

T 705-733-9037
tathameng.com

Prepared for:

Schlegel Villages Inc.
325 Max Becker Drive
Kitchener, Ontario N2E 4H5

Authored by:	Reviewed by:
John-Lui Marra, B.Eng., EIT Engineering Intern	Nick Millington, P.Eng. Manager - Land Development, Barrie Branch Manager

LICENSED PROFESSIONAL ENGINEER
N. A. MILLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

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Issue	Date	Description
00	July 10, 2024	Draft for Client Review
01	July 17, 2024	Site Plan Approval - First Submission

Document Contents

Tables

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Appendices

1 Introduction

Tatham Engineering Limited (Tatham) has been retained by Schlegel Villages Inc. to prepare a Functional Servicing Report in support of the Site Plan Approval (SPA) application for a proposed retirement development located at 800 Yonge Street (the Site) in the City of Barrie (City).

1.1 OBJECTIVES

This report has been prepared to demonstrate the feasibility of the proposed development with respect to servicing including water supply and distribution, sewage collection, stormwater management (SWM), drainage and site grading.

The FSR summarizes the SWM plan detailed in the Stormwater Management Report, prepared by Tatham (July 2024), under separate cover. Some engineering drawings are appended in the FSR while additional details and design drawings are provided in the engineering drawing package.

1.2 GUIDELINES AND BACKGROUND REPORTS

This report is prepared in consideration of the following municipal, provincial and agency guideline documents:

- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Stormwater Management Practices Planning and Design Manual* (March 2003);
- The MECP, *Design Guidelines for Drinking-Water Systems*, (2016);
- Lake Simcoe Region Conservation Authority (LSRCA), *Technical Guidelines for Stormwater Management Submissions* (April 2022);
- City of Barrie, *Stormwater Infrastructure Design Standard* (June 2023);
- City of Barrie, *Sanitary Infrastructure Design Standard* (April 2023); and
- City of Barrie, *Drinking Water Infrastructure Design Standard* (April 2024).

This report is prepared in consideration of the following City of Barrie reports and publications:

- AECOM, *Barrie Heritage Developments Phase IV Esther Drive Sanitary Sewer Flow Monitoring* (March 2017);
- City of Barrie, *Wastewater Collection Master Plan Update* (prepared by Cole Engineering Group Ltd.) (2019);

- City of Barrie, *Wastewater Treatment Master Plan* (prepared by WSP Canada Inc.) (2019);
- City of Barrie, *Water Storage and Distribution Master Plan Update* (prepared by WSP Canada Inc.) (2019); and
- City of Barrie, *Water Supply Master Plan Update* (prepared by WSP Canada Inc.) (2019).

This report is also prepared in consideration of the following site-specific reports:

- EXP Services Inc., *Hydrogeological Investigation and Water Balance Assessment* (January 2024);
- EXP Services Inc., *Preliminary Geotechnical Investigation – Final Report* (January 2023); and
- Tatham Engineering Limited, *Stormwater Management Report* (July 2024).

2 Site Description

2.1 SITE DESCRIPTION

The subject property is located at 800 Yonge Street, approximately 300 m northwest of the Mapleview Drive East and Yonge Street intersection. The site is bound by Yonge Street to the northeast, Country Lane to the northwest, existing residential lands to the southwest and future development lands to the southeast.

The site is legally described as:

PART OF BLOCK 19
PLAN 51M-832
CITY OF BARRIE
COUNTY OF SIMCOE

Refer to Figure 1 for the Site Location Plan (found on page 23 of the report).

2.2 LAND USE AND ZONING

The City of Barrie Official Plan designates the subject property as 'Commercial District'.

The subject property is currently zoned General Commercial C4 (SP-348) and is proposed to be rezoned to General Commercial with Special Provisions (C4) (SP-XXX) under a Community Infrastructure and Housing Accelerator (CIHA) order.

2.3 TOPOGRAPHY

Information relating to existing topography, ground cover, and drainage patterns was obtained through a review of relevant background studies, available plans, base mapping, and topographic surveys, and was confirmed during site visits.

A detailed topographic survey of the site was provided by KRCMAR Surveyors Ltd. in February 2022.

The subject site is approximately 4.05 ha and consists of mainly undeveloped, plowed agricultural fields. It gently slopes (at approximately 1%) from southeast to the northwest (towards Country Lane).

2.4 GEOTECHNICAL & HYDROGEOLOGICAL SETTINGS

The *Preliminary Geotechnical Investigation – Final Report* (2023), prepared by EXP Services Inc., was completed to identify the subsurface conditions and determine the engineering properties of the in-situ soils for the design and construction of the proposed development.

The report describes the existing soils generally as sandy silt and sand extending to the borehole termination depths between 3.5 and 15.8 mbgs. Topsoil was found at depths ranging from 0.01 to 0.58 mbgs.

The *Hydrogeological Investigation and Water Balance Assessment* (2024), also prepared by EXP Services Inc., was completed to assess the presence of groundwater and the impact to the groundwater regime due to the construction of the proposed site. During the monitoring seasons groundwater was present at depths ranging from 6.82 to 8.36 mbgs (elevations 257.20 m to 258.73 m). Based on EXP's completion of the monitoring program and final design, a Category 3 Permit to Take Water will be required in support of dewatering activities.

3 Proposed Development

The proposed development consists of a long-term care home, retirement homes and residential apartment buildings. Each building contains accessory uses including, but not limited to, a medical facility, restaurants/dining areas and various commercial spaces.

Refer to Appendix A for the Master Site Plan (Drawing SP1.0) prepared by Anderson Wellsman Architects Incorporated, dated July 2024.

We understand the site plan will be constructed in four stages and sequenced as follows:

Stage 1: Phase 1

- One 6-Storey Long Term Care (LTC) Facility (192 LTC beds) & Secure Courtyard;
- Access and parking provided from Country Lane; and
- Access and parking provided from Yonge Street.

Stage 2: Phase 4

- One 26-Storey General Market Residential building (Phase 4A, 185 apartments);
- One 18-Storey General Market Residential building (Phase 4B, 175 apartments);
- Parkette;
- 1 Level of Underground Parking; and
- Access and parking provided from Corby Adams Lane (private-owned by others) of the neighbouring Metro Grocery Store (located at 640 Mapleview Drive East).

Stage 3: Phase 2

- One 12-storey Retirement Home building (276 apartments) and Health Centre;
- Town Square (including commercial and amenity uses);
- 1 Level of Underground Parking; and
- Additional parking and an access provided from Phase 1.

Stage 4: Phase 3

- One 12-storey Retirement Home building (278 apartments); and
- 1 Level of Underground Parking.

Refer to the Construction Staging Plan (Drawing CSP-1; dated July 17, 2024) in the engineering drawing package for additional information.

4 Water Supply & Distribution

4.1 EXISTING WATER SYSTEM

The site is located within an area of the City serviced by the municipal water distribution system. Specifically, the site is located within Pressure Zone 2S, supplied by the City's surface water system, as per the *Water Storage and Distribution Master Plan Update* (WSDMP), prepared by WSP Canada Inc. (2019). The City's Surface Water Treatment Plant (SWTP) is located on the southern shore of Kempenfelt Bay at 20 Royal Parkside Drive and draws water supply from Lake Simcoe.

4.1.1 Existing Infrastructure

The proposed development will be serviced by the municipal water distribution system. The following existing watermains front the subject site:

- 300 mm dia. PVC distribution watermain on Yonge Street; and
- 200 mm dia. PVC distribution watermain on Country Lane.

4.1.2 Municipal Water Supply

Per Table 6-4 of the WSDMP, the City's SWTP (which supplies Pressure Zones 2S and 3S) has a firm capacity of 60 ML/day (60,000 m^3/day).

Per Table 3-2 of the WSDMP, the estimated ADD and MDD based on projected growth within Pressure Zones 2S and 3S (i.e. an area of the City supplied via the SWTP) are summarized in Table 1 (overleaf).

Table 1: Municipal Water Supply – Projected Zones 2S and 3S Demands

SCENARIO	AVERAGE DAY DEMAND (m^3/DAY)	MAXIMUM DAY DEMAND (m^3/DAY)	RESIDUAL (m^3/DAY)
2026	27,111	48,800	11,200
2031	31,278	56,300	3,700
2036	34,831	62,695	-2,695
2041	39,764	71,575	-11,575

Therefore, there is sufficient water supply to service additional development within Pressure Zones 2S and 3S until the 2031 growth scenario. The SWTP is projected to reach its capacity based on the 2036 growth scenario. However, future improvements (in two phases) are proposed by the City to increase the SWTP firm capacity to support the population growth projections beyond 2036 for the combined Pressure Zones 2S and 3S population, as per Figure 5-1 of the *Water Supply Master Plan Update* (WSMP), prepared by WSP Canada Inc. (2019).

4.1.3 Municipal Water Storage

Per Table 6-3 of the WSDMP, water storage for Pressure Zone 2S is provided by the Harvie Road Reservoir (located at 70 Harvie Road) which has a total volume of 27.6 ML (27,600 m^3). Under existing conditions, there is a local storage surplus of 11.89 ML (11,890 m^3) within the Zone 2S system. Therefore, there is sufficient water storage within the existing municipal system to service additional development in the area.

Under growth projections to 2041 there is a storage surplus of 1.20 ML (1,200 m^3) within the surface water supplied zones (per Table 6-7 of the WSDMP).

4.2 PROPOSED WATER SYSTEM

4.2.1 Water Demands

Water demands for the proposed development have been estimated by applying the City's design guidelines and relevant Ontario Building Code (OBC) standards, including the following:

- Per capita ADD = 225 L/person/day;
- Per LTC bed ADD = 450 L/person/day (per OBC Table 8.2.1.3.B.);
- Commercial (accessory uses) ADD = 28 m^3/ha/day;
- High Density PPU = 1.67; and

- LTC PPU = 1 person/bed.

Residential MDD and Peak Hour Demand (PHD) factors of 2.9 and 4.3, respectively, have been applied in accordance with Table 3-3 of the MECP Design Guidelines for Drinking-Water Systems (2016). Commercial (accessory uses) MDD and PHD factors of 2.0 have been applied.

Table 2 (overleaf) summarizes each phase's combined residential and commercial (accessory uses) water demands. Refer to Appendix B for detailed Water Demand Calculations.

Table 2: Proposed Water Demands

	PHASE 1 (STAGE 1)			PHASE 2 (STAGE 3)			PHASE 3 (STAGE 4)			PHASE 4 (STAGE 2)			TOTAL		
	ADD	MDD	PHD	ADD	MDD	PHD	ADD	MDD	PHD	ADD	MDD	PHD	ADD	MDD	PHD
Volume (m^3/day)	102.03	281.83	-	121.08	335.51	-	116.50	327.16	-	158.88	439.66	-	498.49	1,384.16	-
Demand (L/s)	1.19	3.27	4.67	1.42	3.90	5.58	1.36	3.80	5.49	1.85	5.10	7.30	5.82	16.07	23.04

4.2.2 Fire Protection

FUS Calculations

Firefighting water demands have been estimated for the site using Water Supply Public Fire Protection (2020) prepared by the Fire Underwriters Survey (FUS). The required fire flows for buildings of the various phases were calculated using OBC matrix data provided by the architect. To summarize, the required fire flows for each phase are as follows:

- Phase 1 (Stage 1): 100 L/s;
- Phases 2 and 3 (Stages 3 and 4): 117 L/s; and
- Phases 4A and 4B (Stage 2): 67 L/s.

Refer to the FUS calculations and accompanying OBC matrices in Appendix B.

Available Fire Flow

A dual flow hydrant test was completed by WSP on July 17, 2024 on existing hydrants fronting the site. The hydrant test was completed in accordance with City of Barrie design guidelines. The recorded static pressure in the Yonge Street watermain was 59.5 psi. The fire flow achieved was 197.5 L/s which resulted in a residual pressure of 56.3 psi. This is greater than the required fire flow of 117 L/s. Therefore, the existing infrastructure is sufficient to provide the required fire flows for the site.

Refer to Appendix B for the hydrant test results and additional calculations.

4.2.3 Proposed Water Infrastructure

The proposed water services are designed in accordance with City and MECP standards, including but not limited to the following:

- The minimum depth of watermain and water services is 1.7 m, measured to the top of pipe;
- Maximum watermain velocity of 1.5 m/s under normal operating conditions (ADD and MDD flows); and
- Maximum watermain velocity of 5.0 m/s under fire flow conditions.

The proposed service connections include:

- Phase 1 (Stage 1): 100 mm dia. domestic service and a 200 mm dia. fire service both connected to the existing 300 mm dia. distribution main on Yonge Street;

- Phases 2 and 3 (Stages 3 and 4): shared 100 mm dia. domestic service and a 250 mm dia. fire service both connected to the existing 300 mm dia. distribution main on Yonge Street; and
- Phases 4A and 4B (Stage 2): shared 150 mm dia. domestic service and a 200 mm dia. fire service both connected to the existing 300 mm dia. distribution main on Yonge Street.

Refer to Appendix B for Water Supply Calculations.

New fire hydrants are also proposed within 45 m of each buildings' fire department connection.

Refer to the Master Servicing Plan (Drawing MSP-1; dated July 17, 2024) in Appendix D for additional information.

5 Sanitary Sewage System

5.1 EXISTING SANITARY SYSTEM

The site is located in an area of the City serviced with a municipal sanitary sewer collection system conveying sewage to the Barrie Wastewater Treatment Facility (WWTF) located at 249 Bradford Street at the west end of Kempenfelt Bay on Lake Simcoe.

There are existing 250 mm dia. local sanitary sewers within Yonge Street and Country Lane. Both local sewers connect to the existing 300 mm dia. trunk sewer on Esther Drive conveying flow west to a 1050 mm dia. trunk sewer running parallel to Lovers Creek. The larger trunk sewer flows via gravity in a northerly direction, ultimately discharging to the WWTF. The downstream trunk sewers do not contribute to any sanitary pumping stations before reaching the WWTF.

5.1.1 WWTF Capacity

As per the *Wastewater Treatment Master Plan* (WWTMP), prepared by WSP Canada Inc. (2019), the Barrie WWTF has a rated average day flow (ADF) capacity of 76,000 m^3/day, and a rated peak flow (PF) capacity of 156,000 m^3/day. Based on historical flow data, the WWTF has received between 48,000 m^3/day to 50,700 m^3/day between 2014 and 2017. Refer to Table 3 for ADF estimates based on population growth projections which summarizes Table 3-8 of the WWTMP.

Table 3: Projected City Sewage Flows

SCENARIO	PROJECT POPULATION (PERSONS)	ADF (m^3/DAY)	RESIDUAL (m^3/DAY)
2026	282,549	68,478	7,522
2031	310,953	76,026	-26
2036	344,320	84,903	-8,903
2041	382,962	95,050	-19,050

Therefore, there will be an estimated ADF residual capacity of 7,522 m^3/day under the 2026 growth scenario. However, the WWTF is expected to reach its current rated capacity of 76,000 m^3/day in 2031. Future improvements are proposed (with some already underway) to increase the capacity of the plant to support population growth projections beyond 2031.

5.2 PROPOSED SANITARY SYSTEM

5.2.1 Sanitary Flows

Sanitary flows generated from the proposed development have been estimated by applying the City's design guidelines and relevant Ontario Building Code (OBC) standards, including the following:

- Per capita ADF = 225 L/person/day;
- Per LTC Bed ADF = 450 L/person/day (per OBC Table 8.2.1.3.B.);
- Commercial (Accessory Uses) ADF = 28 m^3/ha/day;
- Extraneous Flow = 0.10 L/s/ha;
- High Density PPU = 1.67; and
- LTC PPU = 1 person/bed.

Peak Flow (PF) has been estimated by applying the Harmon Peaking factor for residential uses, while a commercial (accessory uses) peak factor of 2.0 has been utilized.

Table 4 (overleaf) summarizes each phase's combined residential and commercial (accessory uses) sanitary flows. Refer to Appendix C for detailed Sanitary Flow Calculations.

Table 4: Proposed Sanitary Flows

	VOLUME (m^3/day)	FLOW (L/s)
Phase 1 (Stage 1)		
ADF	102.02	1.19
PF (Including Extraneous)	352.21	4.09
Phase 2 (Stage 3)		
ADF	121.08	1.42
PF (Including Extraneous)	423.93	4.92
Phase 3 (Stage 4)		
ADF	116.50	1.36
PF (Including Extraneous)	407.33	4.73
Phase 4 (Stage 2)		
ADF	158.88	1.85
PF (Including Extraneous)	547.41	6.34
Site Totals		
ADF	498.48	5.82
PF (Including Extraneous)	1,730.88	20.08

Note 1: Peak Flow values based on Harmon Peaking Factor of site's population and commercial factor of 2.05

Therefore, the estimated total ADF is 498.48 m^3/day which can be adequately processed by the Barrie WWTF.

5.2.2 Peak Flow (Local Sewer Design)

The site will discharge sewage to the upper sewer runs of the local sanitary sewer network within Country Lane and Yonge Street as described above.

Phase 1 will discharge to Country Lane with peak flow of 4.09 L/s. The 250 mm dia. local sewer receiving these flows in Country Lane is constructed at a slope of 1.0%, resulting in a full flow

capacity of 59.47 L/s. Therefore, the flows generated by Phase 1 represent only 6.9% of the sewer's full flow capacity, leaving sufficient residual capacity for downstream contributors.

Phases 2, 3 and 4 will discharge to the Yonge Street sewers with a combined peak flow of approximately 15.99 L/s. The 250 mm dia. local sewer receiving these flows in Yonge Street is constructed at a slope of 0.4%, resulting in a full flow capacity of 37.61 L/s. Therefore, the flows generated by Phases 2, 3 and 4 represent 42.5% of the sewer's full flow capacity leaving sufficient residual capacity for downstream contributors.

5.2.3 Peak Flow (Esther Trunk Sewer Design)

AECOM (2017) prepared the *Barrie Heritage Developments Phase IV Esther Drive Sanitary Sewer Flow Monitoring* letter for the City on the downstream sanitary sewers which can be found in Appendix C. The report assessed the capacity of the downstream Esther Drive sanitary trunk sewer, specifically the section located immediately upstream of the Painswick-Lovers Creek trunk system.

Sanitary flow and rain gauge monitoring were used to measure the actual peak flows contributing to the Esther Drive trunk sewer as the surrounding area was developed. Ultimately, AECOM determined the residual capacity of the sewer to be 49.24 L/s. Since the report was completed, Phases 1 and 2 of the Yonge-GO Village development (Tatham project no. 417410) have been constructed with a design peak flow of 18.63 L/s and the Metro Grocery Store (located at 640 Mapleview Drive East, Tatham project no. 421426) has been accepted by the City with a design PF of 1.12 L/s. This results in a present-day residual capacity of approximately 29.49 L/s in the Esther Drive trunk sewer. Therefore, there is sufficient capacity in the downstream system to receive the peak flow of 20.08 L/s from the proposed development. It should be noted this assessment does not take into account reduced Harmon peaking factors applied when assessing the entire lands contributing to the sewer which therefore represents a conservative approach. In addition, we understand the City is currently completing master servicing plan updates further assess the capacity of this sewer, and as part of the study are also considering flow diversion for future growth areas which may otherwise contribute to this sewer.

5.2.4 Service Connections

Each phase will be serviced with an individual sanitary service.

Phase 1 will be serviced via a 250 mm dia. sanitary service which will connect to the existing 250 mm dia. local sewer on Country Lane. Phases 2, 3 and 4 will each be serviced by individual 250 mm dia. sanitary services which will connect to an on-site 250 mm dia. local sewers conveying flows to the existing 250 mm dia. local sewer on Yonge Street.

Refer to the Master Servicing Plan (Drawing MSP-1; dated July 17, 2024) in Appendix D for additional information.

6 Stormwater Management

A *Stormwater Management Report* has been prepared under separate cover and is to be read in conjunction with this report. Key findings of the report are provided below:

- The site is located within Commercial Block 19 of the original Swallow Glen Subdivision design within an original catchment which had a drainage area of 6.95 ha with a total imperviousness (TIMP) of 86%. Minor flows from the site were designed to drain towards the Country Lane storm sewers while major flows were designed to drain overland via the road allowances towards the existing SWM Pond LV19. SWM Pond LV19 is a wet pond designed to provide quantity and quality controls for the full build-out of the subdivision (including the subject site).
- Under the proposed condition, the site has a TIMP of 75%. As this is lower than the original design assumption of 86%, the downstream SWM Pond LV19 is sized to provide sufficient water quality and quantity controls for the site and, therefore, on-site water quantity and quality controls are not required.
- Conveyance of minor and major peak flows will be provided via a combination of internal storm sewers and designated overland flow routes. A storm sewer design sheet and Storm Sewer Catchment Plan (Drawing STM-1) are provided and have been designed using City standards. Site-generated runoff will ultimately drain to SWM Pond LV19.
- In accordance with LSRCA requirements, projects defined as 'major development' are required to meet the volume control requirements outlined in Section 3.2.4 of *Technical Guidelines for Stormwater Management Submission*. Infiltration-based low impact development (LID) facilities are provided on site to infiltrate at minimum the 25 mm rainfall event captured from the building rooftops of Phases 1, 2 and 3 which is equivalent to the 9.5 mm rainfall event across the site impervious area.
- In accordance with the LSPP, it must be demonstrated best efforts have been made to mitigate changes in water balance due to the proposed development. As such, a water balance assessment in support of the proposed development has been completed as part of the *Hydrogeological Investigation and Water Balance Assessment*. As a total of 368 m^3 of rooftop infiltration storage is provided within the LID facilities, water balance is expected to be achieved.
- An assessment of the phosphorus loading from the site under existing and proposed conditions has been completed using the Low Impact Development Treatment Train Tool

(LID-TTT). Phosphorus removal (approximately 75% reduction) will be provided through the implementation of the LID facilities and SWM Pond LV19.

- Throughout construction, siltation and erosion control will be maintained and inspected to reduce erosion and the transportation of sediment from the site and between each stage. These measures will mitigate environmental impacts downstream during construction.

7 Grading

The site grading design has been prepared to achieve architectural goals while providing for SWM/drainage objectives.

Architectural grading requirements include:

- One building finished floor elevation (264.75 m);
- Basement and parking lot level 3.82 m below finished floor elevation (260.93);
- Accessible apron (2% max. sloping away from building); and
- Minimum parking lot grading for accessibility (0.5% to 5%).

An overland flow route is provided from the back of the Phase 2 building to Country Lane, while the parking areas fronting Yonge Street will pond to a safe depth (max. 0.25 m) before spilling onto Yonge Street at three spill location (designed for emergency overland flow only).

Refer to the Master Grading Plan (Drawing MGP-1; dated July 17, 2024) in Appendix D for additional information.

8 Utilities

The following utility agencies provide services to the proposed development:

- Alectra;
- Enbridge Inc.;
- Bell Canada; and
- Rogers Communication Inc.

Utility coordination is being completed by the electrical consultant and is currently underway.

9 Summary

Water Supply & Distribution

The site will be serviced by the municipal water distribution system. Domestic and fire service connections for each phase will be provided from the existing 300 mm dia. distribution watermain on Yonge Street. A hydrant flow test confirmed the existing infrastructure is sufficient to provide the required fire flows for the site.

Sewage Collection & Treatment

The site will be serviced by the municipal sanitary sewer collection system. Phase 1 will be serviced via a 250 mm dia. sanitary service which will connect to the existing 250 mm dia. local sewer on Country Lane. Phases 2, 3 and 4 will each be serviced by individual 250 mm dia. sanitary services which will connect to an on-site 250 mm dia. local sewers conveying flows to the existing 250 mm dia. local sewer on Yonge Street. Both of these local sewers connect to the existing 300 mm dia. trunk sewer on Esther Drive conveying sewage west to a larger trunk sewer which runs parallel to Lovers Creek before ultimately terminating at the Barrie WWTF. The receiving sewers as well as the WWTF are understood to have sufficient capacity to service the subject development.

Stormwater Management

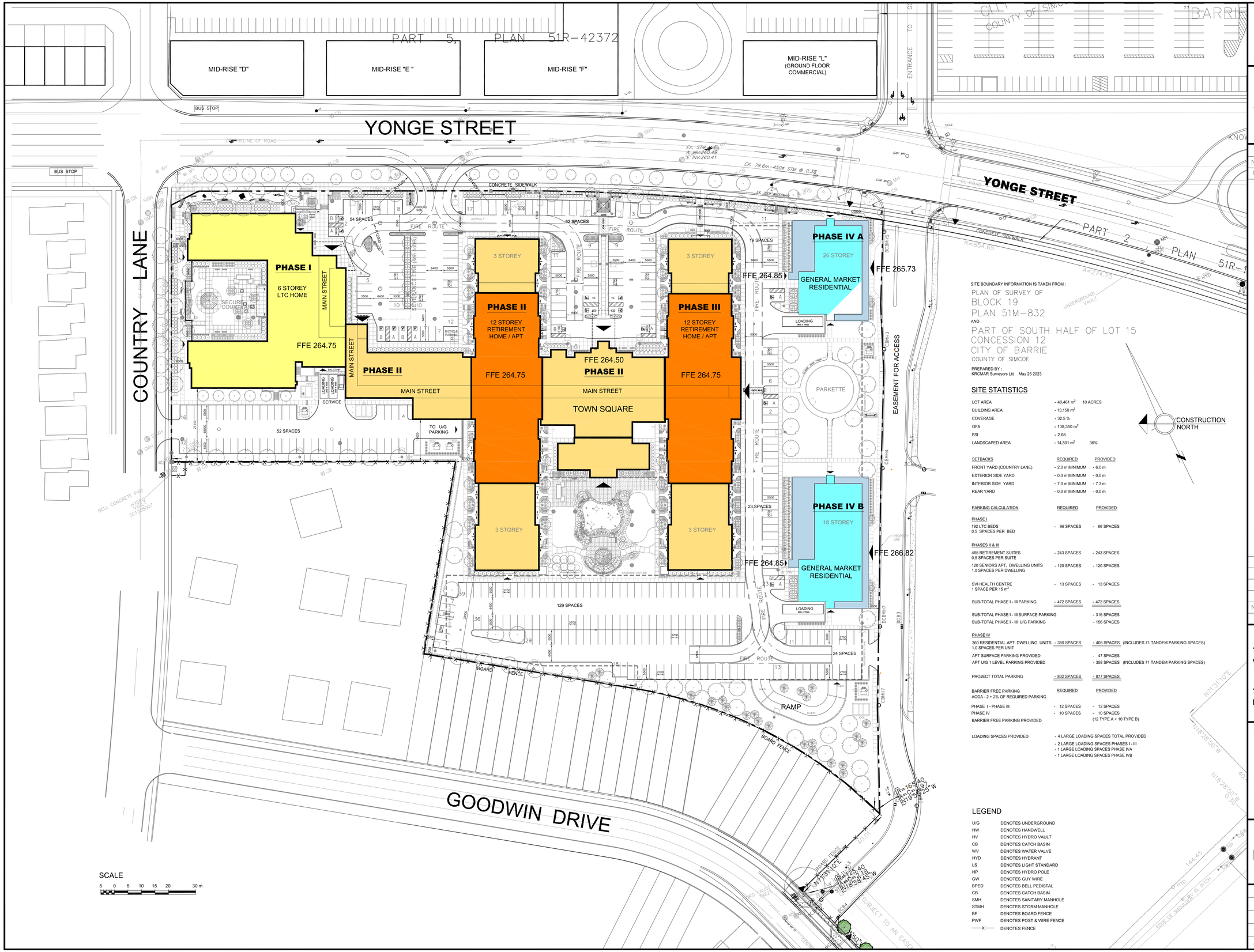
The SWM plan demonstrates the proposed development will not result in negative impacts with respect to stormwater and has been designed to meet the objectives and guidelines of the approving agencies.

Grading & Landscaping

The detailed grading design was prepared to meet the architectural goals of the site plan while achieving the objectives of the SWM plan and tying into surrounding grades.

Figure 1: Site Location Plan

Appendix A:
Master Site Plan



SITE BOUNDARY INFORMATION IS TAKEN FROM :
PLAN OF SURVEY OF
BLOCK 19
PLAN 51M-832
AND
PART OF SOUTH HALF OF LOT 15
CONCESSION 12
CITY OF BARRIE
COUNTY OF SIMCOE

PREPARED BY :
KRCMAR Surveyors Ltd May 25 2023

SITE STATISTICS

LOT AREA	- 40,461 m^2	10 ACRES
BUILDING AREA	- 13,150 m^2	
COVERAGE	- 32.5 %	
GFA	- 108,350 m^2	
FSI	- 2.68	
LANDSCAPED AREA	- 14,501 m^2	36%

SETBACKS	REQUIRED	PROVIDED
FRONT YARD (COUNTRY LANE)	- 2.0 m MINIMUM	- 6.0 m
EXTERIOR SIDE YARD	- 0.0 m MINIMUM	- 0.0 m
INTERIOR SIDE YARD	- 7.0 m MINIMUM	- 7.3 m
REAR YARD	- 0.0 m MINIMUM	- 0.0 m

PARKING CALCULATION	REQUIRED	PROVIDED
PHASE I		
192 LTC BEDS 0.5 SPACES PER BED	- 96 SPACES	- 96 SPACES
PHASES II & III		
485 RETIREMENT SUITES 0.5 SPACES PER SUITE	- 243 SPACES	- 243 SPACES
120 SENIORS APT. DWELLING UNITS 1.0 SPACES PER DWELLING	- 120 SPACES	- 120 SPACES
SVI HEALTH CENTRE 1 SPACE PER 15 m^2	- 13 SPACES	- 13 SPACES
SUB-TOTAL PHASE I - III PARKING	- 472 SPACES	- 472 SPACES
SUB-TOTAL PHASE I - III SURFACE PARKING		- 316 SPACES
SUB-TOTAL PHASE I - III U/G PARKING		- 156 SPACES
PHASE IV		
360 RESIDENTIAL APT. DWELLING UNITS 1.0 SPACES PER UNIT	- 360 SPACES	- 405 SPACES (INCLUDES 71 TANDEM PARKING SPACES)
APT SURFACE PARKING PROVIDED		- 47 SPACES
APT U/G 1 LEVEL PARKING PROVIDED		- 358 SPACES (INCLUDES 71 TANDEM PARKING SPACES)
PROJECT TOTAL PARKING	- 832 SPACES	- 877 SPACES

BARRIER FREE PARKING AODA - 2 + 2% OF REQUIRED PARKING	REQUIRED	PROVIDED
PHASE I - PHASE III	- 12 SPACES	- 12 SPACES
PHASE IV	- 10 SPACES	- 10 SPACES (12 TYPE A + 10 TYPE B)
BARRIER FREE PARKING PROVIDED		

LOADING SPACES PROVIDED
- 4 LARGE LOADING SPACES TOTAL PROVIDED
- 2 LARGE LOADING SPACES PHASES I - III
- 1 LARGE LOADING SPACES PHASE IVA
- 1 LARGE LOADING SPACES PHASE IVB

LEGEND

U/G	DENOTES UNDERGROUND
HW	DENOTES HANDWELL
HV	DENOTES HYDRO VAULT
CB	DENOTES CATCH BASIN
WV	DENOTES WATER VALVE
HYD	DENOTES HYDRANT
LS	DENOTES LIGHT STANDARD
HP	DENOTES HYDRO POLE
GW	DENOTES GUY WIRE
BPED	DENOTES BELL PEDISTAL
CB	DENOTES CATCH BASIN
SMH	DENOTES SANITARY MANHOLE
STMH	DENOTES STORM MANHOLE
BF	DENOTES BOARD FENCE
PWF	DENOTES POST & WIRE FENCE
——X——	DENOTES FENCE

CONSTRUCTION NORTH

REVISIONS

No.	DATE	DESCRIPTION
1		

No.	Date	Description
1	2024.7.18	For SPA Submission

Issued

ANDERSON WELLSMAN ARCHITECTS INCORPORATED
1090 DON MILLS ROAD
SUITE 612
TORONTO, ONTARIO
M3C 3R6
TEL: 416.391.3699
FAX: 416.510.2629

Project:
THE VILLAGE OF INNIS LANDING

800 YONGE STREET
BARRIE, ON

Drawing Title
MASTER SITE PLAN

Scale:	1:600
Date:	JUL 12 2022
Input by:	G.V.
Checked by:	R.A.
Job No.	2116

Sheet No.
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FILE NAME: VERSION 8.2

Appendix B: Water Calculations and Supporting Documentation

TATHAM ENGINEERING

PROJECT	The Village of Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	July 5, 2024
SUBJECT	Water Demand Calculations	NAME	JLM
		PAGE	1 OF 4

1.1 Demand Criteria

Design Criteria as per City of Barrie's *Drinking Water Infrastructure Design Standard* (April 2024)

Demands			
Long-Term Care Demand	=	450	L/bed/day
Per Capita Demand	=	225	L/cap/day
Commercial (Accessory Uses)	=	28,000	L/ha/day

Peaking Factors			
Residential*	Maximum Day Factor	=	2.9
	Peak Hour Factor	=	4.3

*From Table 3-3 of MECP's Design Guidelines for Drinking-Water Systems

Population Densities			
Long-Term Care Unit	=	1.00	PPU
High Density	=	1.67	PPU

Commercial	Maximum Day Factor	=	2.0
	Peak Hour Factor	=	2.0

1.2 Proposed Development Design Water Demands

Site Information as per *Master Site Plan* by Anderson Wellsman Architects Inc. (dated May 31, 2024)

Phase 1: Long-Term Care (LTC) Home (Stage 1)

LTC Units	=	192	beds			Phase 1 Populatior	=	192	
Commercial (Accessory) Space	=	0.56	ha						

Average Day Demand (ADD)

ADD, Residential	=	86,400	L/day	=	86.40	m^3/day	=	1.00	L/s
ADD, Commercial	=	15,633	L/day	=	15.63	m^3/day	=	0.19	L/s
Total ADD	=	102,033	L/day	=	102.03	m^3/day	=	1.19	L/s

Maximum Day Demand (MDD)

MDD, Residential	=	86,400	L/day	x	2.90				
	=	250,560	L/day	=	250.56	m^3/day	=	2.90	L/s
MDD, Commercial	=	15,633	L/day	x	2.00				
	=	31,265	L/day	=	31.27	m^3/day	=	0.37	L/s
Total MDD	=	281,825	L/day	=	281.83	m^3/day	=	3.27	L/s

Peak Hour Demand (PHD)

PHD, Residential	=	86,400	L/day	x	4.30				
	=	371,520	L/day	=	371.52	m^3/day	=	4.30	L/s
PHD, Commercial	=	15,633	L/day	x	2.00				
	=	31,265	L/day	=	31.27	m^3/day	=	0.37	L/s

Total PHD	=	402,785	L/day	=	402.79	m^3/day	=	4.67	L/s

Phase 2: Retirement Home & Town Square (Stage 3)

Apartments = 276 units — Phase 2 Populatior = 461 (rounded)

Commercial (Accessory) Space = 0.62 ha

Average Day Demand (ADD)

ADD, Residential	=	103,725	L/day	=	103.73	m^3/day	=	1.21	L/s
ADD, Commercial	=	17,354	L/day	=	17.35	m^3/day	=	0.21	L/s
Total ADD	=	121,079	L/day	=	121.08	m^3/day	=	1.42	L/s

Maximum Day Demand (MDD)

MDD, Residential	=	103,725	L/day	x	2.90				
	=	300,803	L/day	=	300.80	m^3/day	=	3.49	L/s
MDD, Commercial	=	17,354	L/day	x	2.00				
	=	34,708	L/day	=	34.71	m^3/day	=	0.41	L/s
Total MDD	=	335,510	L/day	=	335.51	m^3/day	=	3.90	L/s

Peak Hour Demand (PHD)

PHD, Residential	=	103,725	L/day	x	4.30				
	=	446,018	L/day	=	446.02	m^3/day	=	5.17	L/s
PHD, Commercial	=	17,354	L/day	x	2.00				
	=	34,708	L/day	=	34.71	m^3/day	=	0.41	L/s
Total PHD	=	480,725	L/day	=	480.73	m^3/day	=	5.58	L/s

Phase 3: Retirement Home (Stage 4)

Apartments = 278 units — Phase 3 Populatior = 465 (rounded)

Commercial (Accessory) Space = 0.42 ha

Average Day Demand (ADD)

ADD, Residential	=	104,625	L/day	=	104.63	m^3/day	=	1.22	L/s
ADD, Commercial	=	11,872	L/day	=	11.87	m^3/day	=	0.14	L/s
Total ADD	=	116,497	L/day	=	116.50	m^3/day	=	1.36	L/s

Maximum Day Demand (MDD)

MDD, Residential	=	104,625	L/day	x	2.90				
	=	303,413	L/day	=	303.41	m^3/day	=	3.52	L/s
MDD, Commercial	=	11,872	L/day	x	2.00				
	=	23,745	L/day	=	23.74	m^3/day	=	0.28	L/s
Total MDD	=	327,157	L/day	=	327.16	m^3/day	=	3.80	L/s

Peak Hour Demand (PHD)

PHD, Residential	=	104,625	L/day	x	4.30				
	=	449,888	L/day	=	449.89	m^3/day	=	5.21	L/s
PHD, Commercial	=	11,872	L/day	x	2.00				
	=	23,745	L/day	=	23.74	m^3/day	=	0.28	L/s
Total PHD	=	473,632	L/day	=	473.63	m^3/day	=	5.49	L/s

Phase 4: General Market Residential (Stage 2)

Apartments	=	360	units	Phase 4 Populatior =	602	(rounded)
Commercial (Accessory) Space	=	0.84	ha			

Average Day Demand (ADD)

ADD, Residential	=	135,450	L/day	=	135.45	m^3/day	=	1.57	L/s
ADD, Commercial	=	23,428	L/day	=	23.43	m^3/day	=	0.28	L/s
Total ADD	=	158,878	L/day	=	158.88	m^3/day	=	1.85	L/s

Maximum Day Demand (MDD)

MDD, Residential	=	135,450	L/day	x	2.90				
	=	392,805	L/day	=	392.81	m^3/day	=	4.55	L/s
MDD, Commercial	=	23,428	L/day	x	2.00				
	=	46,855	L/day	=	46.86	m^3/day	=	0.55	L/s
Total MDD	=	439,660	L/day	=	439.66	m^3/day	=	5.10	L/s

Peak Hour Demand (PHD)

PHD, Residential	=	135,450	L/day	x	4.30				
	=	582,435	L/day	=	582.44	m^3/day	=	6.75	L/s

PHD, Commercial	=	23,428	L/day	x	2.00					
	=	46,855	L/day	=	46.86	m^3/day	=	0.55	L/s	
Total PHD	=	629,290	L/day	=	629.29	m^3/day	=	7.30	L/s	

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 1 (Stage 1)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for Phase 1 only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**2456**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**1228**			
		Total Effective Area				**3684**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						11,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,650)	9,350
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(4,675)	4,675
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.1	%	935	5,610
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	Greater than 30.0 m	0.00				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	5,610
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							6,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							100
		Required Duration of Fire Flow of 6,000 L/min (hrs):							2
		Required volume for Fire Flow of 6,000 L/min (m^3):							720

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 2 Health Centre (Stage 3)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for the Phase 2 Health Centre only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
1	Frame Use for Construction of Unit	**Framing Material**							
		Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**1027**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**514**			
		Total Effective Area				**1541**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						7,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,050)	5,950
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(2,975)	2,975
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.2	%	1,190	4,165
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	4,165
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							4,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							67
		Required Duration of Fire Flow of 4,000 L/min (hrs):							1.5
		Required volume for Fire Flow of 4,000 L/min (m^3):							360

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 2 Residential (Tower & Podium) (Stage 3)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for the Phase 2 residential 12-storey tower and 3-storey podium only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
1	Frame Use for Construction of Unit	**Framing Material**							
		Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**2894**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**1447**			
		Total Effective Area				**4341**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						12,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,800)	10,200
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(5,100)	5,100
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.2	%	2,040	7,140
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	7,140
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							7,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							117
		Required Duration of Fire Flow of 7,000 L/min (hrs):							2
		Required volume for Fire Flow of 7,000 L/min (m^3):							840

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 2 Town Square (Stage 3)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for the Phase 2 Town Square only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
1	Frame Use for Construction of Unit	**Framing Material**							
		Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**1704**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**852**			
		Total Effective Area				**2556**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						9,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,350)	7,650
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(3,825)	3,825
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.2	%	1,530	5,355
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	5,355
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							5,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							83
		Required Duration of Fire Flow of 5,000 L/min (hrs):							1.75
		Required volume for Fire Flow of 5,000 L/min (m^3):							525

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 3 Residential (Tower & Podium) (Stage 4)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for the Phase 3 residential 12-storey tower and 3-storey podium only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
1	Frame Use for Construction of Unit	**Framing Material**							
		Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**2894**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**1447**			
		Total Effective Area				**4341**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						12,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,800)	10,200
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(5,100)	5,100
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.2	%	2,040	7,140
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	7,140
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							7,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							117
		Required Duration of Fire Flow of 7,000 L/min (hrs):							2
		Required volume for Fire Flow of 7,000 L/min (m^3):							840

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 4A (Stage 2)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for Phase 4A only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**981**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**491**			
		Total Effective Area				**1472**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						7,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,050)	5,950
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(2,975)	2,975
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.1	%	595	3,570
			East Side	Greater than 30.0 m	0.00				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	3,570
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							4,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							67
		Required Duration of Fire Flow of 4,000 L/min (hrs):							1.5
		Required volume for Fire Flow of 4,000 L/min (m^3):							360

TATHAM ENGINEERING	Project: The Village of Innis Landing, 800 Yonge Street, Barrie	Date:	July 8, 2024
	File No.: 422426	Designed:	JLM
	Subject: FUS Fire Flow Calculations : Phase 4B (Stage 2)	Checked	NM
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for Phase 4B only.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
1	Frame Use for Construction of Unit	**Framing Material**							
		Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**1302**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**	**651**			
		Total Effective Area				**1953**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						8,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,200)	6,800
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.5	%	(3,400)	3,400
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	Yes				
			c) Fully supervised system	-0.1	Yes				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.1	%	680	4,080
			East Side	Greater than 30.0 m	0.00				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	4,080
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							4,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							67
		Required Duration of Fire Flow of 4,000 L/min (hrs):							1.5
		Required volume for Fire Flow of 4,000 L/min (m^3):							360

Name of Practice: Anderson Wellsman Architects Incorporated
1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6
tel (416) 391-3699

Certificate of Practice No. 5948

Name of Project: Schlegel Villages Barrie Stage One - Long-Term Care

Project Location: 800 Yonge Street, Barrie, Ontario

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C.	REFERENCE
1	Project Description: ■ New ☐ Addition ☐ Alteration		
2	Major Occupancy: Group B2 Major Occupancy w/ A2 and F3 Subsidiary Occupancy		3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 2,456m² Total: 2,456m²		1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 13,674m² Total: 13,674m²		1.4.1.2.[A]
5	Number of Storeys: Above Grade: 6 Below Grade: 1 Height of Building (m): 21.63 m		3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 2 (Building is fully sprinklered)		3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy Height Area Support Areas (Basement) F3 - Subsidiary Occupancy Common Areas (1st Floor) A2 - Subsidiary Occupancy Care Units (1st Floor - 6th floor) B2 Any Any		3.2.2.38
8	Sprinkler System Proposed: ■ Entire building ☐ Basement only ☐ Roof / Attic only		3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES ☐ NO		3.2.9
10	Fire Alarm Required: ■ YES ☐ NO		3.2.4
11	Water Service / Supply is Adequate: ■ YES ☐ NO		3.2.5.7
12	High Building: ■ YES ☐ NO		3.2.6.1 (c)
13	Permitted Construction: ☐ COMBUSTIBLE ■ NON-COMBUSTIBLE ☐ BOTH		3.2.2.38
14	Mezzanine (s) Area m²: N/A		
15	Occupant Load based on: ☐ m² / Person ■ Design of building Location / Occupancy / Number of Persons 64 Staffs (During Peak Shift) First Floor Common Areas A2 30 Visitors First Floor - Sixth Floor B2 32 Residents per Floor **286 TOTAL**		3.1.17
16	Barrier-free Design: ■ YES ☐ NO (EXPLAIN)		3.8
17	Hazardous Substances: ☐ YES ■ NO		SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor 2 Hours Precast Concrete Roof 0 Hours Building is Fully Sprinklered Support Member Ratings Floor 2 Hours Walls - Cast-in-place Concrete Columns 2 Hours Protected Concrete / Steel Columns Beams 2 Hours Protected Concrete / Steel Beams		3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 38 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls		3.2.3

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	
North	782.2 m²	17.5m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
East	873.7 m²	26.9m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
South	191.6 m²	198.7m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
West	871.3 m²	27.1m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d

20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Group B2 Occupancy Requirements	3.3.3.1 / 2 / 3
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 2 Universal Washroom req'd	3.8.2.3.(2)
	High Building Requirements 1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4 2. Protection of Stairs Below the Lowest Exit Level (Stair A & D) 3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D) 4. Limiting Smoke Movement into Upper Storeys 5. Operation of Air Circulation Systems 6. Connected Buildings (Existing) 7. Emergency Operation of Elevators 8. Firefighters Elevators 9. Smoke Venting 10. Central Alarm and Control Facility 11. Voice Communication System 12. System Testing	3.2.6.2.(1) 3.2.6.2.(2) 3.2.6.2.(3) 3.2.6.2.(4) 3.2.6.2.(5) 3.2.6.3. 3.2.6.4. 3.2.6.5. 3.2.6.6. 3.2.6.7. 3.2.6.8. 3.2.6.9.

STAGE ONE OBC MATRIX

Name of Practice: Anderson Wellsman Architects Incorporated
1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6
tel (416) 391-3699

Certificate of Practice No. 5948

Name of Project: Schlegel Villages Barrie Stage Two - Residential Apartment

Project Location: 800 Yonge Street, Barrie, Ontario

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C.	REFERENCE
1	Project Description: ■ New ☐ Addition ☐ Alteration		
2	Major Occupancy (s): Group C Major Occupancy w/ A2 & F3 Subsidiary Occupancy		3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 2,131 m² (Tower A 906 m²; Tower B: 1,225 m²) Total: 2,131 m² (Tower A 906 m²; Tower B: 1,225 m²)		1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 33,628 m² (Tower: A 17,240 m²; Tower B: 16,389 m²) Total: 33,628 m² (Tower: A 17,240 m²; Tower B: 16,389 m²)		1.4.1.2.[A]
5	Number of Storeys: Above Grade: 26 (Tower A: 26; Tower B: 18) Below Grade: 1 Height of Building (m): 84 m (Tower A: 84 m; Tower B: 58.4 m)		3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 1 (Building is fully sprinklered)		3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy Height Area Underground Parking Areas (Basement) F3 - Subsidiary Occupancy Stores and Shops Areas (1st Floor) A2 - Subsidiary Occupancy Residential Units (1st Floor - 26th floor) C Any Any		3.2.2.42
8	Sprinkler System Proposed: ■ Entire building ☐ Basement only ☐ Roof / Attic only		3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES ☐ NO		3.2.9
10	Fire Alarm Required: ■ YES ☐ NO		3.2.4
11	Water Service / Supply is Adequate: ■ YES ☐ NO		3.2.5.7
12	High Building: ■ YES ☐ NO		3.2.6.1 (c)
13	Permitted Construction: ☐ COMBUSTIBLE ■ NON-COMBUSTIBLE ☐ BOTH		3.2.2.42
14	Mezzanine (s) Area m²: N/A		
15	Occupant Load based on: ■ m² / Person ■ Design of building Location / Occupancy / Number of Persons Underground Parking Areas F3 388 Persons First Floor Common Areas A2 448 Persons (Tower A: 160 Persons; Tower B: 288 Persons) First Floor - twenty-sixth Floor C 1,062 Persons (Tower A: 556 Persons; Tower B: 506 Persons) **1,898 TOTAL**		3.1.17
16	Barrier-free Design: ■ YES ☐ NO (EXPLAIN)		3.8
17	Hazardous Substances: ☐ YES ■ NO		SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor 2 Hours Precast Concrete Roof 0 Hours Building is Fully Sprinklered Support Member Ratings Floor 2 Hours Walls - Cast-in-place Concrete Columns 2 Hours Protected Concrete / Steel Columns Beams 2 Hours Protected Concrete / Steel Beams		3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 42 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls		3.2.3

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	
North: Tower A	2908.9 m²	9.5m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
Tower B	2693.4 m²	9.5m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
East: Tower A	2282.2 m²	20.1m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
Tower B	1617.7 m²	94.6m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
South: Tower A	2908.9 m²	12.1m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
Tower B	2693.4 m²	8.4m	n/a	82%	0HR	Faces a street	3.2.3.10.(2)
West: Tower A	2282.2 m²	48.5m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d
Tower B	1617.7 m²	148.6m	n/a	100%	0HR	Masonry / Curtain Ext Wall	Table 3.2.3.1.d

20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 1 Universal Washroom req'd for each High-Rise Residential Building	3.8.2.3.(2)
	High Building Requirements 1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4 2. Protection of Stairs Below the Lowest Exit Level (Stair A & D) 3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D) 4. Limiting Smoke Movement into Upper Storeys 5. Operation of Air Circulation Systems 6. Connected Buildings (Existing) 7. Emergency Operation of Elevators 8. Firefighters Elevators 9. Smoke Venting 10. Central Alarm and Control Facility 11. Voice Communication System 12. System Testing	3.2.6.2.(1) 3.2.6.2.(2) 3.2.6.2.(3) 3.2.6.2.(4) 3.2.6.2.(5) 3.2.6.3. 3.2.6.4. 3.2.6.5. 3.2.6.6. 3.2.6.7. 3.2.6.8. 3.2.6.9.

STAGE TWO OBC MATRIX

Name of Practice: Anderson Wellsman Architects Incorporated
1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6
tel (416) 391-3699

Certificate of Practice No. 5948

Name of Project: Schlegel Villages Barrie Stage Three - Retirement Home

Project Location: 800 Yonge Street, Barrie, Ontario

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C.	REFERENCE
1	Project Description: ■ New ☐ Addition ☐ Alteration		
2	Major Occupancy (s): A2, B3, C, F3		3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 5,197 m² Total: 5,197 m²		1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 27,973 m² Total: 27,973 m²		1.4.1.2.[A]
5	Number of Storeys: Above Grade: 12 Below Grade: 1 Height of Building (m): 43.47 m		3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 1 (Building is fully sprinklered)		3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy Height Area Garage and Support Areas (Basement) F3 Any Any Common Areas (1st Floor) A2 Any Any Care Units (1st Floor - 3rd Floor) B3 Any Any Retirement Units (4th Floor - 12th Floor) C Any Any		3.2.2.42
8	Sprinkler System Proposed: ■ Entire building ☐ Basement only ☐ Roof / Attic only		3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES ☐ NO		3.2.9
10	Fire Alarm Required: ■ YES ☐ NO		3.2.4
11	Water Service / Supply is Adequate: ■ YES ☐ NO		3.2.5.7
12	High Building: ■ YES ☐ NO		3.2.6.1 (c)
13	Permitted Construction: ☐ COMBUSTIBLE ■ NON-COMBUSTIBLE ☐ BOTH		3.2.2.42
14	Mezzanine (s) Area m²: N/A		
15	Occupant Load based on: ■ m² / Person ■ Design of building Location / Occupancy / Number of Persons 64 Staffs (During Peak Shift) Garage & Support Areas F3 140 Persons First Floor Common Areas A2 30 Visitors First Floor - Second Floor B3 72 Residents Third Floor - Twelfth Floor C 408 Persons **714 TOTAL**		3.1.17
16	Barrier-free Design: ■ YES ☐ NO (EXPLAIN)		3.8
17	Hazardous Substances: ☐ YES ■ NO		SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor 2 Hours Precast Concrete Roof 0 Hours Building is Fully Sprinklered Support Member Ratings Floor 2 Hours Walls - Cast-in-place Concrete Columns 2 Hours Protected Concrete / Steel Columns Beams 2 Hours Protected Concrete / Steel Beams		3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 42 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls		3.2.3

Wall	Area of EBF (m²)	L.D. (m²)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	
North	1384.7m²	7.3m	n/a	66%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
East	290.6 m²	36.4m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
South	269.3 m²	47.2m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
West	290.6 m²	33.5m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d

20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 1 Universal Washroom req'd	3.8.2.3.(2)
	High Building Requirements 1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4 2. Protection of Stairs Below the Lowest Exit Level (Stair A & D) 3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D) 4. Limiting Smoke Movement into Upper Storeys 5. Operation of Air Circulation Systems 6. Connected Buildings (Existing) 7. Emergency Operation of Elevators 8. Firefighters Elevators 9. Smoke Venting 10. Central Alarm and Control Facility (Existing) 11. Voice Communication System 12. System Testing	3.2.6.2.(1) 3.2.6.2.(2) 3.2.6.2.(3) 3.2.6.2.(4) 3.2.6.2.(5) 3.2.6.3. 3.2.6.4. 3.2.6.5. 3.2.6.6. 3.2.6.7. 3.2.6.8. 3.2.6.9.

STAGE THREE OBC MATRIX

Name of Practice: Anderson Wellsman Architects Incorporated
1090 Don Mills Road Suite 612, Toronto, ON M3C 3R6
tel (416) 391-3699

Certificate of Practice No. 5948

Name of Project: Schlegel Villages Barrie Stage Four - Retirement Home

Project Location: 800 Yonge Street, Barrie, Ontario

ITEM	ONTARIO BUILDING CODE DATA MATRIX PART 3	O.B.C.	REFERENCE
1	Project Description: ■ New ☐ Addition ☐ Alteration		
2	Major Occupancy (s): A2, B3, C, F3		3.1.2.1. (1)
3	Building Area (m²): Existing: 0 m² New: 3,335 m² Total: 3,335 m²		1.4.1.2.[A]
4	Gross Area (m²): Existing: 0 m² New: 24,989 m² Total: 24,989 m²		1.4.1.2.[A]
5	Number of Storeys: Above Grade: 12 Below Grade: 1 Height of Building (m): 43.47 m		3.2.1.1
6	Number of Streets / Fire Fighters Acess Routes: 2 (Building is fully sprinklered)		3.2.2.10 & 3.2.5.
7	Building Classification: Occupancy Height Area Undergraound Parking Areas (Basement) F3 Any Any Common Areas (1st Floor) A2 Any Any Care Units (1st Floor - 3rd Floor) B3 Any Any Retirement Units (4th Floor - 12th Floor) C Any Any		3.2.2.42
8	Sprinkler System Proposed: ■ Entire building ☐ Basement only ☐ Roof / Attic only		3.2.2.15 & 3.2.2.17
9	Standpipe Required: ■ YES ☐ NO		3.2.9
10	Fire Alarm Required: ■ YES ☐ NO		3.2.4
11	Water Service / Supply is Adequate: ■ YES ☐ NO		3.2.5.7
12	High Building: ■ YES ☐ NO		3.2.6.1 (c)
13	Permitted Construction: ☐ COMBUSTIBLE ■ NON-COMBUSTIBLE ☐ BOTH		3.2.2.42
14	Mezzanine (s) Area m²: N/A		
15	Occupant Load based on: ■ m² / Person ■ Design of building Location / Occupancy / Number of Persons 47 Staffs (During Peak Shift) Garage F3 111 Persons First Floor Common Areas A2 30 Visitors First Floor - Third Floor B3 72 Residents Fourth Floor - Twelfth Floor C 412 Persons **672 TOTAL**		3.1.17
16	Barrier-free Design: ■ YES ☐ NO (EXPLAIN)		3.8
17	Hazardous Substances: ☐ YES ■ NO		SB-2 Table 2.6
18	Required Fire Resistance Ratings (FRR): Assembly Ratings Description Floor 2 Hours Precast Concrete Roof 0 Hours Building is Fully Sprinklered Support Member Ratings Floor 2 Hours Walls - Cast-in-place Concrete Columns 2 Hours Protected Concrete / Steel Columns Beams 2 Hours Protected Concrete / Steel Beams		3.3.1.2.(1) & 3.3.1.19.(1) 3.2.2.23 / 42 / 73 3.2.2.17
19	Spatial Separation - Construction of Exterior Walls		3.2.3

Wall	Area of EBF (m²)	L.D. (m²)	L/H or H/L	Max % of Unprotected Openings	FRR (Hours) EBF	Listed Design or Description	
North	3632.2m²	78.6m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
East	290.6 m²	32.9m	n/a	100%	0HR	Faces a street	3.2.3.10.(2)
South	97.9 m²	9.5m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d
West	290.6 m²	36m	n/a	100%	0HR	Masonry / Concrete Ext Wall	Table 3.2.3.1.d

20	Other Relevant Requirements:	
	Safety Within Floor Areas	3.3.1.1-21
	Group A2 Occupancy Requirements	3.3.2.1 / 2 / 5 / 6
	Service Space Requirements	3.3.5.4 / 6 / 7
	Travel Distance/ Locations of Exits 45m to nearest exit in sprinklered occupancies	3.4.2.5.(1)(c)
	Universal Washrooms 1 Universal Washroom req'd	3.8.2.3.(2)
	High Building Requirements 1. Design meets 3.2.6.2.(1) if it conforms to sentences (2) - (5) & SB-4 2. Protection of Stairs Below the Lowest Exit Level (Stair A & D) 3. Protection of Above Grade Exit Stairs (Stairs A, B, C & D) 4. Limiting Smoke Movement into Upper Storeys 5. Operation of Air Circulation Systems 6. Connected Buildings (Existing) 7. Emergency Operation of Elevators 8. Firefighters Elevators 9. Smoke Venting 10. Central Alarm and Control Facility (Existing) 11. Voice Communication System 12. System Testing	3.2.6.2.(1) 3.2.6.2.(2) 3.2.6.2.(3) 3.2.6.2.(4) 3.2.6.2.(5) 3.2.6.3. 3.2.6.4. 3.2.6.5. 3.2.6.6. 3.2.6.7. 3.2.6.8. 3.2.6.9.

STAGE FOUR OBC MATRIX

SCHLEGEL VILLAGES

REVISIONS

ISSUED	ISSUED FOR SPA SUBMISSION
2024-07-18	

ANDERSON WELLSMAN ARCHITECTS INCORPORATED
1090 DON MILLS ROAD SUITE 612 TORONTO ONTARIO M3C 3R6
T 416 391 3699

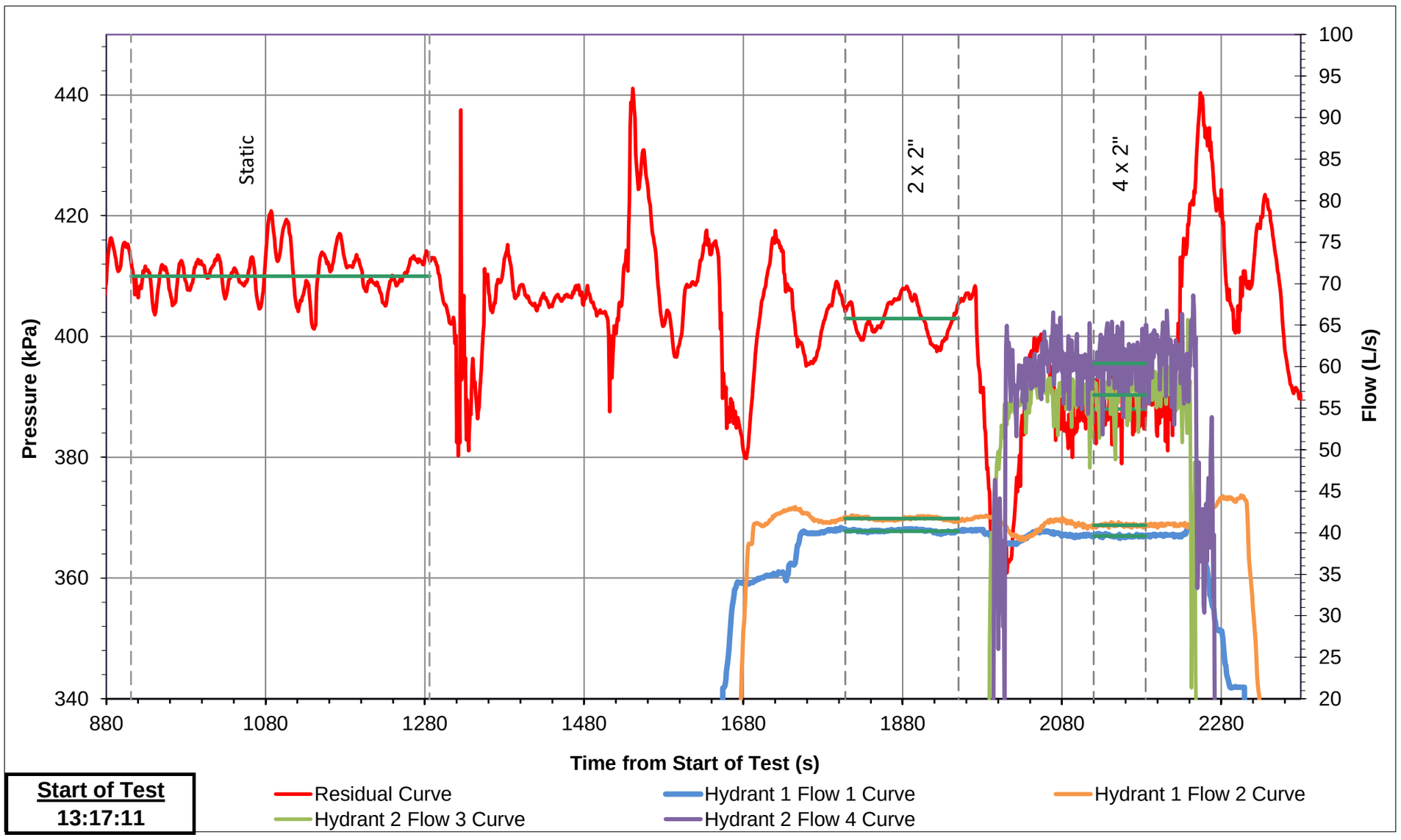
THE VILLAGE OF INNIS LANDING
800 YONGE ST, BARRIE, ON

Drawing Title: BUILDING CODE MATRIX

Project No.: 2116
Plot Date: 7/18/2024 MM/DD/YYYY
Checked By: RA
Drawn By: PC

SP1.1

Dual Flow Hydrant (H2973)



Subject Watermain Details			
Diameter:	400 mm	**Material:**	PVC
Area:	0.126 m2		

Subject Hydrant & Valve Details	
Residual Hydrant:	H2973
Flow Hydrant 1:	H2974
Flow Hydrant 2:	H3504

TABLE A: TESTED PRESSURES AND FLOWS

Point	Time		Residual (H2973)		Flow Hydrant 1 (H2974)				Flow Hydrant 2 (H3504)				Total Flow		Velocity
			Residual (S1)		Flow 1 (S2)		Flow 2 (S3)		Flow 3 (S4)		Flow 4 (S5)				
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)
Static	911	1286	410	59.5	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1 x 2"			0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2 x 2"	1808	1950	403	58.5	40.2	637	41.7	661	0.0	0	0.0	0	81.9	1298	0.7
3 x 2"			0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4 x 2"	2120	2185	388	56.3	39.6	628	40.9	648	56.6	897	60.4	957	197.5	3130	1.6

Dual Flow Hydrant (H2973)

HYDRANT FLOW TEST RESULTS

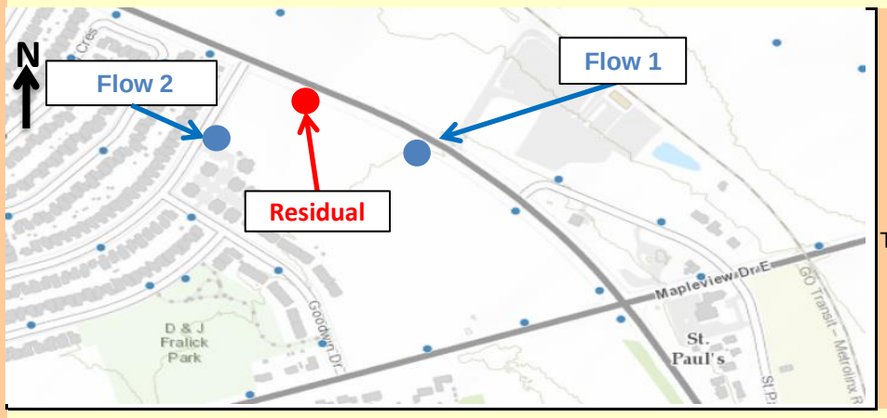
Date: 17-Jul-24 Time: 13:17 (hh/mm)

Municipality: City of Barrie

Operator:

Tested By: Sen, Isaac

Test No: **1**



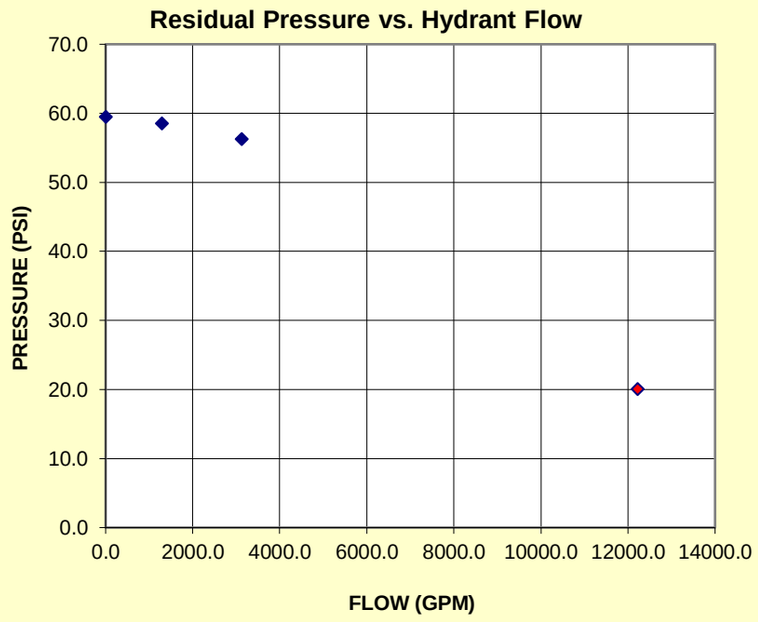
Conditions before Test (STATIC)

Residual Hydrant:	59.5 psi	410 kPa
Hydrant that will Flow:	59.5 psi	410 kPa
Δ pressure:	0.0 psi	0 kPa
Elevation Difference: (Flow El. - Residual El.)	0.0 ft	0.0 m

Test Notes: 197.5 L/s flow achieved during test

TEST		TEST FLOW		RESIDUAL PRESSURE (psi)		Minimum Residual P_r (psi)	Fire Flow at Minimum Residual, Q_r (USGPM)	Fire Flow at Minimum Residual, Q_r (L/s)	10% Pressure Drop Achieved?
Port Size (in)	Nozzle Pressure (psi)	(USGPM)	(L/s)	Monitoring Hydrant	Flow Hydrant (Corrected) *				
STATIC	n/a	0	0	59.5	59.5				
Single Hydrant Test									
1 x 2"	0.0	0.0	0.0			20			
2 x 2"	17.3	1298.0	81.9	58.5	58.5	20	9627	607	NO
3 x 2"									
Hydrant 1	0.0	0.0	0.0			20			
Hydrant 2	0.1	0.0	0.0						
4 x 2"									
Hydrant 1	16.7	1276.0	80.5	56.3	56.3	20	12225	771	NO
Hydrant 2	30.7	1854.0	117.0						

* Pressure correction is equal to the elevation difference. Column 2 (and Table A) show the nozzle pressure while flowing.



Results			
Static Pressure		Flow at 20 psi (140kPa)*	
(psi)	(kPa)	(gpm)	(L/s)
59.5	410	12200	770

* Results carried to nearest 50 gpm or 100 gpm if over 1000 gpm

Hydrant Classification as per NFPA 291			
Class	AA	Color	BLUE

Water Discharged During Test:	39300 L

Rounded up to closest 100L

DISCLAIMER FOR FIRE FLOW TESTS

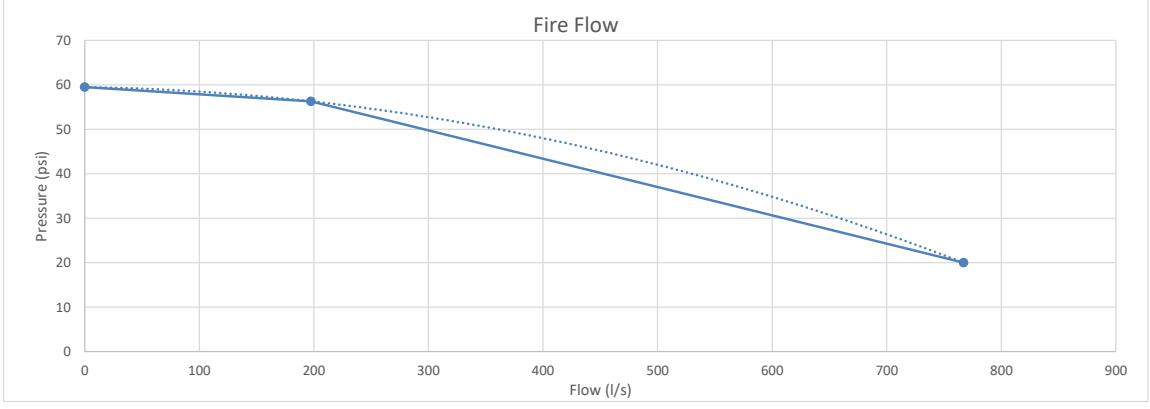
While WSP makes every effort to ensure that the information contained herein is accurate and up to date, WSP is not responsible for unintended or incorrect use of the data and information described and/or contained herein. The user must make his/her own determination as to its accuracy and suitability. The information is representative for a dynamic water system that may change over time.

Fire Flow Test (W501 v1.1)
City of Barrie
18-Jul-2024

Hydrant Number (Residual and Static Pressure)	H2973	
Hydrant Number(s) (Flow)	Flow Hydrant 1: H2974; Flow Hydrant 2: H3504	
Hydrant Street / Address (Residual and Static Pressure)	Yonge Street (2nd hydrant east of Country Lane)	
Hydrant Street / Address (Flow)	Flow Hydrant 1: Yonge Street (2nd hydrant east of Country Lane); Flow Hydrant 2: Opposite 302 Country Lane	
Hydrant Locations Figure (Residual/Static and Flow)	Please refer to WSP's "Hydrant Flow Test Results"	
Date of Test (DD/MM/YYYY)	17/07/2024	
Time (HH:MM AM or PM)	01:17:00 PM	
Time (HH:MM AM or PM)	Unknown	
Company Name	WSP	
Employee Name(s)	Isaac Sen	
City of Barrie Employee Name(s)	Unknown	
Static Pressure	59.5	psi
Residual Pressure	56.3	psi
Hydrant Elevation (Residual and Static Pressure)	263	m
Hydrant Elevation (Flow)	263	m
Elevation Difference (m)	0	m
Pitot Pressure - Outlet 1	16.7	psi
Pitot Pressure - Outlet 2	30.7	psi
Outlet Size	2	inch
Outlet Coefficient	0.9	
Pressure Drop Check (NFPA 291)	5.38	% Minimum pressure drop of 25% is recommended, please consider opening other outlets or flowing additional hydrants
Pressure Drop Check (AWWA M17)	3.20	psi Minimum pressure drop of 10 psi is recommended, please consider opening other outlets or flowing additional hydrants
Q Hydrant Flow - Outlet 1	1276.00	US gpm
Q Hydrant Flow - Outlet 2	1854.00	US gpm
Q Total Flow	197.47	l/s
Pressure at Desired Fire Flow	20.00	psi
Q Outlet 1_R	4957.15	US gpm
Q Outlet 2_R	7202.63	US gpm
Q $Total_R$	12159.78	US gpm
Q $Total_R$	767.16	l/s
Have any Cell formulas been changed? (Yes/No)	Yes	C28 (Q hydrant flow) was revised to measured value instead of theoretical calculation. Measured value is more conservative of actual flow scenario.
Hydrant Colour:	Blue	

Boundary Conditions (ET, Reservoir, BPS, PRV, Wells etc):
Unknown

Other Considerations (flushing, fire, operational issues, outlet coefficient etc):
Entered data from test with four 2-inch ports flowing.
Estimated hydrant elevations from ground elevations from Barrie OpenData GIS mapping.



TATHAM ENGINEERING

PROJECT	The Village at Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	5-Jul-2024
SUBJECT	Water Supply Calculations: Phase 1 (Stage 1)	NAME	JLM CHECK NM
		PAGE	1 OF 2

SITE DESCRIPTION

Proposed Phase 1

DAILY DEMAND DESIGN PARAMATERS

Site Area	4.05	ha	Max Day Factor	2.9
Domestic	28	m³/ha/day	Peak Hour Factor	4.3
Fire Flow	100	L/s		

Design Demand			Total	
			L/day	L/s
Average Daily			102,033	1.19
Maximum Day			281,825	3.27
Peak Hour			402,785	4.67

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service/Scenario	D (mm)	Q (L/s)	A (m^2)	V (m/s)	C	L (m)	Friction Loss (m)	Friction Loss psi	Friction Loss kPa
Domestic (M. Day)	150	3.27	0.0177	0.19	100	11.0	0.006	0.009	0.07
Domestic (Peak)	150	4.67	0.0177	0.27	100	11.0	0.012	0.017	0.12
Fire Line	200	100.00	0.0315	3.18	110	11.0	0.697	0.991	6.84

D - Pipe Diameter
Q - Demand Flow
A - Pipe Flow Area
V - Flow Velocity
C - Pipe Coefficient
L - Pipe Length

Notes:

- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m^3/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m^3/s.

TATHAM ENGINEERING

PROJECT	The Village at Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	5-Jul-2024
SUBJECT	Water Supply Calculations: Phase 1 (Stage 1)	NAME	JLM CHECK NM
		PAGE	2 OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Floor (m)		Total Head Loss (m)	(psi)	(kPa)
Static Head Loss	263.21	1.80	264.75		3.34	4.750	32.76

Note - static head loss calculated at FFE and does not consider height of building

TOTAL LOSSES

Service Type	Static Pressure (psi)	(kPa)	Static Loss (kPa)	Friction Loss (kPa)		Total Loss (kPa)	Service Pressure (kPa)	(psi)
Domestic (Peak)	60.00	413.69	32.76	0.12		32.88	380.81	55.24
Fire Line	60.00	413.69	32.76	6.84		39.60	374.09	54.26

Note - The pressure loss between the residual hydrant and the connection point of the proposed 200 mm dia. fire service has been estimated assuming the static pressure in the Yonge main is 60 psi.

SUMMARY

- the estimated pressure available in the 150 mm dia. domestic water service at the proposed building FFE is 55.24 psi under peak hour conditions

- the 200 mm dia. fire service can provide the required fire flow of 100 L/s to the building with a maximum velocity of 3.18 m/s. The estimated pressure in the fire service at the proposed building FFE is 54.26 psi

TATHAM ENGINEERING

PROJECT	The Village at Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	5-Jul-2024
SUBJECT	Water Supply Calculations: Phases 2 & 3 (Stages 3 & 4)	NAME	JLM CHECK NM
		PAGE	1 OF 2

SITE DESCRIPTION

Proposed Phases 2 and 3 (combined)

DAILY DEMAND DESIGN PARAMATERS

Site Area	4.05	ha	Max Day Factor	2.9
Domestic	28	m³/ha/day	Peak Hour Factor	4.3
Fire Flow	117	L/s		

Design Demand			Total	
			L/day	L/s
Average Daily			237,576	2.78
Maximum Day			662,667	7.70
Peak Hour			954,357	11.07

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service/Scenario	D (mm)	Q (L/s)	A (m^2)	V (m/s)	C	L (m)	Friction Loss (m)	psi	kPa
Domestic (M. Day)	150	7.70	0.0177	0.44	100	63.0	0.168	0.239	1.65
Domestic (Peak)	150	11.07	0.0177	0.63	100	63.0	0.328	0.467	3.22
Fire Line	250	117.00	0.0491	2.39	110	63.0	1.800	2.560	17.66

D - Pipe Diameter
Q - Demand Flow
A - Pipe Flow Area
V - Flow Velocity
C - Pipe Coefficient
L - Pipe Length

Notes:

- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m^3/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m^3/s.

TATHAM ENGINEERING

PROJECT	The Village at Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	5-Jul-2024
SUBJECT	Water Supply Calculations: Phases 2 & 3 (Stages 3 & 4)	NAME	JLM CHECK NM
		PAGE	2 OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Floor (m)		Total Head Loss (m)	(psi)	(kPa)
Static Head Loss	263.65	1.80	264.75		2.90	4.124	28.44

Note - static head loss calculated at FFE and does not consider height of building

TOTAL LOSSES

Service Type	Static Pressure (psi)	(kPa)	Static Loss (kPa)	Friction Loss (kPa)		Total Loss (kPa)	Service Pressure (kPa)	(psi)
Domestic (Peak)	60.00	413.69	28.44	3.22		31.66	382.03	55.41
Fire Line	60.00	413.69	28.44	17.66		46.10	367.59	53.32

Note - The pressure loss between the residual hydrant and the connection point of the proposed 250 mm dia. fire service has been estimated assuming the static pressure in the Yonge main is 60 psi.

SUMMARY

- the estimated pressure available in the 150 mm dia. domestic water service at the proposed building FFE is 55.41 psi under peak hour conditions

- the 250 mm dia. fire service can provide the required fire flow of 117 L/s to the building with a maximum velocity of 2.39 m/s. The estimated pressure in the fire service at the proposed building FFE is 53.32 psi

TATHAM ENGINEERING

PROJECT	The Village at Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	5-Jul-2024
SUBJECT	Water Supply Calculations: Phases 4A & 4B (Stage 2)	NAME	JLM CHECK NM
		PAGE	1 OF 2

SITE DESCRIPTION

Proposed Phases 4A and 4B (combined)

DAILY DEMAND DESIGN PARAMATERS

Site Area	4.05	ha	Max Day Factor	2.9
Domestic	28	m³/ha/day	Peak Hour Factor	4.3
Fire Flow	67	L/s		

Design Demand			Total	
			L/day	L/s
Average Daily			158,878	1.85
Maximum Day			439,660	5.10
Peak Hour			629,290	7.30

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service/Scenario	D (mm)	Q (L/s)	A (m^2)	V (m/s)	C	L (m)	Friction Loss (m)	Friction Loss psi	Friction Loss kPa
Domestic (M. Day)	150	5.10	0.0177	0.29	100	8.0	0.010	0.015	0.11
Domestic (Peak)	150	7.30	0.0177	0.42	100	8.0	0.019	0.028	0.20
Fire Line	200	67.00	0.0315	2.13	110	8.0	0.241	0.344	2.38

D - Pipe Diameter
Q - Demand Flow
A - Pipe Flow Area
V - Flow Velocity
C - Pipe Coefficient
L - Pipe Length

Notes:

- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m^3/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m^3/s.

TATHAM ENGINEERING

PROJECT	The Village at Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	5-Jul-2024
SUBJECT	Water Supply Calculations: Phases 4A & 4B (Stage 2)	NAME	JLM CHECK NM
		PAGE	2 OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Floor (m)		Total Head Loss (m)	(psi)	(kPa)
Static Head Loss	264.74	1.80	264.75		1.81	2.574	17.75

Note - static head loss calculated at FFE and does not consider height of building

TOTAL LOSSES

Service Type	Static Pressure (psi)	(kPa)	Static Loss (kPa)	Friction Loss (kPa)		Total Loss (kPa)	Service Pressure (kPa)	(psi)
Domestic (Peak)	60.00	413.69	17.75	0.20		17.95	395.74	57.4
Fire Line	60.00	413.69	17.75	2.38		20.13	393.56	57.09

Note - The pressure loss between the residual hydrant and the connection point of the proposed 200 mm dia. fire service has been estimated assuming the static pressure in the Yonge main is 60 psi.

SUMMARY

- the estimated pressure available in the 150 mm dia. domestic water service at the proposed building FFE is 57.40 psi under peak hour conditions

- the 200 mm dia. fire service can provide the required fire flow of 67 L/s to the building with a maximum velocity of 2.13 m/s. The estimated pressure in the fire service at the proposed building FFE is 57.09 psi

Appendix C:
Sanitary Calculations and Supporting Documentation

TATHAM ENGINEERING

PROJECT	The Village of Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	July 5, 2024
SUBJECT	Sanitary Flow Calculations	NAME	JLM
		PAGE	1 OF 3

1.1 Demand Criteria

Design Criteria as per City of Barrie's *Sanitary Infrastructure Design Standard* (April 2023)

Flows

Long-Term Care Flow	=	450	L/bed/day
Per Capita Flow	=	225	L/cap/day
Commercial (Accessory Uses)	=	28,000	L/ha/day
Extraneous Flow (Infiltration)	=	0.10	L/s/ha

Peaking Factor

*Residential = Harmon

= 1+14/(4+1.720^0.5)

= 3.64

*Total development population of 1,720 persons

Population Densities

Long-Term Care Unit	=	1.00	PPU
High Density	=	1.67	PPU

**Commercial = 2.05

**Peak Flow as per WSP's *City of Barrie Wastewater Treatment Master Plan* (2019)

1.2 Proposed Development Design Sewage Flows

Site Information as per *Master Site Plan* by Anderson Wellsman Architects Inc. (dated May 31, 2024)

Phase 1: Long-Term Care (LTC) Home (Stage 1)

LTC Units	=	192	beds
Commercial (Accessory) Space	=	0.56	ha
Phase 1 Area	=	0.66	ha

Phase 1 Populatior = 192

Average Day Flow (ADF)

ADF, LTC Home	=	86,400	L/day	=	86.40	m^3/day	=	1.00	L/s
ADF, Commercial	=	15,624	L/day	=	15.62	m^3/day	=	0.19	L/s
Total ADF	=	102,024	L/day	=	102.02	m^3/day	=	1.19	L/s

Peak Flow (PF)

PF, Residential	=	86,400	L/day	x	3.64				
	=	314,133	L/day	=	314.13	m^3/day	=	3.64	L/s
PF, Commercial	=	15,624	L/day	x	2.05				
	=	32,029	L/day	=	32.03	m^3/day	=	0.38	L/s
Total PF (Incl. Extraneous)	=	4.02	L/s	+	0.07	L/s	=	4.09	L/s

Phase 2: Retirement Home & Town Square (Stage 3)

Apartments	=	276	units
Commercial Space	=	0.62	ha
Phase 2 Area	=	1.29	ha

Phase 2 Populatior = 461 (rounded)

Average Day Flow (ADF)

ADF, Residential	=	103,725	L/day	=	103.73	m^3/day	=	1.21	L/s
ADF, Commercial	=	17,354	L/day	=	17.35	m^3/day	=	0.21	L/s
Total ADF	=	121,079	L/day	=	121.08	m^3/day	=	1.42	L/s

Peak Flow (PF)

PF, Residential	=	103,725	L/day	x	3.64				
	=	377,123	L/day	=	377.12	m^3/day	=	4.37	L/s
PF, Commercial	=	17,354	L/day	x	2.05				
	=	35,577	L/day	=	35.58	m^3/day	=	0.42	L/s
Total PF (Incl. Extraneous)	=	4.79	L/s	+	0.13	L/s	=	4.92	L/s

Phase 3: Retirement Home (Stage 4)

Apartments	=	278	units	Phase 3 Populatior =	465 (rounded)
Commercial (Accessory) Space	=	0.42	ha		
Phase 3 Area	=	0.33	ha		

Average Day Flow (ADF)

ADF, Residential	=	104,625	L/day	=	104.63	m^3/day	=	1.22	L/s
ADF, Commercial	=	11,872	L/day	=	11.87	m^3/day	=	0.14	L/s
Total ADF	=	116,497	L/day	=	116.50	m^3/day	=	1.36	L/s

Peak Flow (PF)

PF, Residential	=	104,625	L/day	x	3.64				
	=	380,395	L/day	=	380.40	m^3/day	=	4.41	L/s
PF, Commercial	=	11,872	L/day	x	2.05				
	=	24,338	L/day	=	24.34	m^3/day	=	0.29	L/s
Total PF (Incl. Extraneous)	=	4.70	L/s	+	0.03	L/s	=	4.73	L/s

Phase 4: General Market Residential (Stage 2)

Apartments	=	360	units	Phase 4 Populatior =	602 (rounded)
Commercial (Accessory) Space	=	0.84	ha		
Phase 4 Area	=	0.78	ha		

TATHAM ENGINEERING

PROJECT	The Village of Innis Landing, 800 Yonge Street, Barrie	FILE	422426
		DATE	July 5, 2024
SUBJECT	Sanitary Flow Calculations	NAME	JLM
		PAGE	3 OF 3

<u>Average Day Flow (ADF)</u>									
ADF, Residential	=	135,450	L/day	=	135.45	m^3/day	=	1.57	L/s
ADF, Commercial	=	23,428	L/day	=	23.43	m^3/day	=	0.28	L/s
Total ADF	=	158,878	L/day	=	158.88	m^3/day	=	1.85	L/s
<u>Peak Flow (PF)</u>									
PF, Residential	=	135,450	L/day	x	3.64				
	=	492,469	L/day	=	492.47	m^3/day	=	5.70	L/s
PF, Commercial	=	23,428	L/day	x	2.05				
	=	48,027	L/day	=	48.03	m^3/day	=	0.56	L/s
Total PF (Incl. Extraneous)	=	6.26	L/s	+	0.08	L/s	=	6.34	L/s

AECOM
55 Cedar Pointe Drive, Suite 620
Barrie, ON, Canada L4N 5R7
www.aecom.com

705 721 9222 tel
705 734 0764 fax

March 8, 2017

Mr. Gary Matthie, P. Eng.
Senior Development Services Technologist
City of Barrie
Engineering Department – 6th Floor
P. O. Box 400, 70 Collier Street
Barrie ON L4M 4T5

Dear Mr. Matthie:

Project No: 60118297.0002

Regarding: Barrie Heritage Developments Phase IV Esther Drive Sanitary Sewer Flow Monitoring

To facilitate surrounding development, Barrie Heritage Developments Ltd (BHD) constructed a sanitary sewer extending from the Lover's Creek Sanitary Trunk Sewer, generally within the Esther Drive municipal right-of-way toward Yonge Street. To facilitate future development of its Phase IV lands, the Esther Drive sanitary sewer was extended across Yonge Street and stubbed in to Phase IV lands by BHD at the time the City of Barrie upgraded the Yonge Street right-of-way.

Sanitary flow monitoring was undertaken for the Esther Drive sanitary sewer for approximately 9 months from February 13, 2015, to October 9, 2015, to collect data on the actual flows in the sanitary sewer. The measured flows were then compared to the design flows and the sanitary sewer capacity to determine the remaining capacity in the sanitary sewer that is available for future development of the upstream lands; Swallow Glen owned by 2144176 Ontario Inc et al, and the undeveloped Phase IV lands east of Yonge Street owned by 3251586 Canada Inc / BHD.

In addition to the flow monitoring, a rain gauge was set up to collect rain data from April 15, 2015, to September 13, 2015. The rain data was compared with the flow data in order to determine the impact of infiltration, if any, on the peak flows in the sanitary sewer.

Methodology

AMG Environmental Advanced Monitoring Group was retained to undertake flow monitoring for the Esther Drive sanitary sewer and the associated rain gauge monitoring. A flow monitor was installed in the Esther Drive sanitary sewer maintenance hole SAP24009, located approximately 10 m north of Esther Drive at the sanitary and storm outlet block between 222 Esther Drive and 218 Esther Drive (see attached Figure SAN-1).

The flow monitoring device was located in MH SAP24009 (the east 300 mm diameter inlet sewer), and measured the flow, depth and velocity of the sanitary sewage flowing to the MH from the lands to the east.

A rain gauge was installed nearby on the roof at 640 Yonge Street to collect rain data for comparison with the flow monitoring data.

Design Flows

The original sanitary sewer design sheet for the Esther Drive sanitary sewer included a design flow of 74.13 L/s at MH SAP24009 based on the anticipated future development upstream. The design consisted of a 300 mm diameter sewer at 0.70% slope, having a calculated full pipe capacity of 84.42 L/s.

As the upstream lands were sequentially developed, the design flows were adjusted based on the actual developments. Two areas (Swallow Glen commercial block and Phase IV lands) that are included in the original design flow to this sewer currently remain undeveloped and one area (Yonge Station) was under constructed with only some occupied units during the flow monitoring period. Currently, the developed lands contributing to the Esther Drive sanitary sewer consist of 1010.5 equivalent units (excluding Yonge Station). As per the sanitary sewer design sheet provided by the developer's engineer, Yonge Station has a design peak flow of 5.23 L/s.

Figure SAN-1 attached to this letter shows the areas contributing to the sanitary sewer.

Taking into account the undeveloped lands, the adjusted design peak flow to MH SAP24009 for the existing developed lands (excluding Yonge Station) is 32.72 L/s. This number can be compared to the actual peak flows established by the flow monitoring to determine the actual remaining capacity in the Esther Drive sanitary sewer.

Sanitary Sewer Constraints

A review of the as-constructed drawings for the Esther Drive sanitary sewer was completed to identify any flow constraints upstream of the flow monitoring location.

The overall capacity of the Esther Drive sanitary sewer is affected by a 326 m long section of 300 mm diameter sanitary sewer with minimum slopes which extends from MH SAP25055 at the intersection with Honey Crescent and Stephanie Lane to MH SAP24017 in front of the school (see attached Figure SAN-2). The sanitary sewer section with the lowest capacity is a 65 m long, 300 mm diameter sanitary sewer at 0.37% slope west of Madelaine Drive. This sewer has a full pipe capacity of 61.38 L/s. The net slope over the entire 326 m long section of sanitary sewer is 0.65%, which equates to a full pipe capacity of 77.96 L/s.

Summary of Monitoring Results

The results of the flow monitoring are summarized for each month and overall in the Table 1 below.

Table 1. Summary of Sanitary Sewer Monitoring Results

From Date	To Date	Average			Peak		
		Flow (L/s)	Depth (mm)	Velocity (m/s)	Flow[1] (L/s)	Depth[1] (mm)	Velocity (m/s)
13-Feb-15	28-Feb-15	6.68	82.32	0.41	18.4	114.61	0.92
1-Mar-15	31-Mar-15	8.61	88.43	0.48	21.76	122.57	0.96
1-Apr-15	30-Apr-15	11.14	94.57	0.56	27.11	124.38	1.04
1-May-15	31-May-15	9.56	88.40	0.52	28.25	125.42	1.01
1-Jun-15	30-Jun-15	9.69	88.36	0.53	22.32	117.45	1.23
1-Jul-15	31-Jul-15	8.32	87.09	0.47	21.17	120.13	0.92
1-Aug-15	31-Aug-15	8.19	90.43	0.44	25.26	126.72	0.94
1-Sep-15	30-Sep-15	8.69	89.58	0.47	23.51	127.75	0.96
1-Oct-15	9-Oct-15	9.03	95.69	0.45	18.85	128.78	0.72
Overall		**8.99**	**89.29**	**0.49**	Peak: **28.25** Avg: **22.96**	Peak: **128.78** Avg: **123.09**	Peak: **1.23** Avg: **0.97**

Note: 1. Excludes rain event peak flows and depths on June 27/28 and August 18.
2. Data based on 5 minute data intervals.

Over the course of the flow and rain gauge monitoring, five (5) rain events occurred with rain volumes totalling more than 25.4 mm (1 inch) of rain. Two (2) of these events appeared to impact the peak flow in the sanitary sewer. The first large event occurred in June and consisted of a large volume of rain falling over a long time period. The second event occurred in August and was a relatively short duration with high intensity. The peak flows and depths for these two events are summarized below.

Table 2. Summary of Large Rainfall Events

Date	Duration HH:MM	Total Rain Volume (mm)	Peak Intensity (mm/hr)	Rain Volume Prior to Max Flow (mm)	Peak Flow During Rain Event (L/s)	Max Depth During Rain Event (mm)
June 27/28	30:50	43.45	21.34	42.7	35.31	128.58
August 18	1:40	38.61	115.82	37.6	32.99	150.43

Note: 1. Data based on 5 minute data intervals.

Comparison of Peak Flows

Per Unit Design Flows
Design parameters for single family residential development in the *City of Barrie Sanitary Sewage Collection Policies and Design Guidelines* (2012) are as follows:

- People per unit (ppu) = 3.13
- Density = 25 units / ha
- Average Daily Flow = 225 L/c/day
- Peaking factor (M) = Harmon Formula $\left(1 + \frac{14}{4+ P^{0.5}}\right)$
- Infiltration = 0.1 L/s/ha

Based on the above criteria, the design flow per unit (based on the existing equivalent population for 1010.5 units) can be determined as follows:

Design Population = 1010.5 units x 3.13 ppu = 3,163 people

Peaking factor (M) = $\left(1 + \frac{14}{4+ P^{0.5}}\right) = \left(1 + \frac{14}{4+3.163^{0.5}}\right) = 3.42$

Peak Residential Flow per unit (Q_p) = Residential Peak Flow + Infiltration
= 3.42 x 3.13 ppu x 225 L/c/day + 0.1 L/s/ha ÷ 25 units/ha
= 0.0318 L/s/unit

Based on the existing development of 1010.5 equivalent single family residential units, the measured peak flow (excluding the largest rain events) of 28.25 L/s equates to a peak flow of approximately 0.028 L/s/unit (28.25 L/s ÷ 1010.5 units). This is less than the design standard per unit flow rate of 0.0318 L/s/unit.

Flow Monitoring Location (MH SAP24009)
The measured peak flow (excluding the largest rain events) of 28.25 L/s is less than the design peak flow for the developed lands of 32.72 L/s at the sanitary flow monitoring location (MH SAP24009).

Comparing the original design full pipe capacity of 84.42 L/s to the measure peak flow of 28.25 L/s (excluding the large rain events), there is additional available capacity in the sanitary sewer at this location of 56.17 L/s for the remaining undeveloped upstream lands and Yonge Station. Subtracting the design flow for Yonge Station of 5.23 L/s, the remaining available capacity is **50.94 L/s** for the remaining developments (i.e. Phase III Swallow Glen undeveloped lands and Phase IV).

Upstream Constraint Location (MH SAP24017)
The measured peak flow was pro-rated to approximate the actual peak flows at the location of the upstream sanitary sewer constraint. 170 equivalent units connect to the sanitary sewer between the noted flatter section of pipe and the flow monitoring location. Using a per unit peak flow rate of 0.028 L/s (as determined by the flow monitoring data above), the pro-rated peak flow at the constraint location is 23.49 L/s (28.25 L/s – 170 units x 0.028 L/s/unit).

Comparing the net full pipe capacity of this section of sanitary sewer of 77.96 L/s to the pro-rated peak flow of 23.49 L/s, there is additional available capacity at this location of 54.47 L/s for the remaining upstream lands and Yonge Station. Subtracting the design flow for Yonge Station of 5.23

L/s, the remaining available capacity is **49.24 L/s** for the remaining developments (i.e. Phase III Swallow Glen undeveloped lands and Phase IV).

Barrie Heritage Phase IV Design Flows

The current Draft Plan and concept plan developed by MHBC Planning, Urban Design & Landscape Architecture for the Barrie Heritage Phase IV lands, located east of Yonge Street, consists of 1278 residential units and approximately 1.25 ha of commercial land use. The sanitary design flows for the current concept plan can be calculated as follows:

Design Population = 750 mid-rise residential units x 1.67 ppu + 528 townhouse units x 2.34 ppu
= 2,488 people

Residential Peaking Factor (M) = $\left(1 + \frac{14}{4+P^{0.5}}\right) = \left(1 + \frac{14}{4+2.488^{0.5}}\right) = 3.51$

Residential Flow (Q_r) = 3.51 x 2,488 x 225 L/c/day = 22.74 L/s

Commercial Peaking Factor = 2.0

Commercial Flow (Q_c) = 2.0 x 1.25 ha x 28 m^3/ha/day = 0.81 L/s

Infiltration & Inflow (Q_i) = 18.15 ha x 0.1 L/s/ha = 1.82 L/s

Total Peak Design Flow = Q_r + Q_c + Q_i
= 22.74 L/s + 0.81 L/s + 1.82 L/s
= **25.37 L/s**

The design peak flow for the Barrie Heritage Phase IV lands of 25.37 L/s is well below the available capacity in the sanitary sewer of 49.24 L/s. Therefore, there is sufficient capacity in the existing sanitary sewer system to accommodate the proposed development for the Barrie Heritage Phase IV lands. An available capacity of 23.87 L/s would remain for the additional undeveloped lands within the service area.

Conclusion

Based on the flow monitoring completed for the Esther Drive sanitary sewer, the actual peak flows in the sanitary sewer are significantly below the design peak flows.

The sanitary sewer capacity is impacted by a section of sanitary sewer upstream of the flow monitoring location with a net slope of 0.65%. At this location, there is an additional available capacity of **49.24 L/s** for the remaining undeveloped upstream lands.

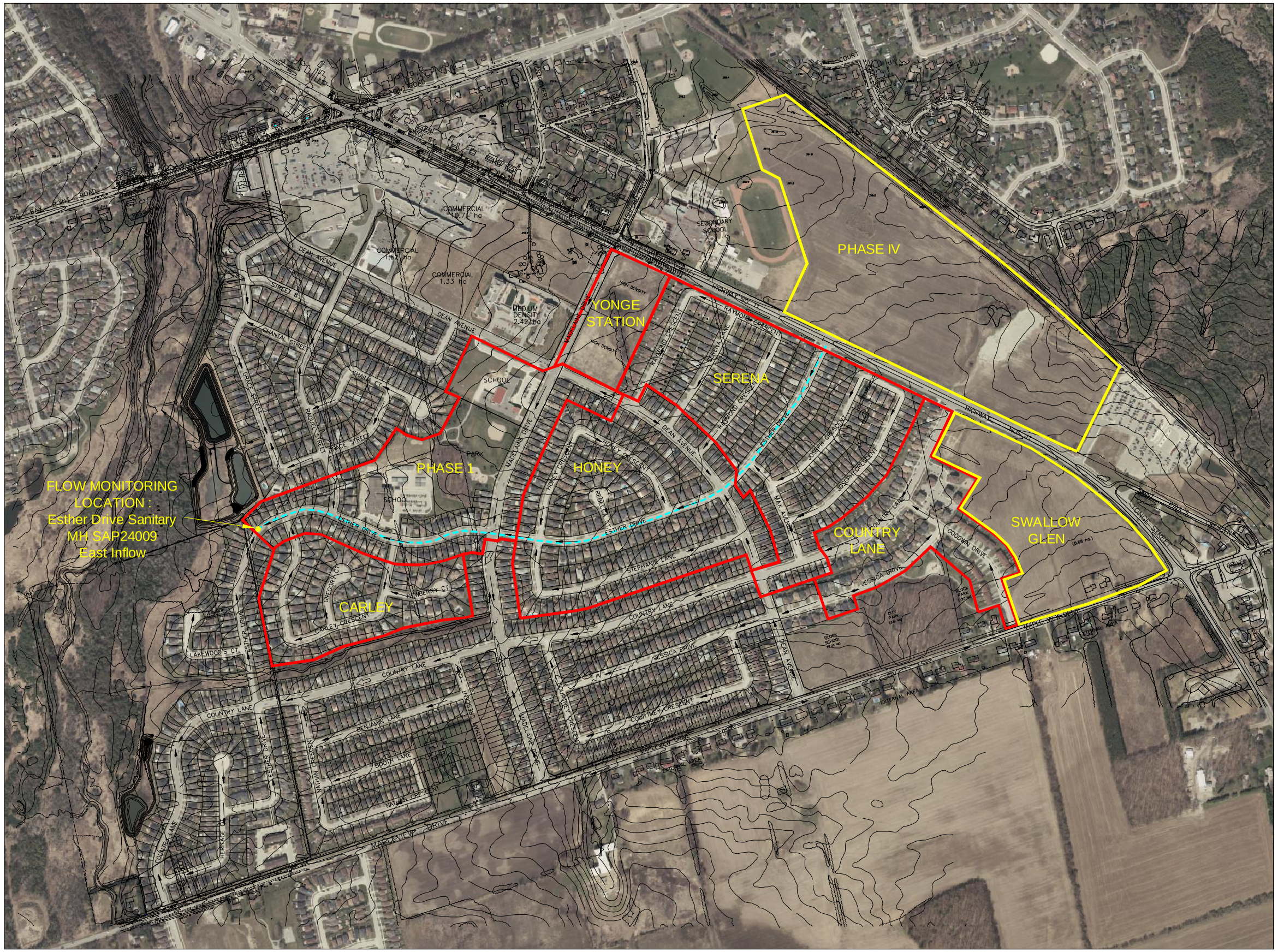
The Barrie Heritage Phase IV lands current concept plan has a design peak flow of **25.37 L/s**. There is sufficient capacity in the existing sanitary sewer to accommodate this flow. A remaining available capacity of **23.87 L/s** would be available for the additional undeveloped lands within the service area.

Sincerely,
AECOM Canada Ltd.

Melanie Ego, B.Sc.(Eng.)

Randy Provencal, P. Eng.
Senior Project Manager

ME:ls
Encl.
cc: F. Palka – City of Barrie (email)
C. Corosky – BHD (email)



LEGEND

- SANITARY DRAINAGE BOUNDARY
- PHASE III (SWALLOW GLEN), YONGE STATION & PHASE IV DEVELOPMENT LANDS
- EXISTING DEVELOPMENTS TO ESTHER DRIVE SANITARY SEWER
- SEWAGE FLOW DIRECTION
- ESTHER DRIVE SANITARY TRUNK SEWER

AERIAL IMAGE FROM DISCOVER SIMCOE MAPPING

NORTH

AECOM

PROJECT

Esther Drive Sanitary Flow Monitoring

Barrie, ON

CLIENT

BARRIE HERITAGE DEVELOPMENTS INC.

Commerce Court West
199 Bay Street, Suite 2900
P.O. Box 459, Toronto, ON M5L 1G4

CONSULTANT

AECOM Canada Ltd.
55 Cedar Pointe Drive, Suite 620
Barrie, ON L4N 5R7
705.721.9222 tel 705.734.0764 fax
www.aecom.com

ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60118297.0002

SHEET TITLE

Sanitary Drainage Plan

SHEET NUMBER

SAN-1 MARCH 2017

Project Management Initials: Designer: ME Checked: RP Approved: RP

Last saved by: EGOM(2017-02-28) Last Plotted:
2017-03-01
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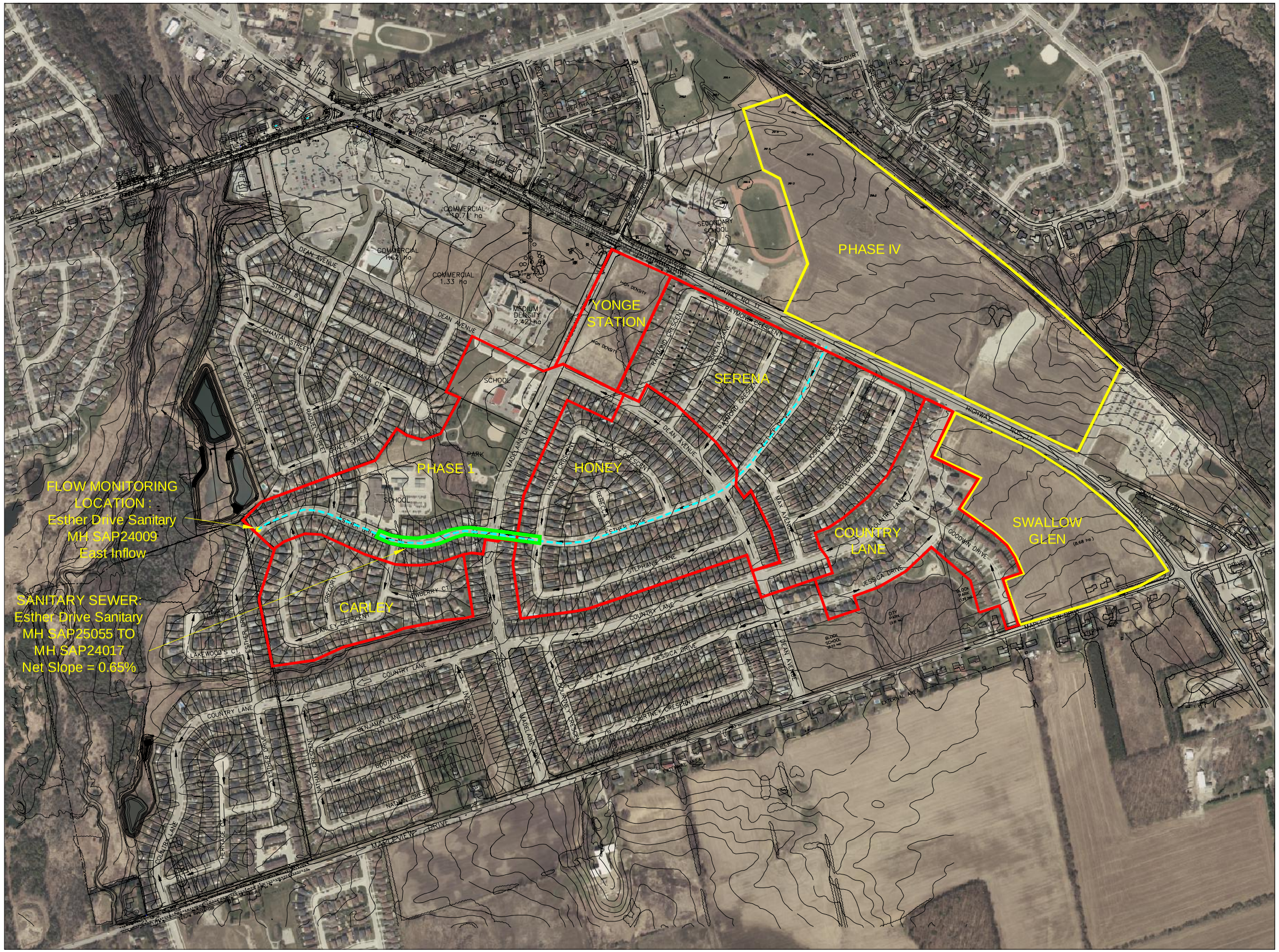

LEGEND

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AERIAL IMAGE FROM DISCOVER SIMCOE MAPPING

AECOM

PROJECT

Esther Drive Sanitary Flow Monitoring

Barrie, ON

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CONSULTANT

AECOM Canada Ltd.
55 Cedar Pointe Drive, Suite 620
Barrie, ON L4N 5R7
705.721.9222 tel 705.734.0764 fax
www.aecom.com

ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60118297.0002

SHEET TITLE

0.65% Section of Esther Sanitary Sewer

SHEET NUMBER

SAN-2 MARCH 2017

Project Management Initials: Designer: ME Checked: RP Approved: RP

Last saved by: EGOM(2017-03-08) Last Plotted: 2017-03-08
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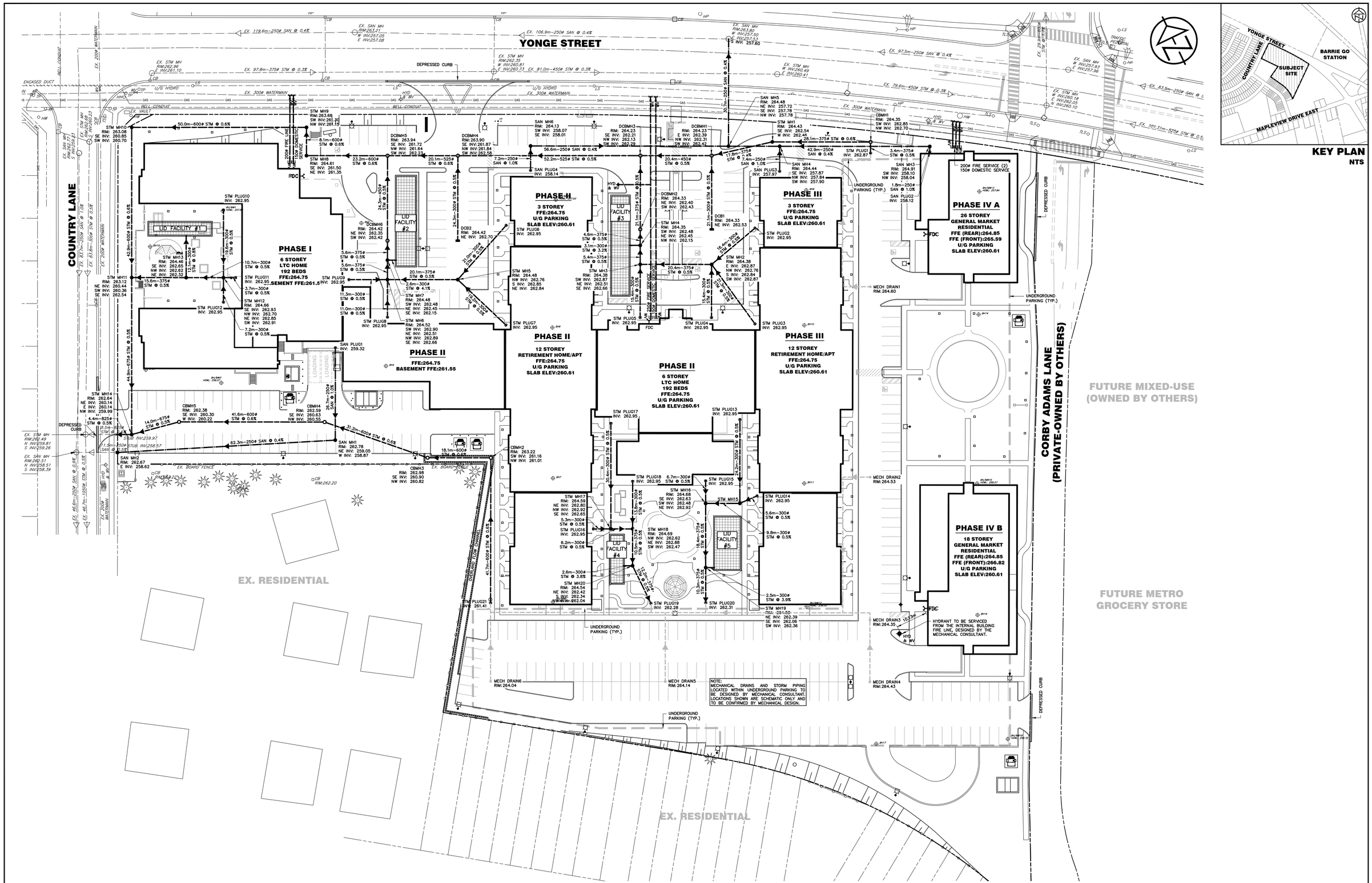
Appendix D: Drawings



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SITE PLAN INFORMATION SHOWN ON THIS PLAN BASED ON DRAWING SP1.0, PREPARED BY ANDERSON WELLSMAN ARCHITECTS INCORPORATED DATED JULY 18, 2024.

BENCHMARK

TBM#1 ELEV. 263.48 m

MNR No. 001193IU460S – SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH–EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH–EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
N. A. MILLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

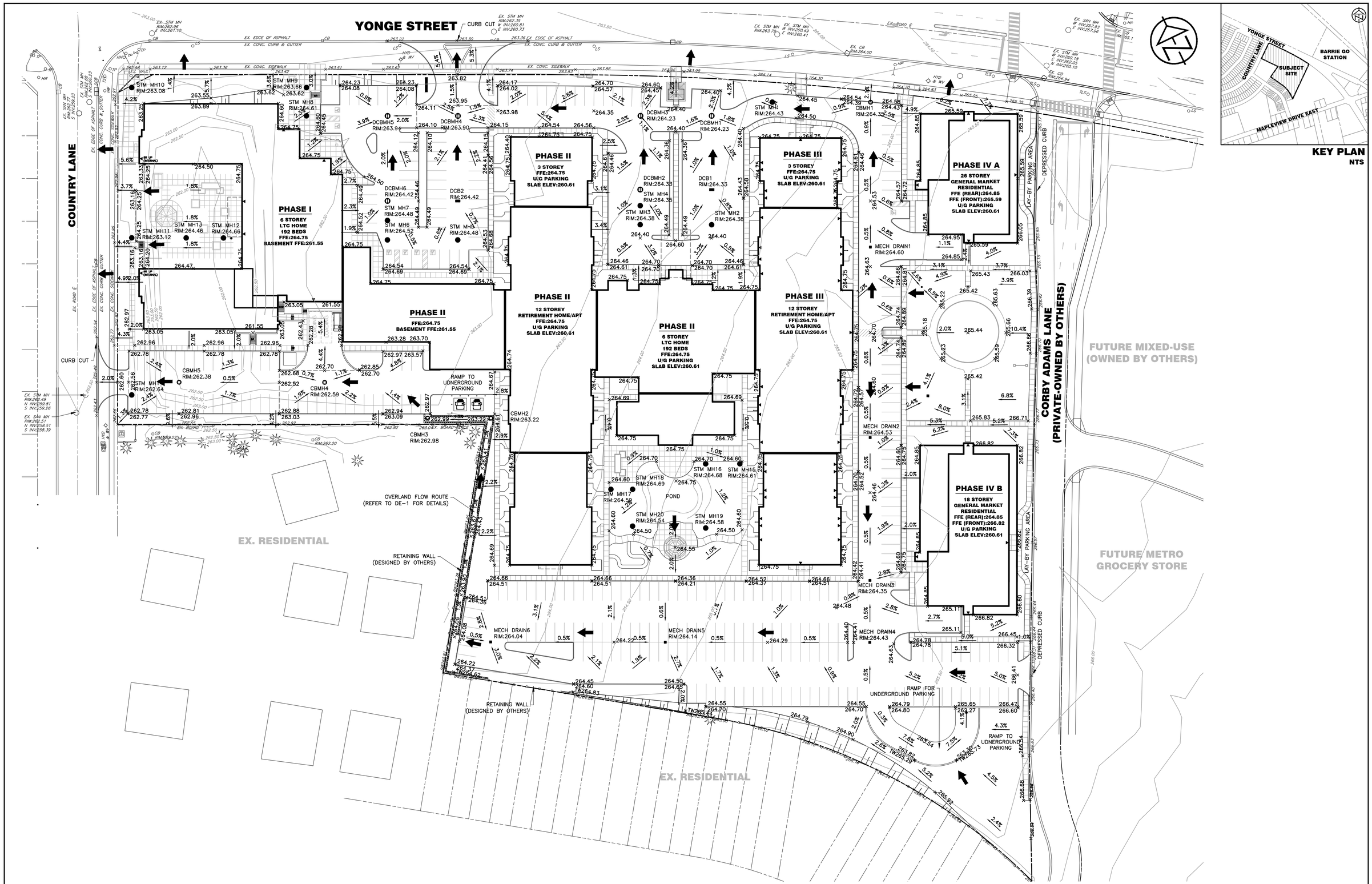
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

TATHAM ENGINEERING

MASTER SERVICING PLAN

DESIGN: LC	FILE: 422426	DWG: MSP-1
DRAWN: LQ/JLM	DATE: APRIL 2024	
CHECK: BFS/NM	SCALE: 1:500	

Drawing Name: 422426–MSP01.dwg, Plotted: Jul 17, 2024



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BENCHMARK

TBM#1 ELEV. 263.48 m

MNR No. 0011931U460S – SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH-EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
NEA MILLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

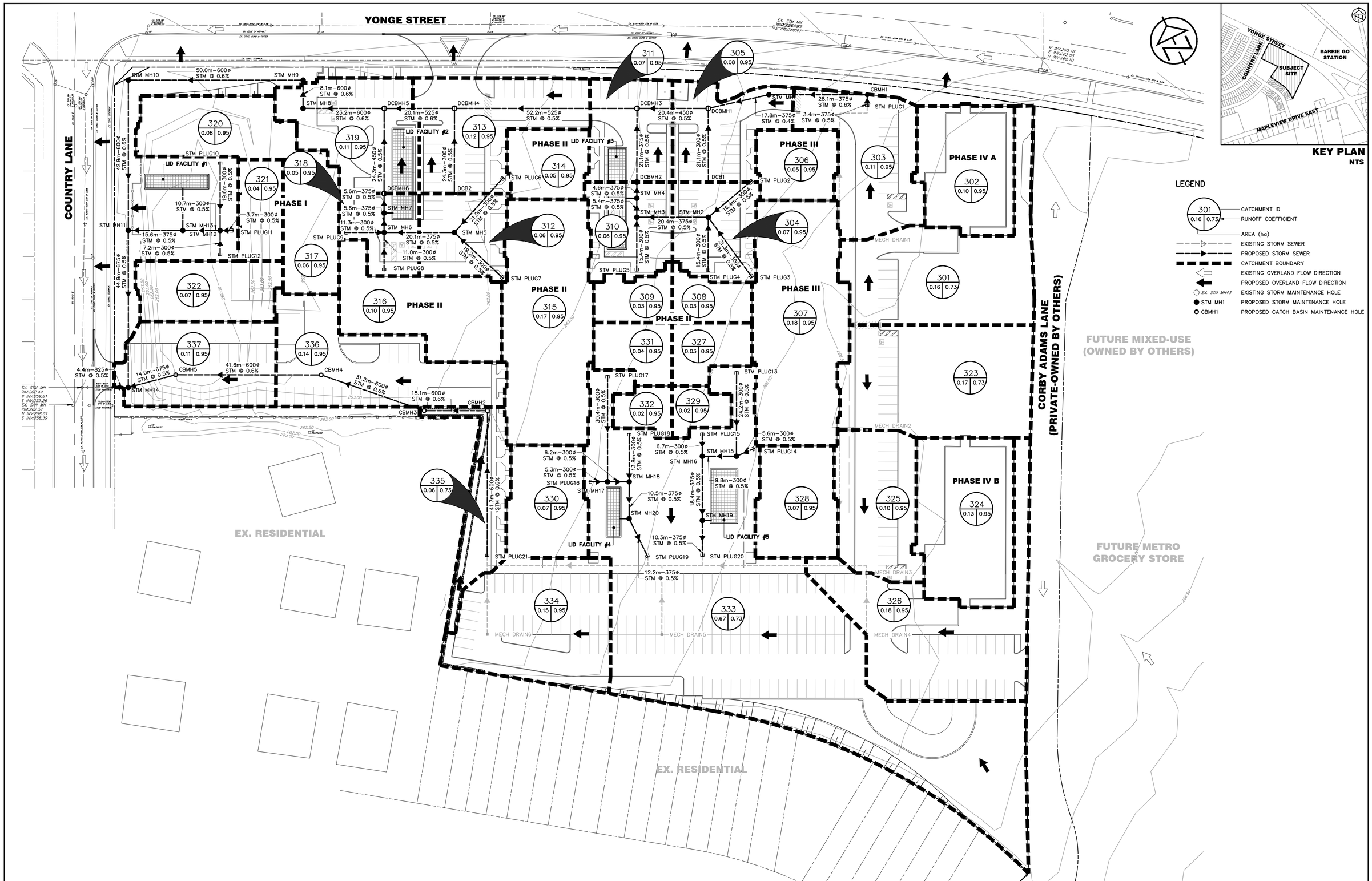
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

MASTER GRADING PLAN

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG: MGP-1
DRAWN: LQ/JLM	DATE: APRIL 2024	
CHECK: BFS/NM	SCALE: 1:500	

Drawing Name: 422426-MGP01.dwg, Plotted: Jul 17, 2024



KEY PLAN
NTS

LEGEND

- 301 / 0.16 / 0.73 — CATCHMENT ID / RUNOFF COEFFICIENT / AREA (ha)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- CATCHMENT BOUNDARY
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- EX. STM MH3 — EXISTING STORM MAINTENANCE HOLE
- STM MH1 — PROPOSED STORM MAINTENANCE HOLE
- CBMH1 — PROPOSED CATCH BASIN MAINTENANCE HOLE

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1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
N. A. MILLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

STORM SEWER CATCHMENT PLAN

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG:	
DRAWN: LQ/JLM	DATE: APRIL 2024	STM-1	
CHECK: BFS/NM	SCALE: 1:500		

Drawing Name: 422426–STM01.dwg, Plotted: Jul 17, 2024

TATHAM ENGINEERING

Storm Sewer Design Sheet

Project Information
The Village of Innis Landing, 800 Yonge Street | 422426

Drawing Reference
Storm Sewer Catchment Plan (Drawing STM-1) | July 17/24

Prepared By
LJC/AJM | July 17/24

Reviewed By
EC/AS | July 17/24

Municipality
City of Barrie

Runoff Coefficient Adjustment

Equation	1	
Year	A	B
10	1.00	0.00
25	1.10	0.00
50	1.20	0.00
100	1.25	0.00

Time of Concentration
10 mins

IDF Curve Coefficients

Year	A	B	C
2	670.59	4.60	0.78
5	843.02	4.58	0.76
10	976.90	4.75	0.76
25	1133.12	4.73	0.76
50	1251.47	4.85	0.75
100	1363.63	4.91	0.75

Manning's Coefficient

Material	Value
CSP	0.024
Concrete	0.013
PVC	0.013

Notes

Version Date: July 17, 2024
Version Number: 1

Engineer Stamp

Street Name	Area ID / Label	Upstream Maintenance Hole	Downstream Maintenance Hole	Area (Ha)	5 Year Runoff Coefficient (C)	Design Storm (Year)	Adjusted Runoff Coefficient (C)	Area x Runoff Coefficient	Cumulative Area (Ha)	Cumulative Area x Adjusted Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow (m³/s)	Manning's Roughness Coefficient	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (m³/s)	Actual Velocity (m/s)	Travel Time (min)	Calculated Sewer Diameter (mm)	Percentage of Full Pipe Capacity (%)	Total Time of Travel (min)
North Sewers TBD by Mech	301	DRAIN1	STM PLUG1	0.16	0.73	5	0.73	0.12	0.16	0.12	10.00	109.11	0.035	0.013	37.5	0.5%	300	0.97	0.068	0.91	0.69	234	51.8%	10.69
Ph. 4A Roof Leader TBD by Mech	302	Ph. 4A Roof	STM PLUG1	0.10	0.95	5	0.95	0.10	0.10	0.10	10.00	109.11	0.029	0.013	11.0	0.5%	300	0.97	0.068	0.86	0.21	217	42.1%	10.21
North Sewers	-	STM PLUG1	CBMH1	-	-	5	-	0.00	0.26	0.21	10.69	105.34	0.062	0.013	8.4	0.5%	375	1.12	0.124	1.05	0.05	289	50.0%	10.74
North Sewers	303	CBMH1	STM MH1	0.11	0.95	5	0.95	0.10	0.37	0.32	10.74	105.06	0.092	0.013	32.9	0.5%	375	1.12	0.124	1.12	0.49	336	74.5%	11.23
North Sewers	-	STM MH1	DCBMH1	-	-	5	-	0.00	0.37	0.32	11.23	102.57	0.090	0.013	13.1	0.5%	375	1.12	0.124	1.12	0.19	333	72.7%	11.42
North Sewers	304	DCB1	DCBMH1	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	21.1	0.5%	300	0.97	0.068	0.78	0.45	190	29.5%	10.45
North Sewers	305	DCBMH1	DCBMH3	0.08	0.95	5	0.95	0.08	0.52	0.46	11.42	101.62	0.130	0.013	20.4	0.5%	450	1.27	0.202	1.27	0.27	381	64.2%	11.69
North Sewers	306	STM PLUG2	STM MH2	0.01	0.95	5	0.95	0.01	0.01	0.01	10.00	109.11	0.014	0.013	16.4	0.5%	300	0.99	0.070	0.72	0.38	166	20.6%	10.38
North Sewers	307	STM PLUG3	STM MH2	0.18	0.95	5	0.95	0.17	0.18	0.17	10.00	109.11	0.052	0.013	21.3	0.5%	300	0.97	0.068	0.97	0.37	270	75.9%	10.37
North Sewers	308	STM PLUG4	STM MH2	0.03	0.95	5	0.95	0.03	0.03	0.03	10.00	109.11	0.009	0.013	15.4	0.5%	300	0.97	0.068	0.62	0.41	138	12.6%	10.41
North Sewers	-	STM MH2	STM MH3	-	-	5	-	0.00	0.26	0.21	10.37	107.06	0.073	0.013	20.4	0.5%	375	1.12	0.124	1.10	0.31	308	59.2%	10.68
North Sewers	309	STM PLUG5	STM MH3	0.03	0.95	5	0.95	0.03	0.03	0.03	10.00	109.11	0.009	0.013	15.4	0.5%	300	0.97	0.068	0.62	0.41	138	12.6%	10.41
North Sewers	-	STM MH3	STM MH4	-	-	5	-	0.00	0.29	0.28	10.68	105.39	0.081	0.013	9.4	0.5%	375	1.12	0.124	1.12	0.08	319	65.1%	10.76
North Sewers	-	STM MH4	DCBMH2	-	-	5	-	0.00	0.29	0.28	10.76	104.97	0.080	0.013	4.6	0.5%	375	1.12	0.124	1.12	0.07	319	64.6%	10.83
North Sewers	310	DCBMH2	DCBMH3	0.06	0.95	5	0.95	0.06	0.35	0.33	10.83	104.62	0.097	0.013	21.1	0.5%	375	1.12	0.124	1.12	0.31	341	77.9%	11.14
North Sewers	311	DCBMH3	DCBMH4	0.07	0.95	5	0.95	0.07	0.94	0.86	11.69	100.34	0.239	0.013	52.2	0.5%	525	1.40	0.304	1.40	0.62	480	78.6%	12.31
North Sewers	312	DCB2	DCBMH4	0.06	0.95	5	0.95	0.06	0.06	0.06	10.00	109.11	0.017	0.013	24.3	0.5%	300	0.97	0.068	0.75	0.54	179	25.3%	10.54
North Sewers	313	DCBMH4	DCBMH5	0.12	0.95	5	0.95	0.11	1.12	1.03	12.31	97.52	0.279	0.013	20.1	0.6%	525	1.54	0.333	1.54	0.22	491	83.7%	12.53
North Sewers	314	STM PLUG6	STM MH5	0.01	0.95	5	0.95	0.01	0.01	0.01	10.00	109.11	0.014	0.013	21.0	0.5%	300	0.97	0.068	0.71	0.49	167	21.1%	10.49
North Sewers	315	STM PLUG7	STM MH5	0.17	0.95	5	0.95	0.16	0.17	0.16	10.00	109.11	0.049	0.013	19.2	0.5%	300	0.97	0.068	0.97	0.33	265	71.6%	10.33
North Sewers	-	STM MH5	STM MH6	-	-	5	-	0.00	0.22	0.21	10.33	107.25	0.062	0.013	20.1	0.5%	375	1.12	0.124	1.05	0.32	290	50.2%	10.65
North Sewers	316	STM PLUG8	STM MH6	0.10	0.95	5	0.95	0.10	0.10	0.10	10.00	109.11	0.029	0.013	11.0	0.5%	300	0.97	0.068	0.86	0.21	217	42.1%	10.21
North Sewers	317	STM PLUG9	STM MH6	0.06	0.95	5	0.95	0.06	0.06	0.06	10.00	109.11	0.017	0.013	11.3	0.5%	300	0.97	0.068	0.75	0.25	179	25.3%	10.25
North Sewers	-	STM MH6	STM MH7	-	-	5	-	0.00	0.38	0.36	10.65	105.53	0.106	0.013	9.6	0.5%	375	1.12	0.124	1.12	0.08	353	85.4%	10.73
North Sewers	-	STM MH7	DCBMH6	-	-	5	-	0.00	0.38	0.36	10.73	105.10	0.105	0.013	5.6	0.5%	375	1.12	0.124	1.12	0.08	353	85.0%	10.82
North Sewers	318	DCBMH6	DCBMH5	0.05	0.95	5	0.95	0.05	0.43	0.41	10.82	104.66	0.119	0.013	24.3	0.5%	450	1.27	0.202	1.24	0.33	369	58.9%	11.14
North Sewers	319	DCBMH5	STM MH8	0.11	0.95	5	0.95	0.10	1.66	1.54	12.53	96.57	0.414	0.013	23.2	0.6%	600	1.68	0.476	1.68	0.23	569	87.0%	12.76
North Sewers	-	STM MH8	STM MH9	-	-	5	-	0.00	1.66	1.54	12.76	95.59	0.409	0.013	8.1	0.6%	600	1.68	0.476	1.68	0.08	567	86.1%	12.84
North Sewers	-	STM MH9	STM MH10	-	-	5	-	0.00	1.66	1.54	12.84	95.26	0.408	0.013	50.0	0.6%	600	1.68	0.476	1.68	0.50	566	85.8%	13.33
West Sewers	-	STM MH10	STM MH11	-	-	5	-	0.00	1.66	1.54	13.33	93.24	0.399	0.013	42.9	0.6%	600	1.68	0.476	1.68	0.43	562	84.0%	13.76
West Sewers	320	STM PLUG10	STM MH12	0.08	0.95	5	0.95	0.08	0.08	0.08	10.00	109.11	0.023	0.013	19.8	0.5%	300	0.97	0.068	0.81	0.40	199	33.7%	10.40
West Sewers	321	STM PLUG11	STM MH12	0.04	0.95	5	0.95	0.04	0.04	0.04	10.00	109.11	0.012	0.013	3.7	0.5%	300	0.97	0.068	0.67	0.09	154	16.8%	10.09
West Sewers	322	STM PLUG12	STM MH12	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	7.2	0.5%	300	0.97	0.068	0.78	0.15	190	29.5%	10.15
West Sewers	-	STM MH12	STM MH13	-	-	5	-	0.00	0.19	0.18	10.40	106.86	0.054	0.013	10.7	0.5%	300	0.97	0.068	0.97	0.18	274	78.4%	10.59
West Sewers	-	STM MH13	STM MH11	-	-	5	-	0.00	0.19	0.18	10.59	105.87	0.053	0.013	15.6	0.5%	375	1.12	0.124	1.00	0.26	273	42.8%	10.85
West Sewers	-	STM MH13	STM MH14	-	-	5	-	0.00	1.85	1.72	13.76	91.59	0.438	0.013	44.9	0.5%	675	1.66	0.594	1.66	0.45	602	73.7%	14.21
South Sewers TBD by Mech	323	DRAIN2	DRAIN3	0.17	0.73	5	0.73	0.12	0.17	0.12	10.00	109.11	0.038	0.013	40.8	0.5%	300	0.97	0.068	0.93	0.74	240	55.0%	10.74
Ph. 4B Roof Leader TBD by Mech	324	Ph. 4B Roof	DRAIN3	0.13	0.95	5	0.95	0.12	0.13	0.12	10.00	109.11	0.037	0.013	5.2	0.5%	300	0.97	0.068	0.92	0.09	239	54.7%	10.09
South Sewers TBD by Mech	325	DRAIN3	DRAIN4	0.50	0.95	5	0.95	0.47	0.64	0.54	10.74	105.58	0.160	0.013	17.4	0.5%	375	1.12	0.124	1.12	0.26	346	80.7%	11.00
South Sewers TBD by Mech	326	DRAIN4	DRAIN5	0.58	0.95	5	0.95	0.17	0.58	0.51	11.00	103.75	0.148	0.013	58.5	0.5%	450	1.27	0.202	1.27	0.77	401	73.4%	11.76
South Sewers	327	STM PLUG13	STM MH15	0.03	0.95	5	0.95	0.03	0.03	0.03	10.00	109.11	0.009	0.013	24.2	0.5%	300	0.97	0.068	0.62	0.65	138	12.6%	10.65
South Sewers	328	STM PLUG14	STM MH15	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	5.6	0.5%	300	0.93	0.066	0.76	0.12	193	30.7%	10.12
South Sewers	-	STM MH15	STM MH16	-	-	5	-	0.00	0.10	0.10	10.45	106.61	0.028	0.013	9.8	0.5%	300	0.97	0.068	0.86	0.19	215	41.1%	10.64
South Sewers	329	STM PLUG15	STM MH16	0.02	0.95	5	0.95	0.02	0.02	0.02	10.00	109.11	0.006	0.013	6.7	0.5%	300	0.97	0.068	0.56	0.20	119	8.4%	10.20
South Sewers	-	STM MH16	STM MH19	-	-	5	-	0.00	0.12	0.11	10.64	105.58	0.033	0.013	18.4	0.5%	375	1.12	0.124	0.89	0.35	229	27.0%	10.99
South Sewers	-	STM MH19	STM PLUG20	-	-	5	-	0.00	0.12	0.11	10.99	103.79	0.033	0.013	10.3	0.5%	375	1.12	0.124	0.88	0.19	228	26.5%	11.18
South Sewers TBD by Mech	-	STM PLUG20	DRAIN5	-	-	5	-	0.00	0.12	0.11	11.18	102.81	0.033	0.013	33.9	0.5%	375	1.12	0.124	0.88	0.64	227	26.3%	11.82
South Sewers	330	STM PLUG16	STM MH17	0.07	0.95	5	0.95	0.07	0.07	0.07	10.00	109.11	0.020	0.013	5.3	0.5%	300	0.97	0.068	0.78	0.11	190	29.5%	10.11
South Sewers	331	STM PLUG17	STM MH17	0.04	0.95	5	0.95	0.04	0.04	0.04	10.00	109.11	0.012	0.013	30.4	0.5%	300	0.97	0.068	0.67	0.75	154	16.8%	10.75
South Sewers	-	STM MH17	STM MH18	-	-	5	-	0.00	0.11	0.10	10.45	106.61	0.031	0.013	8.2	0.5%	300	0.97	0.068	0.88	0.12	223	45.3%	10.57
South Sewers	332	STM PLUG18	STM MH18	0.02	0.95	5	0.95	0.02	0.02	0.02	10.00	109.11	0.006	0.013	13.8	0.5%	300	0.97	0.068	0.56	0.41	119	8.4%	10.41
South Sewers	-	STM MH18	STM MH20	-	-	5	-	0.00	0.13	0.12	10.57	105.97	0.036	0.013	10.5	0.5%	375	1.12	0.124	0.91	0.19	237	29.3%	10.76
South Sewers	-	STM MH20	STM PLUG21	-	-	5	-	0.00	0.13	0.12	10.76	104.95	0.036	0.013	12.2	0.5%	375	1.12	0.124	0.90	0.22	236	29.0%	10.99
South Sewers TBD by Mech	-	STM PLUG21	DRAIN5	-	-	5	-	0.00	0.13	0.12	10.99	103.79	0.036	0.013	26.2	0.5%	375	1.12	0.124	0.90	0.48	235	28.7%	11.47
South Sewers TBD by Mech	333	DRAIN5	DRAIN6	0.67	0.73	5	0.73	0.49	1.50	1.24	11.76	100.00	0.344	0.013	49.9	0.5%	600	1.54	0.434	1.54	0.54	550	79.3%	12.31
South Sewers TBD by Mech	334	DRAIN6	STM PLUG22	0.15	0.95	5	0.95	0.14	1.65	1.38	12.31	97.54	0.375	0.013	31.2	0.6%	600	1.54	0.434	1.54	0.34	568	86.3%	12.65
Storm Sewers	-	STM PLUG22	CBMH2	-	-	5	-	0.00	1.65	1.38	12.65	96.49	0.371	0.013	41.7	0.6%	600	1.68	0.476	1.68	0.41	566	77.9%	12.96
Storm Sewers	-	CBMH2	CBMH3	-	-	5	-	0.00	1.65	1.38	12.96	94.76	0.364	0.013	18.1	0.6%	600	1.68	0.476	1.68	0.18	563	76.5%	13.14
Storm Sewers	335	CBMH3	CBMH4	0.06	0.73	5	0.73	0.04	1.71	1.43	13.14	94.02	0.373	0.013	31.2	0.6%	600	1.68	0.476	1.68	0.31	547	78.3%	13.45
Storm Sewers	336	CBMH4	CBMH5	0.14	0.95	5	0.95	0.13	1.85	1.56	13.45	92.79	0.402	0.013	41.6	0.6%	600	1.68	0.476	1.68	0.41	563	84.5%	13.86
Storm Sewers	337	CBMH5	STM MH14	0.11	0.95	5	0.95	0.10	1.96	1.66	13.86	91.20	0.422	0.013	14.0	0.5%	675	1.90	0.564	1.90	0.14	593	70.9%	14.00
OUTLET	-	STM MH14	EX. STUB	-	-	5	-	0.00	3.81	3.39	14.21	89.91	0.846	0.013	8.4	0.5%	825	1.90	1.015	1.90	0.04	770	83.3%	14.25

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SITE PLAN INFORMATION SHOWN ON THIS PLAN BASED ON DRAWING SP1.0, PREPARED BY ANDERSON WELLSMAN ARCHITECTS INCORPORATED DATED JULY 18, 2024.

BENCHMARK

TBM#1 ELEV. 263.48 m
MNR No. 001193104605 – SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH–EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH–EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
N. A. MILLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

Sheet 1 of 1

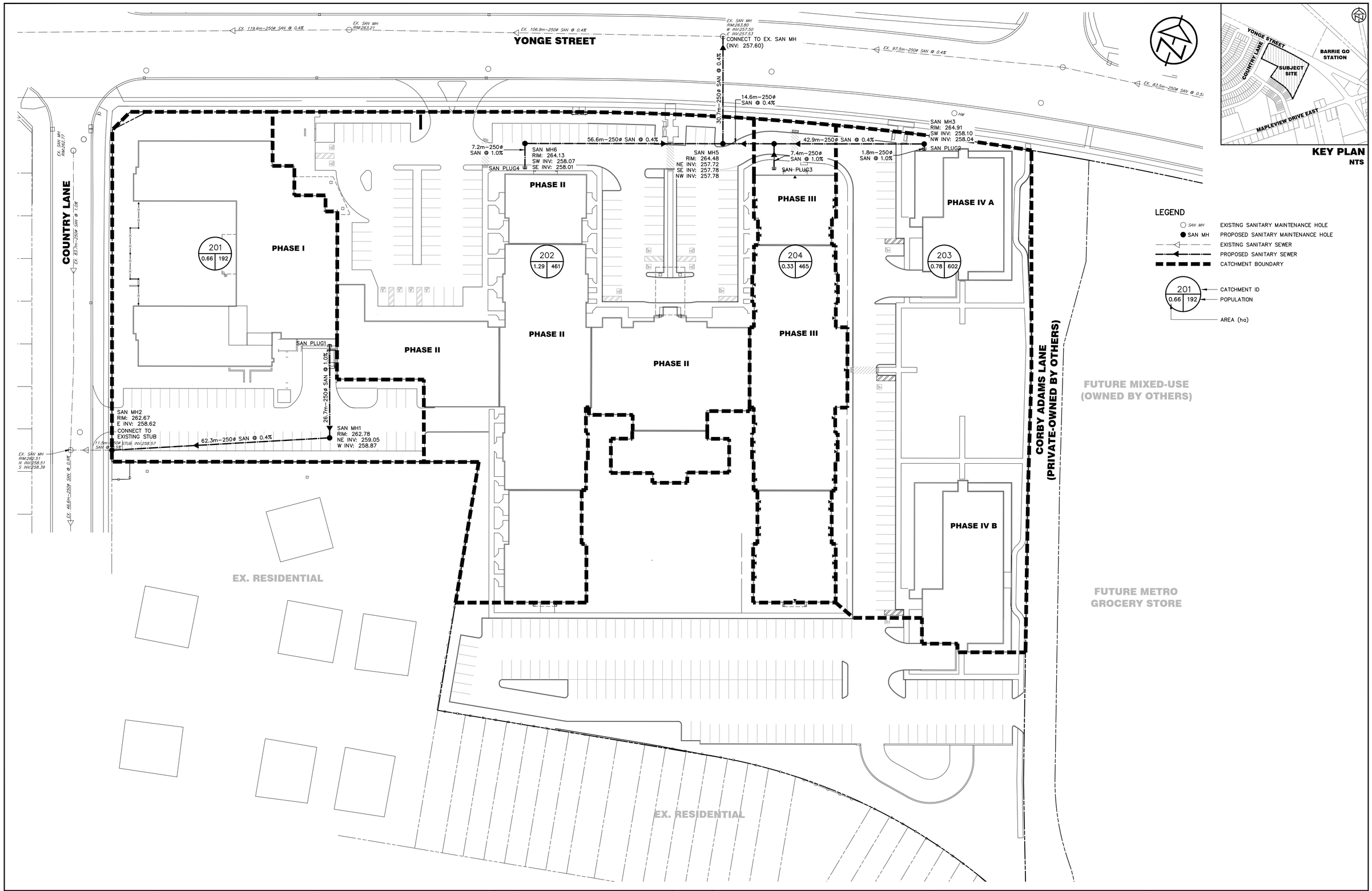
THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

STORM SEWER DESIGN SHEET

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG:	
DRAWN: LQ/JLM	DATE: APRIL 2024	STM-2	
CHECK: BFS/NM	SCALE: –		

Drawing Name: 422426–STM02.dwg, Plotted: Jul 17, 2024



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TOPOGRAPHIC FEATURES AND LEGAL BOUNDARIES SHOWN ON THIS PLAN FROM SURVEY COMPLETED BY KRCMAR SURVEYORS LTD., OLS, DATED FEBRUARY 2022.

SITE PLAN INFORMATION SHOWN ON THIS PLAN BASED ON DRAWING SP1.0, PREPARED BY ANDERSON WELLSMAN ARCHITECTS INCORPORATED DATED JULY 18, 2024.

BENCHMARK

TBM#1 ELEV. 263.48 m

MNR No. 0011931U460S – SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH–EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH–EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
N.A. MILLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

SANITARY CATCHMENT PLAN

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG:	
DRAWN: LQ/JLM	DATE: APRIL 2024	SAN-1	
CHECK: BFS/NM	SCALE: 1:500		

Drawing Name: 422426–SAN01.dwg, Plotted: Jul 17, 2024

Sanitary Sewer Design Sheet

Project Information

The Village of Innis Landing, 800 Yonge Street	422426

Drawing Reference

Sanitary Sewer Catchment Plan (Drawing SAN-1)	July 17/24

Prepared By

LJC	July 17/24

Reviewed By

LC	July 17/24

Municipality

City of Barrie

Population Density

Capita per Unit	Low	Medium	High
	3.13	2.34	1.67

Infiltration

Infiltration (L/s/ha)	0.10

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	225	2
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	28,000	2
Commercial	28,000	2
Industrial (High)	55,000	-
Industrial (Low)	50,000	-

Notes

1) Average flow and peak flow values obtained from "Sanitary Flow Calculations" design sheet.

2) Phase 1 - LTC Home population density (PPU) calculated to be 1.00 per "Sanitary Flow Calculations" design sheet.

Version Date: July 17, 2024

Version Number: 1

Engineers Seal

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s)			Peak Flow (L/s)			Proposed Sanitary Sewer						
												Development	Infiltration	Total	Development	Infiltration	Total	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
Country Lane	201	SAN PLUG1	SAN MH1	Phase 1 - LTC Home	1.00	192	192	192	3.64	0.66	0.66	1.19	-	1.19	4.02	0.07	4.09	26.7	1.0%	250	1.21	59.47	0.68	92	6.9%
Country Lane	-	SAN MH1	SAN MH2	Phase 1 - LTC Home	-	-	-	192	3.64	-	0.66	1.19	-	1.19	4.02	0.07	4.09	62.3	0.4%	250	0.77	37.61	0.48	109	10.9%
Country Lane	-	SAN MH2	EX. MH1	Phase 1 - LTC Home	-	-	-	192	3.64	-	0.66	1.19	-	1.19	4.02	0.07	4.09	11.5	0.5%	250	0.86	42.05	0.52	104	9.7%
Yonge Street	202	SAN PLUG4	SAN MH6	Phase 2 - Retire. Home	1.67	276	461	461	3.64	1.29	1.29	1.42	-	1.42	4.79	0.13	4.92	7.2	1.0%	250	1.21	59.47	0.71	98	8.3%
Yonge Street	-	SAN MH6	SAN MH5	Phase 2 - Retire. Home	-	-	-	461	3.64	-	1.29	1.42	-	1.42	4.79	0.13	4.92	56.6	0.4%	250	0.77	37.61	0.51	117	13.1%
Yonge Street	203	SAN PLUG2	SAN MH3	Phase 4 - Market/Res	1.67	360	602	602	3.64	0.78	0.78	1.85	-	1.85	6.26	0.08	6.34	1.8	1.0%	250	1.21	59.47	0.76	108	10.7%
Yonge Street	-	SAN MH3	SAN MH4	Phase 4 - Market/Res	-	-	-	602	3.64	-	0.78	1.85	-	1.85	6.26	0.08	6.34	42.9	0.4%	250	0.77	37.61	0.54	128	16.9%
Yonge Street	204	SAN PLUG3	SAN MH4	Phase 3 - Retire. Home	1.67	278	465	465	3.64	0.33	0.33	1.36	-	1.36	4.70	0.03	4.73	7.4	1.0%	250	1.21	59.47	0.70	97	8.0%
Yonge Street	-	SAN MH4	SAN MH5	Phase 3 - Retire. Home	-	-	-	1067	-	-	1.11	-	-	3.21	-	-	11.07	14.6	0.4%	250	0.77	37.61	0.63	158	29.4%
Yonge Street	-	SAN MH5	EX. MH2	Phase 3 - Retire. Home	-	-	-	1528	-	-	2.40	-	-	4.63	-	-	15.99	30.7	0.4%	250	0.77	37.61	0.70	181	42.5%

O:\Barrie\2022 PROJECTS\422426 - Barrie Long Term Care Facility - Barrie\Design\Sanitary\422426 - Sanitary Sewer Design Sheet

DRAWING REFERENCES

TOPOGRAPHIC FEATURES AND LEGAL BOUNDARIES SHOWN ON THIS PLAN FROM SURVEY COMPLETED BY KRCMAR SURVEYORS LTD., OLS, DATED FEBRUARY 2022.

SITE PLAN INFORMATION SHOWN ON THIS PLAN BASED ON DRAWING SP1.0, PREPARED BY ANDERSON WELLSMAN ARCHITECTS INCORPORATED DATED JULY 18, 2024.

BENCHMARK

TBM#1 ELEV. 263.48 m

MNR No. 0011931U460S – SOUTHWEST CORNER OF ST. PAUL'S CRESCENT AND YONGE STREET, TABLET SET HORIZONTALLY IN NORTH FACE OF CONCRETE FOUNDATION OF ST. PAUL'S ANGLICAN CHURCH, AT NORTH-EAST CORNER (TOWER) 15.2 m WEST OF BEL POLE AND 9.2 m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15 cm BELOW BRICK.

No.	REVISION DESCRIPTION	DATE
1.	SITE PLAN APPROVAL – FIRST SUBMISSION	JULY 17/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
NEIL A. BELLINGTON
100190121
July 17/24
PROVINCE OF ONTARIO

THE VILLAGE OF INNIS LANDING
800 YONGE STREET
CITY OF BARRIE

SANITARY SEWER DESIGN SHEET

TATHAM ENGINEERING

DESIGN: LC	FILE: 422426	DWG:	
DRAWN: LQ/JLM	DATE: APRIL 2024		SAN-2
CHECK: BFS/NM	SCALE: –		

Drawing Name: 422426-SAN02.dwg, Plotted: Jul 17, 2024