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Lockhart II Subdivision

Functional Servicing Report

Lockhart Innisfil Investments (II) Limited

October 2021

The Jones Consulting Group Ltd.
#1-229 Mapleview Drive East, Barrie ON L4N 0W5

GOL-20538 (70)

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Functional Servicing Report

Lockhart Innisfil Investments (II) Limited, Lockhart II Subdivision
South Half of Lot 13, Concession 11, City of Barrie

1. Introduction

1.1. Appointment

The Jones Consulting Group Ltd. (TJCGL) has been retained by Lockhart Innisfil Investments (II) Limited (Client) to provide engineering services for a proposed development referred to as the Lockhart II Subdivision (Site) located along the north side of Lockhart Road, west of Yonge Street and south of the proposed GG (9 Mile) Limited Subdivision, in the City of Barrie (City).

This Functional Servicing Report (FSR) has been prepared in support of the *Draft Plan of Subdivision* prepared by TJCGL (attached in Appendix A) and demonstrates how the site will be serviced by the surrounding municipal infrastructure. In particular, this report examines the properties servicing in relation to:

- Stormwater servicing
- Sanitary servicing
- Water servicing
- Grading and landform
- Transportation and parking
- Utility servicing

1.2. Property Description

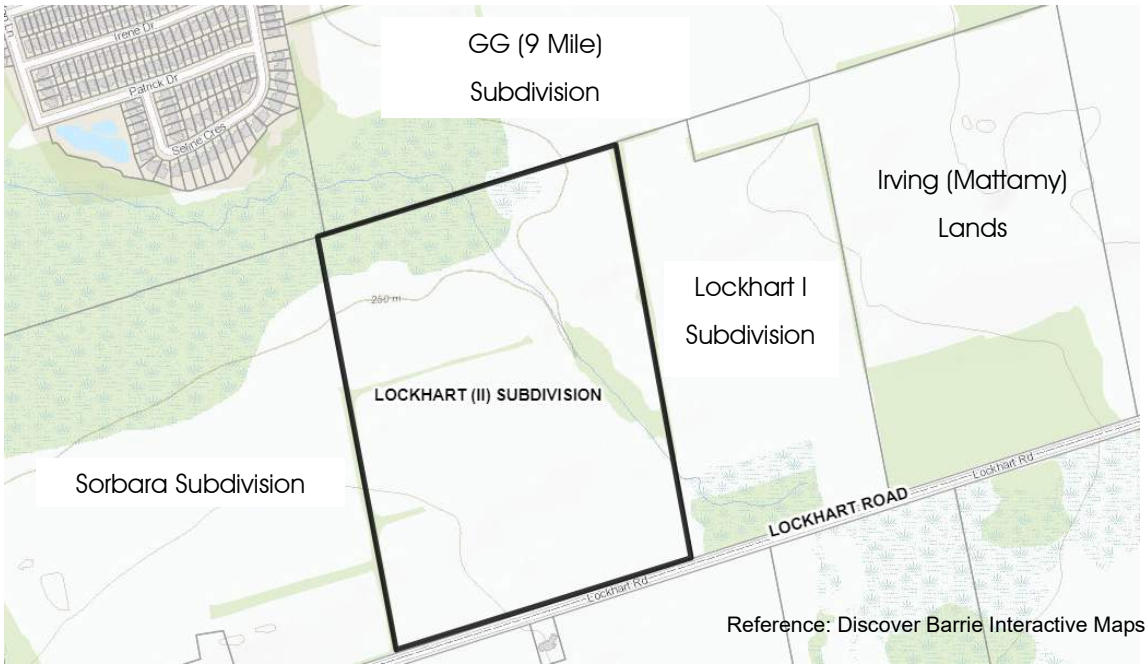
The site is rectangular in shape, bound to the north by the proposed GG (9 Mile) Limited Subdivision, to the east by the future Lockhart I Subdivision, to the west by the proposed Sorbara Subdivision and to the south by Lockhart Road. The property's total area is approximately 32.10 hectares (ha). The site is legally described as the South Half of Lot 13, Concession 11, Geographic Township of Innisfil, now in the City of Barrie, County of Simcoe.

1.3. Current Site Conditions

The site currently consists of cropland with scattered clusters of trees and shrubs. A section of Lover's Creek cuts through the site's north-east corner. The site and surrounding lands existing uses are shown on the *Hewitt's Secondary Plan Area Subwatershed Impact Study Existing Land Use* figure (Figure No. FIG 2, Dated January 28, 2016, prepared by R.J. Burnside and Associates) attached in Appendix A.

The existing ground surface is rolling and generally drains from the boundary of the site inwards towards the creek. Elevations range from 245 meters along the northern limits to 265 meters at the south-west property limit with slopes from 1% to 5%. Topographical information for the site was obtained from surveys completed by Hunt Surveys Inc. with survey truthing completed by TJCGL. The location of the site is shown in **Figure 1**.

Figure 1: Site Location



1.4. Proposed Land Use

Barrie-Innisfil Boundary Adjustment Act, 2009

The *Barrie-Innisfil Boundary Adjustment Act, 2009* (effective January 1, 2010) extended the southern boundary of Barrie to include approx. 2,335 hectares (5,770 acres) of land previously within the Town of Innisfil. In response to the Boundary Adjustment, the City of Barrie completed a Master Planning Process for the Hewitt's Creek Secondary Plan (East Annexation Lands) which included Infrastructure Master Plans. These Master and Secondary Planning Documents along with the City's Growth Management Strategy have formed a framework for intensification and development activities taking place in the annexation lands. The framework ensures the future developments successful implementation while meeting the City's vision for growth.

Amendment No. 39 to the City of Barrie Official Plan – Hewitt's Secondary Plan

The *City's Amendment No. 39 to the City of Barrie Official Plan* (OP) – *Hewitt's Secondary Plan* (HSP)*, June 2014*, added the lands generally refer to as the 2010 Annex Lands East to the City's OP. The lands have an area of approximately 860 hectares (2,125 acres) and are bounded to the north by Big Bay Point Road and MVDE; 20th Sideroad to the east; Lockhart Road to the south and the former City boundary east of Huronia Road on the west. The Lockhart II lands are located in the western limit of the HSP. The HSP established a detailed planning framework for the future urban development to ensure that it conforms to the Provincial Growth Plan (PGP) and be consistent with the Provincial Policy Statement (PPS).

The HSP *Land Use (Schedule 9C)* shows the Lockhart II lands having residential, school / neighbourhood park area and stormwater management facility (optional) designations. The HSP *Development Phases (Schedule 9E)* shows the Lockhart II lands are located within the Phase 2 limits. Copies of the Land Use and Development Phases plans have been attached in Appendix A.

Amendment No. 40 to the City of Barrie Official Plan – General Growth Related Amendments

The *City's Amendment No. 40 to the City of Barrie OP – General Growth Related Amendments, June 2014*, refined the growth management policies to reflect the results of the City's Growth Management Strategy, the 2013 Infrastructure Master Plans, a Fiscal Impact Assessment, and

other related plans and studies. The process included detailed background technical analyses as well as the consideration of land use options and the endorsement of a preferred Concept Plan by Council as a basis for the preparation of the Secondary Plans (HSP and the Salem Secondary Plan). The preparation of the general OP Amendments, Secondary Plans and Infrastructure Master Plans was conducted in accordance with both the Planning Act and Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA). The OP Amendment which incorporates general amendments to the Official Plan, together with the Official Plan Amendments which incorporate the Salem Secondary Plan for the 2010 Annexed Lands West and the HSP for the 2010 Annexed Lands East, have been developed based on the results of a detailed evaluation including input from the public and stakeholders received as part of the public process and written submissions.

The City's *Schedule 1 to OP Amendment 40 - Land Use (Schedule A)* shows the Lockhart II lands having a residential designation. A copy of the *Land Use* plan has been attached in Appendix A.

Hewitt's Creek Area Subwatershed Impact Study

The developable limits of the HSP were established by the Hewitt's Creek Area Subwatershed Impact Study (SIS) (prepared by R.J. Burnside and Associates, dated September 2016 and amended November 2017), as well as regional flood lines and set back requirements established by the Lake Simcoe Region Conservation Authority. The Hewitt's Creek SIS has been utilized as a framework for developing a servicing strategy that is outlined in further detail in this report. As such, many of the assumptions noted in this FSR are based on the findings and recommendations of the HSP SIS.

West of Yonge Conformity Review Plan 1

The *West of Yonge Conformity Review Plan 1 (Conformity Plan)* (prepared by TJGCL, dated June 9, 2016, attached in Appendix A) (HSP west of Yonge Street) was developed concurrently with the SIS to establish a serviceable draft development plan that meets the City's OPA 39 and 40 requirements in terms of mixed-use growth. The *Conformity Plan* road and lot/block layout also assisted in determining the future developments water, sanitary and stormwater requirements. The Lockhart Innisfil Investments Limited and Lockhart Innisfil Investments (II) Limited developments are shown as one of eight (8) property owner participants. The *Conformity Plan* participating owners and preliminary development statistics are summarized in **Table 1.1**.

Table 1.1: Conformity Plan Land Use Statistics

Plan Reference	Property Owner (Development Name)	Residential Lot Breakdown	Area (ha)	Units
A	BEMP Holdings 2 Inc.	Single Family Residential		283.00
	(BEMP 2)	Medium Density - Street Townhomes		32.00
		High Density - Mixed Use		196.00
Sub-Total			**19.44**	**511.00**
B	BEMP Holdings 1 Inc.	Single Family Residential		266.00
	(BEMP I/Sorbara)	Medium Density - Street Townhomes		37.00
		High Density - Mixed Use		72.00
Sub-Total			**36.59**	**375.00**
C	GG (9 Mile) Limited (GG)	Single Family Residential		763.00
	(formerly Lockmaple Subdivision)	Medium Density - Street Townhomes		337.50
		High Density - Mixed Use		
Sub-Total			**65.56**	**1,100.5**
D	Lockhart Innisfil Investments, and Lockhart Innisfil Investments (II) Limited	Single Family Residential		392.80
	(Lockhart)	Medium Density - Street Townhomes / Back-to-back Townhomes		92.00
		High Density - Mixed Use		107.00
Sub-Total			**51.85**	**591.8**
E	Rainsong Land Development Ltd.	Single Family Residential		600.5
		Medium Density - Street Townhomes / Back-to-back Townhomes		154.00
		High Density - Mixed Use		
Sub-Total			**50.15**	**754.5**
F	Van Der Hayden – Lockhart	Single Family Residential		52.50
		Medium Density - Street Townhomes / Back-to-back Townhomes		
		High Density - Mixed Use		
Sub-Total			**3.18**	**52.50**
G	Sobey's Capital Incorporated	Single Family Residential		

Plan Reference	Property Owner (Development Name)	Residential Lot Breakdown	Area (ha)	Units
		Medium Density - Street Townhomes / Back-to-back Townhomes		
		High Density - Mixed Use		
Sub-Total			**8.26**	**TBD**
Total			**235.03**	**3,385.3**

Lockhart Innisfil Investments Limited Plan of Subdivision

TJCGL has been retained by Lockhart Innisfil Investments Limited to complete the preliminary engineering design for the Lockhart I Subdivision (Lockhart I). The Lockhart I lands include various sized residential lots, environmental protection, stormwater management blocks and local and major and minor collector road connections to the GG (9 Mile) Limited site, future residential lands to the east (Mattamy Subdivision), the subject site to the west and to Lockhart Road to the south. The Lockhart I site's proposed land use statistics are summarized in **Table 1.2**.

Table 1.2: Lockhart I Draft Plan of Subdivision Land Use Statistics

Singles Residential Lot Breakdown	Area (ha)	Units
12.2m Singles	3.13	79
11.0m Singles	2.54	79
9.15m Singles	0.89	32
Sub-Total	**6.56**	**190**
Future Lots	0.38	8
Environmental Protection	3.96	
Stormwater Management	5.08	
Widening and Reserve	0.38	
Roads	3.29	
Future Roads	0.07	
Total	**19.72**	**198**

Refer to the Lockhart Innisfil Investments Limited *Draft Plan of Subdivision* attached in Appendix A for the location and orientation of the development's future lots, blocks and ROW's.

BEMP I/Sorbara Subdivision Plan of Subdivision

The detailed design of the Sorbara Subdivision is currently being completed by SCS Consulting Group Ltd. preliminary engineering design for the Sorbara Subdivision (Sorbara). The Sorbara lands include various sized residential lots, environmental protection, stormwater management blocks, mixed use block and local and major and minor collector road connections to the subject lands, the existing residential subdivision to the west and to Lockhart Road to the south. The Sorbara site's proposed land use statistics, based on the Conformity Plan (2016), are summarized in **Table 1.3**.

Table 1.3: Sorbara Draft Plan Land Use Statistics

Singles Residential Lot Breakdown	**Area (ha)**	**Units**
12.2m Singles		59
11.0m Singles		85
9.75m Singles	8.6	113
Mixed Use	1.55	62-186
Street Townhomes	2.60	138
Future Lots Blocks	0.40	13
Stormwater Management Pond	0.67	
Village Square Open Spaces	0.90	
Institutional	2.41	
Environmental Protection	13.25	
Widening and Reserves	0.31	
Roads	6.03	
Total	**36.72**	**470-594**

Lockhart Innisfil Investment (II) Limited Draft Plan of Subdivision

The latest Lockhart Innisfil Investments (II) Limited (Lockhart II) *Draft Plan of Subdivision* prepared by TJCGL indicates that the property will be subdivided into various sized residential lots (singles, street townhomes and back-to-back townhomes), stormwater management blocks, environmental protection areas and right-of-way's (18.0 metre wide local roads, 27.0 metre major collector). The Lockhart II lands stormwater management blocks will be utilized as a group stormwater management facility that will collect and treat stormwater runoff from its own lands as well as developments outside of the site's boundary. The site's proposed land use statistics are summarized in **Table 1.4**. Refer to the *Draft Plan of Subdivision* attached in Appendix A for the location and orientation of the future lots, blocks and right-of-way's (ROW's).

Table 1.4: Lockhart Innisfil Investments (II) Limited Draft Plan of Subdivision Land Use Statistics

Residential Lot Breakdown	Area (ha)	Units
12.2m Singles	2.99	78
11.0m Singles	2.34	68
19.15m Singles	1.31	48
Sub-Total	**6.64**	194
6.0m Street Townhomes	0.47	20
6.4m Back-to Back-Townhomes	1.88	180
Future Lots and Blocks	0.02	1
Environmental Protection	12.43	
Stormwater Management	4.14	
Reserves and Widenings	0.58	
Roads	5.94	
Total	**32.10**	**395**

1.5. Overview of Municipal Infrastructure

1.5.1. Stormwater Servicing

Lake Simcoe Region Conservation Authority

The *Schedule 6 to OP Amendment 40 – Conservation Authority Limits (Schedule F)* shows that the site and surrounding lands are part of the Lover's Creek tributary within the Lake Simcoe watershed. A section of Lover's Creek enters the Lockhart II lands flowing northwards from Lockhart Road. The Creek bends and exits Lockhart II's northern limit draining to the GG (9 Mile) Limited lands where the creek bends and exits the western limit and drains around the south and west limits of the existing LJ Mapleview Subdivision and eventually crosses MVDE between Huronia Road and Country Lane.

The Lockhart II development is located within the Lake Simcoe Region Conservation Authority's (LSRCA) Regulated Limits and therefore the construction works will require an Application for Development, Interference with Wetlands and Alterations to Shorelines and Watercourse Permit. A copy of the City's *Schedule F* and the LSRCA's on-line watershed mapping data has been attached in Appendix B.

Lockhart Road

Lockhart Road is an arterial ROW running along the site's southern boundary. The road is a two-lane paved road with open ditches on both sides. There are plans to widen Lockhart Road within



the next 5 years; this construction will be funded using Development Credits. At the time of this constructions, it is expected that a watermain will be installed under Lockhart Road creating a loop for the newly expanded water system.

Sub-Watershed Impact Study

As part of the HSP background studies a Sub-Watershed Impact Study (SIS) was undertaken by the Hewitt's Creek Landowners Group (HLOG); a consortium of 15 companies and individuals with land holdings totaling approximately 650 ha within the 860 ha Hewitt's Secondary Plan Area. The SIS was completed to establish a macro level of detail in the integration of land use, servicing, and stormwater management. Additional servicing details from the SIS and other supporting studies have been referenced throughout this FSR.

Lockhart Innisfil Investment (II) Limited Subdivision

The Lockhart II Subdivision includes two (2) proposed municipal SWMP to provide for the HSP lands located generally west of Yonge Street with the necessary post stormwater quality and quantity controls. Additional SWMP details have been provided in this FSR and accompanying *Preliminary Stormwater Management Report*.

1.5.2. Sanitary Sewers

The City's *Sanitary Infrastructure Map* (revised January 2021) shows that the site is located south and east of the existing Painswick catchment boundary limits. The map shows an existing trunk sewer within Thicketwood Avenue running north towards the LJ Mapleview Subdivision at Stunden Lane and eventually reaches the wastewater treatment plant (WWTP) located at Lakeshore Drive. A copy of the City's infrastructure map has been attached in Appendix C.

1.5.3. Watermains

The City's *Water Infrastructure Map* (revised January 2021) shows that the site is located outside of the existing distribution zone, just south and east of the Zone 2 limits. A copy of the City's infrastructure map has been attached in Appendix D. The site will be serviced through connections to the future Lockhart I and GG (9 Mile) Limited Subdivisions.

The preliminary design confirms that the existing lot drainage and elevations can be accommodated by the proposed stormwater management system. The **Existing Conditions Drainage Plan (FIG.5)** included in Appendix B, identify the pre-development storm drainage conditions.

3.2. Lover's Creek Crossing

In the SIS, Section 3.7 Floodplain Investigation, it is proposed that a crossing of Lover's Creek be installed at STA 1470.11 where the natural heritage system narrows. The crossing would involve low-profile box culverts spanning 15.0 m x 1.0 m high to convey the 25-year flow and ensure the Regional event does not overtop the roadway.

The preliminary design for the subdivision proposes five (5) box culverts 2438x1219mm in size to provide the needed conveyance. The design details of the configuration and details of the floodplain compensation will be further reviewed during the Detailed Design stage.

3.3. Stormwater Management Plan

The stormwater management plan is intended to provide an environmentally sound approach to stormwater issues. The issues can be divided into four main categories: stormwater quality control, stormwater quantity control, water balance, and erosion and sediment control.

In order to provide the development with the required stormwater quality and quantity control measures it is proposed to utilize a combination of storm sewers (minor system), roadways (major system), low-impact-development (LID) features (where possible) and two extended detention SWM facilities located within the site's limits. Although not credited against SWM facilities quantity control function the on-site LID measures are proposed to compliment the SWM system by promoting at source filtration / infiltration and water balance. The Lover's Creek tributary will be the ultimate discharge location for the ponds' treated stormwater and for all other stormwater runoff from the site.

1.7. Road Network

The subject property is bound by future residential developments fronting onto Lockhart Road to the east and west, the stormwater management block for the GG (9 Mile) Limited Subdivision to the north and Lockhart Road to the south. Lockhart Road is shown as an existing arterial ROW on the *City's Schedule 1 to OP Amendment 40 – Road Plan (Schedule D).* A copy of the *Road Plan* has been attached in Appendix E.

2. Approval Agencies and Design Criteria

The development is subject to the policies and requirements of the City, LSRCA, and the Ministry of the Environment and Climate Chance (MOECC) with respect to municipal servicing (water, wastewater, roads, street lighting and traffic signals), stormwater management (quantity, quality, erosion control and water balance) and utility servicing (gas, hydro, phone, cable and internet).

2.1. City of Barrie

The municipal services, roads, utilities, grading and stormwater drainage design must conform to the City's latest engineering standards, policies, guidelines and master plan documents listed below:

- City of Barrie Stormwater Drainage and Stormwater Management Policies and Design Guidelines, Updated October 2020
- City of Barrie Sanitary Sewage Collection System Policies and Design Guidelines, 2017
- City of Barrie Water Transmission and Distribution Policies and Design Guidelines, 2021
- City of Barrie Lot Grading and Drainage Standards Design Manual, 2019
- City of Barrie Transportation Design Manual, 2020
- City of Barrie Water Storage and Distribution Master Plan, July 2019 (amec 2013)
- City of Barrie Wastewater Collection Master Plan, July 2019
- City of Barrie Transportation Master Plan, June 2018
- Hewitt's Secondary Plan Area Subwatershed Impact Study, Lover's, Hewitt's and Sandy Cove Creeks, R.J. Burnside & Associates Ltd., September 2016

2.2. Lake Simcoe Region Conservation Authority

The Study Area is located within the Lover's Creek watershed where any major development is required to comply with the policies and regulations enforced by the LSRCA. The LSRCA requires the site's stormwater management plan to adhere to the LSRCA's *Technical Guidelines for Stormwater Management Submissions* (September 2016) and the *Guidelines for the*

Development and Implementation of Comprehensive Stormwater Management Master Plans in the Lake Simcoe Watershed (April 2011). Further, the LSRCA requires the incorporation of low-impact-development (LID) features into major developments in accordance with the *Credit Valley Conservation Authority & Toronto Region Conservation Authority, Low Impact Development Stormwater Management Planning and Design Guide* (2010).

2.3. Ministry of the Environment, Conservation and Parks

An Environmental Compliance Approval (ECA) will be required from the MECP for the proposed wastewater (sanitary) and stormwater management system (storm sewers). An ECA for Lockhart II's SWMF's will also be required. The future sanitary and stormwater infrastructure must generally be design in accordance with the following guidelines:

- Ministry of the Environment, Lake Simcoe Protection Plan, July 2009
- Ministry of the Environment, Stormwater Management Planning and Design Manual, March 2003
- Ministry of the Environment, Design Guidelines for Drinking-Water Systems, 2008
- Ministry of the Environment, Design Guidelines for Sewage Works, 2008
- Ministry of the Environment, Guidelines for the Design of Water Storage Facilities, Water Distribution Systems, Sanitary Sewage Systems and Storm Sewers, May 1979
- Ministry of Transportation, Drainage Management Manual, 1997

Once the detailed design for the site has been completed, this FSR and the accompanying PSWMR will be updated and submitted to the MECP in support of an application for the ECA's.

3. Stormwater Servicing

A *Preliminary Stormwater Management Report* (PSWMR) has been completed as part of the TJCGL appointment and scope of work for the development. The PSWMR has been submitted concurrently with this FSR and the following is a brief overview of the report.

The PSWMR has outlined a design for the site's future stormwater management system to meet the compulsory post-development quantity and quality requirements imposed by the City, LSRCA, MECP and the Hewitt's SIS. During the developments detailed design stage a (detailed) Stormwater Management Report (SWMR) will be completed in support of the storm system and facilities MECP ECA.

The City and the LSRCA require Level 1 (Enhanced) quality control for the stormwater runoff generated from this site. The proposed SWM facilities have been sized based on the combination of Level 1 quality control, quantity control of the 100 year post to allowable development flows (unitary discharge rates) as determined by the SIS, and the extended detention (24 hour) for the 25mm storm event for erosion control. Sediment and erosion control measures will be investigated and recommended during the detailed design stage, taking into consideration the sensitivity of the receiving watercourse.

Additionally, where possible, the subject site is proposed to implement a variety of Low Impact Development (LID) measures consisting of soakaway pits, infiltration/filtration galleries, vegetated buffer strips, reduced lot grading, etc. The use of LID measures follows the recommendations of the Hewitt's SIS and will assist in reducing run-off volumes and the quantity of water to be treated by the stormwater management facilities while promoting at source filtration, infiltration and groundwater recharge.

3.1. Existing Drainage Conditions

Lockhart II Subdivision

The site consists of approximately 32.10 hectares (79.32 acres) of land that is primarily used for agricultural purposes. The existing ground surface is rolling and generally drains from the limits of the site in towards the existing Lover's Creek. Elevations range from 245 meters along the northern limits to 265 meters at the south-west property limit with slopes from 1% to 5%. The site drains to the Lover's Creek tributary within the site.

The preliminary design confirms that the existing lot drainage and elevations can be accommodated by the proposed stormwater management system. The **Existing Conditions Drainage Plan (FIG.5)** included in Appendix B, identify the pre-development storm drainage conditions.

3.2. Lover's Creek Crossing

In the SIS, Section 3.7 Floodplain Investigation, it is proposed that a crossing of Lover's Creek be installed at STA 1470.11 where the natural heritage system narrows. The crossing would involve low-profile box culverts spanning 15.0 m x 1.0 m high to convey the 25-year flow and ensure the Regional event does not overtop the roadway.

The preliminary design for the subdivision proposes five (5) box culverts 2438x1219mm in size to provide the needed conveyance. The design details of the configuration and details of the floodplain compensation will be further reviewed during the Detailed Design stage.

3.3. Stormwater Management Plan

The stormwater management plan is intended to provide an environmentally sound approach to stormwater issues. The issues can be divided into four main categories: stormwater quality control, stormwater quantity control, water balance, and erosion and sediment control.

In order to provide the development with the required stormwater quality and quantity control measures it is proposed to utilize a combination of storm sewers (minor system), roadways (major system), low-impact-development (LID) features (where possible) and two extended detention SWM facilities located within the site's limits. Although not credited against SWM facilities quantity control function the on-site LID measures are proposed to compliment the SWM system by promoting at source filtration / infiltration and water balance. The Lover's Creek tributary will be the ultimate discharge location for the ponds' treated stormwater and for all other stormwater runoff from the site.

3.4. Proposed Drainage System

General

The proposed *Draft Plan of Subdivision* consists of various sized residential lots (singles, street townhomes, back-to-back townhomes), stormwater management pond block, environmental protection area, and right-of-way's (18.0m and 27.0m). All of the individual lots and blocks will be developed with buildings, parking and landscaped areas conforming to the City's *Draft HSP Zoning By-Law* for coverages and the *Lot Grading and Drainage Standards Design Manual* (2019). The lot and block grading will direct stormwater runoff to the internal road network, which will contain a storm sewer system to convey minor flows (5-year storm event) to the proposed SWM facilities. The roads will also convey the major flows (greater than the 5-year storm event) overland within the right-of-way to the SWM facilities. The proposed end-of-pipe facility, SWMF 1, has been designed as a wetland facility with a wet cell forebay. The proposed end-of-pipe facility, SWMF 2, has been designed by SCS for the BEMP I/Sorbara Subdivision. It is a hybrid wetland facility with two (2) wet cell forebays.

Rights-of-Way

The City's *Transportation Design Manual* (Dated 2020) provides draft ROW cross-sections (BSD-301 to BSD-314) used as the premises for the proposed roadway designs.

SIS and Low Impact Development Measures

Where possible the site will include LID measures to provide lot level at-source controls that reduce run-off volumes, promote groundwater recharge and aid in maintaining water balance. The *SIS* has identified LID measures suitable for implementation within the subject property that are intended to achieve the LSRCA and City targets for infiltration, filtration, water balance and total phosphorus removal.

As there are no park blocks, open space blocks or site plan blocks associated with the Lockhart Innisfil Investments II limited draft plan, the only available space for LIDs is within the proposed road right-of-way (ROW). LIDs within the ROW will be employed to meet infiltration targets, filtration targets and provide additional Phosphorus removal. The most effective LID within the ROW consists of a dry swale along one or both sides of the street with a subsurface infiltration trench. A plan view showing the proposed location of all proposed dry swales is included on Drawing **LID-1**, refer to Appendix G. It is important to recognize that the locations of the dry



swales are limited to local roads in accordance with the City's LID screening process. In addition, due to driveway and other utility conflicts, the dry swale locations have been limited to side yards and window streets along other local roads. A typical 18.0m ROW plan view and cross-sections of proposed LIDs along with sizing calculations is provided on Drawings **LID-2** in Appendix G. Further design details regarding LID measures are provided in the *Preliminary Stormwater Management Report* submitted concurrently under separate cover.

Stormwater Management Facilities

The proposed stormwater management facility SWM 1 will be designed to achieve the quality and quantity requirements outlined in the *SIS*, along with those of the City of Barrie, LSRCA and MECP, before discharging to Lover's Creek. Further design details are provided on Drawings PND-1and PND-2 attached in Appendix G. In addition, reference should be made to the *Preliminary Stormwater Management Report* submitted in conjunction with this report under separate cover.

The proposed stormwater management facility SWM 2 has been designed by SCS Consulting Group Ltd., to achieve the quality and quantity requirements outlined in the *SIS*, along with those of the City of Barrie, LSRCA and MECP, before discharging to Lover's Creek. This facilities design has been approved by the City of Barrie and LSRCA. For further information on this facility, reference should be made to the *Stormwater Management Report*, dated November 2020, prepared by SCS Consulting Group Ltd.

The General Servicing Plan (Drawing No. **G-1** attached in Appendix G) illustrates the proposed servicing scenario. The Storm Sewer Catchment Plan and the accompanying storm sewer design sheet (Drawing No. **STM-1** and **DS-1** attached in Appendix G) confirms that the proposed sewer system is capable of conveying the 5-year storm event runoff to the proposed SWMPs' without surcharging. A copy of the storm sewer design sheet is also included in Appendix B.

3.5. Water Balance

The primary objective of the Lake Simcoe Region Conservation Authority's water balance target as outlined in the SIS, is to capture and manage annual rainfall on the development site to preserve pre-development hydrology (water balance) through a combination of infiltration, evapotranspiration, landscaping, rainwater reuse and/or other low impact development practices.

Various site-specific characteristics contributed to the ability to achieve water balance. They include but are not limited to soil permeability, the ability to collect and direct drainage into the ground, groundwater table elevations and seasonal fluctuations. A site-specific water balance in accordance with the SIS recommendations will be required, and best efforts should be made via the SWM plan to maintain groundwater recharge while considering site specific characteristics. Preliminary water balance calculations are provided in the PSWMR. Detailed water balance calculations will be completed at the detailed design stage and included in the final Detailed Stormwater Management Report.

3.6. Erosion and Sediment Control

During construction, the majority of the Study Area's existing features will be removed and the topsoil stripped within the development area. The exposed surface will be susceptible to erosion, increasing the potential for sediment runoff. To minimize local and downstream impacts from erosion and sedimentation during construction, the following measures have been recommended:

- Excess earth and topsoil is to be stockpiled away from established drainage areas and/or removed from site. Stockpiles shall be seeded if left for periods of greater than 30 days;
- Temporary sediment control fencing should be erected around the perimeter of all grading activities;
- Temporary sediment fabric and stone filters should be installed on catchbasins until surface cover has been stabilized;
- Temporary rock flow check dams should be installed within drainage cut-off swales;
- A temporary construction access mud mat should be installed at the construction accesses to reduce the amount of materials that may be transported off site;
- Temporary erosion and sediment control basins are to be constructed, complete with a Hickenbottom outlet control structure and overflow weir. The basins' purpose is to detain runoff long enough to allow the majority of soil particles to settle out of suspension;



- Construction during drier months should be monitored for wind-borne transport of sediments. At the direction of the engineer, the contractor may be directed to water down exposed earth areas with an aqueous solution of calcium chloride;
- All disturbed areas not under immediate construction for 30 days should be stabilized with seeding, and;
- Phased removal of temporary sediment basins during building phase of the development to coincide with upstream stabilization (established vegetation) of catchment areas.

A detailed *Erosion and Sediment Control Plan* (ESC Plan) will be prepared and submitted at the detailed design stage to identify the location and details of the temporary devices. The design particulars will be provided within the *Detailed Stormwater Management Report* at that time.

4. Sanitary Servicing

4.1. External Sanitary Servicing Framework

The City's *Sanitary Infrastructure Map* (revised January 2021) shows that the site is located south and east of the existing Painswick catchment boundary limits. The map shows an existing trunk sewer within Thicketwood Avenue that drains north to Stunden Lane, across MVDE onto Country Lane and eventually reaches the wastewater treatment plant (WWTP) located at Lakeshore Drive. A copy of the City's infrastructure map has been attached in Appendix C.

4.2. Allocated and Projected Sanitary Flows

Allocated Sanitary Flow

The Thicketwood Avenue 300mm diameter sanitary sewer and 375mm diameter trunk sanitary sewer that drains north to Stunden Lane is shown on the Sorbara Subdivision (Drawing No. SAN1 and SAN2, prepared by SCS Consulting Group Ltd. The accompanying *Sanitary Sewer Design* sheet on Drawing SAN3 (prepared by SCS Consulting Group Ltd.) is also attached in Appendix C. As shown on these drawings, all sanitary flow from the Lockhart II development drains to Thicketwood Avenue. The SCS design sheet included sanitary flows from the Lockhart II subdivision and determined the total drainage to E2 Connection Point is 30.7 L/s.

SIS Municipal Servicing and Grading

The SIS Section 6.0 *Municipal Servicing and Grading* notes that the HSP study included an analysis of the City's existing water and wastewater servicing infrastructure, an evaluation of a number of servicing alternatives based on future land use options and the identification and detailing of future preferred options for the Hewitt's SPA. There are 11 existing gravity sanitary sewer connections for the HSP areas identified in the *Wastewater Collection Master Plan* (*WCMP*) (dated July 2019), six (6) of which are on the west side of Yonge Street. The connection points are shown on the SIS's *Proposed Sanitary Sewer Plan (1 to 3)* attached in Appendix C. The Lockhart II and surrounding lands connection is referred to as *E2.*

The SIS *Proposed Sanitary Sewer Plan (1 of 3)* (dated 2017) shows that the Lockhart II lands are part of a 31.0 ha central catchment connecting to Thicketwood Avenue. The SIS *Calculated Sewage Flows to Existing Connection Points* (*Table 39*) (**Figure 4.1**) provides the estimated sewage flow rates to each connection for 2031.

***Figure 4.1*: SIS Table 39 Calculated Sewage Flows to Existing Connection Points**

Point	Identification	Master Plan	SIS	Pipe Capacity
		Discharge Flow (L/s)	Discharge Flow (L/s)	(L/s)
E1	SAP09044	5	7.3	59.5
E2	SAP09067	77	20.8	96.0
E3	SAP09006A	66	79.8	156.2
E4A	6940	24	34.5	40.3
E4B	SAP25122	11	n/a	n/a
E4C	SAP25121	1	n/a	n/a
E5	SAH08044	129	157.7	1435.4
E6	SAH09043	2	2.3	229.3
E7	SAH08021	8	1.0	40.8
E8	SAH08063	16	14.6	53.0
E9	SAH08066	14	15.5	37.6

Based on the completed sanitary routing for the Sorbara Subdivision there are no flows to Connection Point E1, accordingly, all flows previously allocated to Connection Point E1 are now directed to the E2 Connection Point. The Master Plan accounted for a total drainage of 82 L/s while the SIS accounted for 28.1 L/s based on the combined flow at Connection Points E1 and E2. The total flow calculated by SCS at Connection Point E2 was 30.7 L/s. This is less than what was accounted for in the Master Plan (82 L/s) and significantly less than identified pipe capacity

of 96 L/s at the E2 Connection Point. Therefore, we do not anticipate any capacity concerns associated with the proposed development.

Sanitary Design Criteria

The *City's Sanitary Sewer Collection Policies and Design Guidelines* (2017) provides theoretical design criteria for future developments and their projected sanitary loading demands. Specifically, Section 3.3 *Design Flows* in the guidelines provide design criteria for residential, commercial, and institutional developments. The **Table 4.2** summarizes the sanitary design criteria for the proposed developments within the HSP lands west of Yonge Street.

Table 4.2: Sanitary Design Criteria

Development Type	Design Population	Sanitary Demand	City Reference
Single Family Residential	3.13 persons/unit	225 L/day/person peaking factor of 2 - 4	3.3.1.1
Medium Density - Street Townhomes	2.34 persons/unit		
High Density - Mixed Use	1.67 persons/unit		
Commercial / Institutional		28 cu.m/day/ha peaking factor of 2	3.3.2.1
Extraneous Flows		0.1 L/sec/ha of gross area	3.3.4

Projected Sanitary Flows

To confirm the proposed sanitary sewers within Thicketwood Avenue have capacity the peak projected sanitary flows have been calculated using the anticipated design population with the *Peak Domestic Sewage Flow* equation and the *Harmon Formula* provided below.

Peak Domestic Sewage Flow $Q_p = P \times q \times M / 86.4 + I \times A$

Where: Q_p = *peak residential sanitary sewage flow, including extraneous flow (L/s),*
P = *design population,*
q = *average domestic flow per capita (litres/day/person),*
M = *Peaking factor (no less than 2 and not greater than 4),*
I = *Peak extraneous flow (litres/second/hectare),*
A = *tributary area (hectares).*

Harmon Formula $M = 1 + 14/(4 + P^{1/2})$

Where: M = *ratio of peak flow to average flow,*

P = *tributary population in thousands.*

Using the above equations with the development areas and land use types, the total peak sanitary flows have been summarized in **Table 4.3**.

Table 4.3: Sorbara Design Flows for Lockhart Vs Lockhart II Actual Design Flows

	Development Name	Area (ha)	Design Pop.	M	Res. Flow (L/s)	Extran. Flow (L/s)	Total Peak Flow (L/s)
Sorbara Design [Refer to SAN2 Drawing Prepared by SCS]	Lockhart II Subdivision	14.87	1105	3.77	10.85	1.49	**12.34**
Jones Design	Lockhart II Subdivision	14.95 [Excludes EP, SWM and Widening Blocks]	1,078	3.78	10.61	1.50	**12.11**

Based on the above calculations, the Sorbara Subdivision accounted for a total flow from the Lockhart II Development of 12.34 L/s. The design flow determined by Jones Consulting for the Lockhart II development is 12.11 L/s, accordingly, we do not anticipate any downstream capacity concerns resulting from the proposed Lockhart II development.

4.3. Proposed Sanitary Servicing Scenario

Local Sanitary Sewers

The future right-of-way local sewers will be installed a minimum 2.8 meters below the centre line of the road allowance. Refer to the preliminary Plan and Profiles (Drawing No. **PP-1** through **PP-11**) attached in Appendix G for the preliminary depth and location of the proposed sewers. The future lots/blocks will have individual services stubbed at the limit of the rights-of-way. The exact service locations will be confirmed during the detailed design when the subdivisions draft plans have been approved by the City.

The development's sanitary sewers will be constructed in accordance with the City's Engineering Standards and the MECP guidelines. The proposed local sewer networks will consist of PVC, DR35

pipe with a minimum diameter of 200mm. The design will ensure that the minimum and maximum velocities are maintained under full flow conditions. The internal sanitary sewer catchment areas are delineated on Drawing **SAN-1** attached in Appendix G. Sanitary sewer design calculations are provided on Drawing **DS-2** and in Appendix G. A copy of the sanitary sewer design sheet is also included in Appendix C for reference.

5. Water Servicing

5.1. External Water Servicing

The City's *Water Infrastructure Map* (revised January 2021) shows that the site is located outside of the existing distribution zone, just south of the Zone 2 limits. Pressure *Zone 2 South* generally operates between elevations of 237m and 273m with variations in static pressure from 344 kPa (50psi) to 690 kPa (100psi). Elevations for the subject property vary from 265m to 245m, well within the *Zone 2 South* operating pressure range. A copy of the City's infrastructure map has been attached in Appendix D.

The Lockhart II Subdivision will connect to the Lockhart I Subdivision to the east at Fenchurch Manor. A 300 mm and 200 mm diameter watermain connection will also be made to the Sorbara Subdivision at Fenchurch Manor and Thicketwood Avenue, respectively. An additional 300mm diameter connection will be made at the intersection of Ball Gate and Lockhart Road. The proposed water servicing strategy is outlines on drawing **GS-1** in Appendix G.

5.2. Water Storage and Distribution Master Plan

The *Water Storage and Distribution Master Plan* (*WSDMP*) (July 2019, amec 2013) developed a preferred alternative option to meet the HSP's future water demands. The *WSDMP Draft Final* plan (Drawing No. 2 of 4, attached in Appendix D) shows the HSP proposed external trunk watermain upgrades in proximity the HSP area, and the internal trunk watermains and the associated connection locations. Furthermore, the *WSDMP Draft Final Annexed Area, East Land Use Option 1 - Alt-1* (Drawing No. 2 of 18, attached in Appendix D) shows that the internal future trunk mains will generally consist of 200mm and 300mm diameter watermains.

The *HSP SIS Proposed Water Distribution Plan* (Figure No. 12, dated January 28, 2016, attached in Appendix D) shows a similar watermain arrangement but with a more recent draft plan lotting and road layout. This plan also shows the HSPA Phase 1 and Phase 2 limits.

5.3. Proposed Watermain System

External Watermains

The *WSDMP Draft Final Annexed Area, East Land Use Option 1 - Alt-1* (Drawing No. 2 of 18) identifies that a 600mm trunk watermain (DC trunk watermain as per SIS Figure No. 12) will be installed along the northern boundary of the HSP lands west of Yonge Street. This plan also identifies future 300mm diameter watermains within Yonge Street, from MVDE to Lockhart Road, and within Lockhart Road, from Yonge Street to just east of Finsbury Street.

Internal HSP Watermains

The trunk watermains will loop through the HSP lands to provide the proposed developments with the necessary potable water and fire flow demands. Proposed 150mm, 200mm and 250mm diameter local watermains will connect to the trunk mains.

Water services connections will be installed at the limit of the right-of-way for each individual lot and block. The exact service locations will be confirmed during the detailed design when the subdivisions draft plan has been approved by the City. The mains will be installed at a minimum depth of 1.7 meter cover within the ROW and fire hydrants will be spaced in accordance with City standards (150 meters in residential areas, 90 meters in industrial, commercial, institutional and multi-family residential areas).

Refer to the General Servicing Plan (Drawing No. **G-1**) attached in Appendix G for the location of the existing external watermains, future connection points and internal layout.

5.4. Water System Analysis

The WSDMP assessed the City's existing municipal distribution system and provided recommendations for upgrades and new infrastructure necessary to service the HSP. The amec recommendations are reiterated in the HSP SIS and form the basis for which the detailed subdivision design will be prepared. Following the City's approval of the draft plan, the detailed design will be accompanied by a development specific water system analysis (WSA). The WSA

will demonstrate how the development of the proposed draft plan will achieve the MOECC, City and Ontario Building Code (OBC) guidelines for water distribution systems. The model will also examine the effect of the development's demands on the adjacent municipal system.

Based on the location of the development and the external watermain upgrades proposed by the City there should not be any issues meeting minimum potable and fire system standards for flow and pressure.

6. Grading and Landform

6.1. Existing Conditions

The surrounding municipal Landform was determined through site specific detailed topographical surveys completed by Hunt Surveys Inc., Joe Topo, MNT Consultants Ltd., and Rudy Mak Surveying Ltd. These surveys were compiled and field truthed by TJCGL for the Lockhart II lands.

6.2. Proposed Grading Scenario

The proposed grading scenario is based on the latest, Lockhart II *Draft Plan* as well as Lockhart Road existing topography. Generally, the preliminary grading design has been completed in accordance with the City's *Transportation Design Manual* (2020) and *Lot Grading and Drainage Standards and Design Manual* (2019), including the minimum and maximum road grades, minimum and maximum K values for sags and crests for the local and collector roads.

The road and subdivision lots and blocks grading is proposed to match into the existing sites perimeter elevations along the north and east boundaries. Beyond the draft plan limits temporary boundary sloping (3:1 max.) is proposed where necessary to match into existing grades.

The future road profiles center line elevations have taken into consideration the HSP area's sanitary and storm sewer servicing elevation crossing constraints. The HSP SIS established approximate drainage catchment areas (storm and sanitary) as guidance for design of site-specific development plans. Refer to the Grading Plans (Drawings No. **GP-1** to **GP-5**) and preliminary Plan and Profiles (Drawing No.'s **PP-1** through **PP-11**) attached in Appendix G for the proposed road and lot elevations. Constant collaboration with the Sorbara Subdivision Owner's

and Consultant (SCS Consulting Group) have been undertaken to ensure grading works are fully coordinated between the two developments.

7. Transportation

7.1. External Road Network

The subject property is bound by future residential lands the east and west, the GG (9 Mile) Limited Subdivision stormwater management block to the north and Lockhart Road to the south. Lockhart Road is identified as an existing arterial ROW on the *City's Schedule 1 to OP Amendment 40 – Road Plan (Schedule D, January 2018).* The *Schedule D* also identifies Yonge Street and Mapleview Drive East as arterial roadways, Fenchurch Manor as a minor collector, and Thicketwood Avenue as a local road. The *OPA 40 Road Widening Plan (Schedule E, January 2018)* and *Schedule 9D-2* identifies arterial, major collector and minor collectors as consisting of a maximum ROW width of 41 meters, 27 meters and 24 meters, respectively. A copy of the *OPA 40* plans have been attached in Appendix E.

7.2. Lockhart Road Widening

Currently Lockhart Road from Huronia Road to Younge Street is a two-lane arterial road with open ditches on both sides. Development Credit project 2203 includes widening Lockhart Road from Bayview Drive to Yonge Street. This project is scheduled to occur in two phases, ultimately being completed by 2031.

7.3. Proposed Site Entrances and Internal Road Network

The latest *Draft Plan of Subdivision* illustrates that the property will be subdivided into various sized residential lots (singles, street townhomes, back-to-back townhomes), stormwater management pond blocks, environmental protection area and right-of-way's (18.0 metre wide local roads and 27.0 metre major collector). Entrance to the Lockhart II Subdivision from the existing external ROW's will be provided at Ball Gate. Additional road connections will be provided to the Lockhart I Subdivision and the Sorbara Subdivision.

The Lockhart II subdivisions internal road pattern and connection locations can be seen on the *Draft Plan of Subdivision,* and the *Conformity Plan* shows the overall HSP lands west of Yonge Street and associated internal road patterns and connections.

A Traffic Impact Study has been completed by JD Northcote Engineering Inc. and is provided under separate cover.

8. Utilities, Street Lighting and Traffic Signals

The Lockhart II Subdivision and surrounding development lands will be serviced by secondary utilities including power, gas, phone, cable, streetlights, and Canada Post for mail service. Generally, the macro HSP utility servicing requirements are being coordinated with the various utility providers by the HLOG. The proposed developments are to be serviced in accordance with the master servicing plans currently being established by the respective utility providers. At this time the macro servicing requirements are still being confirmed by the HLOG. The specific internal servicing requirements for the development will be determined during the project's detail design process following completion of the macro utility planning works. The following provides a summary for the existing utility provider's plant data and street lighting information surrounding the site.

8.1. Gas

The *Enbridge Atlas Tile Mapping* plans identifies existing mains within MVDE's southern boulevard, Lockhart Road's north and south boulevards, Yonge Street's east and west boulevards and along Seline Crescent's eastern boulevard. A copy of the mapping data has been included in Appendix F. Initial discussions between Enbridge and the HLOG indicate that sufficient gas supply will not be made available until construction of the external gas distribution mains has been completed. However, the macro analysis is still on-going.

New internal gas mains will connect to the proposed external upgrades at the development's entrances and loop through the future rights-of-way. The proposed internal and external main size will be determined during the detailed designs stage. A composite utility plan (CUP) will summarize all of the utility design and construction works for the Study Area.

8.2. Power

The future HSP development lands are within the InnPower (formerly Innisfil Hydro) servicing limits. The HSP will be serviced from InnPower's existing and new electric network by connecting to the grid at the future site entrances and installing underground cables and pad mounted transformers that will loop through the future ROW's. The primary and secondary power servicing specifics for the future lot and blocks will be determined at the detailed design stage, following InnPower's completion of their macro servicing design. Initial discussion between InnPower and the HLOG indicate that electricity will be provided and the macro plan will be forthcoming in the near future.

8.3. Rogers

Rogers was contacted to obtain their networks utility information surrounding the property, but it was not made available at the time of this report's preparation. However, correspondence has been provided from Rogers, confirming there will be no issues servicing the development. A joint utility trench is proposed throughout the development.

8.4. Bell

Bell currently has buried cable and conduit servicing the properties surrounding the site and HSP lands. There are existing services running along MVDE, Yonge Street and Lockhart Road. These services will be extended through the Study Area to service the individual lots and blocks. Confirmation from Bell has been received confirming there will be no issue servicing the development.

8.5. Street Lighting

Street lighting will be required in accordance with the *City's Roadway Illumination Policies and Design Guidelines* (June 2015). The street light design will be completed by the electrical consultant at the detailed design stage.

9. Conclusions

This Functional Servicing Report identifies the recommended servicing design for the proposed Lockhart II Subdivision. This Report outlines the proposed infrastructure required to service the site for water, wastewater, roads, stormwater management quality control, quantity control, water balance, erosion and sediment control, conventional utilities and street lighting. This Report has been prepared based on the recommendations provided in the HSPA SIS prepared by R. J. Burnside (November 2017). In particular, this Report has recommended the proposed development can be adequately serviced based on the following:

- The post-development stormwater runoff from the site and surrounding lands can be accommodated by the construction of the stormwater quality and quantity control facilities;
- The site's grading, landform and future road profile elevations can accommodate the sanitary and storm sewer servicing requirements;
- The City's existing trunks sanitary sewer infrastructure can accommodate the effluent from the site and surrounding lands full build-out;
- The City's planned external watermain upgrades with the internal trunk and local mains can accommodate the site and surrounding lands future potable water and fire flow demands;
- In accordance with the *Functional Design Review* prepared by Lea Consulting the site and HSP ultimate road network connections to the adjacent arterial and collector roadways can accommodate the developments traffic demands;
- The site's street lighting and boulevard features will be designed in accordance with the City's standards and guidelines during the detailed design stage, and
- Following the implementation of the external utility infrastructure upgrades currently being assessed by the various utility providers the hydro, gas, telephone and cable networks within the surrounding roadways will accommodate the site's future utility requirements.

It is recommended that this Report be accepted as demonstrating a preliminary functional servicing approach in support of the application for the Draft Plan.

All of which is respectfully submitted,

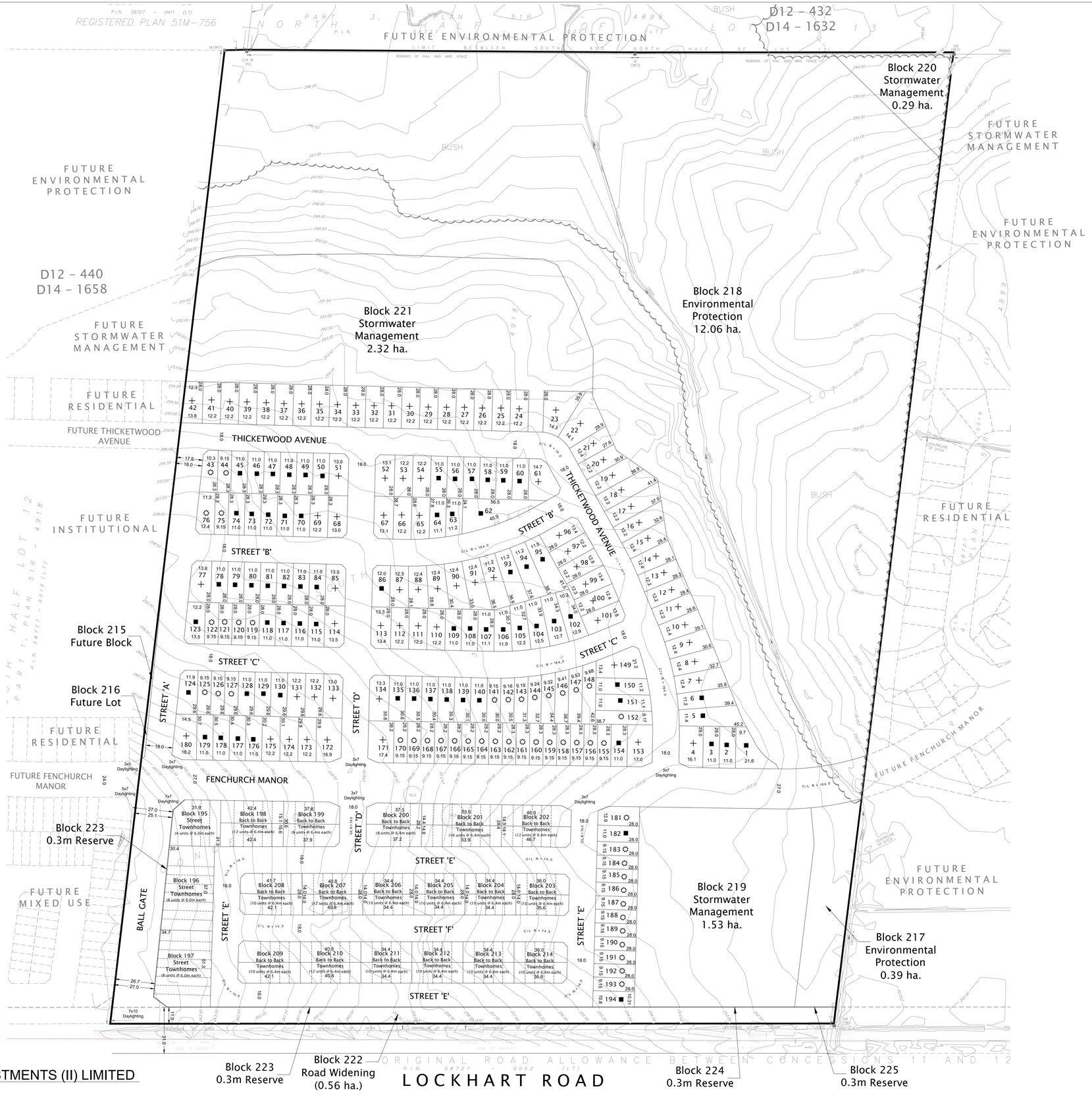
THE JONES CONSULTING GROUP LTD.

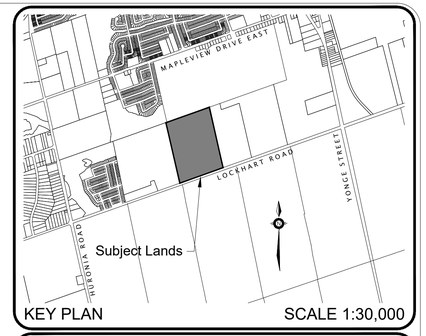


Jon Ingram, P.Eng.
Associate Partner, Project Engineer

Appendix A

External Reference Information





Draft Plan of Subdivision

South Half Lot 13, Concession 11
(Geographic Township of Innisfil)
City of Barrie
2021

OWNER'S CERTIFICATE

I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE THE JONES CONSULTING GROUP LTD., TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE CITY OF BARRIE FOR APPROVAL.

July 16, 2021
DATE

LOCKHART INNISFIL INVESTMENTS (II) LIMITED

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

JULY 16, 2021
DATE

J. D. BARNES LIMITED
ONTARIO LAND SURVEYORS

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON DRAFT PLAN
b) SHOWN ON DRAFT PLAN
c) SHOWN ON KEY PLAN
d) RESIDENTIAL, SWM, & EP
e) SHOWN ON DRAFT PLAN
f) SHOWN ON DRAFT PLAN
g) SHOWN ON DRAFT PLAN
h) MUNICIPAL PIPED WATER TO BE PROVIDED
i) SANDY CLAY LOAM
j) SHOWN ON DRAFT PLAN
k) ALL MUNICIPAL SERVICES TO BE PROVIDED
l) SHOWN ON DRAFT PLAN

STATISTICS	Area (ha.)	Units
+ 12.2m Singles (LOTS 4, 7 - 42, 51 - 54, 61, 65 - 69, 77, 85, 87 - 92, 96 - 101, 110 - 114, 131 - 134, 149, 153, 171 - 175 & 180)	2.99 ha.	78 units
■ 11.0m Singles (LOTS 1-3, 5 & 6, 45 -50, 55 - 60, 62 - 64, 70 - 74, 78 - 84, 86, 93 - 95, 102 - 109, 115 - 118, 123 & 124, 128 - 130, 135 - 140, 150 & 151, 154, 176 - 179, 182 & 194)	2.34 ha.	68 units
☼ 9.15m Singles (LOTS 43 & 44, 75 & 76, 119 - 122, 125 - 127, 141 - 148, 152, 155 - 170, 181, & 183 - 193)	1.31 ha.	48 units
Street Townhomes (6.0m/unit) (BLOCK 195 - 197)	0.47 ha.	20 units
Back to Back Townhomes (6.4m/unit) (BLOCKS 198 - 214)	1.88 ha.	180 units
Future Lots and Blocks (LOTS/BLOCKS 215 - 216)	0.02 ha.	1 units
Environmental Protection (BLOCKS 217 & 218)	12.43 ha.	
Stormwater Management (BLOCKS 219 - 221)	4.14 ha.	
Reserves & Widenings (BLOCKS 222 - 225)	0.58 ha.	
Roads Major Collector - Fenchurch Manor - Ball Gate Local Roads: Thicketwood Avenue, Streets 'A', 'B', 'C', 'D', 'E', & 'F'	5.94 ha.	
TOTAL	32.10 ha.	395 units

0 10 50 100M
SCALE 1 : 1250 (A1)

Lockhart Innisfil Investments (II) Limited

Draft Plan of Subdivision

Raymond J. Duhamel
REGISTERED PROFESSIONAL PLANNER
R.P.P.

Date Issued:	JULY 29, 2021
Checked By:	RD
Project No.:	GOL-20538
Drawn By:	m.c.r.
Drawing Name:	GOL-20538-DP-4b.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Drive East, Unit 1, Barrie, Ontario, L4N 0W5
Phone: 705-734-2538 Fax: 705-734-1056
www.joneconsulting.com

LOCKHART INNISFIL INVESTMENTS (II) LIMITED
CITY OF BARRIE

G:\Planning Drawings\GOL-20538\Submitted\July2021\GOL-20538-DP-4b.dwg Layout:DP Plotted Jul 29, 2021 @ 11:46am by mariohards The Jones Consulting Group Ltd.

I REQUIRE THIS PLAN
TO BE DEPOSITED UNDER THE
LAND TITLES ACT.

DATE _____

_____
DOUGLAS E. HUNT
ONTARIO LAND SURVEYOR

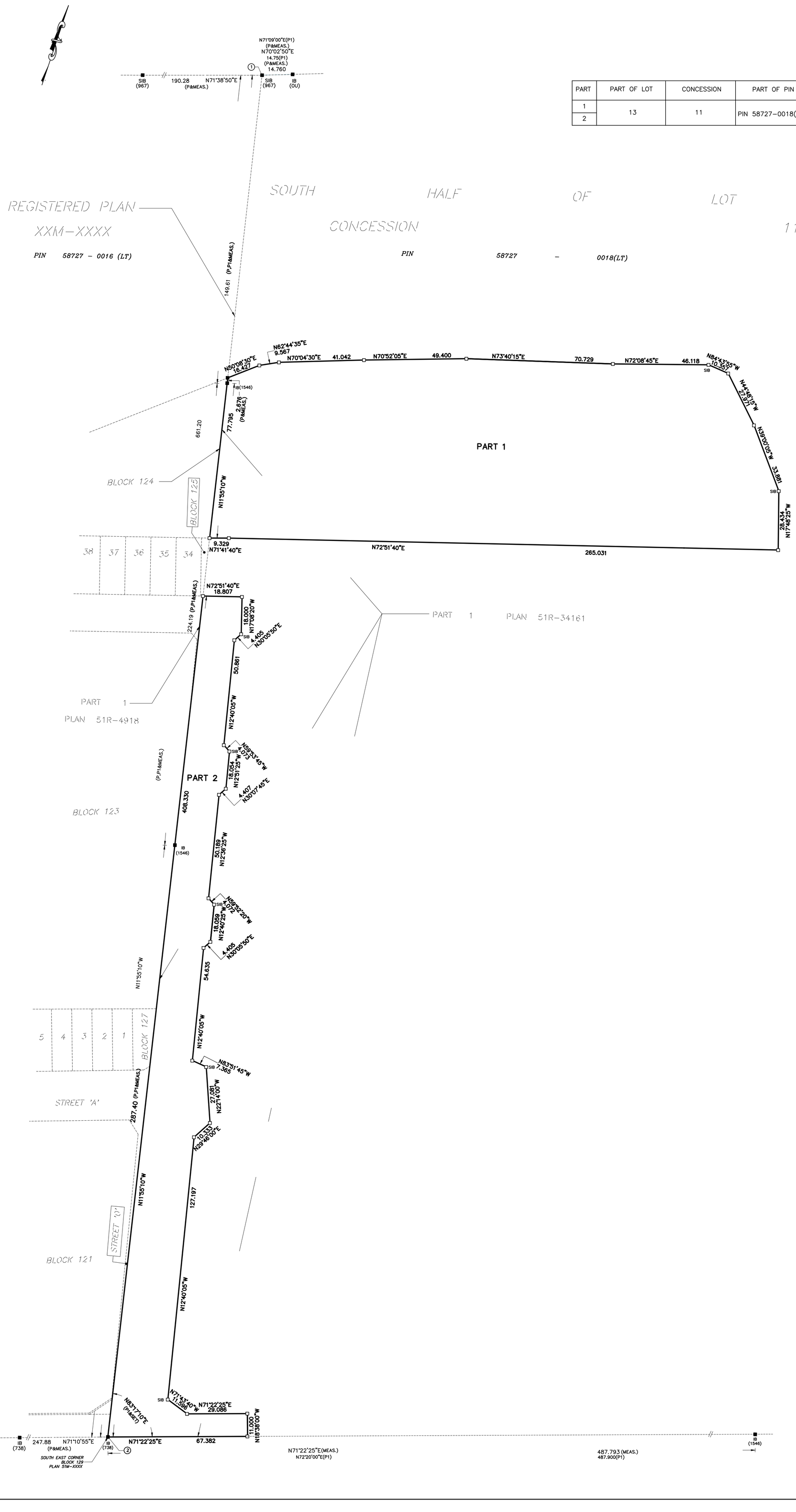
PLAN 51R–

RECEIVED AND DEPOSITED

DATE _____

_____
REPRESENTATIVE FOR THE
LAND REGISTRAR FOR THE
LAND TITLES DIVISION OF
SIMCOE (No.51)

PART	PART OF LOT	CONCESSION	PART OF PIN	AREA (m²)
1	13	11	PIN 58727–0018(LT)	22841
2				9695



PLAN OF SURVEY OF PART OF

SOUTH HALF OF LOT 13

CONCESSION 11

FORMERLY IN THE GEOGRAPHIC TOWNSHIP OF INNISFIL

CITY OF BARRIE

COUNTY OF SIMCOE

SCALE 1:1000

0 5 10 20 30 40 50 metres 100

2019 HUNT SURVEYS INC.

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

BEARING NOTE:

BEARINGS ARE UTM GRID , DERIVED FROM THE SPECIFIED CONTROL POINTS 00119713716 AND 00919753982, UTM ZONE 17, NAD83, CENTRAL MERIDIAN 79° 30' WEST LONGITUDE (ORIGINAL).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99971141.

INTEGRATION DATA:

OBSERVED REFERENCE POINTS (ORPs): UTM NAD 83 (CSRS) (2010.0)
CENTRAL MERIDIAN 79° 30', WEST LONGITUDE.

COORDINATE VALUES ARE TO AN URBAN ACCURACY
IN ACCORDANCE WITH SECTION 14 (2) OF O.REG 216/10

POINT I.D.	NORTHING	EASTING
ORP A	4909645.96	608058.60
ORP B	4909448.62	607479.48

COORDINATES CANNOT, IN THEMSELVES BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

GRID COORDINATES

POINT I.D.	NORTHING	EASTING
1	4910292.71	607922.08
2	4909645.96	608058.60

ALL SURVEY MONUMENTS ARE IRON BARS UNLESS OTHERWISE NOTED
0.30 RESERVES HAVE BEEN EXAGGERATED FOR CLARITY.
ALL FOUND SURVEY MONUMENTS ARE 1534 UNLESS OTHERWISE NOTED

LEGEND

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT PLANTED
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
MEAS.	DENOTES MEASURED
OU	DENOTES ORIGIN UNKNOWN
(738)	DENOTES R.C. KIRKPATRICK, O.L.S.
(967)	DENOTES W.N. WILDMAN, O.L.S.
(1546)	DENOTES RUDY MAK, O.L.S
P	DENOTES REGISTERED PLAN 51M–XXXX
P1	DENOTES PLAN 51R–34161

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON _____, 2019

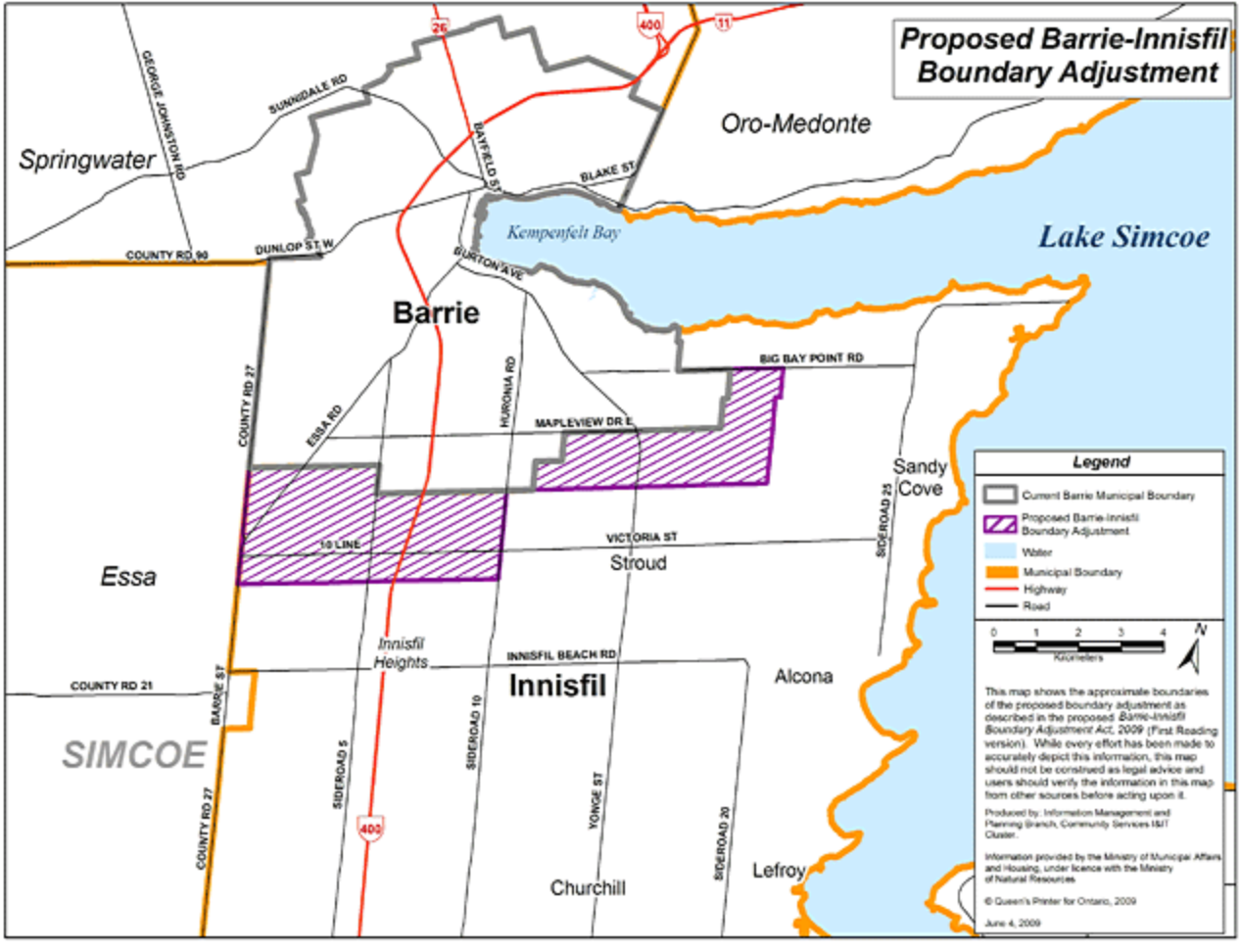
DATE: December 16 ,2019 _____
PRELIMINARY Douglas E. Hunt
ONTARIO LAND SURVEYOR

HUNT SURVEYS INC.
SURVEYING MAPPING
LAND INFORMATION SERVICES
OFFICE OF ORIGIN
45–A West Wilmot Street, Unit 207
RICHMOND HILL, ONTARIO
2 L4B 2P2
TELEPHONE (905) 764–8759
FAX (905) 764–6812
Email huntsurveys@rogers.com

DRAWN BY: A.D. CHECKED BY: D.E.H.

094008–RPLAN–GROUND–03.dwg

REFERENCE NO.: 094008–RPLAN–GROUND–03


Proposed Barrie-Innisfil Boundary Adjustment
Springwater
Oro-Medonte
Kempenfelt Bay
Lake Simcoe
Barrie
Essa
Stroud
Sandy Cove
Innisfil Heights
Innisfil
Alcona
Churchill
Lefroy
SIMCOE
GEORGE JOHNSTON RD
SUNNIDALE RD
BAYFIELD ST
BLAKE ST
COUNTY RD 90
DUNLOP ST W
BURTON AVE
COUNTY RD 27
ESSA RD
HURONIA RD
MAPLEVIEW DR E
BIG BAY POINT RD
10 LINE
VICTORIA ST
SIDEROAD 25
INNISFIL BEACH RD
COUNTY RD 21
BARRIE ST
SIDEROAD 5
SIDEROAD 10
YONGE ST
SIDEROAD 20
26
400
11
Legend
Current Barrie Municipal Boundary
Proposed Barrie-Innisfil Boundary Adjustment
Water
Municipal Boundary
Highway
Road
0 1 2 3 4
Kilometers
N
This map shows the approximate boundaries of the proposed boundary adjustment as described in the proposed Barrie-Innisfil Boundary Adjustment Act, 2009 (First Reading version). While every effort has been made to accurately depict this information, this map should not be construed as legal advice and users should verify the information in this map from other sources before acting upon it.
Produced by: Information Management and Planning Branch, Community Services I&IT Cluster.
Information provided by the Ministry of Municipal Affairs and Housing, under licence with the Ministry of Natural Resources.
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June 4, 2009

AMENDMENT NO. 40

TO THE

CITY OF BARRIE OFFICIAL PLAN

GENERAL GROWTH MANAGEMENT RELATED AMENDMENTS

June 2014

OFFICIAL PLAN

FOR THE CITY OF

BARRIE

Amendment No. 40

Amendment No. 40 to the City of Barrie Official Plan was prepared by the Barrie General Committee and was recommended to the Council of the City of Barrie under the provisions of the Planning Act, on the 16th day of June, 2014.

Mayor

City Clerk

This amendment was adopted by the Corporation of the City of Barrie by By-law No.2014-079 in accordance with the provisions of the Planning Act, on the 16th day of June, 2014.

Mayor

City Clerk

Bill No. 083

BY-LAW NUMBER 2014-079

A By-law of the Corporation of the City of Barrie to adopt an amendment to the Official Plan (O.P.A. No. 40)

WHEREAS, Section 21 of The Planning Act, R.S.O., 1990 Chapter P.13 authorizes Council to initiate an amendment to or repeal of any Official Plan that applies to the municipality;

AND WHEREAS, by Resolutions 14-G-125 and 14-G-126 of the Council of the Corporation of the City of Barrie deems it expedient to pass such a by-law to adopt an amendment to the City of Barrie Official Plan and to repeal those portions of the County of Simcoe Official Plan and the Town of Innisfil Official Plan applicable to the lands described as:

i) the 2010 Annexed Lands East which have an area of approximately 860 hectares bounded by Big Bay Point Road and Mapleview Drive East to the north; 20th Sideroad to the east; Lockhart Road to the south and the former City boundary east of Huronia Road on the west, and,

ii) the 2010 Annexed Lands West which have an area of approximately 1,470 hectares with boundaries as follows:
North
- Mid concession in the block bounded by Mapleview Drive West to the north, Veterans Drive to the east, Salem Road to the south and Simcoe County Road 27 to the west; and,
- Salem/Lockhart Road between 5th and 10th Sideroads.

East – Huronia Road
South – Mid concession south of McKay Road between Huronia Road and Simcoe County Road 27
West – Simcoe County Road 27;

NOW THEREFORE, the Council of the Corporation of the City of Barrie enacts as follows:

1. Amendment No.40 to the City of Barrie Official Plan attached to and forming part of this by-law, is hereby adopted; and,

2. The portions of the County of Simcoe Official Plan and the Town of Innisfil Official Plan applicable to the 2010 Annexed Lands East and West are hereby repealed.

READ a first and second time this 16th day of June, 2014

READ a third time and finally passed this 16th day of June, 2014

THE CORPORATION OF THE CITY OF BARRIE

Mayor

Clerk

This Amendment No. 40 to the City of Barrie Official Plan, which has been recommended by the Barrie General Committee and adopted by the Council of the Corporation of the City of Barrie, is hereby approved in accordance with the Planning Act as Amendment No. 40 to the City of Barrie Official Plan.

June 12/2024
Date

City Clerk

AMENDMENT NO. 40 TO THE OFFICIAL PLAN

OF THE BARRIE PLANNING AREA

TABLE OF CONTENTS

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Minutes of the General Committee Public Meeting	
Staff Report	
Council Resolution	

INTRODUCTION

PART A - THE PREAMBLE does not constitute part of this amendment.

PART B - THE AMENDMENT, consisting of the following text and schedules constitutes Amendment No. 40 to the City of Barrie Official Plan.

Also attached is **PART C - THE APPENDIX,** which does not constitute part of this amendment. This appendix contains the Public Meeting Minutes associated with this amendment.

PART A - THE PREAMBLE

Purpose

The purpose of this amendment is to amend the City of Barrie Official Plan to refine the growth management policies to reflect the results of the City's Growth Management Strategy, the 2013 Infrastructure Master Plans, a Fiscal Impact Assessment, and other related plans and studies.

Location

The amendment to the City of Barrie Official Plan applies to the entire City.

Basis

The City is required to conform to the Provincial Growth Plan, and be consistent with the Provincial Policy Statement, 2014. The City recently carried out a Section 26 Official Plan Review and amended its Plan to conform to the Provincial Growth Plan. The City has undertaken a strategic planning process to address how the population and employment growth in accordance with the Growth Plan will be accommodated. This includes the population of 210,000 and employment of 101,000 for 2031 for Barrie in Schedule 7 of the Growth Plan (Amendment No. 1). The process was initiated with the preparation of the Growth Management Strategy. The Growth Management Strategy is the foundation for land use planning, infrastructure plans, business plans and budgets.

In addition, Official Plan Amendments including Secondary Plans for the Annexed Lands which became part of the City of Barrie on January 1, 2010, and related general amendments were prepared. The process included detailed background technical analyses as well as the consideration of land use options and the endorsement of a preferred Concept Plan by Council as a basis for the preparation of the Secondary Plans.

The background analysis included the following reports:

- City of Barrie Annexed Lands: Background and Options Report;
- Existing Conditions Report Built Heritage & Cultural Heritage Landscapes, Annexed Lands;
- Intensification and Annexed Lands Aboriginal Engagement Program and Stage 1 Archaeological Resource Assessment for the Annexed Lands;
- Agricultural Impact Assessment;
- Annexed Lands Natural Heritage System Framework;
- Annexed Lands Natural Heritage System Report;
- Annexed Lands: Background and Options Report; and,
- Staff Report IDC007-12 Annexed Lands Secondary Plan Preferred Concept Plan.

A Fiscal Impact Assessment was also part of this process. In addition, Infrastructure Master Plans were prepared for the entire City, as well as updated plans and studies for Fire, Solid Waste, Parks and Recreation and Transit. Master Plans are long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles.

The preparation of the general Official Plan Amendments, Secondary Plans and Infrastructure Master Plans was conducted in accordance with both the Planning Act and Phases 1 and 2 of the Municipal Class Environmental Assessment. This process included an extensive public consultation program including a vision workshop in March 2011; a combined Master Plan Public Information Centre (PIC #1)) and Land Use Option Workshop on September 13, 2011, a combined Growth Management Strategy and Master Plan PIC#2 on April 25, 2012, consideration of the preferred Concept Plan report at a public meeting of Development Services Committee in May 8, 2012 and at General Committee on June 11, 2012, and a Preliminary Draft Secondary Plans – Annexed Lands Public Information Centre on September 27, 2012, which also provided an update on the Infrastructure Master Plans. Finally, a combined Statutory Public Open House and Master Plan Public Information Centre (PIC#3) was held on

March 6, 2013 and a Statutory Public Meeting on March 18. 2013. Council also considered the Secondary Plan Consultant Team Response to Stakeholders Submissions Report at a public meeting of General Committee on December 9, 2013 and released revised plans on December 30, 2013.

This Official Plan Amendment which incorporates general amendments to the Official Plan, together with the Official Plan Amendments which incorporate the Salem Secondary Plan for the 2010 Annexed Lands West and the Hewitt's Secondary Plan for the 2010 Annexed Lands East, have been developed based on the results of a detailed evaluation including input from the public and stakeholders received as part of the public process and through written submissions.

Part B – The Amendment

Details of the Amendment

The Official Plan is amended as follows by:

1. adding to Section 1.3 after the fourth paragraph the following new paragraph:

   "The *Growth Plan* was amended on January 19, 2012. Amendment No. 1 relates to the Simcoe Sub-area, including the City of Barrie. Barrie is identified as the principal primary settlement area within the Simcoe Sub-area and Downtown Barrie is the only urban growth centre. As amended, the *Growth Plan* forecasts a population of 210,000 for Barrie by 2031 and a corresponding local employment base of 101,000 jobs."

2. modifying the first sentence of Section 2.1 Background Introduction.

   i) By deleting the number "77" and replacing it with the number "100" ;

   ii) putting a period after "kilometres"; and,

   iii) deleting the word "and" after the word "kilometres" and replacing it with the phrase "The City".

3. deleting the first paragraph of Section 2.1 Growth and Development and replacing it with the following:

   "The Provincial Growth Plan identifies the City of Barrie as a primary settlement area in the Simcoe Sub-Area. In addition, Downtown Barrie is identified as an urban growth centre. The City is the location of many private and public sector institutions and facilities serving a market that extends well beyond the current boundaries of Simcoe County. On January 1, 2010, the City's municipal boundaries were expanded to include an additional 2,300 hectares of land on its southern boundaries. Schedule 7 of the Province's *Growth Plan* as modified on January 19, 2012, has identified a forecast population of 210,000 within the City's municipal boundaries by the year 2031 to be achieved through a mix of new development and intensification. Infrastructure improvements are also planned to facilitate the achievement of this population. The *Growth Plan*, as amended, also identifies an employment forecast of 101,000 to 2031. A significant amount of the forecasted population and employment will be accommodated on lands within the former City boundary. The remaining forecasted population and employment will be accommodated on a portion of the 2010 annexed lands."

4. adding at the end of Section 2.3 (a) the phrase "and a primary settlement area in accordance with the *Growth Plan*."

5. deleting the last sentence of Section 2.3 (b) and replacing it with the following:

   "This rate of growth reflects high density growth within the City's built-up areas and new Greenfield development in the limited remaining designated areas and in the Salem and Hewitt's Secondary Plan Areas. The City's Growth Management Strategy forms the basis for planning for the 2031 population forecast of 210,000 and the related employment forecast of 101,000 allocated to Barrie in the Growth Plan."

6. deleting Section 3.1.2.3 (d) and replacing it with the following:

   "The City's Growth Management Strategy identifies that the built up area as identified on Schedule I can accommodate an additional 13,500 housing units, of which 39% are in the Urban Growth Centre and 61% are outside the Urban Growth Centre. An additional 5,700 units will be

developed in the City's designated Greenfield areas within the former City of Barrie, while approximately 15,700 units will be accommodated in the Salem and Hewitt's Secondary Plan Areas. These units will accommodate the population forecast in the Growth Plan and will be subject to monitoring and review throughout the life of this Plan."

7. deleting the second last sentence in Section 3.1.2.4 and replacing it with the following:

"The Settlement Area boundary is shown on Schedule A- Land Use of this Plan. The Settlement Area boundary generally follows the City boundary except in the Salem and Hewitt's Secondary Plan Areas where it follows a boundary which will accommodate forecasted growth to the year 2031 as identified on Schedule "A"."

8. adding to Section 4.2.2.2 (a):

i) After the phrase "Greenfield areas," in the third sentence, the phase "the *Growth Plan*"; and
ii) After the word "density" in the third sentence the phrase "target of 50 residents and jobs combined per hectare".

9. modifying Section 4.2.2.7 (a) by :

i) deleting the word "twelve" and replacing it with the word "fourteen";
ii) adding at the end of the section the following:

"13. Salem Secondary Plan (See Section 8 of the Plan)
14. Hewitt's Secondary Plan (See Section 9 of the Plan)".

10. adding to Section 4.2.2.7 after subsection (c) a new subsection (d) as follows, and changing subsection (d) to subsection (e):

"Development in the Salem and Hewitt's Secondary Plan Areas as identified on Schedule A shall proceed in accordance with the Salem and Hewitt's Secondary Plans in Sections 8 and 9 respectively of this Plan."

11. The addition of a new section 4.10 as follows:

"**4.10 SPECIAL RURAL AREA**

The policies for this designation are found in Section 8, Salem Secondary Plan and Section 9, Hewitt's Secondary Plan."

12. The addition of the following new sentence at the end of Section 5.4.1 (c):

"Public transit would be a first priority for transportation infrastructure planning and major transportation investments where financially feasible."

13. modifying Section 6.1.3 by:

(i) deleting the title "DEVELOPMENT AGREEMENTS" and replacing it with "DEVELOPMENT REVIEW AND GROWTH MANAGEMENT";

(ii) adding new subsections as follows:

"6.1.3.1 Growth Management Requirements Prior to Development

In order to implement the policies of the Official Plan, in particular Section 3 Growth Management, and apply the principle of financial sustainability and the principle that growth pays for growth to the greatest extent possible within the law, applications for development can be processed, but shall only be finally approved including the

registration of subdivisions, and development shall only proceed in accordance with the phasing policies of Section 3.1.2.2, and when:

a) Council for the City of Barrie has satisfied itself that future growth can proceed in a financially sustainable manner as demonstrated in its Long-Term Fiscal Impact Assessment of Growth, *2014* (FIA) prepared by Watson & Associates Economists Ltd. as adopted by Council, or as updated through the City's Long Range Financial Plan (LRFP). The purpose of the FIA is to establish an affordable and sustainable financing plan for development in all areas of the City over the planning period. Development must be consistent with the assumptions and findings of the FIA as it provides the City with the financial tools to ensure that the required infrastructure and community services can be delivered in a timely and fiscally responsible manner. As such, it is an essential requirement that all such development applications be evaluated and found to be consistent with the assumptions of the FIA. In the event that Council determines at any time during a development review process that the assumptions of the FIA are not being adhered to, it is understood that the Council may determine that it is premature to grant approvals until suitable funding is put in place which is consistent with the assumptions of the FIA. Notwithstanding the provisions of this section, once a landowner(s) has entered into an agreement with the City in accordance with this subsection 6.1.3.1 c), their application shall be deemed to be consistent with the assumptions of the FIA and will not be deemed to be premature;

b) The City has in full force and effect, and not subject to appeal, a Development Charges By-law(s) enacted under the *Development Charges Act, 1997* or any successor legislation, identifying and imposing charges applicable to the lands which are the subject of the application;

c) The landowner(s) has entered into an agreement or agreements with the City or shall be required to enter into an agreement or agreements with the City including development agreements in accordance with Section 6.1.3 of the Official Plan, or have made other satisfactory arrangements with the City for the provision of funds or the provision of services or both in accordance with the policies of this Plan, recognizing that:

   i) in order to reflect particular circumstances that may apply to an individual phase or phases of development, the City may require a separate agreement or agreements with the landowner(s) within each phase or phases; and,

   ii) landowners who are not parties to the original agreements referred to in subsections c) and c)i) herein shall enter into agreements assuming all the rights and obligations of the agreements as applicable, as if they had been original signatories to that agreement;

   Notwithstanding the provisions of this Section such agreements shall not be required to be entered into prior to approval of draft plans of subdivision and rezoning, provided that a condition of approval has been imposed requiring such agreements to be entered into prior to final approval;

d) Any additional requirements of the City are satisfied.

6.1.3.2 Development Coordination

The City will plan the provision of municipal services in a coordinated manner with land use approvals including plans of subdivision, plans of condominium and site plans, as well as with the City's LRFP and Infrastructure Master Plan, to ensure services are available prior to occupancy. In particular, final development approvals shall only be issued in accordance with the requirements of Section 6.3.1.1 of this Plan, and in accordance with the requirements for the provision of services established in any required Functional Servicing Plans. To achieve the objectives in this subsection, the City

may where necessary use mechanisms such as holding zones and conditions in subdivision agreements including staging of development within plans of subdivision.

iii) Delete the letter "(a)" and renumber as "6.1.3.3 Development Agreements"; and,

iv) Delete the letter "(b)" and renumber as "6.1.3.4 Required Studies".

14. adding to Section 6.1.5, Density Calculations:

i) After the phrase "Greenfield areas," in the third sentence, the phase "the *Growth Plan*"; and
ii) After the word "density" in the third sentence the phrase "target of 50 residents and jobs combined per hectare".

15. Add the following new paragraph after Section 6.11 (dd):

"The requirement to prepare studies in accordance with this policy shall be satisfied when the relevant studies are submitted to the City, addressing all matters set out in approved terms of reference where applicable, but shall not require such studies to be reviewed or approved by staff or Council in order for a development application to be considered complete."

16. Add a new section 6.12, Monitoring as follows:

" 6.12 **Monitoring**

All development shall be monitored to ensure that:

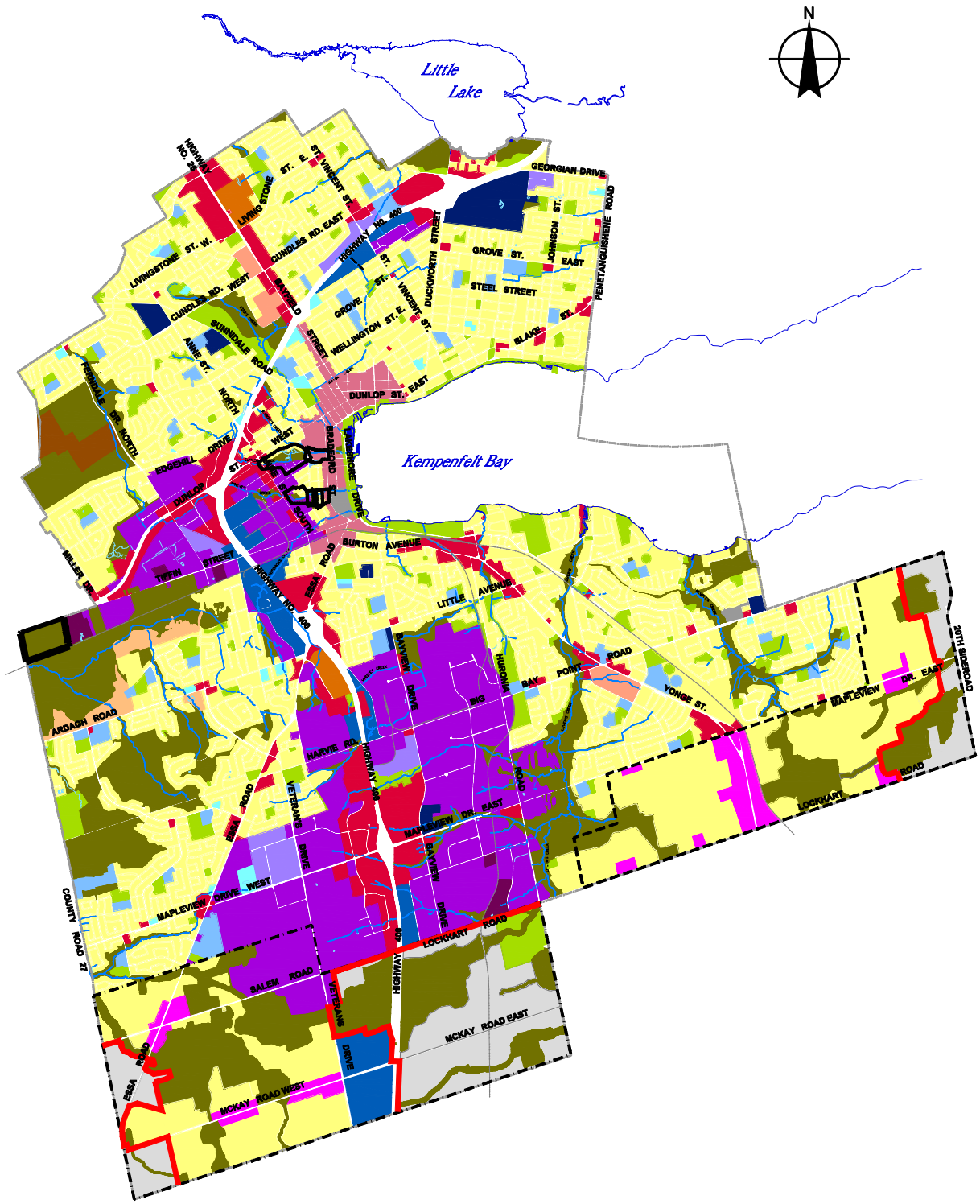
a) The overall progression is in accordance with the Vision and Planning Principles of the Plan;
b) The forecasts and targets of the Plan are being achieved;
c) The health of the Natural Heritage System is being maintained and enhanced; and,
d) The implementation of the Plan is being carried out in an appropriate, fiscally prudent manner in accordance with the principles of the FIA.

Reports to City Council outlining the results of the monitoring program and updates on the Long Range Financial Plan (LRFP) will be submitted to Council on an annual basis. The reporting will include the status of the Development Charges fund, variances between planned and actual, and recommendations to address issues of concern. Notwithstanding the annual monitoring reports, once a landowner(s) has entered into an agreement with the City in accordance with subsection 6.1.3.1 c), their application shall be deemed to be consistent with the assumptions of the FIA and may not be deemed to be premature."

17. amending Official Plan Schedules A-J as amended to date, and replacing them with Schedules 1-10 of this Official Plan amendment.

Implementation and Interpretation

The provisions of the Official Plan, as amended from time to time, shall apply in regard to this Amendment.



The City of BARRIE

Schedule 1 to OFFICIAL PLAN AMENDMENT 40

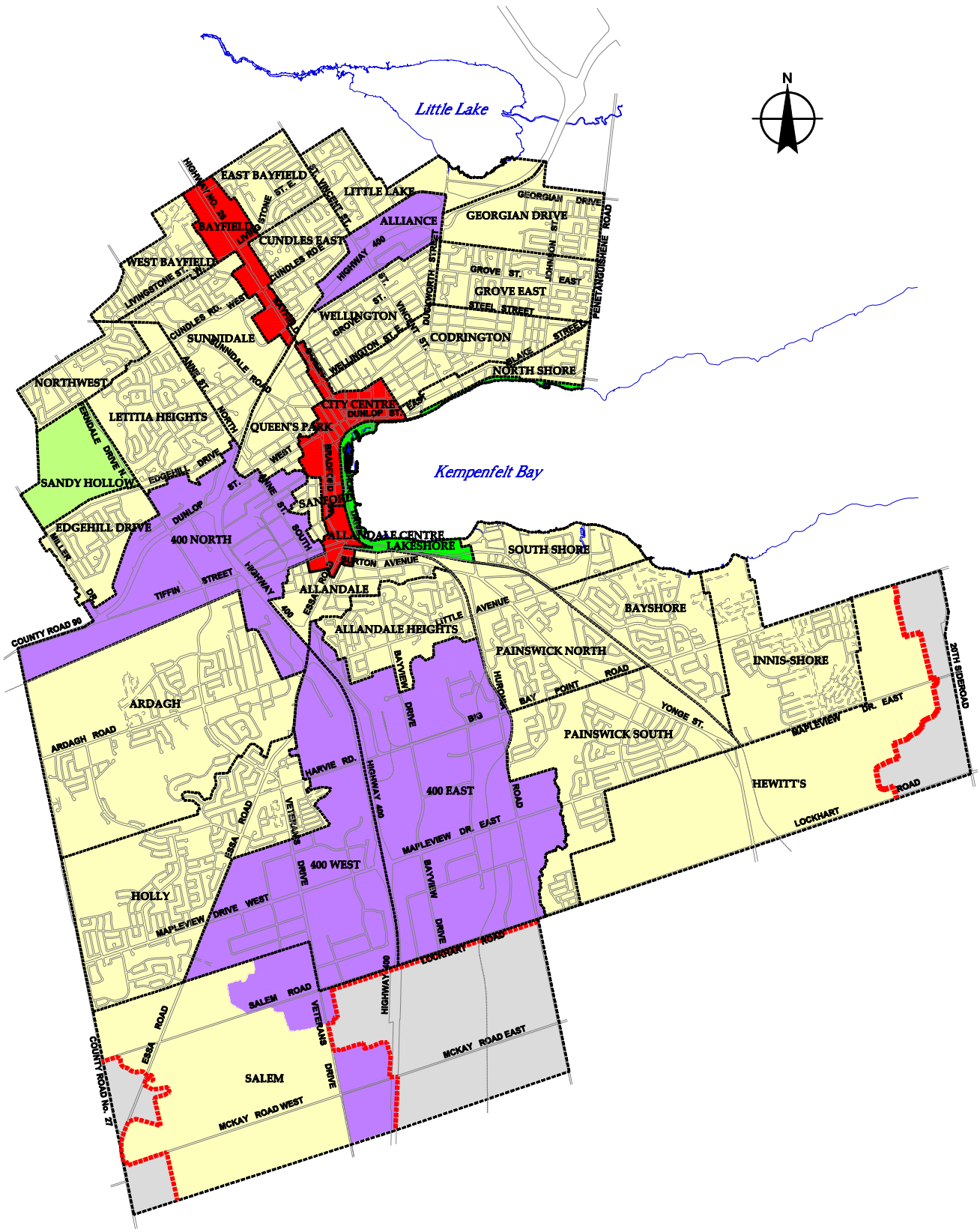
- Residential
- City Centre
- General Commercial
- Mixed-Use Nodes and Corridors
- Community Centre Commercial
- Regional Centre Commercial
- Business Park
- General Industrial
- Settlement Area Boundary
- Highway 400 Industrial
- Restricted Industrial
- Institutional
- Educational Institutional
- Major Institutional
- Open Space
- Environmental Protection Area
- Special Rural Area
- Areas to be Designated Natural Heritage System
- Water Treatment Centre
- Waste Management Facility
- Future Urban
- Waste Disposal Assessment Area Non decision per section 4.7.2.8
- City Boundary
- Application currently before the Ontario Municipal Board (OMB)
- Salem Secondary Plan Area
- Hewitt's Secondary Plan Area

SCHEDULE A
Land Use

MAY 2016

500 0 500 1000 metres

Note: Office consolidation, please consult the Planning Services Department for an accurate reference. Not to be reproduced without permission from the City of Barrie Planning Services Department.



The City of BARRIE

Schedule 2 to OFFICIAL PLAN AMENDMENT 40

PLANNING AREA BOUNDARY

COMMERCIAL

INDUSTRIAL

RESIDENTIAL

LAKESHORE

SANDY HOLLOW

SPECIAL RURAL AND OPEN SPACE

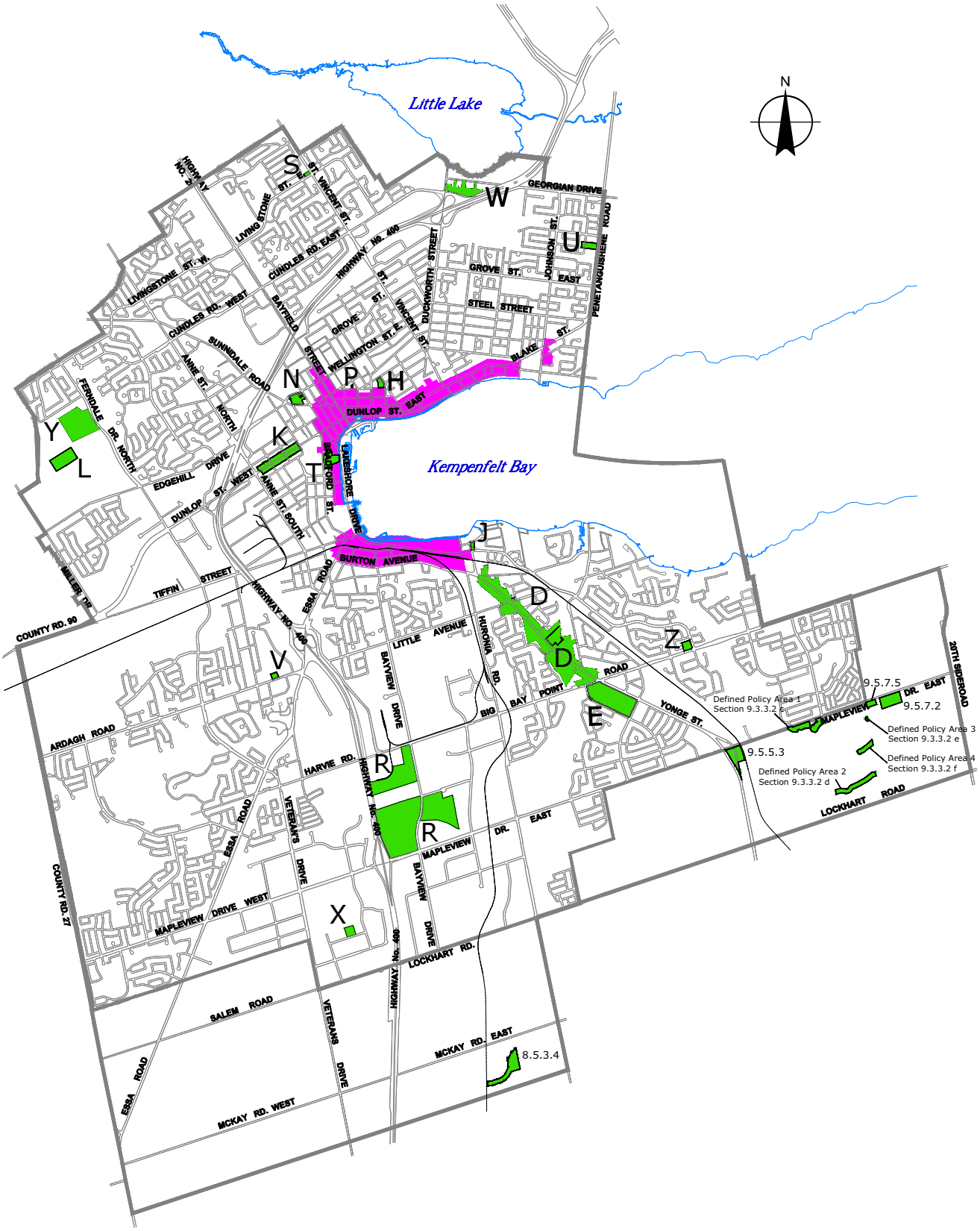
SETTLEMENT AREA BOUNDARY

SCHEDULE B

Planning Areas

MAY 2016

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The City of BARRIE

Schedule 3 to OFFICIAL PLAN AMENDMENT 40

A — DEFINED POLICY AREA

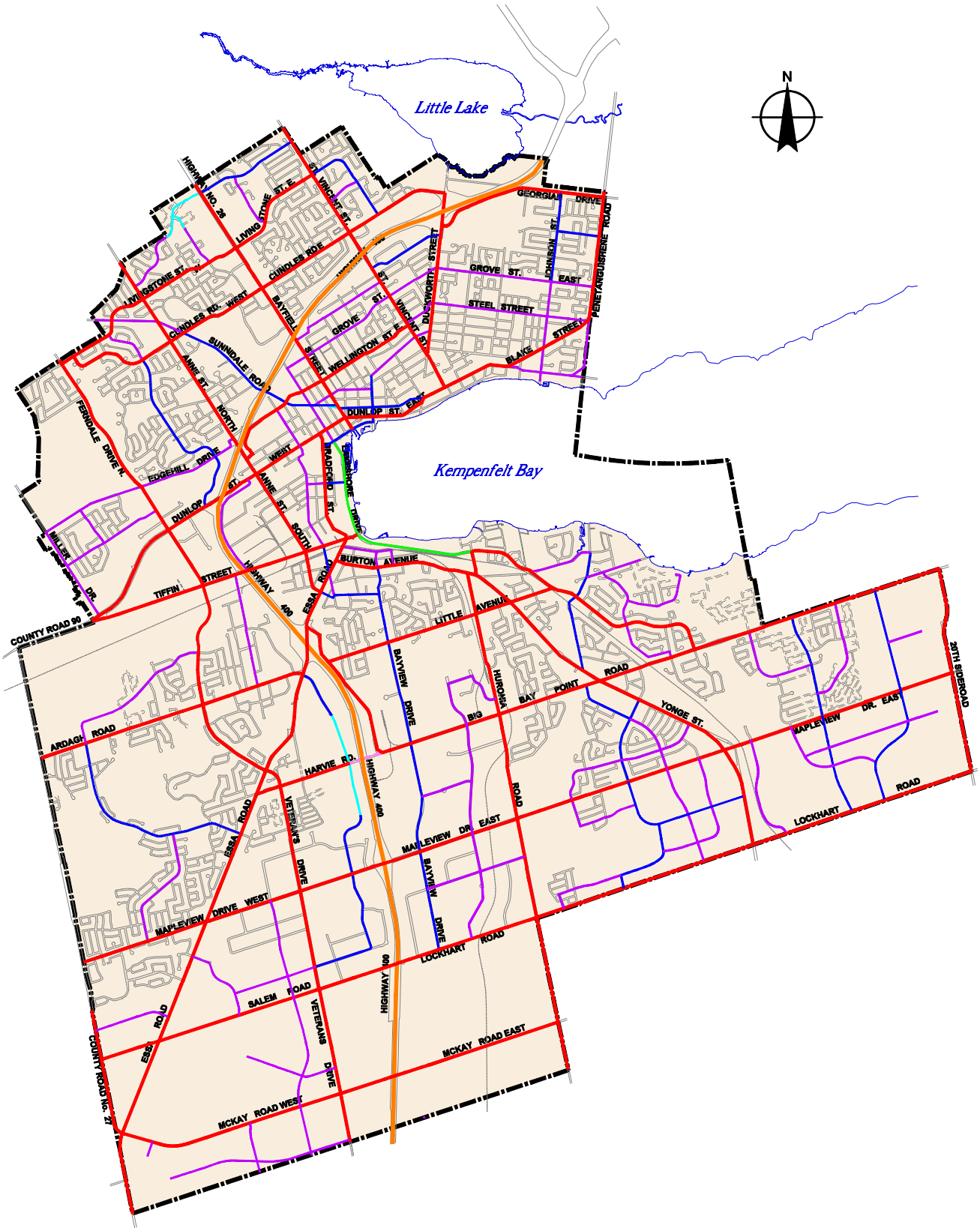
HEIGHT REVIEW STUDY

CITY BOUNDARY

SCHEDULE C
Defined Policy Areas

MAY 2016

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The City of
BARRIE

Schedule 4 to OFFICIAL PLAN AMENDMENT 40

ARTERIAL
FUTURE ARTERIAL
MAJOR COLLECTOR
MINOR COLLECTOR
FUTURE COLLECTOR
PARKWAY
PROVINCIAL HIGHWAY
LOCAL
RAILWAY LINE
CITY BOUNDARY

SCHEDULE D
Road Plan

MAY 2016

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The City of BARRIE

Schedule 5 to OFFICIAL PLAN AMENDMENT 40

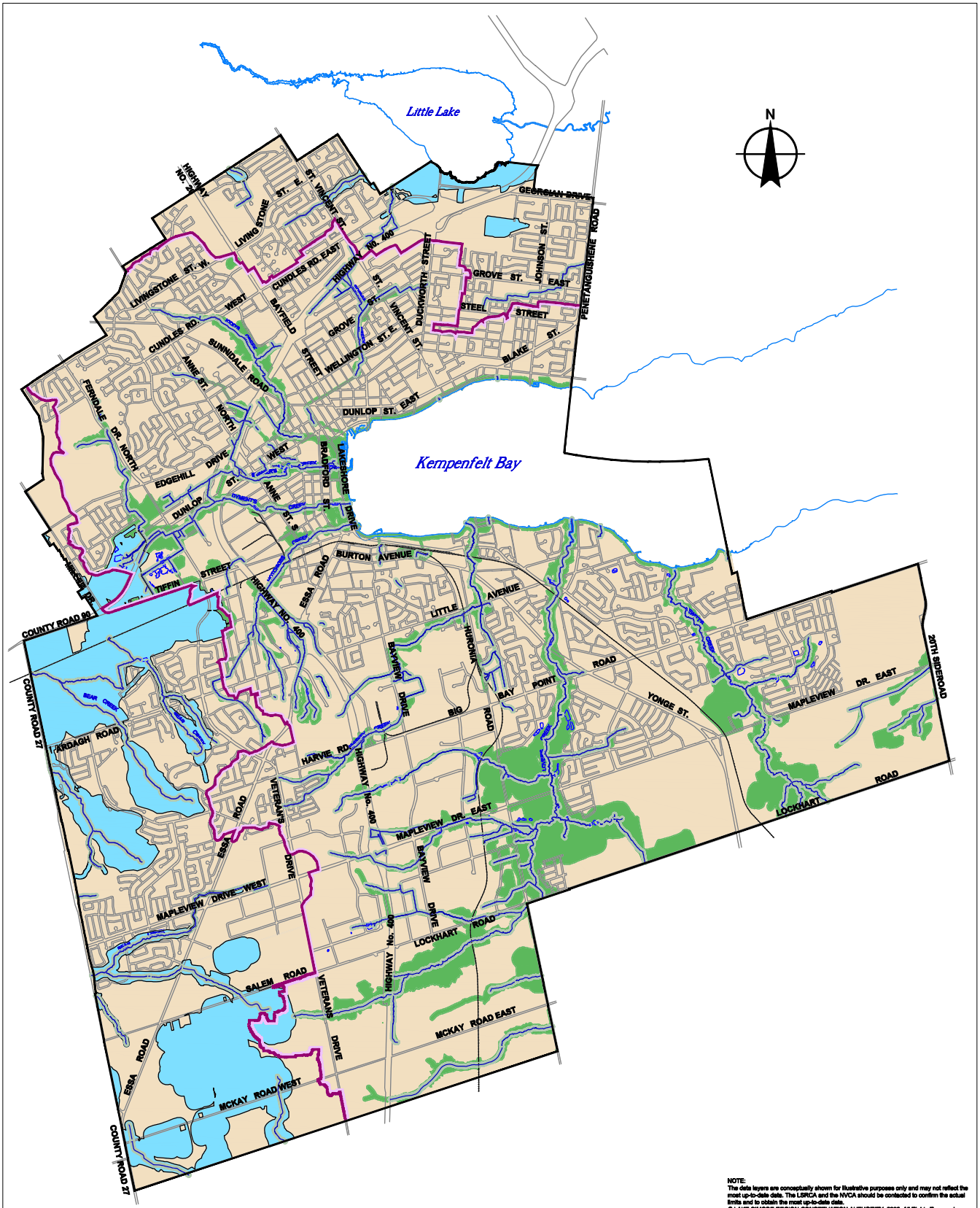
19M R.O.W.	25M R.O.W.	30M R.O.W.	37M R.O.W.	
20M R.O.W.	26M R.O.W.	31M R.O.W.	41M R.O.W.	
22M R.O.W.	27M R.O.W.	32M R.O.W.	CITY BOUNDARY	
23M R.O.W.	28M R.O.W.	33M R.O.W.	Other Streets	
24M R.O.W.	29M R.O.W.	34M R.O.W.		

Schedule E

Road Widening Plan

MAY 2016

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NOTE:
The data layers are conceptually shown for illustrative purposes only and may not reflect the most up-to-date data. The LSRCA and the NVCA should be contacted to confirm the actual limits and to obtain the most up-to-date data.
© LAKE SIMCOE REGION CONSERVATION AUTHORITY, 2008. All Rights Reserved.
© NOTTAWASAGA VALLEY CONSERVATION AUTHORITY, 2008. All Rights Reserved.

PLANNING SERVICES DEPARTMENT December 2013

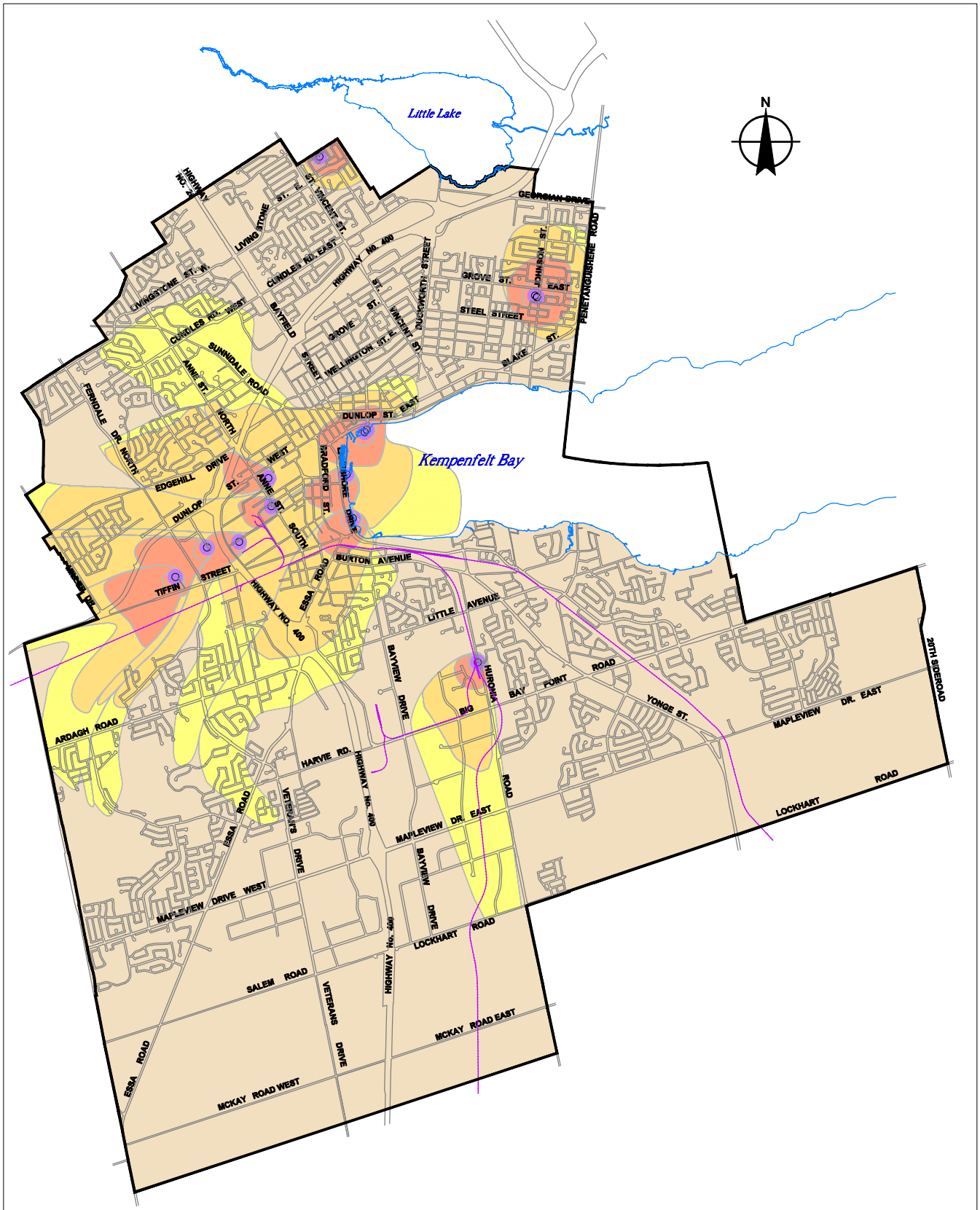
The City of
BARRIE

Schedule 6 to OFFICIAL PLAN AMENDMENT 40

- WATERCOURSES
- 30 METRE WATERCOURSE SETBACK
- LAKE SIMCOE REGION CONSERVATION AUTHORITY BOUNDARY
- NOTTAWASAGA VALLEY CONSERVATION AUTHORITY BOUNDARY
- LAKE SIMCOE REGION CONSERVATION REGULATION LIMITS
- NOTTAWASAGA VALLEY CONSERVATION REGULATION LIMITS
- CITY BOUNDARY

Schedule F
Conservation Authority Regulation Limits
MAY 2016

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The City of BARRIE

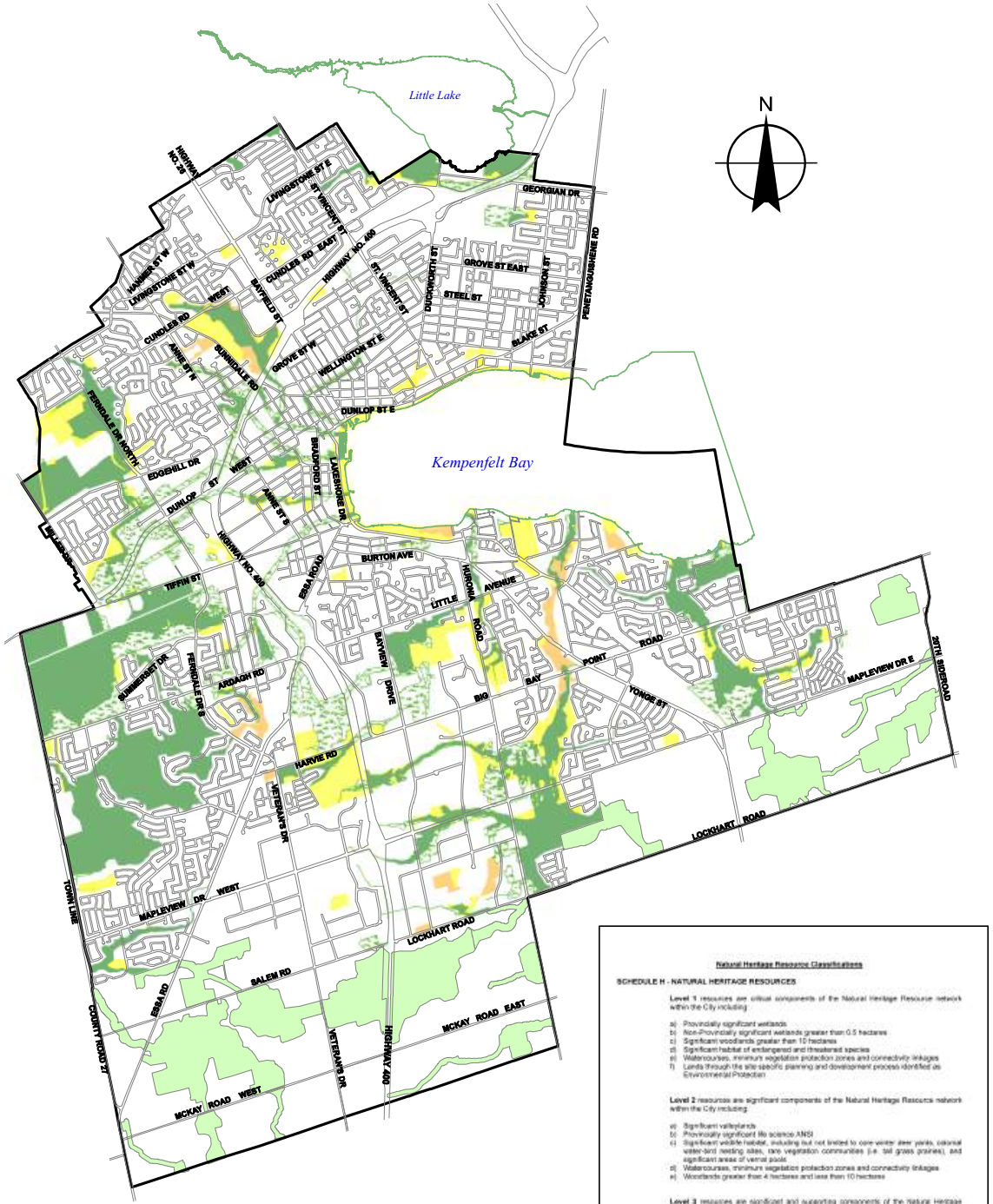
Schedule 7 to OFFICIAL PLAN AMENDMENT 40

- MUNICIPAL WATER SUPPLY WELL
- 100 METRE RADIUS OFFSET FROM OPERATIONAL MUNICIPAL WELL
- CITY BOUNDARY
- 2 YEAR CAPTURE ZONE
- 10 YEAR CAPTURE ZONE
- 25 YEAR CAPTURE ZONE

Schedule G
Wells & Wellhead Protection Areas

MAY 2016

Note: Office consolidation, please consult the Planning Services Department for an accurate reference. Not to be reproduced without permission from the City of Barrie Planning Services Department.



Natural Heritage Resource Classifications

SCHEDULE H - NATURAL HERITAGE RESOURCES

Level 1 resources are critical components of the Natural Heritage Resource network within the City including:

a) Provincially significant wetlands
b) Non-Provincially significant wetlands greater than 0.5 hectares
c) Significant woodlands greater than 10 hectares
d) Significant habitat of endangered and threatened species
e) Watercourses, minimum vegetation protection zones and connectivity linkages
f) Lands through the site specific planning and development process identified as Environmental Protection

Level 2 resources are significant components of the Natural Heritage Resource network within the City including:

a) Significant valleylands
b) Provincially significant life science ANSI
c) Significant wildlife habitat, including but not limited to core winter deer yards, colonial water-bird nesting sites, rare vegetation communities (i.e. tall grass prairies), and significant areas of vernal pools
d) Watercourses, minimum vegetation protection zones and connectivity linkages
e) Woodlands greater than 4 hectares and less than 10 hectares

Level 3 resources are significant and supporting components of the Natural Heritage Resource network within the City including:

a) Regionally significant life science ANSI
b) Woodlands greater than 0.5 hectares and less than 4 hectares
c) Woodlands within 30 metres of a Level 1 or 2 feature
d) Cultural thicket or cultural meadow communities contiguous with woodland or wetland patches
e) Connectivity linkages

The City of BARRIE

Schedule 8 to

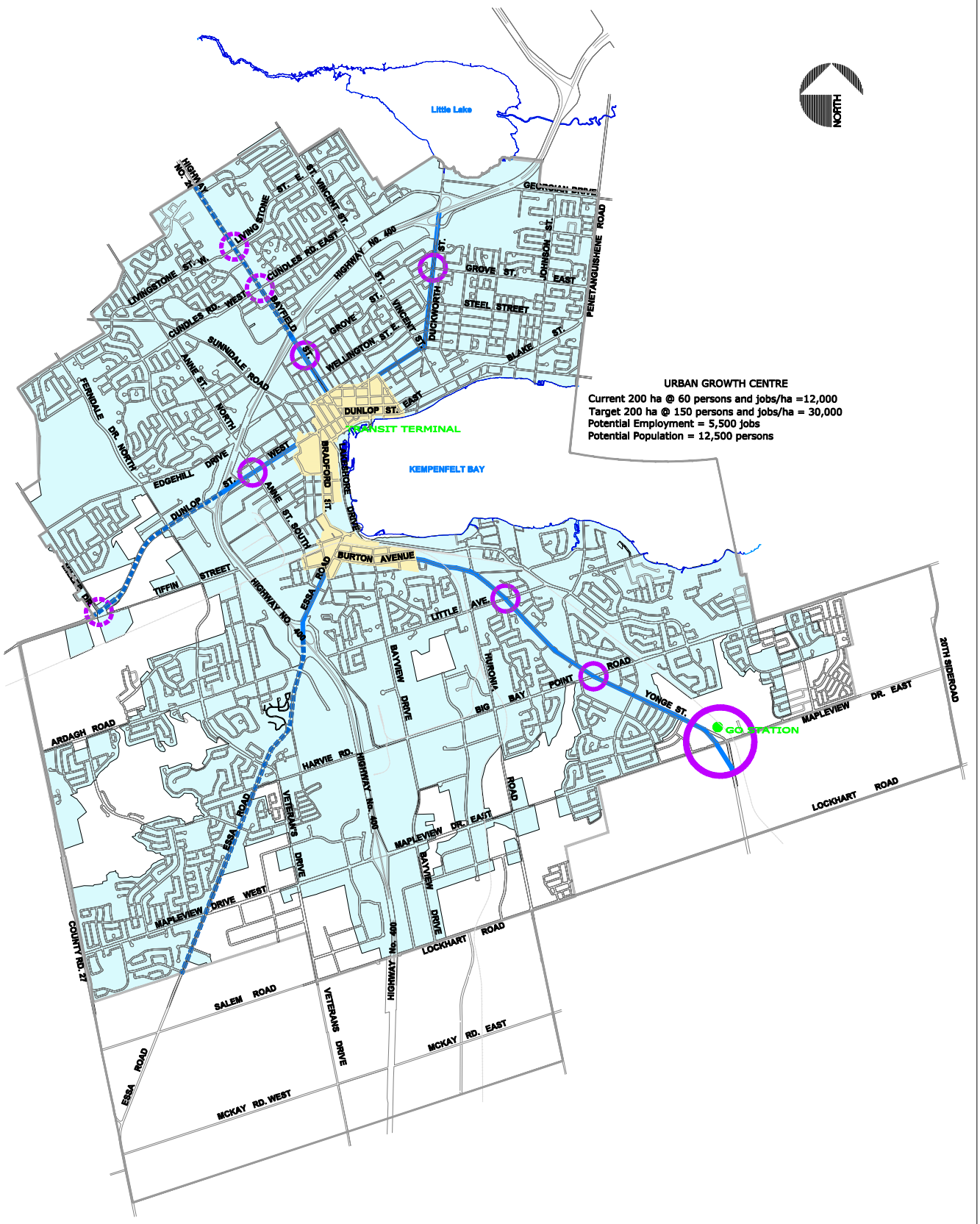
OFFICIAL PLAN AMENDMENT 40

- Level 1
- Level 1 With Existing Development Designation Subject to 3.5.2.4 d)
- Level 2
- Level 3
- Natural Heritage System Salem and Hewitt's Secondary Plan Areas

Schedule H
Natural Heritage Resources

May 2016

Note; Office consolidation, please consult the Planning Services Department for an accurate reference. Not to be reproduced without permission from the City of Barrie Planning Services Department.



The City of

BARRIE

Schedule 9 to OFFICIAL PLAN AMENDMENT 40

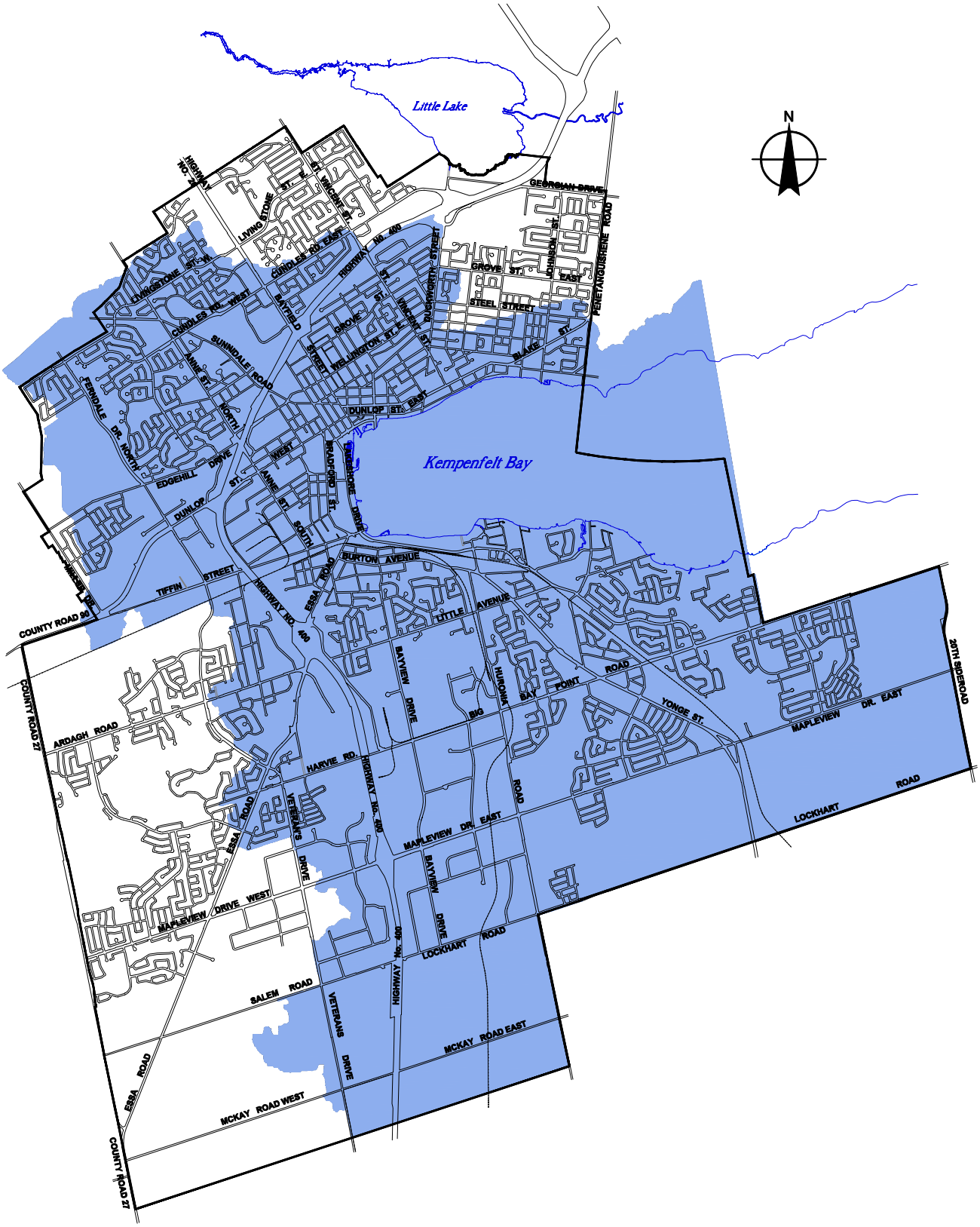
- Urban Growth Centre - 150 persons/jobs per ha.
- Primary Corridor - 50 units per ha.
- Secondary Corridor - 50 units per ha.
- Primary Node - 50-120 units per ha.
- Secondary Node - 50-120 units per ha.
- Built -up Area
- Major Transit Station - 50-120 units per ha.
- City Boundary

SCHEDULE I

Intensification Areas

MAY 2016

NOTE: Office consolidation, please consult the Planning Services Department for an accurate reference. Not to be reproduced without written consent from the City of Barrie Planning Services Department.
Urban Growth Centre for the Growth Plan for the Greater Golden Horseshoe, 2006(c) Queen's Printer for Ontario, 2008. Reproduced with permission of the Ministry ofPublic Infrastructure Renewal.



The City of BARRIE

Schedule 10 to OFFICIAL PLAN AMENDMENT 40

Lake Simcoe Watershed Boundary

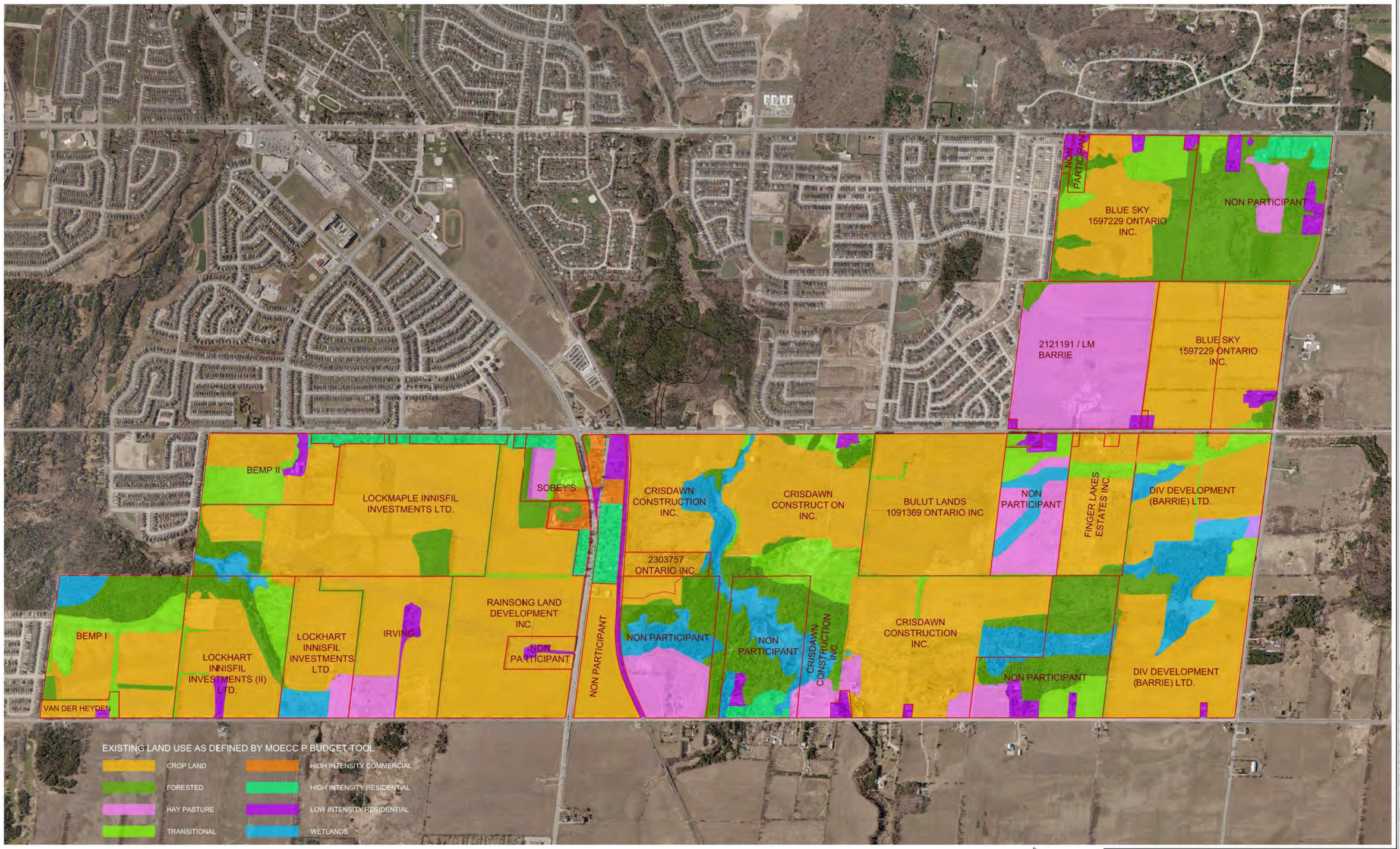
City boundary

Schedule J

Lake Simcoe Watershed

MAY 2016

NOTE: Office consolidation, please consult the Planning Services Department for an accurate reference. Not to be reproduced without written consent from the City of Barrie Planning Services Department.



N

0 100 200 400 600
Metres

NOTE: "SCALE ONLY VALID FOR 24" x 36" SIZED PLOTS"

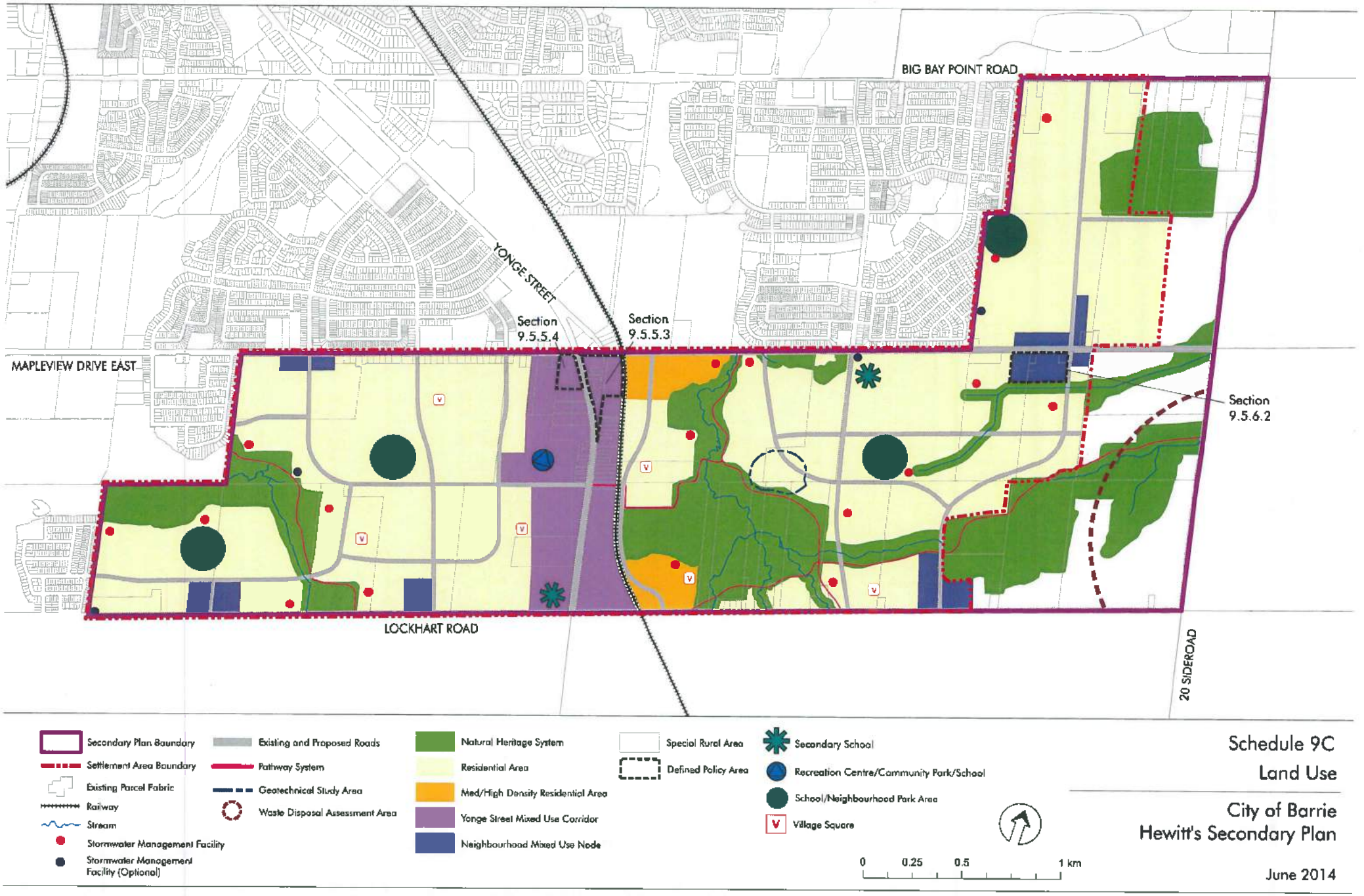
BURNSIDE

Figure Title
HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY
EXISTING LAND USE

Client
HEWITT'S CREEK LANDOWNERS GROUP INC.

Drawn	Checked	Date
BH	CC	16/09/07
Scale		Project No.
H 1:7,500"		300032860

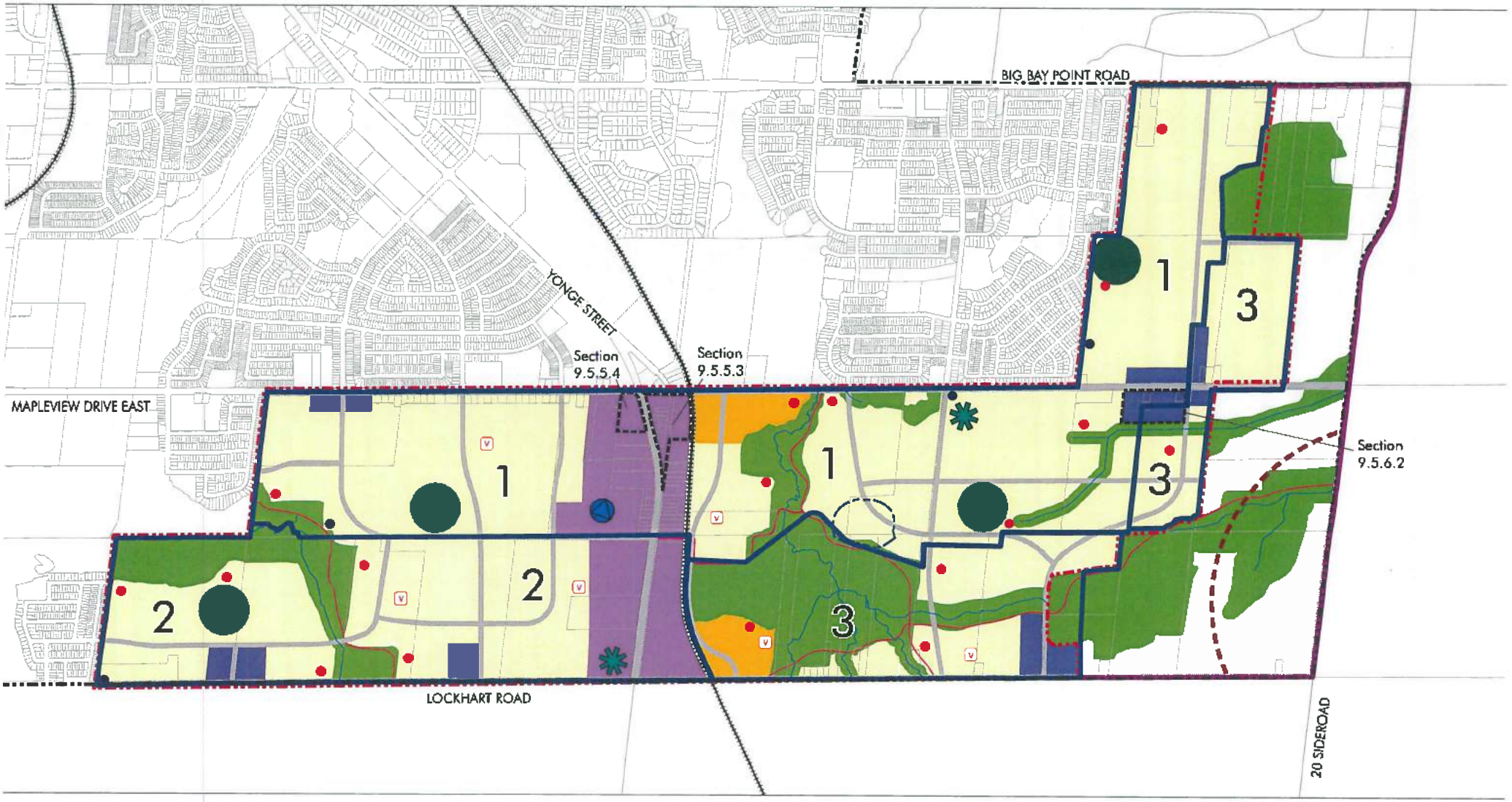
Figure No.
FIG 2



Schedule 9C
Land Use

City of Barrie
Hewitt's Secondary Plan

June 2014



Schedule 9E
Development Phases

City of Barrie
Hewitt's Secondary Plan

June 2014

OFFICIAL PLAN

Schedule A
Land Use

Office Consolidation
January 2018

- Residential
- City Centre
- General Commercial
- Community Centre Commercial
- Regional Centre Commercial
- Mixed Use Nodes and Corridors
- Business Park
- Highway 400 Industrial
- General Industrial
- Restricted Industrial
- Institutional
- Educational Institutional
- Major Institutional
- Open Space
- Environmental Protection Area
- Special Rural Area
- Water Treatment Centre
- Waste Management Facility
- Future Urban
- Waste Disposal Assessment Area
- City Boundary
- Application Before the Ontario Municipal Board (OMB)
- SecondaryPlanBoundary
- Settlement Area Boundary

Barrie

1:20,000

0 0.5 1 2 km

N

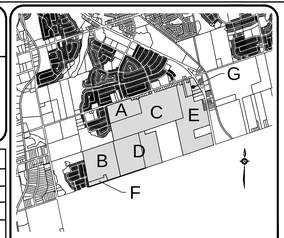
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For information please contact Service Barrie at 705-726-4242 or ServiceBarrie@barrie.ca

GIS Branch 2/4/2020

SCALE = 1:2500 (AO)

A. BEMP HOLDINGS 2 INC.
B. BEMP HOLDINGS 1 INC.
C. LOCKMAPLE INNISFIL INVESTMENTS LTD.
D. LOCKHART INNISIFL INVESTMENTS LTD. & LOCKHART INNISFIL INVESTMENTS (II) LTD.
E. RAINSONG LAND DEVELOPMENT INC.
F. VAN DER HAYDEN
G. SOBEY'S CAPITAL INC.

WEST OF YONGE CONFORMITY REVIEW PLAN 1



KEY PLAN 1:40,000

Raymond J. Dunphy
REGISTERED PROFESSIONAL PLANNER
R.P.P.

Date Issued: June 9, 2016
Checked By: RD
Project No.: GOL-14134/LAW-06129
Drawn By: m.c.r.
Drawing Name: GOL-14134-(WOY)-CR1.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 MaplevIew Drive East, Unit 1, Barrie, Ontario, L4N 0W5
Phone: 705-734-2538 Fax: 705-734-3356
www.jonesconsulting.com

A (Bemp Holdings 2 Inc.)		
Calcs	**# of units**	**% of total units**
13.7m Single	28.5	6
11.5 Single	137.5	27
10.4 Single	75	15
9.0 Single	42	8
Street Townhome	32	6
Mixed Use Blocks	196	38
19.44 ha. Total Lands	511	100

B (Bemp Holdings 1 Inc.)		
Calcs	**# of units**	**% of total units**
13.7m Single	56	15
11.5 Single	100.5	27
10.4 Single	73.5	20
9.0 Single	36	10
Street Townhome	37	10
Mixed Use Block	72	19
36.59 ha. Total Lands	375	100

C (Lockmaple Innisfil Investments Ltd.)		
Calcs	**# of units**	**% of total units**
12.2m Single	87	8
11.0m Single	374	34
9.15m Single	302	27
Street Townhome	337.5	31
65.56 ha. Total Lands	1100.5	100

D (Lockhart Innisfil Investments Ltd.) (Lockhart Innisfil Investments (II) Ltd.)		
Calcs	**# of units**	**% of total units**
12.2m Single	98.8	17
11.0m Single	142.5	24
9.15m Single	151.5	26
Street Townhome	54	9
Back to Back Townhomes	38	6
Mixed Use Block	107	18
51.85 ha. Total Lands	591.8	100

E (Rainsong Land Development Inc.)		
Calcs	**# of units**	**% of total units**
12.2m Single	156.5	21
11.0m Single	224	30
Semi Detached Residential (7.5m/unit)	220	29
Back-to-Back Street Townhouse (6.4m/unit)	154	20
50.15 ha. Total Lands	754.5	100

F (Van Der Hayden - Lockhart)		
Calcs	**# of units**	**% of total units**
11.5m Single	22.5	43
10.4m Single	19	36
9.0m Single	11	21
3.18 ha. Total Lands	52.5	100

G (Sobey's Capital Incorporated)		
Calcs	**# of units**	**% of total units**
To Be Determined		
8.26 ha. Total Lands	0	0.00

	A+B+C+D+E+F+G		A (19.44 ha.)		B (36.59 ha.)		C (65.56 ha.)		D (51.85 ha.)		E (50.15 ha.)		F (3.18 ha.)		G (8.26 ha.)	
Unit Type	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**
13.7m Single	2	84.5	6	28.5	15	56.0	0	0.0	0	0.0	0	0.0	0	0.0		0
12.2m Single	10	342.3	0	0.0	0	0.0	8	87.0	17	98.8	21	156.5	0	0.0		0
11.5m Single	8	260.5	27	137.5	27	100.5	0	0.0	0	0.0	0	0.0	43	22.5		0
11.0m Single	22	740.5	0	0.0	0	0.0	34	374.0	24	142.5	30	224.0	0	0.0		0
10.4m Single	5	167.5	15	75.0	20	73.5	0	0.0	0	0.0	0	0.0	36	19.0		0
9.15m Single	13	453.5	0	0.0	0	0.0	27	302.0	26	151.5	0	0.0	0	0.0		0
9.0m Single	3	89.0	8	42.0	10	36.0	0	0.0	0	0.0	0	0.0	21	11.0		0
Semi Detached (7.5m/unit)	6	220.0	0	0.0	0	0.0	0	0.0	0	0.0	29	220.0	0	0.0		0
Street Townhome (6.0m/unit)	14	460.5	6	32.0	10	37.0	31	337.5	9	54.0	0	0.0	0	0.0		0
Back-to-Back Street Townhome	6	192.0	0	0.0	0	0.0	0	0.0	6	38.0	20	154.0	0	0.0		0
Mixed Use Blocks	11	375.0	38	196.0	19	72.0	0	0.0	18	107.0	0	0.0	0	0.0		0
Totals	**100**	**3385.3**	**100**	**511**	**100**	**375**	**100**	**1100.5**	**100**	**591.8**	**100**	**754.5**	**100**	**52.5**	**0**	**0**

Subject Lands
- Gross Developable 235 ha
- Net Developable 198 ha

Entrance Location

Park/Open Space (5.37 ha.)

Institutional Land Use (13.37 ha.)

Mixed Use Proposed (9.3)

Recreational Centre (7.3 ha.)

Mixed Use as per City of Barrie Secondary Plan (5.5 ha.)

Stormwater Management Pond (16.12 ha.)

Natural Heritage Buffer (6.63 ha)

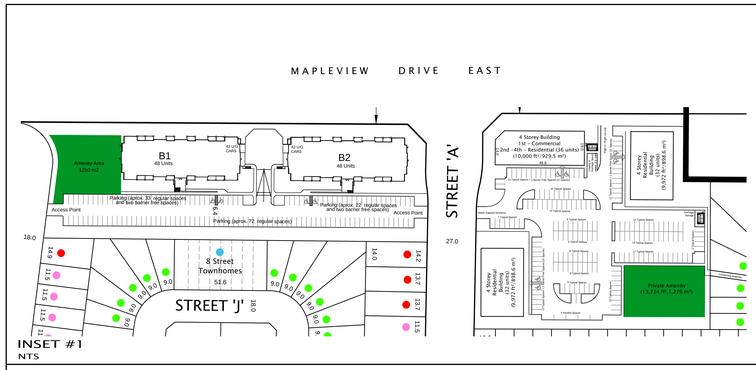
Natural Heritage Core Area (30.08 ha)

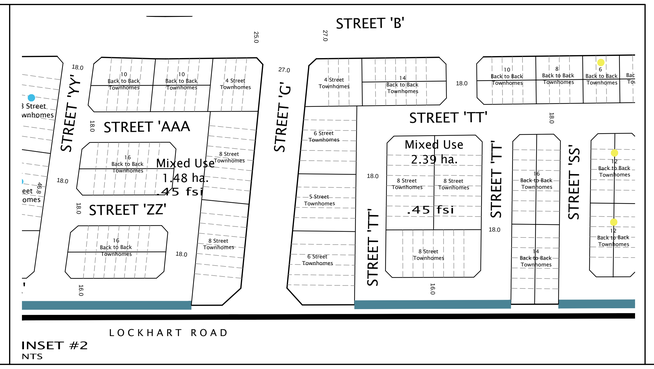
Enhanced Landscaping & Dual Sidewalks

Enhanced Window Streets

Key Intersections (Enhanced treatments)

✲ Lots with this symbol were counted as half lots only.



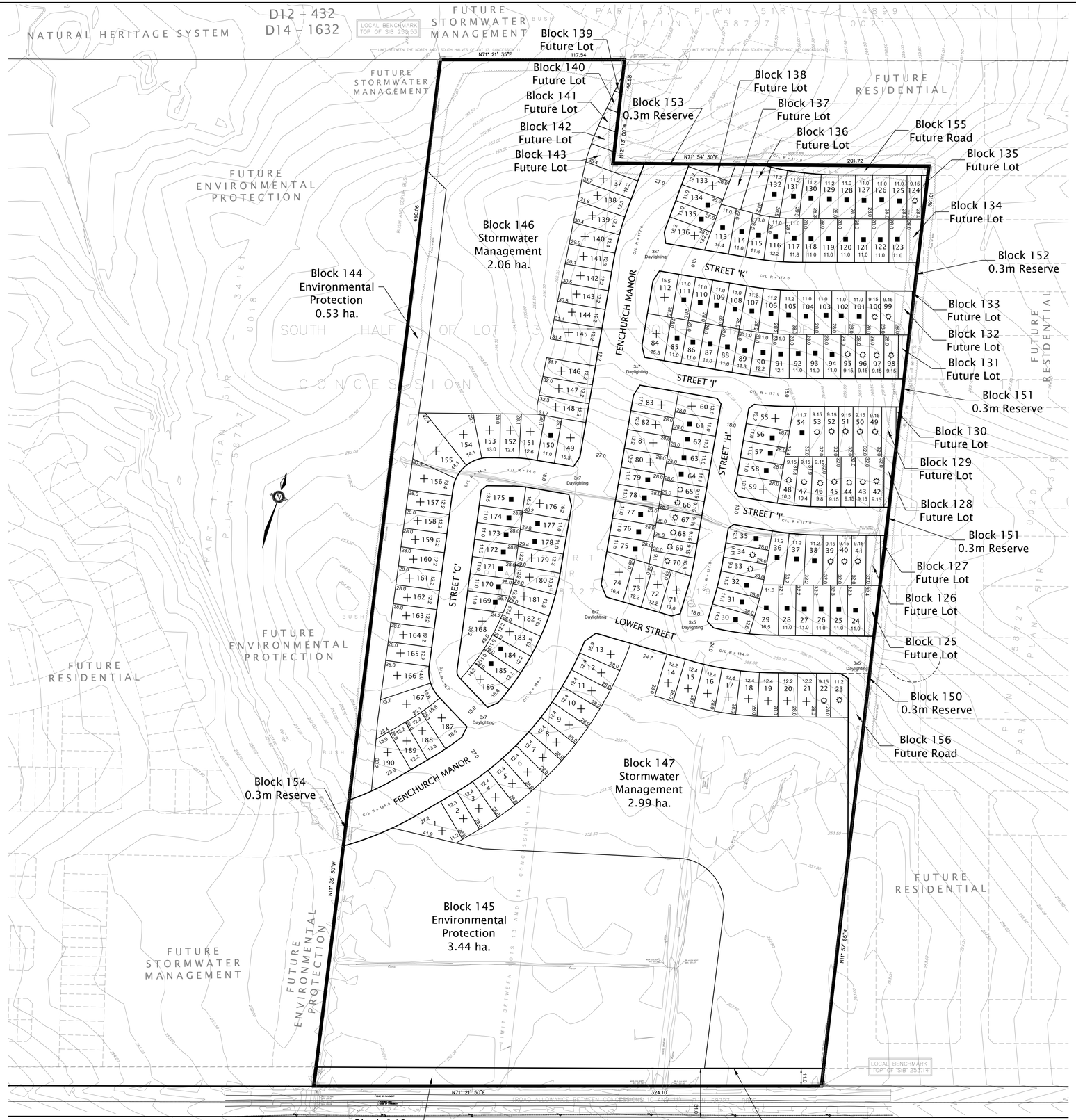


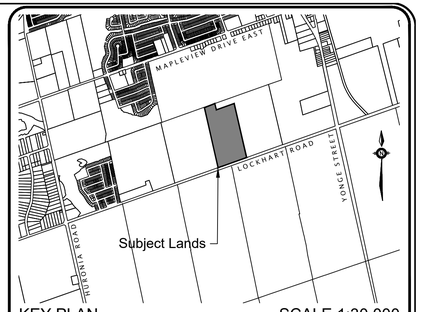
Hewitt's Secondary Plan
West of Yonge Conformity Review Plan 1

A. BEMP HOLDINGS 2 INC.
B. BEMP HOLDINGS 1 INC.
C. LOCKMAPLE INNISFIL INVESTMENTS LTD.
D. LOCKHART INNISIFL INVESTMENTS LTD. & LOCKHART INNISFIL INVESTMENTS (II) LTD.
E. RAINSONG LAND DEVELOPMENT INC.
F. VAN DER HAYDEN
G. SOBEY'S CAPITAL INC.

Submission to City of Barrie for conformity review
May 30, 2016

© \\Planning Drawings\GOL-14134\Goldstar-Lockmaple\Law\Submitted\Conformity Review Plans\June 2016\GOL-14134-(WOY)-CR1.dwg Layout:Conformity Review Plan Plotted: Jun 09, 2016 @ 6:15pm by mandonis The Jones Consulting Group Ltd.





Draft Plan of Subdivision

Part of The South Halves of Lots 13 and 14, Concession 11
(Geographic Township of Innisfil)
City of Barrie
2021

OWNER'S CERTIFICATE

I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE THE JONES CONSULTING GROUP LTD. TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE CITY OF BARRIE FOR APPROVAL.

DATE — LOCKHART INNISFIL INVESTMENTS LIMITED

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE — ONTARIO LAND SURVEYORS

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON DRAFT PLAN
b) SHOWN ON DRAFT PLAN
c) SHOWN ON KEY PLAN
d) RESIDENTIAL, SWM, EP
e) SHOWN ON DRAFT PLAN
f) SHOWN ON DRAFT PLAN
g) SHOWN ON DRAFT PLAN
h) MUNICIPAL PIPED WATER TO BE PROVIDED
i) SANDY CLAY LOAM
j) SHOWN ON DRAFT PLAN
k) ALL MUNICIPAL SERVICES TO BE PROVIDED
l) SHOWN ON DRAFT PLAN

STATISTICS	Area (ha.)	Units
+ 12.2m Singles (LOTS 1 - 21, 55, 59 & 60, 71 - 74, 80 - 84, 112, 133, 136 - 149, 151 - 168, 176, 179 - 183, & 186 - 190)	3.10 ha.	78 units
■ 11.0m Singles (LOTS 24 - 32, 35 - 38, 54, 56 - 58, 61 - 64, 75 - 79, 85 - 94, 101 - 110, 113 - 123, 125 - 132, 134 & 135, 150, 169 - 175, 177 & 178, 184 & 185)	2.60 ha.	80 units
☼ 9.15m Singles (LOTS 22 & 23, 33 & 34, 39 - 53, 65 - 70, 95 - 100, & 124)	0.89 ha.	32 units
Future Lots (LOTS 125 - 143)	0.35 ha.	8 units
Environmental Protection (BLOCKS 144 & 145)	3.97 ha.	
Stormwater Management (BLOCKS 146 & 147)	5.05 ha.	
Reserves & Widenings (BLOCK 148 - 154)	0.38 ha.	
Roads Major Collector - Fenchurch Manor Minor Collector - Lower Street Local Roads - Streets 'G', 'H', 'I', 'J', & 'K',	3.26 ha.	
Future Roads (BLOCKS 155 & 156)	0.13 ha.	
TOTAL	19.73 ha.	198 units

0 10 50 100M
SCALE 1 : 1250 (A1)

Lockhart Innisfil Investments Limited

Draft Plan of Subdivision

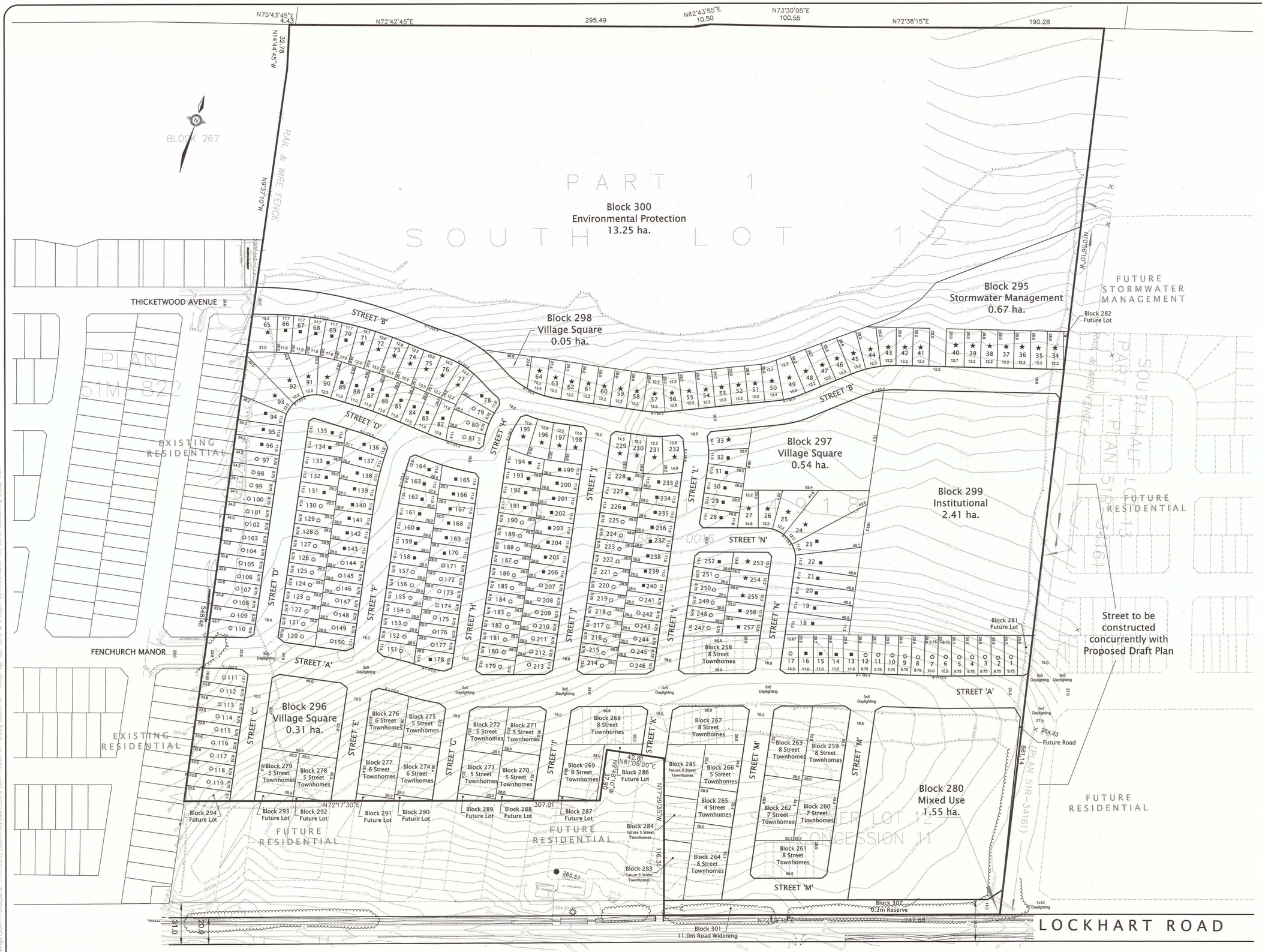
Raymond J. Duhamel
REGISTERED PROFESSIONAL PLANNER
R.P.P.

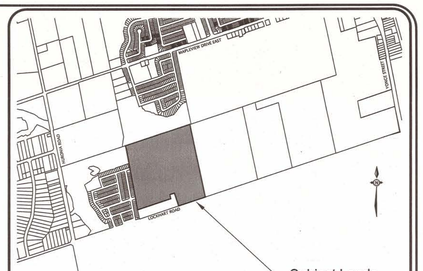
Date Issued:	NOV. 16, 2020
Checked By:	RD
Project No.:	GOL-14193
Drawn By:	m.c.r.
Drawing Name:	GOL-14193-PH-1-DP-1.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Drive East, Unit 1, Barrie, Ontario, L4N 0W5
Phone: 705-734-2538 Fax: 705-734-1056
www.joneconsulting.com

LOCKHART INNISFIL INVESTMENTS LIMITED
CITY OF BARRIE

G:\Planning Drawings\GOL-14193 Lockhart Innisfil\PH-1\dwg\GOL-14193-PH-1-DP-1.dwg Layout: DP Plotted: Jan 08, 2021 @ 9:00am by marichards The Jones Consulting Group Ltd.





KEY PLAN SCALE 1:25,000

Draft Plan of Subdivision

Part of the South Half of Lot 12, Concession 11
Former Township of Innisfil, Now in the
City of Barrie
2019

OWNER'S CERTIFICATE

I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE THE JONES CONSULTING GROUP LTD., TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE CITY OF BARRIE FOR APPROVAL.

17 April 19
DATE

BARRIE LOCKHART ROAD GP INC.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

April 11, 2019
DATE

Douglas E. Hunt
DOUGLAS E. HUNT, O.L.S.
HUNT SURVEYS INC.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON DRAFT PLAN
b) SHOWN ON DRAFT PLAN
c) SHOWN ON KEY PLAN
d) RESIDENTIAL, SWM, MIXED USE, OPEN SPACE, INSTITUTIONAL & EP
e) SHOWN ON DRAFT PLAN
f) SHOWN ON DRAFT PLAN
g) SHOWN ON DRAFT PLAN
h) MUNICIPAL PIPED WATER TO BE PROVIDED
i) SANDY/CLAY LOAM
j) SHOWN ON DRAFT PLAN
k) ALL MUNICIPAL SERVICES TO BE PROVIDED
l) SHOWN ON DRAFT PLAN

STATISTICS

RESIDENTIAL LOT BREAKDOWN

★ 12.2 m Singles		59 units
■ 11.0 m Singles		85 units
☼ 9.75 m Singles (LOTS 1 - 257)		113 units
SUB TOTAL	8.60 ha.	257 units
Street Townhomes (6.0 m/each) (BLOCKS 268 - 279)	2.60 ha.	138 units
Mixed Use (40 - 120 uph) (BLOCKS 280)	1.55 ha.	62 - 186 units
Future Lots/Blocks (BLOCKS 281 - 294)	0.40 ha.	13 units
Stormwater Management Pond (BLOCK 295)	0.67 ha.	
Village Square Open Spaces (BLOCKS 296 - 298)	0.90 ha.	
Institutional (BLOCK 299)	2.41 ha.	
Environmental Protection (BLOCK 300)	13.25 ha.	
Widening & Reserve (BLOCKS 301 & 302)	0.31 ha.	
Roads (MINOR COLLECTOR, STREET 'A') (LOCAL STREETS 'B' - 'N')	6.03 ha.	
TOTAL	36.72 ha.	470 - 594 units

20 0 20 40 60 80 100 120m
SCALE = 1:1250 (A1)

BARRIE LOCKHART ROAD GP INC.
DRAFT PLAN OF SUBDIVISION

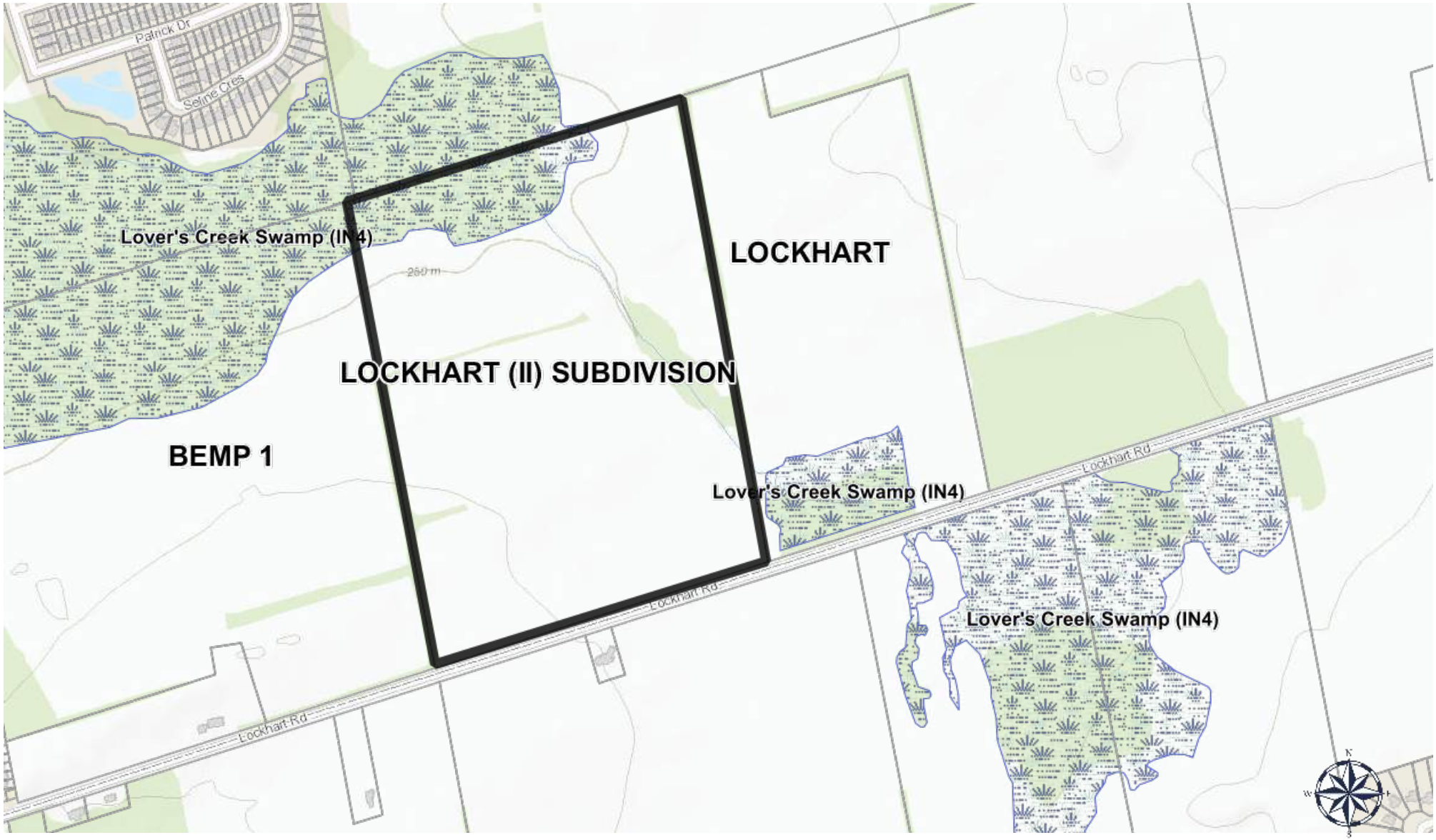
Raymond J. Duhamel REGISTERED PROFESSIONAL PLANNER R.P.P.

Date Issued:	MARCH 8, 2019
Checked By:	RD
Project No.:	SOR-17045
Drawn By:	m.c.r.
Drawing Name:	SOR-17045-DP-2.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
220 Maplevlew Drive East, Unit 1, Barrie, Ontario, L4N 0W5
Phone: 705-734-2538 Fax: 705-734-1056
www.jonesconsulting.com

G:\Planning Drawings\SOR-17045\Barrie...\Submitted\March2019\SOR-17045-DP-2.dwg Layout:DP Plotted Apr 08, 2019 @ 3:39pm by marlicherda The Jones Consulting Group Ltd.

Lockhart - Evaluated Wetland



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0 100 200 300m

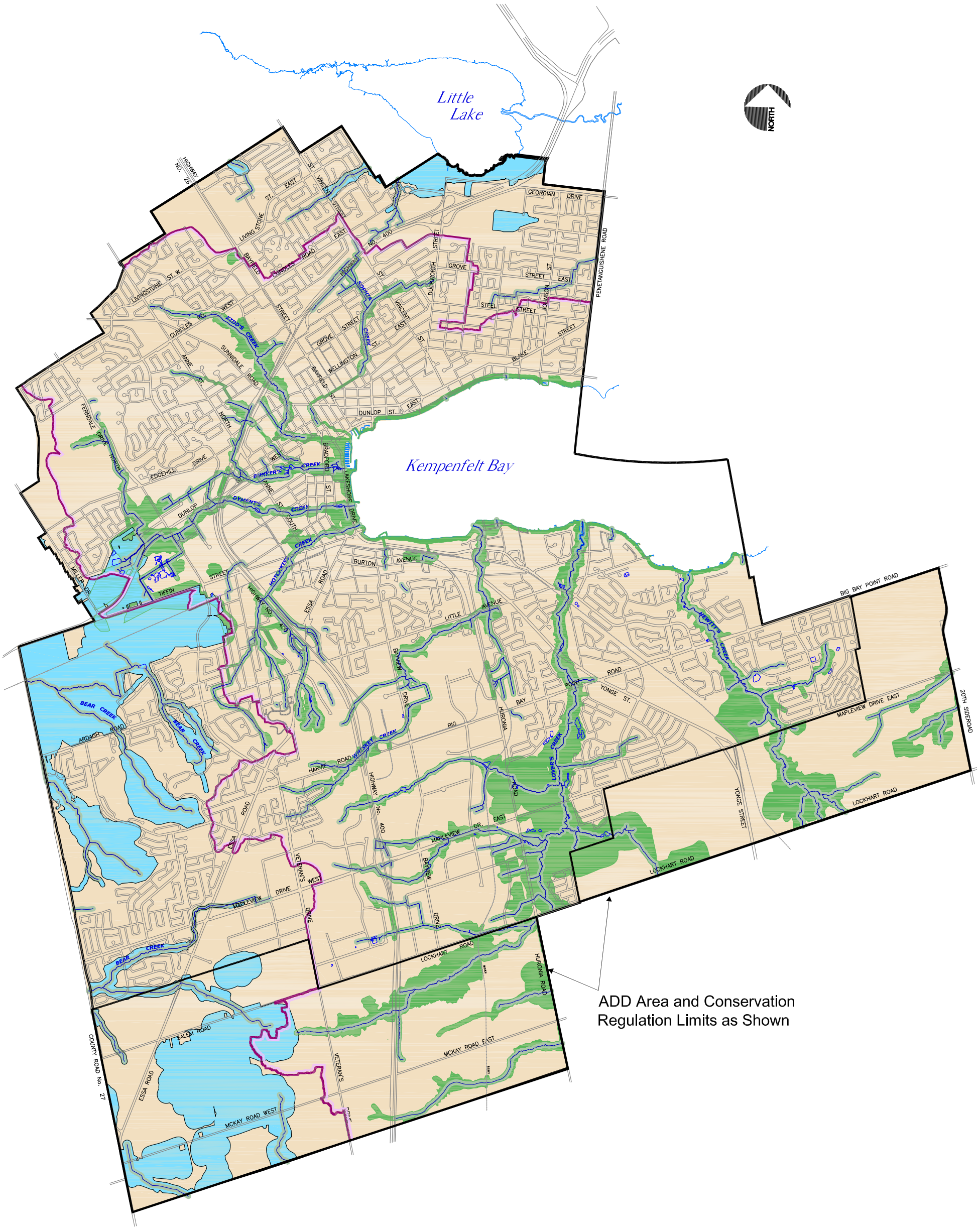
1 : 9,028

May 11, 2021

Appendix B

Stormwater Management Information

This is Schedule 6 to OPA ___



ADD Area and Conservation Regulation Limits as Shown

NOTE:
The data layers are conceptually shown for illustrative purposes only and may not reflect the most up-to-date data. The LSRCA and the NVCA should be contacted to confirm the actual limits and to obtain the most up-to-date data.
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PLANNING SERVICES DEPARTMENT January 2010

The City of
BARRIE

OFFICIAL PLAN

- WATERCOURSES
- 30 METRE WATERCOURSE SETBACK
- LAKE SIMCOE REGION CONSERVATION AUTHORITY BOUNDARY
- NOTTAWASAGA VALLEY CONSERVATION AUTHORITY BOUNDARY
- LAKE SIMCOE REGION CONSERVATION REGULATION LIMITS
- NOTTAWASAGA VALLEY CONSERVATION REGULATION LIMITS
- CITY BOUNDARY

Schedule F

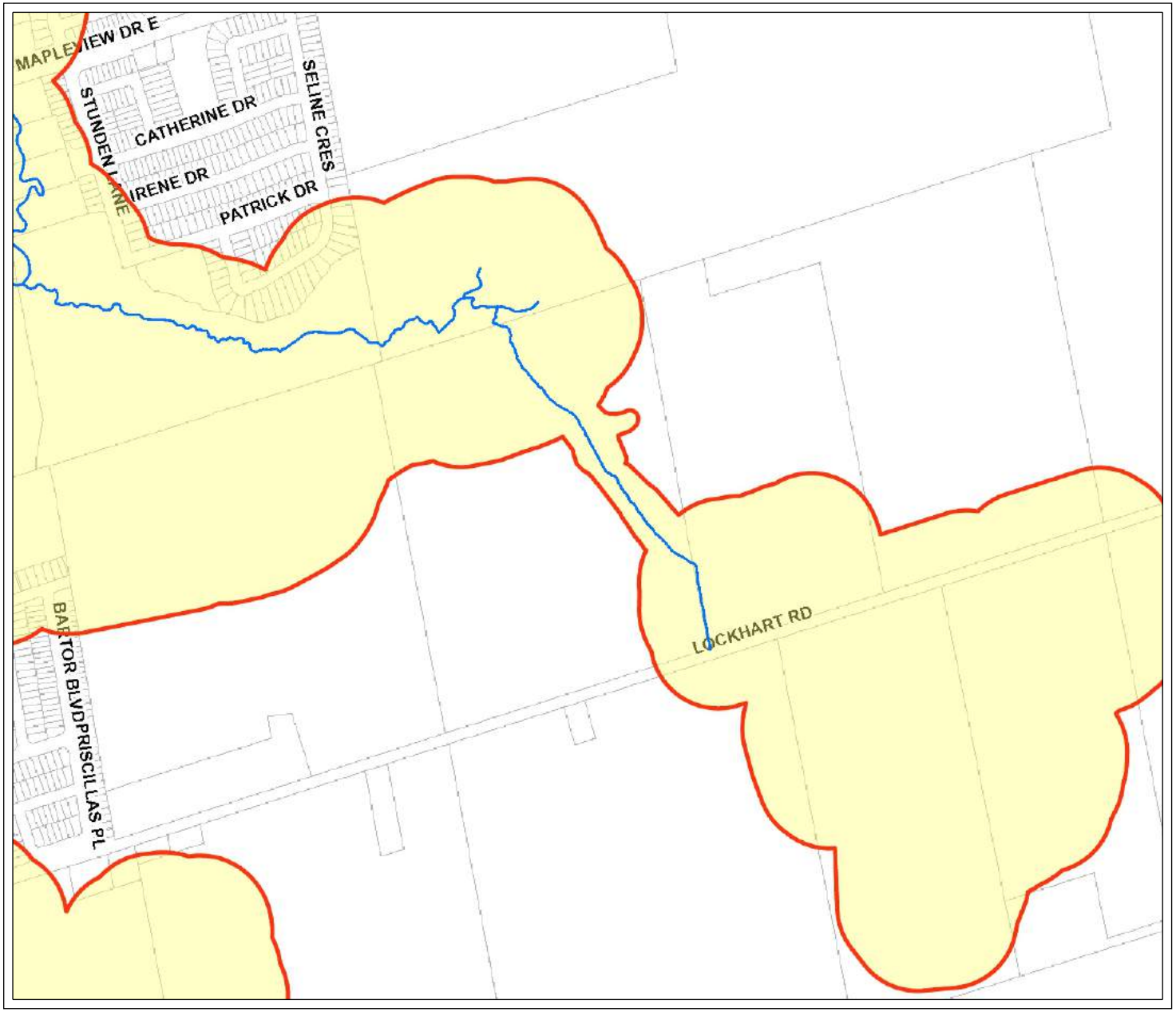
Watercourses

FEBRUARY 2013

Note: Office consolidation, please consult the Planning Services Department for an accurate reference. Not to be reporduced without permission from the City of Barrie Planning Services Department.

Lake Simcoe Region conservation authority

Lockhart Innisfil Investments (II) Limited



Features

- LSRCA Watershed Boundary
- Lake Simcoe
- Watercourse
- Regulated Area Boundary
- Regulated Area
- Road Labels
- Assessment Parcel

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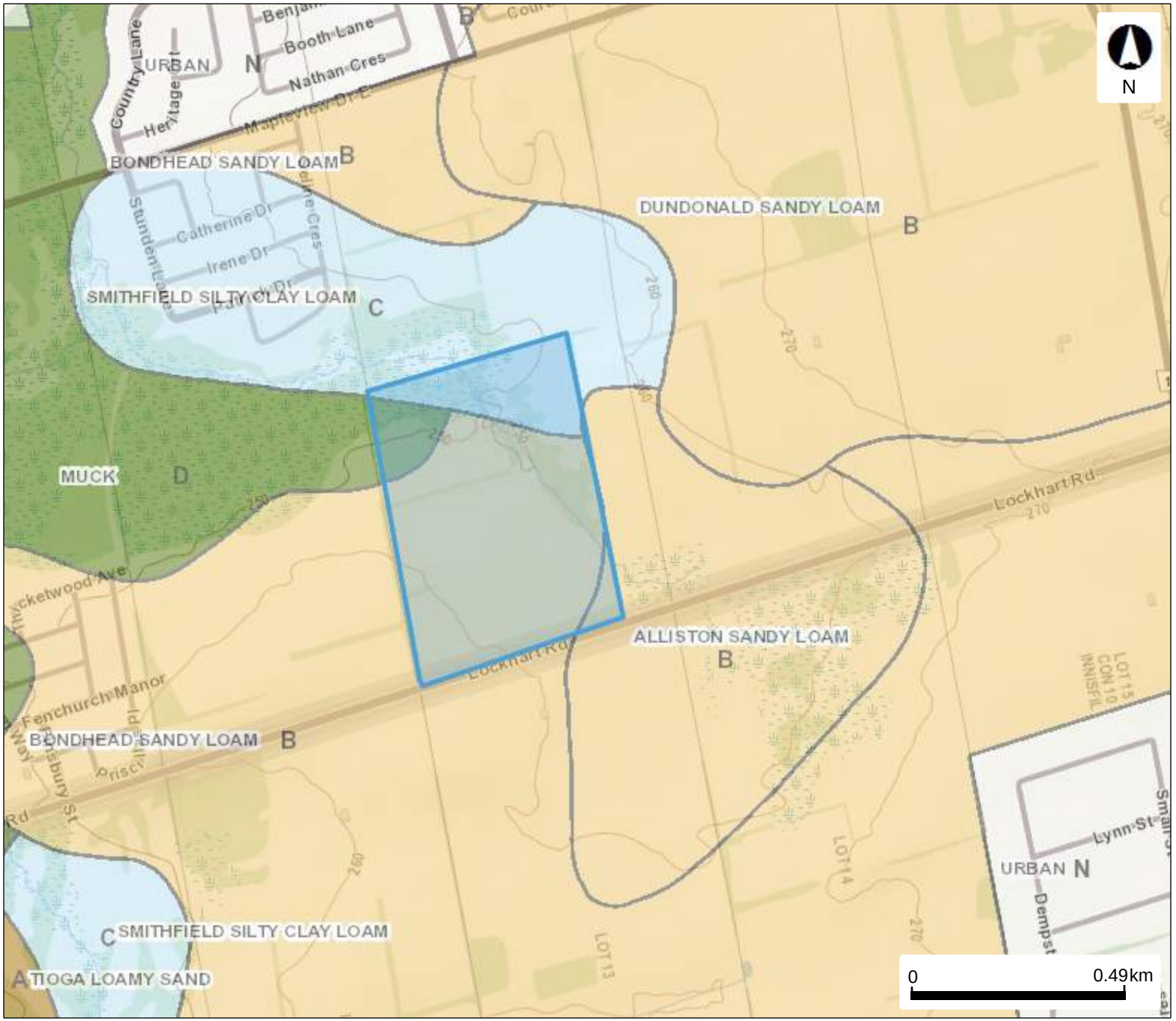
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Scale 1: 10,692

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LOCKHART II SUBDIVISION SOILS



Legend

- @language-layer-soil-name
- @ language-layer-hydrologic-soil-group
  - A - High
  - B - Moderate
  - C - Slow
  - D - Very Slow

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Map Created: 6/7/2021
Map Center: 44.33562 N, -79.63976 W

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110 DRAINAGE AREA ID

DRAINAGE BOUNDARY

EXISTING CONTOURS

ELC BOUNDARIES

WATERSHED BOUNDARY

STAKED 2015 NHS LIMITS

STAKED NHS BUFFER LIMITS

COB GENERATED NHS BUFFER LIMITS (2013)

EXISTING 100yr STORM FLOOD LIMIT

EXISTING REGIONAL STORM FLOOD LIMIT

OVERLAND FLOW ROUTE

UNSTAKED 2015 NHS LIMITS

UNSTAKED NHS BUFFER LIMITS

DASHED FLOOD LINES ARE APPROXIMATE ONLY, BASED ON INTERPOLATED DATA BETWEEN FINGERLAKES AND 1091369 ONTARIO INC. DETAILED TOPOGRAPHIC DATA. FLOODLINES ARE SUBJECT TO CHANGE BASED ON ADDITION OF DETAILED TOPOGRAPHIC SURVEY.

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Metres

NOTE: *SCALE ONLY VALID FOR 24" x 36" SIZED PLOTS*

BURNSIDE

Figure Title

HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY

EXISTING CONDITIONS DRAINAGE PLAN

Client

HEWITT'S CREEK LANDOWNERS GROUP INC.

Drawn	Checked	Date	Figure No.
BH	MZ	17/09/14	**FIG 5**
Scale		Project No.	
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A REPORT TO
LOCKHART AND LOCKHART II

A GEOTECHNICAL INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT

LOCKHART AND LOCKHART II

LOCKHART ROAD
CITY OF BARRIE

REFERENCE NO. 1901-S077

MAY 2021

DISTRIBUTION

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1.0 INTRODUCTION

In accordance with authorization from Mr. Rick McConnell of Matson, McConell Ltd. dated January 26, 2019, a geotechnical investigation was carried out on a parcel of land located on the north side of Lockhart Road in the City of Barrie.

The purpose of the investigation was to reveal the subsurface conditions and to determine the engineering properties of the disclosed soils for the design and construction of a proposed residential development.

The findings and resulting geotechnical recommendations are presented in this Report.

2.0 SITE AND PROJECT DESCRIPTION

The City of Barrie is located within the periphery of Lake Simcoe basin where the glacial till has been partly eroded in places, by glacial Lake Algonquin and filled with lacustrine silts, sands and clay.

The subject property is almost rectangular in shape, comprising an approximate area of 50.6 hectares. It is located on the north side of Lockhart Road and approximately 1000 m west of Yonge Street in the City of Barrie. The property is currently a farm field with treed areas. The existing site gradient is undulating, dropping gently towards a ditch bisecting the property in the north-south direction.

We understand that the property will be developed into a residential subdivision of residential lots and townhouse blocks, with stormwater management facilities. The development will consist of municipal services and roadways meeting urban standards. The existing treed areas, however, will be preserved as a natural heritage system.

3.0 FIELD WORK

The field work, consisting of twenty-two (22) sampled boreholes extending to depths of 5.0 to 10.8 m from the prevailing ground surface, was performed between February 19 and March 5, 2019, at the locations shown on the Borehole Location Plan, Drawing No. 1.

The boreholes were advanced at intervals to the sampling depths by a track-mounted, continuous-flight power-auger machine equipped for soil sampling. Standard Penetration

Tests, using the procedures described on the enclosed "List of Abbreviations and Terms", were performed at the sampling depths. The test results are recorded as the Standard Penetration Resistance (or 'N' values) of the subsoil. The relative density of the granular strata and the consistency of the cohesive strata are inferred from the 'N' values. Split-spoon samples were recovered for soil classification and laboratory testing. The field work was supervised and the findings were recorded by a Geotechnical Technician.

Upon completion of drilling and sampling, groundwater monitoring wells were installed in six (6) selected boreholes to facilitate a hydrogeological assessment by R.J. Burnside & Associates Limited. The remaining boreholes were backfilled with auger cuttings to the ground level.

The location and ground elevation at each borehole or monitoring well location were provided and marked in the field by Jones Consulting Group Ltd., as shown on the Conceptual Borehole Location Plan dated July 10, 2018.

4.0 SUBSURFACE CONDITIONS

The investigation revealed that beneath the topsoil and ploughed soil, the site is underlain by strata of silty sand till and silty clay till, with intermittent layers of sand and silty clay.

Detailed descriptions of the encountered subsurface conditions are presented on the Logs of Boreholes, comprising Figures 1 to 22, inclusive. The revealed stratigraphy is plotted on the Subsurface Profile, Drawing Nos. 2, 3 and 4. The engineering properties of the disclosed soils are discussed herein.

4.1 Topsoil/Ploughed Soil (All Boreholes)

A layer of topsoil or ploughed soil was contacted at the ground surface. The thickness of topsoil ranges from 25 to 38 cm at Boreholes 4, 9, 19 and 21 locations. At the location of Borehole 8, topsoil mixed with organic peat was recorded at 1.7 m in thickness. In the farm field, the ploughed soil extends to a depth of 0.7 to 1.0 m from grade.

The thickness of topsoil and ploughed soil varies across the site. Thicker topsoil or ploughed soil may be contacted beyond the borehole location in the low-lying area.

The topsoil and ploughed soils are dark brown in color and permeated with roots and humus.

They are unstable and compressible, and should be removed for site development. They can only be reused in landscaped areas where future settlement has no consequence.

4.2 **Earth Fill** (Boreholes 2, 5, 7, 14, 16, 18, 19 and 20)

A layer of earth fill was contacted below the topsoil or ploughed soil. The fill extends to depths of 1.1 to 2.8 m from the prevailing ground surface. It consists of a mixture of sand and silt, with clay, gravel, occasional topsoil and organic inclusions.

4.3 **Silty Sand Till** (All Boreholes, except Borehole 9)

Native silty sand till deposit was predominant in the boreholes. It consists of a random mixture of soil particle sizes ranging from clay to gravel, with sand and silt being the predominant fraction. Grain size analyses were performed on 2 representative samples and the results are plotted on Figure 23.

The obtained 'N' values range from 4 to more than 100, with a median of 33 blows per 30 cm of penetration, indicating the relative density of the deposit is loose to very dense, being generally dense. The loose till generally occurs near the ground surface, representing the reworked till or the result of weathering.

Hard resistance to augering was encountered in places, showing cobbles and boulders in the till stratum. Boreholes 4 and 15 were terminated upon refusal to augering on suspected boulder at a depth of 6.9 m and 6.4 m from grade, respectively.

The natural water content of the till samples was determined, and the results are plotted on the Borehole Logs; the values range from 5% to 16%, with a median of 10%, showing moist to very moist conditions.

The engineering properties of the till deposit relating to the project are given below:

- High frost susceptibility with moderate soil-adfreezing potential.
- Moderately low water erodibility.
- Relatively low permeability, with an estimated coefficient of permeability of 10^{-5} to 10^{-6} cm/sec, a percolation rate of 35 to 60 minute/cm, and runoff coefficients of:

Slope	
0% - 2%	0.15

2% - 6%	0.20
6% +	0.28

- Frictional soil, the shear strength is derived from internal friction, thus being density dependent.
- The till will be stable in a relatively steep cut; however, prolonged exposure will allow the sand seams to slough, which may lead to localized sliding.
- A fair pavement-supportive material, with an estimated California Bearing Ratio (CBR) value of 8%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 5000 ohm·cm.

4.4 **Silty Clay** (Boreholes 5, 6, 8, 9, 10 and 11) and **Silty Clay Till** (Borehole 9)

The silty clay deposit was contacted at various depths below the topsoil and peat, ploughed soil or earth fill. It is laminated with sand and silt seams, showing a lacustrine deposit. Grain size analyses were performed on 2 representative samples; the results are plotted on Figure 24.

A deposit of silty clay till was also contacted below the silty clay at Borehole 9 location, at a depth of 4.0 m from grade. The clay till consists of a random mixture of soils, with the clay fraction exerting the dominant influence on the soil properties.

The obtained 'N' values range from 3 to 16 blows per 30 cm of penetration, indicating the consistency of the silty clay is soft to very stiff and the clay till is generally stiff in consistency.

The Atterberg Limits of 2 representative samples of the silty clay were conducted and the results are summarized below:

Borehole No.	**Borehole 8**	**Borehole 9**
Depth	**4.6 m**	**2.3 m**
Liquid Limit	49%	50%
Plastic Limit	25%	25%
Plasticity Index	24%	25%

The above values show that the silty clay is cohesive with medium to high plasticity.
The natural water content of the clay samples were determined in the range of 16% to 37%.

The natural water content of the clay till samples were 11% and 18%. They were generally in moist conditions.

The soft clay stratum may undergo long-term settlement under excessive surcharge loading. Based on the Atterberg Limits and the recorded 'N' values in the soft clay, the Overconsolidation Ratio (OCR) is estimated at 2 to 3. The allowable surcharge at the vicinity of Boreholes 8 and 9 is recommended to limit at 30 kPa.

The following engineering properties of the silty clay and clay till are deduced:

- High frost susceptibility and high soil-adfreezing potential.
- Low water erodibility.

- The high plastic clay is sensitive to moisture changes. It expands or contracts markedly upon changes in water content.
- Very low permeability, with an estimated coefficient of permeability less than 10^{-7} cm/sec, a percolation rate of 80+ minutes/cm and runoff coefficients of:

Slope	
0% - 2%	0.15
2% - 6%	0.20
6% +	0.28

- Cohesive soils, the shear strength is derived from the consistency which is inversely related to the moisture content. The shear strength is also augmented by internal friction.
- In excavation, the clay and clay till will be relatively stable with steep slope.
- A poor pavement-supportive material, with an estimated CBR value of 3% to 6%.
- Moderately high corrosivity to buried metal, with an estimated electrical resistivity of 3000 ohm·cm.

4.5 **Sand** (Boreholes 1, 6, 7, 9, 12, 13, 16, 18, 19, 20 and 22)

The sand deposit was encountered intermittently within the silty sand till or in the lower stratigraphy of boreholes. Sample examinations show that the deposit is either well graded or fine to medium grained, with silt and gravel. Grain size analyses were performed on 2 representative samples; the results are plotted on Figures 25 and 26.

The natural water content values of the sand samples were determined at 5% to 25%. The

collected samples are generated saturated. Due to its perviousness, water could have drained from the samples as they were taken.

The obtained 'N' values range from 7 to 95, with a median of 33 blows per 30 cm of penetration, indicating loose to very dense, generally dense in relative density. The low 'N' values can represent the disturbance by the hydrostatic pressure at the time of drilling and sampling below the saturation level.

The following engineering properties of the sand deposit are deduced:

- High water erodibility.
- Pervious, with an estimated coefficient of permeability of 10^{-3} to 10^{-4} cm/sec, a percolation rate of 10 to 15 minutes/cm and runoff coefficients of:

Slope	
0% - 2%	0.05
2% - 6%	0.10
6% +	0.15

- A frictional soil, the shear strength is derived from its internal friction angle and is soil density dependent.
- In excavation, the sand will slough and run slowly with seepage bleeding from the cut face. It will boil with a piezometric head of 0.3 m.
- A fair pavement-supportive material, with an estimated CBR value of 15%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 6000 ohm·cm.

4.6 **Compaction Characteristics of the Revealed Soils**

The obtainable degree of compaction is primarily dependent on the soil moisture and, to a lesser extent, on the type of compactor used and the effort applied. As a general guide, the typical water content values of the revealed soils for Standard Proctor compaction are presented in Table 1.

Table 1 - Estimated Water Content for Compaction

Soil Type	Determined Natural Water Content (%)	Water Content (%) for Standard Proctor Compaction	
		100% (optimum)	Range for 95% or +
Silty Sand Till	5 to 16 (median 10)	12	7 to 15
Silty Clay/Clay Till	11 to 37 (median 14)	24	20 to 30
Sand	5 to 125	10	5 to 13

Based on the above findings, the majority of the on-site material is suitable for 95% + Standard Proctor compaction. However, the saturated sand and part of the silty clay are generally on the wet side, which will require aeration prior to compaction. Aeration can be achieved by spreading the wet soil thinly on the ground during the dry and warm weather. Saturated sand can also be stockpiled on site to drain the excess water prior to placement and compaction.

In using the earth fill for structural backfill, or in pavement construction, it should be subexcavated, inspected, sorted free of topsoil inclusions and any deleterious materials, and aerated before compaction.

The till and silty clay should be compacted using a heavy-weight kneading-type roller. The sand can be compacted by a smooth drum roller, with or without vibration, depending on the water content of the soil being compacted. The lifts for compaction should be limited to 20 cm, or to a suitable thickness as assessed by test strips performed by the equipment which will be used at the time of construction.

If the compaction of the soils is carried out with the water content within the range for 95% Standard Proctor dry density but on the wet side of the optimum, the surface of the compacted soil mantle will roll under the dynamic compactive load. This is unsuitable for road construction since each component of the pavement structure is to be placed under dynamic conditions which will induce the rolling action of the subgrade surface and cause structural failure of the new pavement.

The foundations or bedding of the sewer and slab-on-grade will be placed on a subgrade which will not be subjected to impact loads. Therefore, the structurally compacted soil

mantle, with the water content on the wet side or dry side of the optimum, will provide an adequate subgrade for the construction.

The presence of boulders will prevent transmission of the compactive energy into the underlying material to be compacted. If an appreciable amount of boulders is mixed with the material, it must either be sorted or must not be used for construction of engineered fill and/or structural backfill.

5.0 GROUNDWATER CONDITIONS

The boreholes were checked for the presence of groundwater or the occurrence of cave-in during and upon completion of the field work. The records are summarized in Table 2.

Table 2 - Groundwater Record upon Completion

Borehole No.	Ground Elevation (m)	Groundwater/Cave-In* Upon Completion	
		Depth (m)	Elevation (m)
1	253.0	1.2/1.8*	251.8/251.2*
2 (MW)	259.6	Dry	below 248.8
3	262.8	4.0/4.6*	258.8/258.2*
4	258.5	6.1	252.4
5	254.9	7.0	247.9
6	253.3	2.4/2.6*	250.9/250.7*
7	252.6	3.0/3.3*	249.6/249.3*
8 (MW)	252.4	Dry	below 245.9
9	252.6	Dry	below 246.1
10 (MW)	252.1	Dry	below 247.1
11	252.1	4.3	247.8
12 (MW)	253.5	4.2	249.3
13	252.1	3.2	248.9
14	250.5	2.4	248.1
15 (MW)	251.5	Dry	below 245.1
16	256.2	3.7/4.3*	252.5/251.9*
17	254.9	2.9/3.0*	252.0/251.9*

Table 2 - Groundwater Record upon Completion (cont'd)

Borehole No.	Ground Elevation (m)	Groundwater/Cave-In* Upon Completion	
		Depth (m)	Elevation (m)
18	256.1	5.5	250.6
19 (MW)	261.2	2.4	258.8
20	264.6	Dry	below 259.6
21	259.5	Dry	below 254.5
22	254.4	1.5/4.3*	252.9/250.1*

Due to the undulation, most of the boreholes located in the high ground are recorded dry upon the completion of drilling.

Free groundwater and/or cave-in were recorded in Boreholes 1, 3 to 7, 11 to 14, 16 to 19, inclusive, and 22, between El. 247.8 m and 258.8 m upon completion of drilling. The groundwater levels appear to drop towards the ditch. It is subject to seasonal fluctuation.

6.0 DISCUSSION AND RECOMMENDATIONS

The investigation revealed that beneath the topsoil and ploughed soil, the site is underlain by strata of loose to very dense silty sand till or stiff silty clay till, with intermittent layers of loose to very dense sand and soft to very stiff silty clay.

Free groundwater and/or cave-in were recorded in most of the boreholes between El. 247.8 m and 258.8 m upon completion of drilling. The groundwater levels appear to drop towards the ditch. It is subject to seasonal fluctuation.

The property will be developed into a residential subdivision of residential lots and townhouse blocks, with stormwater management facilities. The subdivision will consist of municipal services and roadways meeting urban standards. The existing treed areas, however, will be preserved as a natural heritage system.

The geotechnical findings which warrant special consideration are presented below:

1. The topsoil and ploughed soil should be removed for site development. Thicker topsoil or ploughed soil may be contacted beyond the borehole locations in the low-lying area.

In order to prevent overstripping, a diligent control of the stripping operation will be required.

2. The topsoil and ploughed soil can only be used for landscaping and landscape contouring purposes where future settlement has no consequence.
3. The site gradient is undulating, dropping gently towards a ditch bisecting the property in the north-south direction. It is anticipated that the site will be regraded for development.
4. It will be more economical to place an engineered fill for normal footing, sewer and road construction. The site grading should also take into consideration of the high groundwater in the low-lying areas so that the proposed basement structures will not be below the saturation levels. In the vicinity of Boreholes 8 and 9, the additional surcharge should be limited to 1.5 m so that the clay stratum will not be overstressed and long-term settlement will not occur.
5. The native subsoil and the engineered fill are suitable for conventional footing construction. The footing subgrade must be inspected by a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer.
6. Any excavation into the saturated soils will require vigorous pumping from closely spaced sump-wells or well points.
7. A Class 'B' bedding, consisting of compacted 20-mm Crusher-Run Limestone or equivalent, is recommended for the construction of the underground services. In water-bearing sand or in areas where dewatering is necessary, a Class 'A' concrete bedding should be used.

The recommendations appropriate for the project described in Section 2.0 are presented herein. One must be aware that the subsurface conditions may vary between boreholes. Should this become apparent during construction, a geotechnical engineer must be consulted to determine whether the following recommendations require revision.

6.1 **Site Preparation**

The site will be regraded for development. It is generally more economical to place an engineered fill for house footings, underground services and pavement construction.

The design of the site grading plan should consider the high groundwater in the low-lying areas so that the proposed basement structures are not below the saturation levels. In addition, any additional surcharge fill in the vicinity of Boreholes 8 and 9 should be limited to 1.5 m so that the clay stratum is not overstressed and long-term settlement will not occur.

The engineering requirements for a certifiable fill are presented below:

1. All topsoil, ploughed soil and earth fill must be removed and the subgrade must be inspected and proof-rolled prior to any fill placement. Badly weathered soils should also be subexcavated.
2. Inorganic soils must be used for the engineered fill. They must be uniformly compacted in lifts 20 cm thick to 98% or + of their maximum SPDD up to the proposed finished grade. The soil moisture must be properly controlled on the wet side of the optimum. If the foundations are to be built soon after the fill placement, the densification process for the engineered fill must be increased to 100% of the maximum SPDD.
3. If imported fill is to be used, it should be inorganic soils, free of any deleterious material with environmental issue (contamination). Any potential imported earth fill from off site must be reviewed for geotechnical and environmental quality by the appropriate personnel as authorized by the developer or agency, before it is hauled to the site.
4. In areas where significant engineered fill (fill more than 3.0 m) is to be placed, settlement plates must be installed and monitored on a weekly basis to assess any consolidation progress in the fill and the underlying strata. No construction of site services or house foundations can commence in these areas until the settlement records have confirmed that the settlement is reduced to a tolerable level and there is no risk of long-term settlement. Where the readings remain the same for a period of 3 consecutive months, no further monitoring will be required and there is no risk for long-term settlement. The settlement of the engineered fill is anticipated to be reduced to a tolerable limit of 25 mm.
5. If the engineered fill is to be left over the winter months, adequate earth cover, or equivalent, must be provided for protection against frost action.
6. The engineered fill must extend over the entire graded area; the engineered fill envelope and the finished elevations must be clearly and accurately defined in the field, and must be precisely documented by qualified surveyors.
7. The engineered fill must not be placed during the period from late November to early April, when freezing ambient temperatures occur either persistently or intermittently. This is to ensure that the fill is free of frozen soils, ice and snow.
8. Where the ground is wet due to subsurface water seepage, an appropriate subdrain scheme must be implemented prior to the fill placement, particularly if it is to be carried out on sloping ground.
9. Where the fill is to be placed on a bank steeper than 1 vertical (V):

3 horizontal (H) , the face of the bank must be flattened to 3+ so that it is suitable for safe operation of the compactor and the required compaction can be obtained.

10. The fill operation must be inspected on a full-time basis by a technician under the direction of a geotechnical engineer. In this case, the effect of long-term settlement is expected to be negligible as the fill material will be compacted to achieve an appropriate strength and capacity for structural support.
11. The footing and underground services subgrade must be inspected by the geotechnical consulting firm that inspected the engineered fill placement. This is to ensure that the foundations are placed within the engineered fill envelope, and the integrity of the fill has not been compromised by interim construction, environmental degradation and/or disturbance by the footing excavation.
12. Once the engineered fill is certified, any excavation carried out in the certified fill area must be reported to the geotechnical consultant who inspected the fill placement, in order to document the locations of excavation and/or to inspect reinstatement of the excavated areas to engineered fill status. If construction on the engineered fill does not commence within a period of 2 years from the date of certification, the status must be assessed for re-certification.
13. Despite stringent control in the placement of engineered fill, variations in soil type and density may occur in the engineered fill. Therefore, the strip footings and the upper section of the foundation walls constructed on the engineered fill may require continuous reinforcement with steel bars, depending on the uniformity of the soils in the engineered fill and the thickness of the engineered fill underlying the foundations. Should the footings and/or walls require reinforcement, the required number and size of reinforcing bars must be assessed by considering the uniformity as well as the thickness of the engineered fill beneath the foundations. In sewer construction, the engineered fill is considered to have the same structural proficiency as a natural inorganic soil.

6.2 **Foundations**

Conventional footings are recommended for the proposed structures. They should be placed onto the sound natural soils or engineered fill. The requirements for engineered fill construction are discussed in Section 6.1 above. The recommended soil bearing pressures for use in the design of conventional strip and spread footings, are given below:

- Maximum Allowable Bearing Pressure (SLS) = 100 kPa
- Factored Ultimate Bearing Pressure (ULS) = 150 kPa

The total and differential settlements of footings are estimated at 25 mm and 20 mm, respectively.

Higher design bearing pressures are available in some particular areas for special structures, if necessary. They can be reviewed individually by the geotechnical engineers once the design of the development is finalized. Additional boreholes may be required to verify the soil capacity for the design of these structures.

One must be aware that the recommended bearing pressures are given as a guide for foundation design and the footing subsoil must be confirmed by a geotechnical engineer at the time of construction.

If groundwater seepage is encountered during excavation, or where the subgrade of the footing is water bearing, the subgrade should be protected by a concrete mud-slab immediately after exposure. This will prevent construction disturbance and costly rectification.

Footings exposed to weathering, or in unheated areas, should have at least 1.5 m of earth cover for protection against frost action.

The building foundation must meet the requirements specified in the latest Ontario Building Code. As a guide, the structure should be designed to resist an earthquake force using Site Classification 'D' (stiff soil).

6.3 **Basement and Slab-On-Grade**

The basement floor should be at a depth at least 0.5 m above the highest groundwater level. The soil parameters outlined in Section 6.9 can be used for calculating the lateral earth pressure imposed on the basement walls.

In conventional design, perimeter subdrains and dampproofing of the foundation walls will be required in order to provide a dry basement. All the subdrains should be encased in a fabric filter to protect them against blockage by silting.

If the basement floor is less than 1.0 m above the highest detected groundwater elevation, underfloor subdrains should be provided in the granular bedding below the basement floor. The subdrains should be connected to the drainage or sump pits where water can be removed.

In addition, vapour barrier of 6 mil polyethylene sheet should be placed above the granular bedding to alleviate wetting of the basement floor due to moisture upfiltration. A typical design of the bedding and the under-floor weepers is provided in Drawing No. 5.

The slab should be constructed on a granular base of 20 cm thick, consisting of 20-mm Crusher-Run Limestone, or equivalent, compacted to 100% of its maximum SPDD. Where under-floor weepers are required, the thickness of bedding should be increased to 30 cm.

The subgrade for slab-on-grade must consist of sound natural soil or properly compacted inorganic engineered fill. The subgrade should be inspected and assessed by proof-rolling prior to slab-on-grade construction. Where the subgrade consists of soft or weathered soils, it should be subexcavated, sorted free of topsoil inclusions, if any, aerated and uniformly compacted to 98% or + of its maximum Standard Proctor dry density.

6.4 Underground Services

The subgrade for underground services should consist of natural soils or engineered fill. In areas where the subgrade consists of unsuitable material, it should be subexcavated and replaced with properly compacted inorganic soil and/or bedding material compacted to at least 95% + Standard Proctor dry density.

Excavation for service trenches must be carried out in accordance with Ontario Regulation 213/91. In areas where a vertical cut is necessary, the use of a trench box is necessary. The recommended lateral earth pressure coefficients presented in Section 6.9 can be used for the design of trench box or shoring.

A Class ‘B’ bedding is recommended for construction of the underground services. The bedding material should consist of compacted 20-mm Crusher-Run Limestone, or equivalent, as approved by a geotechnical engineer. Where saturated soils are present or extensive dewatering is required, a Class ‘A’ bedding will likely be required, and the pipe joints should be leak-proof or wrapped with a waterproof membrane.

In order to prevent pipe floatation when the sewer trench is deluged with water, a soil cover with a thickness equal to two times the diameter of the pipe should be in place at all times after completion of the pipe installation.

The pipes connecting into manholes and catch basins must be connected by leak-proof joints to prevent subgrade upfiltration through the joints. Openings to subdrains and catch basins should be shielded with a fabric filter to prevent blockage by silting.

The underground services should be protected against soil corrosion. For estimation of anode weight requirements, the estimated electrical resistivity of 4500 ohm·cm can be used. This should be confirmed by testing the soil along the water main alignment at the time of construction.

6.5 Backfilling in Trenches and Excavated Areas

The backfill in service trenches should be compacted to at least 95% of the maximum Standard Proctor dry density (SPDD). In the zone within 1.0 m below the road subgrade, the material should be compacted with the water content 2% to 3% drier than the optimum; and the compaction should be increased to 98% of the respective maximum SPDD to provide the required stiffness for road construction.

In normal construction practice, the problem areas of settlement largely occur adjacent to foundation walls, columns, manholes, catch basins and services crossings. In areas which are inaccessible to a heavy compactor, sand backfill should be used. Unless compaction of the backfill is carefully performed, settlement will occur. Often, the interface of the native soils and sand backfill will have to be flooded for a period of several days.

Narrow trenches for services crossings should be cut at 1V:2H, so that the backfill in the trenches can be effectively compacted. Otherwise, soil arching in the trenches will prevent the achievement of proper compaction. The lift of each backfill layer should be limited to a thickness of 20 cm.

One must be aware of possible consequences during trench backfilling and exercise caution as described below:

- When construction is carried out in freezing winter weather, allowance should be made for these following conditions. Despite stringent backfill monitoring, frozen soil layers may inadvertently be mixed with the structural trench backfill. Should the in situ soil have a water content on the dry side of the optimum, it would be impossible to wet the soil due to the freezing condition, rendering difficulties in obtaining uniform and proper compaction. Furthermore, the freezing condition will prevent flooding of the backfill

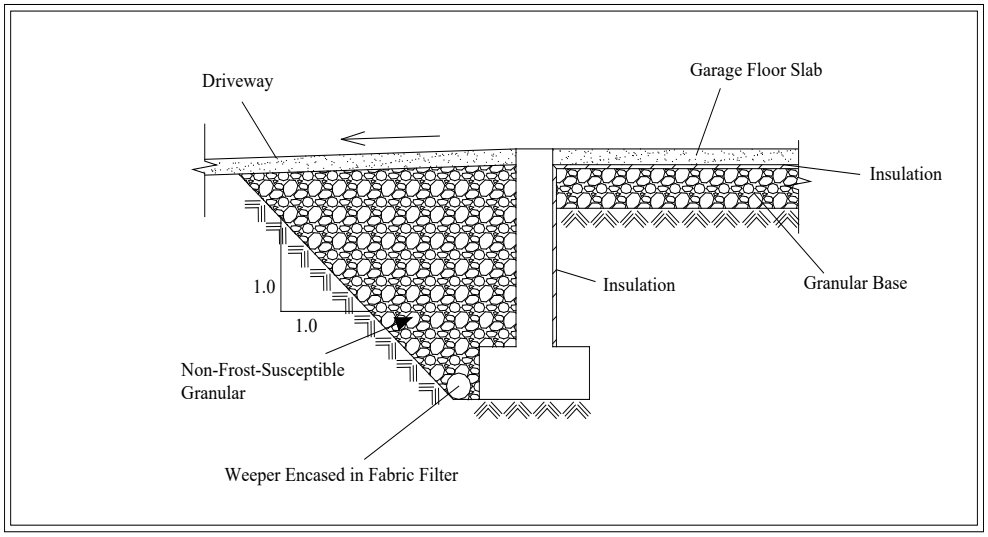
when it is required, such as when the trench box is removed. The above will invariably cause backfill settlement that may become evident within 1 to several years, depending on the depth of the trench which has been backfilled.

- In areas where the underground services construction is carried out during winter months, prolonged exposure of the trench walls will result in frost heave within the soil mantle of the walls. This may result in some settlement as the frost recedes, and repair costs will be incurred prior to final surfacing of the new pavement.
- To backfill a deep trench, one must be aware that future settlement is to be expected, unless the side of the cut is flattened to at least 1V:1.5+H, and the lifts of the fill and its moisture content are stringently controlled; i.e., lifts should be no more than 20 cm (or less if the backfilling conditions dictate) and uniformly compacted to achieve at least 95% of the maximum SPDD, with the moisture content on the wet side of the optimum.
- It is often difficult to achieve uniform compaction of the backfill in the lower vertical section of a trench which is an open cut or is stabilized by a trench box, particularly in the sector close to the trench walls or the sides of the box. These sectors must be backfilled with sand. In a trench stabilized by a trench box, the void left after the removal of the box will be filled by the backfill. It is necessary to backfill this sector with sand, and the compacted backfill must be flooded for 1 day, prior to the placement of the backfill above this sector, i.e., in the upper sloped trench section. This measure is necessary in order to prevent consolidation of inadvertent voids and loose backfill which will compromise the compaction of the backfill in the upper section. In areas where groundwater movement is expected in the sand fill mantle, anti-seepage collars should be provided.

6.6 **Garages, Driveways and Landscaping**

The subgrade soils can be frost susceptible. The ground is expected to heave during the freezing season. In order to minimize frost heaving, the driveway at the entrance to the garage should be backfilled with non-frost-susceptible granular material, with a frost taper at a slope of 1V:1H. The garage floors and the interior of the foundation walls should be insulated by 50-mm Styrofoam (or its equivalent), or a Granular ‘B’ backfill should be used for the garage construction. The recommended scheme is illustrated in Diagram 1.

Diagram 1 - Frost Protection Measures (Garage)



The slab-on-grade or sidewalk in open areas should be designed to tolerate frost heave. The grading around the slab-on-grade and house structures must be such that it directs runoff away from the structures. In areas where ground movement due to frost heave cannot be tolerated, the slab-on-grade or sidewalks must be constructed on a free-draining granular base, 0.3 to 1.5 m thick, depending on the degree of tolerance for settlement. These measures, with proper drainage, will prevent water from accumulating in the granular base. Alternatively, they can be insulated with 50-mm Styrofoam, or equivalent.

6.7 **Pavement Design**

The recommended pavement design for local roads and collectors is presented in Table 3.

Table 3 - Pavement Design

Course	Thickness (mm)	OPS Specifications
Asphalt Surface	40	HL-3
Asphalt Binder Local Roads Collectors	 50 65	HL-8
Granular Base	150	OPSS Granular ‘A’ or equivalent
Granular Sub-base Local Roads Collectors	 300 400	OPSS Granular ‘B’ or equivalent

In preparation of road subgrade, the topsoil, ploughed soil and compressible earth fill must be removed. Any new fill should consist of organic free material, compacted to 95% + Standard Proctor dry density. In the zone within 1.0 m below the pavement subgrade, the backfill should be compacted to at least 98% of the Standard Proctor dry density, with the water content 2% to 3% drier than the optimum. The final subgrade should be inspected and proof-rolled. Any soft spots should be subexcavated, and replaced by properly compacted inorganic earth fill.

All the granular bases should be compacted to the maximum Standard Proctor dry density.

The pavement subgrade will suffer a strength regression if water is allowed to infiltrate prior to paving. The following measures should therefore be incorporated into the construction and road design:

- If road construction does not immediately follow the trench backfilling, the subgrade should be properly crowned and smooth-rolled to allow interim precipitation to be properly drained.
- Lot areas adjacent to the road structure should be properly graded to prevent the ponding of large amounts of water during the interim construction period.
- If the road is to be constructed during the wet seasons and extremely soft subgrade occurs, the granular sub-base may require thickening. This can be further assessed during construction.
- Fabric filter-encased curb subdrains are required to meet the Municipal road requirements.

6.8 **Stormwater Management Facilities** (Boreholes 1, 7, 8, 9, 10, 11, 14 and 15)

Stormwater management facilities are considered at various locations. In areas where permeable sand layers are evident, an imperable liner will be required. Any hydrostatic pressure below the pond liner should also be established to design the thickness of liner to overcome any basal heaving at the time the pond is emptied for maintenance.

The presence of soft and firm clay stratum in the vicinity of Boreholes 8 and 9 will have no significant adverse impact to the performance of the pond.

For the construction of earth berm and access road, topsoil must be removed and the subgrade must be proof-rolled. Inorganic on-site material can be used, compacted to at least

98% of the Standard Proctor dry density. A 300 mm granular course, consisting of 50-mm Crusher-Run Limestone, topped with 50 mm of limestone screening, should be provided on the access road.

The preparation of bearing subsoil and the design soil capacities listed in Sections 6.1 and 6.2 can be used for the design of control structures. The inlet and outlet of the pond must be lined with gabion mats for protection against scouring.

6.9 Soil Parameters

The recommended soil parameters for the project design are given in Table 4.

Table 4 - Soil Parameters

Unit Weight and Bulk Factor	**Unit Weight (kN/m^3)**		**Estimated Bulk Factor**	
	Bulk	**Submerged**	**Loose**	**Compacted**
Sound Tills	22.0	12.0	1.33	1.05
Silty Clay	21.0	11.0	1.30	1.00
Sand	20.5	12.5	1.25	1.05
Lateral Earth Pressure Coefficients		**Active K_a**	**At Rest K_o**	**Passive K_p**
Sound Tills/Sand		0.35	0.50	3.00
Silty Clay		0.40	0.60	2.50
Coefficients of Friction				
Between Concrete and Granular Base			0.50	
Between Concrete and Sound Native Soils			0.35	

6.10 Excavation

Excavation should be carried out in accordance with Ontario Regulation 213/91. For excavation purposes, the types of soils are classified in Table 5.

Table 5 - Classification of Soils for Excavation

Material	Type
Sound Till and Clay	2
Drained Sand and Silt	3
Saturated Soils	4

Free groundwater and/or cave-in were recorded in Boreholes 1, 3 to 7, 11 to 14, 16 to 19, inclusive, and 22, between El. 247.8 m and 258.8 m upon completion of drilling. The groundwater levels appear to drop towards the ditch. It is subject to seasonal fluctuation.

In excavation, groundwater yield from the till and clay will be slow in rate and limited in quantity. Where the excavation extends into saturated sand layers, the possibility of flowing sides dictates that the ground should be predrained by vigorous pumping from closely spaced sump wells, or if necessary, by a well point dewatering system.

Prospective contractors can be asked to assess the in situ subsurface conditions for soil cuts by digging test pits to at least 0.5 m below the sewer subgrade. These test pits should be allowed to remain open for a period of at least 4 hours to assess the trenching conditions.

7.0 LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of Lockhart and Lockhart II, for review by the designated consultants, financial institutions and government agencies. Use of this report is subject to the conditions and limitations of the contractual agreement.

The material in the report reflects the judgment of Nislin Andani, B.Eng., and Bennett Sun, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

SOIL ENGINEERS LTD.

Nislin Andani, B.Eng.

Bennett Sun, P.Eng.
NA/BL:dd



LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS Auger sample
CS Chunk sample
DO Drive open (split spoon)
DS Denison type sample
FS Foil sample
RC Rock core (with size and percentage recovery)
ST Slotted tube
TO Thin-walled, open
TP Thin-walled, piston
WS Wash sample

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '—●—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as '○'

WH Sampler advanced by static weight
PH Sampler advanced by hydraulic pressure
PM Sampler advanced by manual pressure
NP No penetration

SOIL DESCRIPTION

Cohesionless Soils:

'N' (blows/ft)	Relative Density
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

Cohesive Soils:

Undrained Shear Strength (ksf)	'N' (blows/ft)	Consistency
less than 0.25	0 to 2	very soft
0.25 to 0.50	2 to 4	soft
0.50 to 1.0	4 to 8	firm
1.0 to 2.0	8 to 16	stiff
2.0 to 4.0	16 to 32	very stiff
over 4.0	over 32	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

☐ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres
1lb = 0.454 kg
1 inch = 25.4 mm
1ksf = 47.88 kPa

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 1 **FIGURE NO.:** 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 4, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
253.0	Ground Surface							
0.0	**PLOUGHED SOIL**	1A 1B	DO	18	0		31 27	
252.3	brown sandy silt with topsoil inclusions Frost							
0.7	Brown, loose to compact	2	DO	5	1		11	
	SILTY SAND TILL some clay, trace of gravel occ. sand seams and layers, cobbles and boulders	3	DO	20	2		12	
		4	DO	29			8	
250.1					3			
2.9	Brown, loose to dense	5	DO	8			15	
	SAND well graded some gravel, some to silty occ. silt and clay seams below 6 m	6	DO	32	4		11	
		7	DO	12	5		12	
245.8					6			
7.2	Brown, compact	8	DO	18	7		10	
	SILTY SAND TILL some clay, trace gravel occ. cobbles and boulders	9	DO	17	8		12	
243.5					9			
9.5	**END OF BOREHOLE**				10			
					11			
					12			

W.L @ EL. 251.8 m on completion
Cave-in @ El. 251.2 m

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: BH/MW 2 **FIGURE NO.:** 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 1, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.6	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	27	0
258.9	brown sandy silt with topsoil inclusions — Frost				
0.7	**EARTH FILL**	2	DO	6	1
	brown sandy silt some clay and gravel, some organic inclusions	3	DO	5	2
257.4					
2.2	Very dense	4		50/NP	
	SILTY SAND TILL trace to some clay, trace gravel occ. cobbles and boulders	5	DO	68	3
	— brown grey	6	DO	50/15	4
		7	DO	41	5
		8	DO	50/15	6
	Installed 50mm Ø monitoring well to 10.7 m 3.0 m screen from 7.6 to 10.7 m Sand backfill from 7.0 to 10.7 m Bentonite seal from 0.0 to 7.0 m Provided with a 4x4 steel casing	9	DO	53	7
					8
					9
248.8		10	DO	50/15	10
10.8	**END OF BOREHOLE**				11
					12

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 3 **FIGURE NO.:** 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 4, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
262.8	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	35	0
262.1	brown sandy silt with topsoil inclusions Frost				
0.7	Brown, loose to very dense	2	DO	8	1
	SILTY SAND TILL trace of clay and gravel occ. sand and clay layers, cobbles and boulders	3	DO	16	2
		4A 4B	DO	28	
		5	DO	43	3
		6	DO	48	4 5
		7	DO	50/15	6
255.8		8	DO	60/15	7
7.0	**END OF BOREHOLE**				8 9 10 11 12

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

31 18 10 12 12 16 8 11 11 9

WATER LEVEL

W.L @ EL. 258.8 m on completion
Cave-in @ El. 258.2 m

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 4 **FIGURE NO.:** 4

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 4, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
258.5	Ground Surface							
0.0	**38 cm TOPSOIL**	1A 1B	DO	15	0		37	
	Compact to very dense — Frost						13	
	SILTY SAND TILL trace to some clay, trace gravel occ. cobbles and boulders	2	DO	11	1		11	
		3	DO	29	2		10	
	brown grey	4	DO	33			7	
		5	DO	73	3		6	
		6	DO	50/15	4		6	
		7	DO	72	5		7	
251.6					6			
6.9	**END OF BOREHOLE** **Refusal to augering on propable boulder**				7			
					8			
					9			
					10			
					11			
					12			

W.L @ EL. 252.4 m on completion

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 5 **FIGURE NO.:** 5

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 5, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
254.9	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	32	0
254.2	brown silty sand — Frost				
0.7					
253.7	**EARTH FILL**	2	DO	22	1
1.2	brown sand and clay scattered topsoil				
	Brown, stiff	3	DO	12	2
	SILTY CLAY occ. sand seams	4	DO	12	
		5	DO	15	3
251.4					
3.5	Grey, compact to dense				4
	SILTY SAND TILL trace to some clay, trace gravel occ. cobbles and boulders	6	DO	14	5
		7	DO	35	6
		8	DO	20	7
246.8					8
8.1	**END OF BOREHOLE**				9
					10
					11
					12

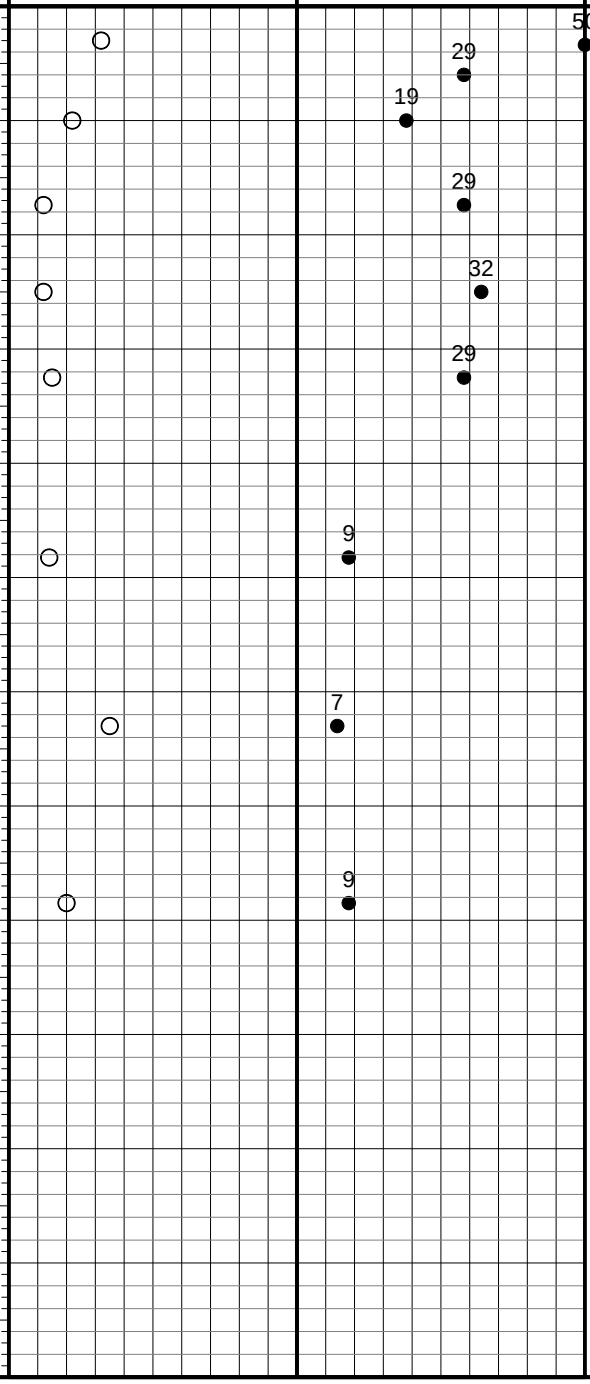
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL

W.L @ EL. 247.9 m on completion

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JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 6 **FIGURE NO.:** 6

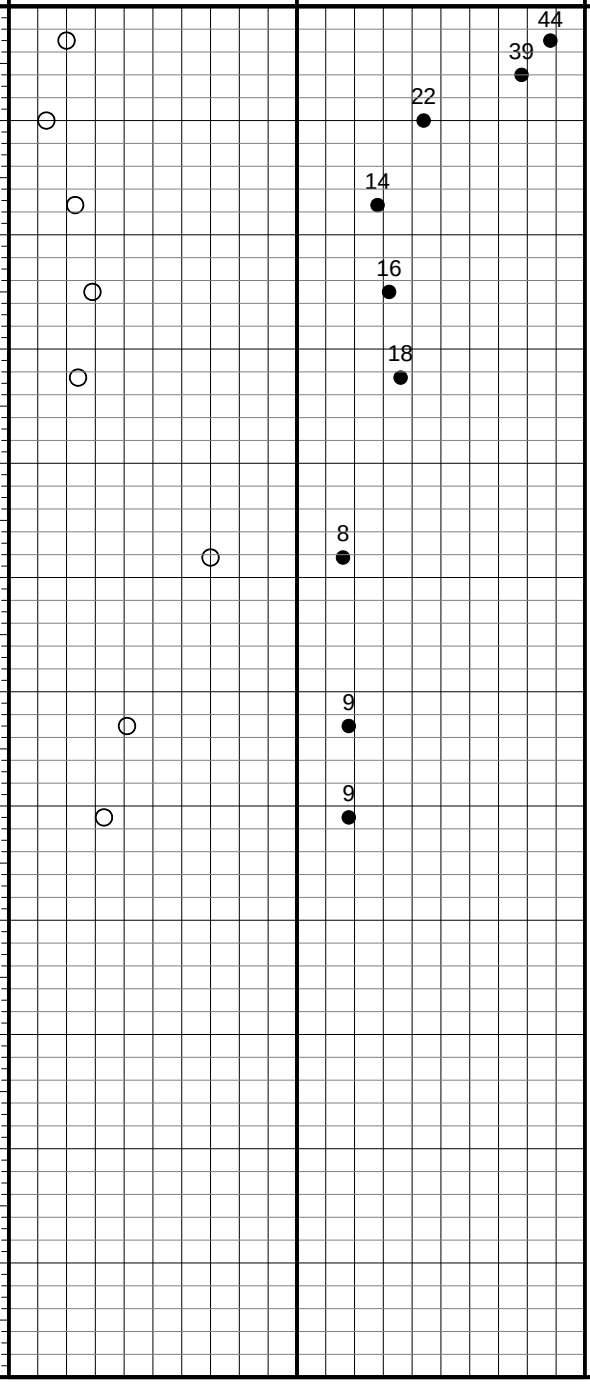
PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 5, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
253.3	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	20	0
252.6 / 0.7	brown sandy silty with topsoil inclusions Frost Brown, stiff	2	DO	13	1
251.9 / 1.4	**SILTY CLAY** occ. sand seams Brown, compact	3	DO	23	2
251.1 / 2.2	**SILTY SAND TILL** trace of clay and gravel occ. sand layers, cobbles and boulders Brown, compact	4	DO	29	
	SAND fine to medium grained, some silt trace of fine gravel	5	DO	24	3
249.3 / 4.0	Dense to very dense				4
	SILTY SAND TILL trace of clay and gravel occ. cobbles and boulders	6	DO	70	5
	brown / grey	7	DO	41	6
246.0 / 7.3	**END OF BOREHOLE**	8	DO	33	7
					8
					9
					10
					11
					12



WATER LEVEL

W.L @ EL. 250.9 m on completion
Cave-in @ El. 250.7 m

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 7 **FIGURE NO.:** 7

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 28, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
252.6	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	21	0
251.9	brown silty sand with topsoil inclusions Frost				
0.7	**EARTH FILL**	2	DO	8	1
	brown to grey silty clay some sand and gravel trace organics	3	DO	13	2
249.8		4	DO	7	
2.8	Brown, compact				3
	SILTY SAND TILL trace to some clay, trace gravel occ. sand seams and layers, cobbles and boulders	5	DO	24	
		6	DO	30	4
		7	DO	20	5
245.9					6
6.7	Grey, compact	8	DO	18	
245.3	**SAND**				7
7.3	fine to medium grained trace of gravel and clay				
	END OF BOREHOLE				8
					9
					10
					11
					12

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

Moisture values: 37, 16, 14, 10, 12, 7, 12, 10, 12

WATER LEVEL

W.L @ EL. 249.6 m on completion
Cave-in @ El. 249.3 m

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: BH/MW 8 **FIGURE NO.:** 8

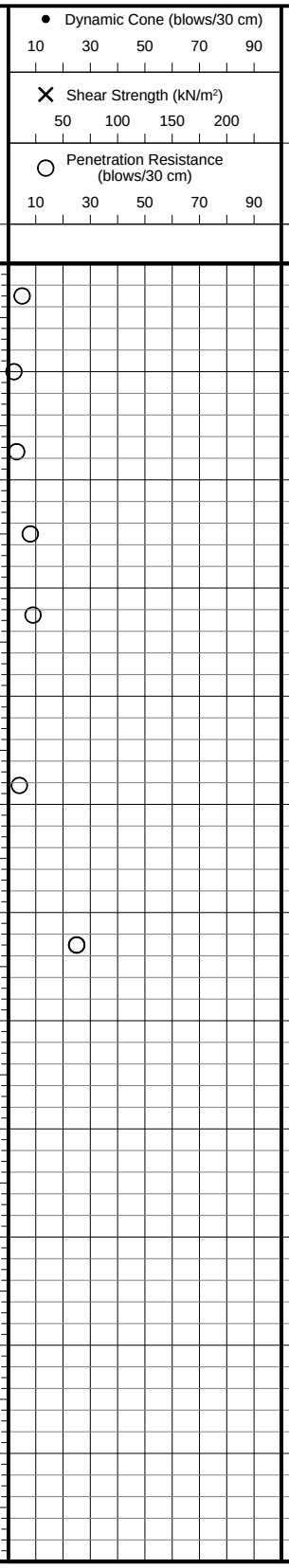
PROJECT DESCRIPTION: Proposed Residential Development

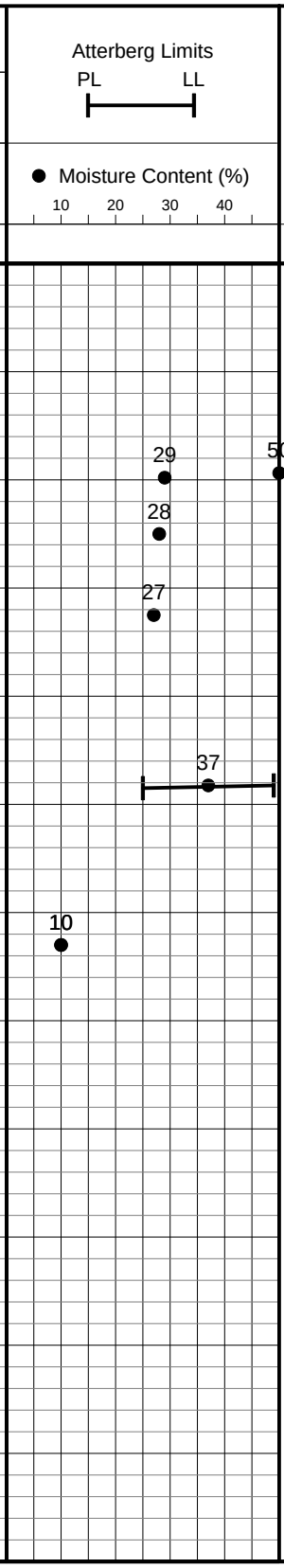
METHOD OF BORING: Flight-Auger Hollow Stem

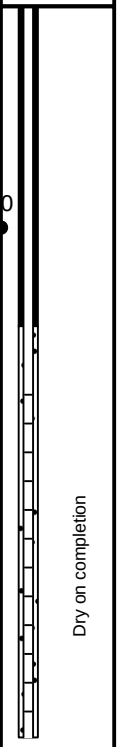
PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 5, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
252.4	Ground Surface				
0.0	**TOPSOIL AND PEAT** occ. wood chips	1	DO	5	0
		2	DO	2	1
250.7 1.7	Grey, soft to stiff **SILTY CLAY** occ. sand seams and layers	3A 3B	DO	3	2
		4	DO	8	
		5	DO	9	3
					4
		6	DO	4	5
246.4 6.0	Grey, compact	7	DO	25	6
245.9 6.5	**SILTY SAND TILL** trace clay and gravel occ. cobbles and boulders				7
	END OF BOREHOLE Installed 50mm Ø monitoring well to 6.4 m 3.0 m screen from 3.4 to 6.4 m Sand backfill from 2.8 to 6.4 m Bentonite seal from 0.0 to 2.8 m Provided with a 4x4 steel casing				8 9 10 11 12







Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 9 **FIGURE NO.:** 9

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: March 5, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
252.6	Ground Surface							
0.0	**30 cm TOPSOIL**	1A 1B	DO	8	0		50	
	Brown, loose						25	
251.7	**SAND**						19	
0.9	weathered	2A 2B	DO	10	1		16	
	fine grained, some silt							
	Firm to stiff	3	DO	6			19	
	SILTY CLAY				2			
	occ. sand seams and layers — brown / grey	4	DO	5			34	
		5	DO	5	3		17	
248.6								
4.0	Grey, stiff				4			
	SILTY CLAY TILL							
	trace of gravel	6	DO	9	5		18	
	occ. sand seams and layers, cobbles and boulders							
					6			
		7	DO	12			11	
246.1								
6.5	**END OF BOREHOLE**				7			
					8			
					9			
					10			
					11			
					12			

Dry on completion

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: BH/MW 10 **FIGURE NO.:** 10

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 26, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
252.1	Ground Surface							
0.0	**PLOUGHED SOIL** brown sand and silt with topsoil inclusions — Frost	1A 1B	DO	22	0		42	
251.2							27	
0.9	Brown, very stiff	2A 2B	DO	9	1		20 32	
	SILTY CLAY occ. sand seams and layers	3	DO	16	2		30	
250.0								
2.1	Grey, compact to very dense	4	DO	12			10	
	SILTY SAND TILL trace to some clay, trace gravel occ. cobbles and boulders	5	DO	13	3		9	
					4			
247.1		6	DO	54	5		10	
5.0	**END OF BOREHOLE** Installed 50mm Ø monitoring well to 4.6 m 3.0 m screen from 1.6 to 4.6 m Sand backfill from 1.0 to 4.6 m Bentonite seal from 0.0 to 1.0 m Provided with a 4x4 steel casing				6			Dry on completion
					7			
					8			
					9			
					10			
					11			
					12			

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 11 **FIGURE NO.:** 11

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 26, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
252.1	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	20	0
251.4	brown silty sand with topsoil inclusions Frost				
0.7	Brown, compact	2	DO	10	1
	SILTY CLAY occ. sand seams and layers				
250.3		3A 3B	DO	6	2
1.8	Grey, loose to dense				
	SILTY SAND TILL trace of gravel, some clay occ. sand seams and layers, cobbles and boulders	4	DO	18	3
		5	DO	20	4
		6	DO	29	5
	boulder	7	DO	30/NP	6
244.8		8	DO	42	7
7.3	**END OF BOREHOLE**				8
					9
					10
					11
					12

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

40 42 28 25 14 12 8 11 9 8

WATER LEVEL

W.L @ EL. 247.8 m on completion

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: BH/MW 12 **FIGURE NO.:** 12

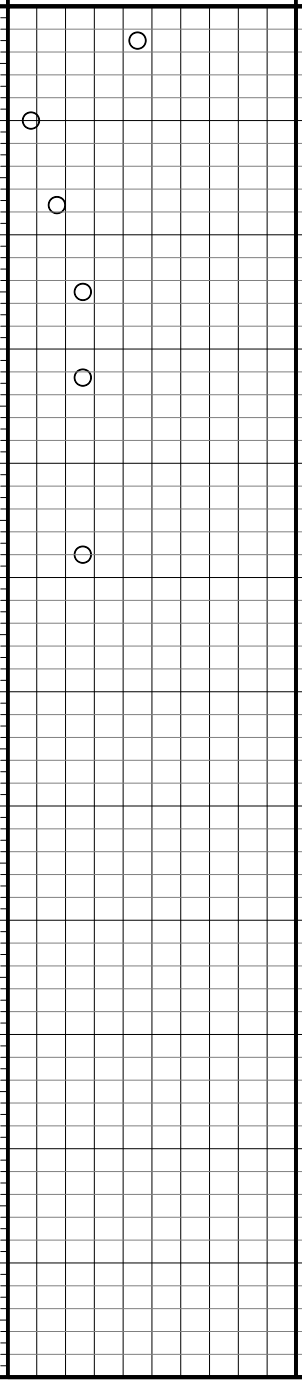
PROJECT DESCRIPTION: Proposed Residential Development

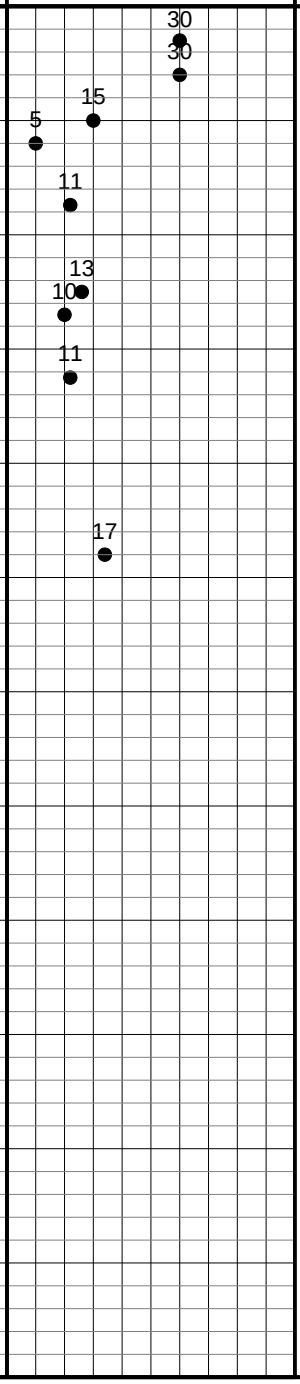
METHOD OF BORING: Flight-Auger Hollow Stem

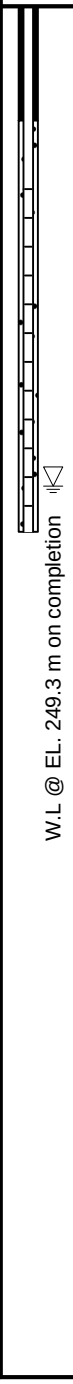
PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 27, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
253.5 / 0.0	Ground Surface				0
	PLOUGHED SOIL brown silty sand with topsoil inclusions _Frost_	1A 1B	DO	45	
252.5 / 1.0	Brown, loose to compact	2A 2B	DO	8	1
	SILTY SAND TILL trace of clay, some gravel occ. sand layers, cobbles and boulders	3	DO	17	2
		4A 4B	DO	26	
		5	DO	26	3
249.5 / 4.0	Brown, compact				4
	SAND fine to medium grained, some silt to silty	6	DO	26	
248.5 / 5.0	**END OF BOREHOLE** Installed 50mm Ø monitoring well to 4.6 m 3.0 m screen from 1.6 to 4.6 m Sand backfill from 1.0 to 4.6 m Bentonite seal from 0.0 to 1.0 m Provided with a 4x4 steel casing				5
					6
					7
					8
					9
					10
					11
					12







Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 13 **FIGURE NO.:** 13

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 27, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
252.1	Ground Surface							
0.0 / 251.4	**PLOUGHED SOIL** brown silty sand Frost	1A 1B	DO	22	0		23 23	
0.7	Brown, loose to dense	2	DO	9	1		10	
	SILTY SAND TILL trace of clay and gravel occ. sand layers, cobbles and boulders	3	DO	22	2		8	
249.6		4	DO	38			10	
2.5	Brown, compact							
248.3	**SAND** fine to medium grained trace of gravel occ. cobbles	5	DO	16	3		19	▽ W.L @ EL. 248.9 m on completion
3.8	Brown, dense				4			
247.1	**SILTY SAND TILL** trace of clay and gravel occ. cobbles and boulders	6	DO	39	5		8	
5.0	**END OF BOREHOLE**				6			
					7			
					8			
					9			
					10			
					11			
					12			

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 14 **FIGURE NO.:** 14

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 27, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
250.5	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	20	0
249.8	brown silty sand — Frost				
0.7	**EARTH FILL**	2	DO	4	1
	brown sand and clay				
	scattered topsoil	3	DO	4	2
248.4					
2.1	Brown, dense to very dense				
	SILTY SAND TILL	4	DO	36	3
	trace to some clay, trace gravel				
	occ. sand layers, cobbles and boulders	5	DO	30	4
		6	DO	85	5
		7	DO	50/15	6
		8	DO	55/15	7
242.6					8
7.9	**END OF BOREHOLE**				9
					10
					11
					12

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

Moisture Content values: 32, 31, 19, 18, 9, 9, 11, 9, 8

WATER LEVEL

W.L @ EL. 248.1 m on completion

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: BH/MW 15 **FIGURE NO.:** 15

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 28, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
251.5	Ground Surface							
0.0	**PLOUGHED SOIL**	1A 1B	DO	19	0		47	
250.8	brown silty sand Frost						12	
0.7	Brown, dense to very dense						12	
	SILTY SAND TILL	2	DO	4	1			
	trace of clay and gravel						13	
	occ. cobbles and boulders	3	DO	5	2			
		4	DO	10			13	
		5	DO	13	3		14	
					4			
		6	DO	38	5		8	
					6			
245.1		7	DO	50/NP				
6.4	**END OF BOREHOLE** **Refusal to augering on probable boulder**				7			
	Installed 50mm Ø monitoring well to 6.0 m				8			
	3.0 m screen from 3.0 to 6.0 m				9			
	Sand backfill from 2.4 to 6.0 m				10			
	Bentonite seal from 0.0 to 2.4 m				11			
	Provided with a 4x4 steel casing				12			Dry on completion

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 16 **FIGURE NO.:** 16

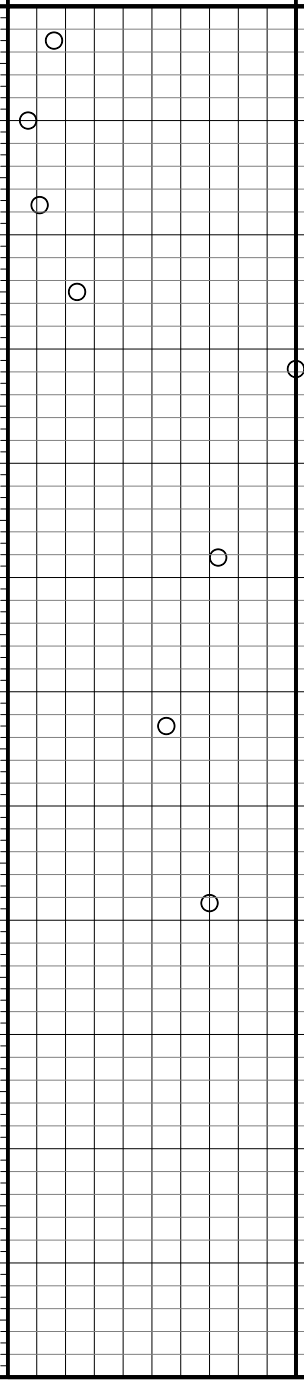
PROJECT DESCRIPTION: Proposed Residential Development

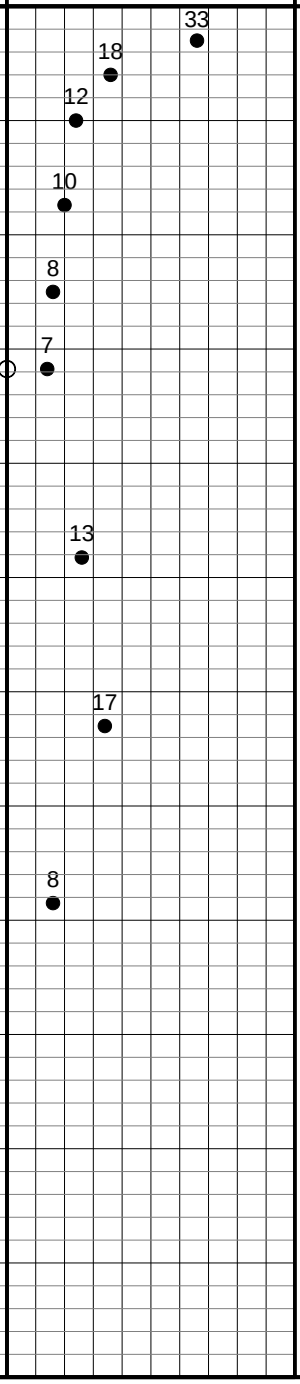
METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 28, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
256.2	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	16	0
255.5	brown silty sand — Frost				
0.7	**EARTH FILL**	2	DO	7	1
	brown sand and clay				
	scattered topsoil				
254.5					
1.7	Brown, compact to very dense	3	DO	11	2
	SILTY SAND TILL				
	trace of clay and gravel	4	DO	24	
	occ. cobbles and boulders				
		5	DO	50/15	3
252.3					
3.9	Brown, very dense				4
	SAND				
	fine to medium grained	6	DO	73	
	trace of gravel				5
	occ. cobbles				
		7	DO	55	6
249.2					
7.0	Brown, very dense				7
	SILTY SAND TILL				
	trace of clay and gravel	8	DO	70	
248.1	occ. cobbles and boulders				8
8.1	**END OF BOREHOLE**				9
					10
					11
					12





WATER LEVEL

W.L @ EL. 252.5 m on completion
Cave-in @ El. 251.9 m

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 17 **FIGURE NO.:** 17

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 28, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
254.9	Ground Surface							
0.0	**PLOUGHED SOIL**	1A 1B	DO	22	0			
254.2	brown silty sand Frost							
0.7	Brown, loose to very dense							
	SILTY SAND TILL	2	DO	8	1			
	trace of clay and gravel							
	occ. sand layers, cobbles and boulders	3	DO	12	2			
		4	DO	28				
		5	DO	24	3			
					4			
250.0		6	DO	50/15				
4.9	**END OF BOREHOLE**				5			
					6			
					7			
					8			
					9			
					10			
					11			
					12			

Moisture Content (%): 40, 23, 12, 12, 9, 10, 8

W.L @ EL. 252 m on completion
Cave-in @ El. 251.9 m

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 18 **FIGURE NO.:** 18

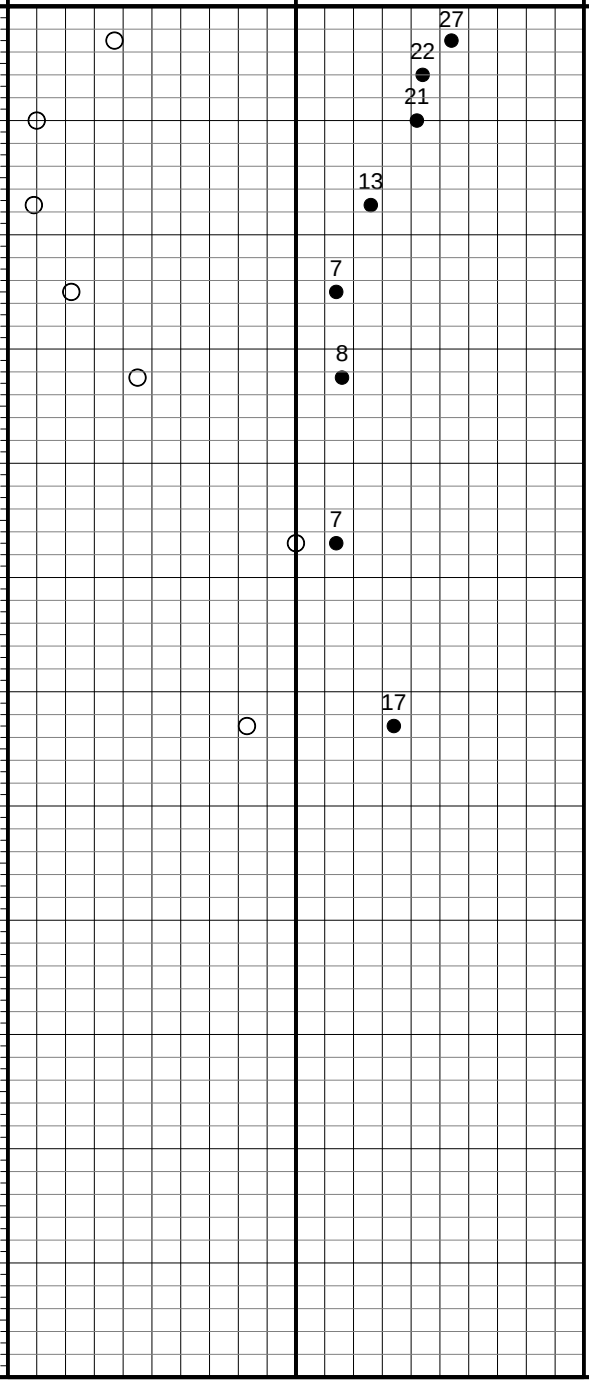
PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 26, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
256.1	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	37	0
255.4	brown silty sand — Frost				
0.7	**EARTH FILL**	2	DO	10	1
	brown sand and clay scattered topsoil	3	DO	9	
254.0					2
2.1	Brown, compact to very dense	4	DO	22	
	SILTY SAND TILL trace of clay and gravel occ. cobbles and boulders	5	DO	45	3
		6	DO	50/15	4
250.6					5
5.5	Brown, very dense				
	SAND well graded, some silt trace of gravel	7	DO	83	6
249.6					7
6.5	**END OF BOREHOLE**				8
					9
					10
					11
					12



WATER LEVEL

W.L @ EL. 250.6 m on completion

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: BH/MW 19 **FIGURE NO.:** 19

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 26, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
261.2	Ground Surface							
0.0	**35 cm TOPSOIL**	1A 1B	DO	25	0		26	
	Frost						11	
	EARTH FILL brown sand and clay scattered topsoil						11	
260.1 / 1.1	Brown, compact to very dense	2	DO	19	1			
	SILTY SAND TILL trace of clay, some gravel occ. sand layers, cobbles and boulders	3	DO	23			7	
		4	DO	53	2		7	
		5	DO	50/15	3		7	
		6	DO	70/15	4		6	
		7	DO	50/10	5		6	
254.2 / 7.0	Brown, very dense				6			
	SAND fine to medium grained trace of gravel, some silt	8	DO	78	7		14	
251.8		9	DO	50/15	8		9	
9.4	**END OF BOREHOLE**				9			
	Installed 50mm Ø monitoring well to 9.1 m 3.0 m screen from 6.1 to 9.1 m Sand backfill from 5.5 to 9.1 m Bentonite seal from 0.0 to 5.5 m Provided with a 4x4 steel casing				10			W.L @ EL. 258.8 m on completion
					11			
					12			

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 20 **FIGURE NO.:** 20

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 19, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
264.6	Ground Surface				
0.0	**PLOUGHED SOIL**	1A 1B	DO	19	0
263.9	brown silty sand — Frost				
0.7	**EARTH FILL**	2	DO	16	1
263.2	brown sandy silt, some clay				
1.4	occ. organic inclusions				
	Brown, compact to dense	3	DO	13	2
	SILTY SAND TILL				
	trace of clay and gravel	4	DO	17	
	occ. pockets of sand, cobbles and boulders				3
		5	DO	43	
260.6					4
4.0	Brown, very dense				
	SAND				
	well graded	6	DO	95	
259.6	some silt and gravel				5
5.0	occ. cobbles				
	END OF BOREHOLE				6
					7
					8
					9
					10
					11
					12

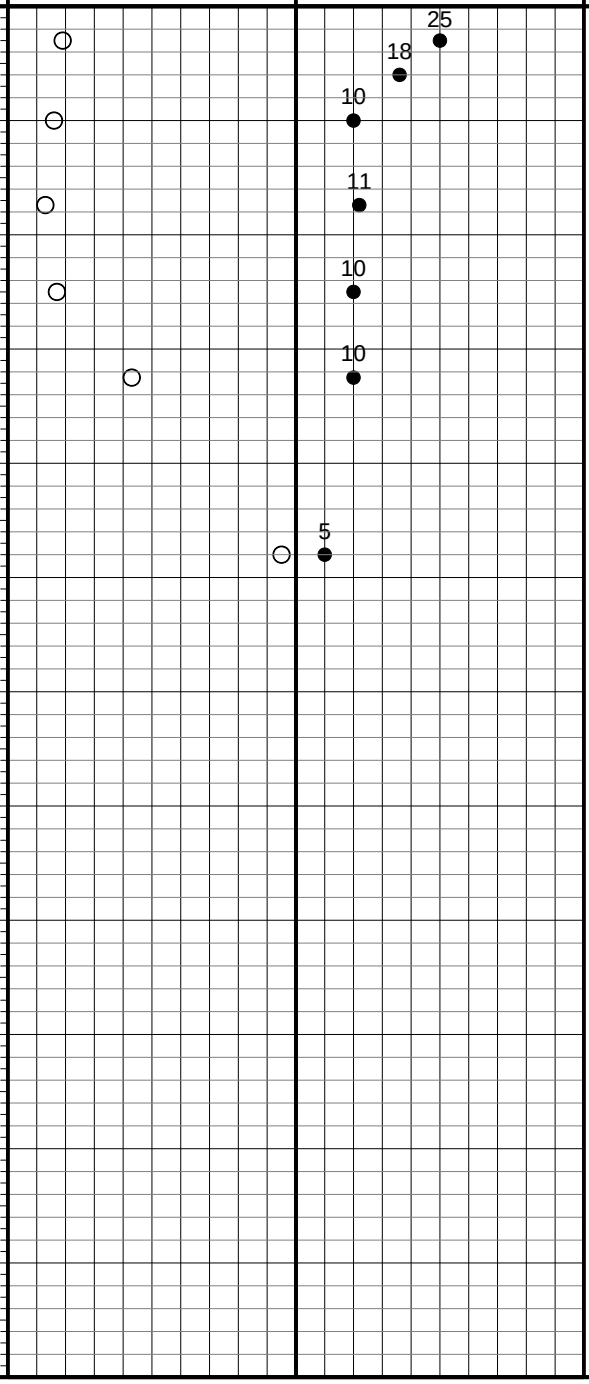
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL: Dry on completion

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 21 **FIGURE NO.:** 21

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 19, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
259.5	Ground Surface							
0.0	**25 cm TOPSOIL**	1A 1B	DO	31	0		23	
	Brown, compact to dense						15	
	Frost						9	
	SILTY SAND TILL	2	DO	16	1			
	trace clay and gravel						9	
	occ. cobbles and boulders	3	DO	26	2			
		4	DO	25			9	
		5	DO	34	3		8	
					4			
254.5		6	DO	44			8	
5.0	**END OF BOREHOLE**				5			Dry on completion
					6			
					7			
					8			
					9			
					10			
					11			
					12			

Soil Engineers Ltd.

JOB NO.: 1901-S077 # LOG OF BOREHOLE NO.: 22 **FIGURE NO.:** 22

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Flight-Auger Hollow Stem

PROJECT LOCATION: Lockhart Road, City of Barrie

DRILLING DATE: February 26, 2019

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
254.4 / 0.0	Ground Surface			
	PLOUGHED SOIL brown silty sand — Frost	1A 1B	DO	27
253.7 / 0.7	Brown, loose to dense			
	SILTY SAND TILL trace to some clay occ. cobbles and boulders	2	DO	8
		3	DO	6
		4	DO	22
		5	DO	34
250.2 / 4.2	Brown, loose			
	SAND (disturbed) fine to medium grained, some silt	6	DO	7
248.9 / 5.5	Brown, very dense			
	SILTY SAND TILL trace of clay and gravel occ. cobbles and boulders	7	DO	50/15
248.0 / 6.4	**END OF BOREHOLE**			

Depth Scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12

Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

Moisture Content values: 47, 25, 13, 12, 13, 8, 18, 8

WATER LEVEL: W.L @ EL. 252.9 m on completion

Cave-in @ El. 250.1 m

Soil Engineers Ltd.

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

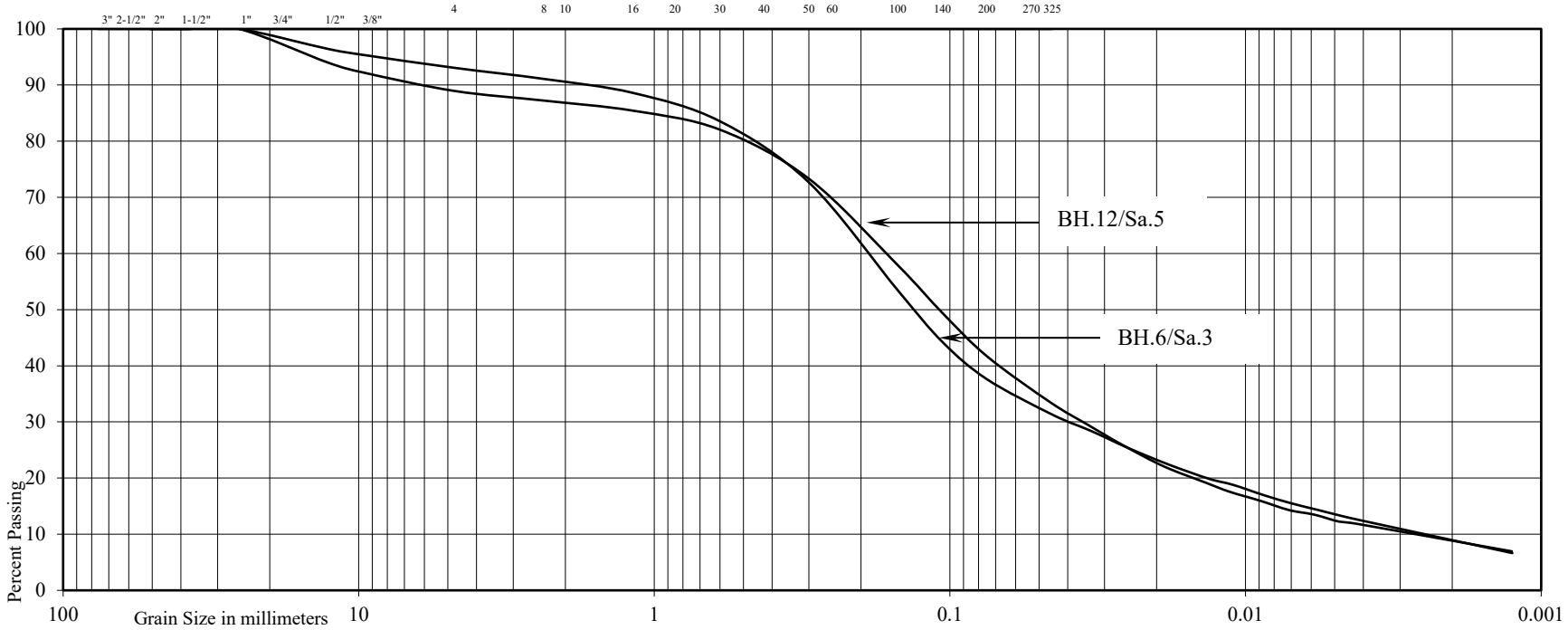
Reference No: 1901-S077

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project:	Proposed Residential Development	
Location:	Lockhart Road, City of Barrie	
Borehole No:	6	12
Sample No:	3	5
Depth (m):	1.7	3.3
Elevation (m):	251.6	250.2

BH./Sa.	6/3	12/5
Liquid Limit (%) =	-	-
Plastic Limit (%) =	-	-
Plasticity Index (%) =	-	-
Moisture Content (%) =	14	11
Estimated Permeability (cm./sec.) =	10^{-6}	10^{-3}

Classification of Sample [& Group Symbol]: SILTY SAND TILL, a trace to some gravel, a trace of clay

Figure: 23

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

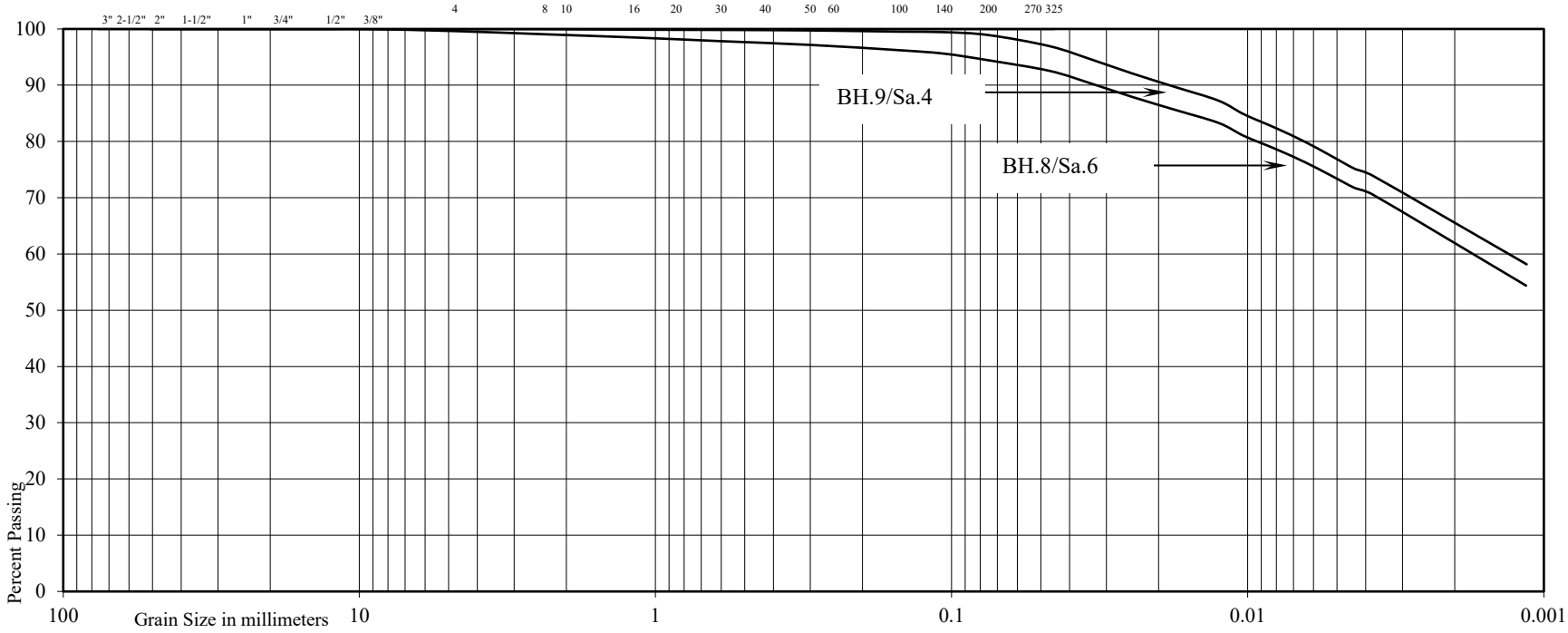
Reference No: 1901-S077

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project:	Proposed Residential Development	
Location:	Lockhart Road, City of Barrie	
Borehole No:	8	9
Sample No:	6	4
Depth (m):	4.8	2.5
Elevation (m):	247.6	250.1

BH./Sa.	8/6	12/5
Liquid Limit (%) =	49	-
Plastic Limit (%) =	25	-
Plasticity Index (%) =	24	-
Moisture Content (%) =	37	11
Estimated Permeability (cm./sec.) =	$>10^{-7}$	$>10^{-7}$

Classification of Sample [& Group Symbol]: SILTY CLAY, traces of sand and fine sand

Figure: 24

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

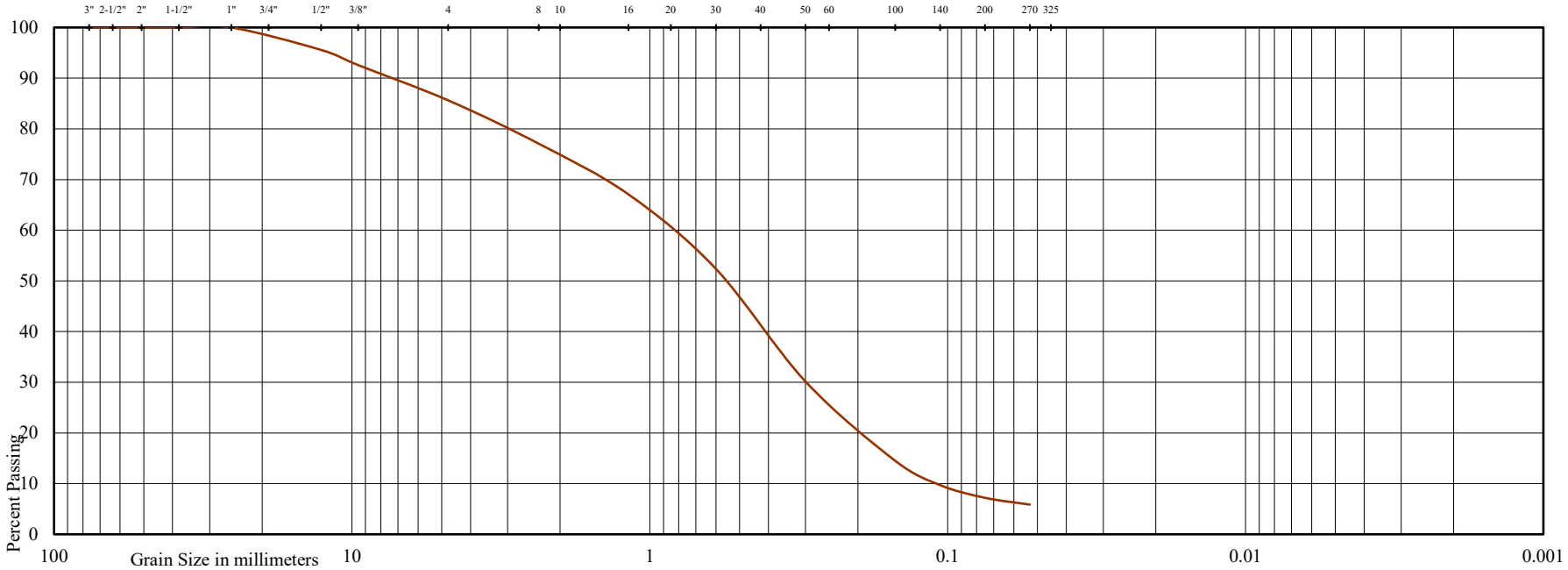
Reference No: 1901-S077

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Lockhart Road, City of Barrie

Borehole No: 1

Sample No: 5

Depth (m): 3.3

Elevation (m): 249.7

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = 15

Estimated Permeability (cm./sec.) = 10^{-3}

Classification of Sample [& Group Symbol]: SAND, well graded, some gravel and a trace of silt

Figure: 25

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

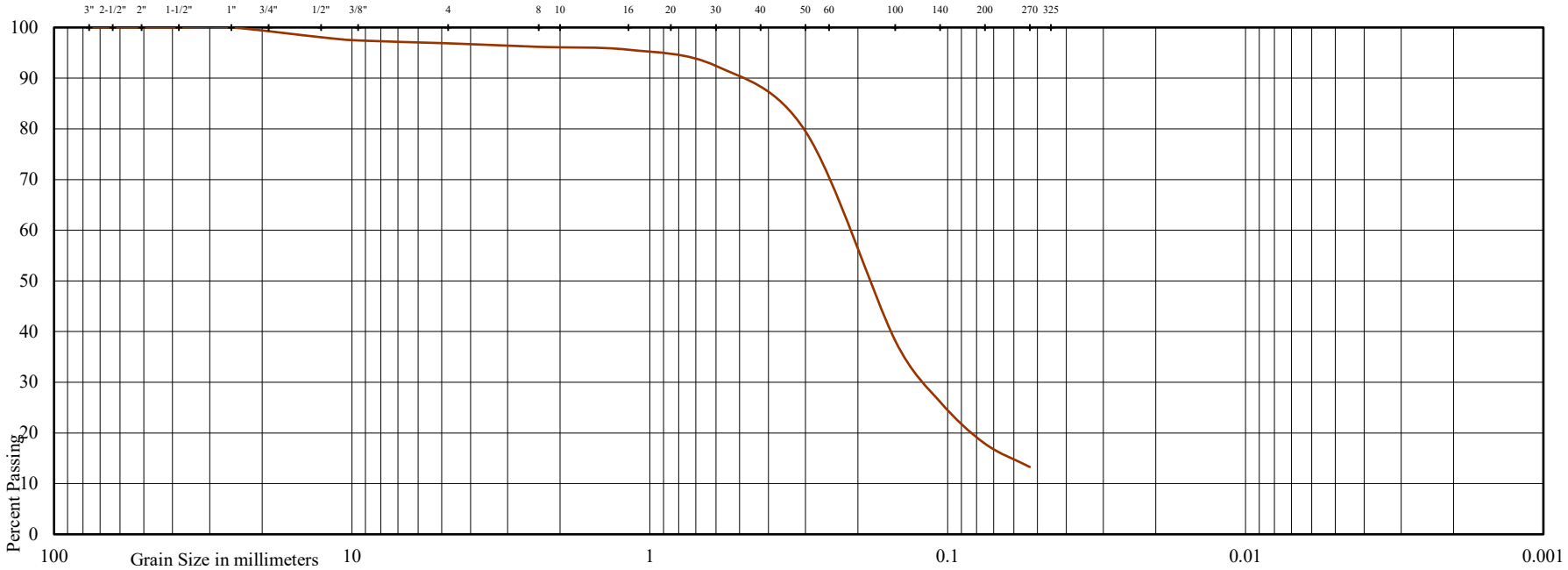
Reference No: 1901-S077

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Lockhart Road, City of Barrie

Borehole No: 19

Sample No: 8

Depth (m): 7.8

Elevation (m): 253.4

Liquid Limit (%) = -

Plastic Limit (%) = -

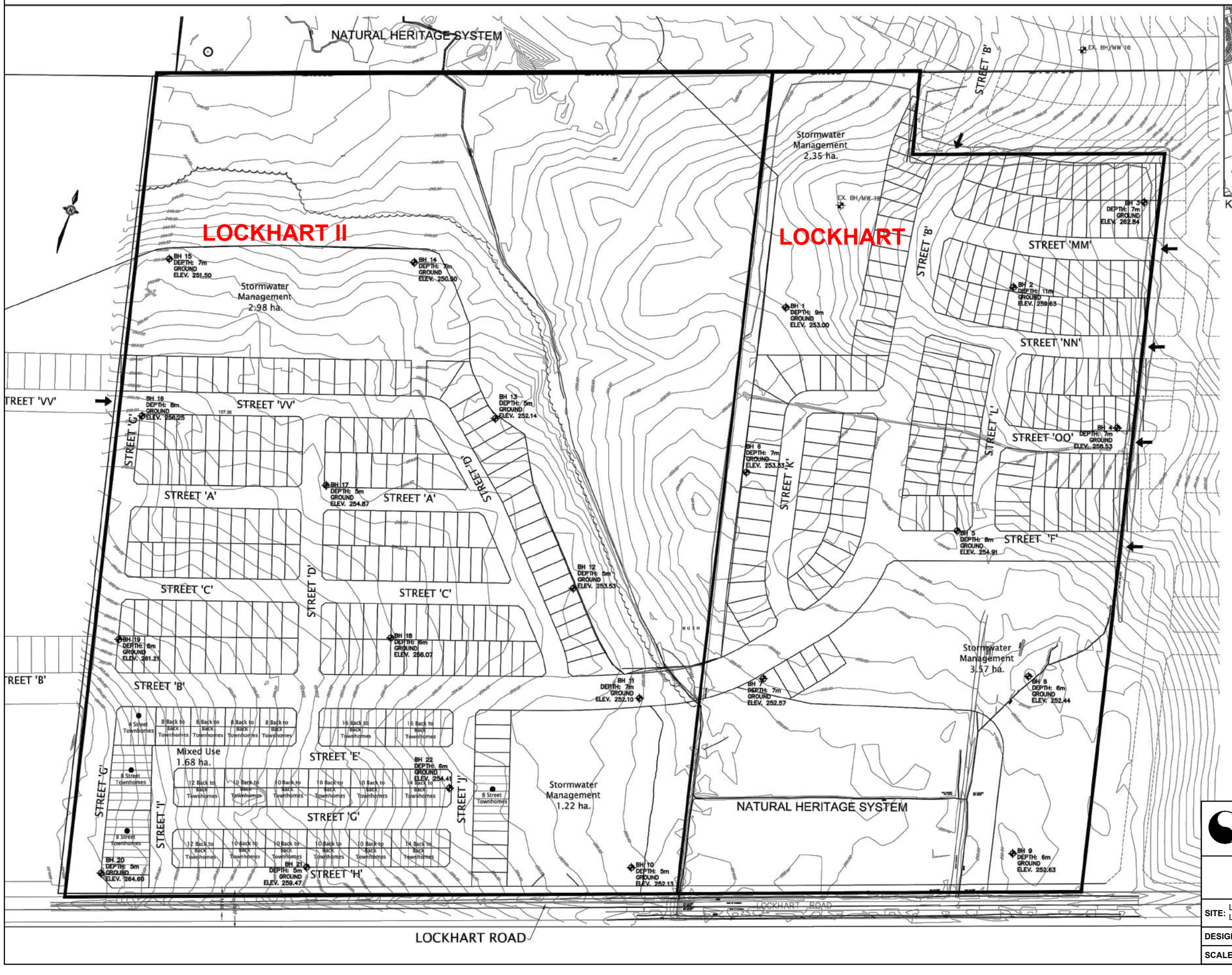
Plasticity Index (%) = -

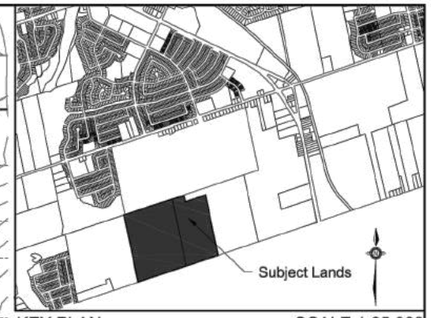
Moisture Content (%) = 14

Estimated Permeability (cm./sec.) = 10^{-4}

Classification of Sample [& Group Symbol]: FINE TO MEDIUM SAND, some silt

Figure: 26





KEY PLAN SCALE 1:25,000

LEGEND

STUDY AREA

EX. BH/MW 1 EXISTING LOCKMAPLE BORE HOLE/MONITOR WELL (SOIL ENGINEERS LTD.)

BH 15 DEPTH: 7m GROUND ELEV. 251.50 PROPOSED BOREHOLE

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BOREHOLE LOCATION PLAN

SITE: Lockhart II and Lockhart Lockhart Road, City of Barrie			
DESIGNED BY: N.A	**CHECKED BY:** B.L	**DWG NO.:** 1	
SCALE: 1:3000	**REF. NO.:** 1901-S077	**DATE:** May 2021	**REV** -

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SUBSURFACE PROFILE
DRAWING NO. 2
SCALE: AS SHOWN

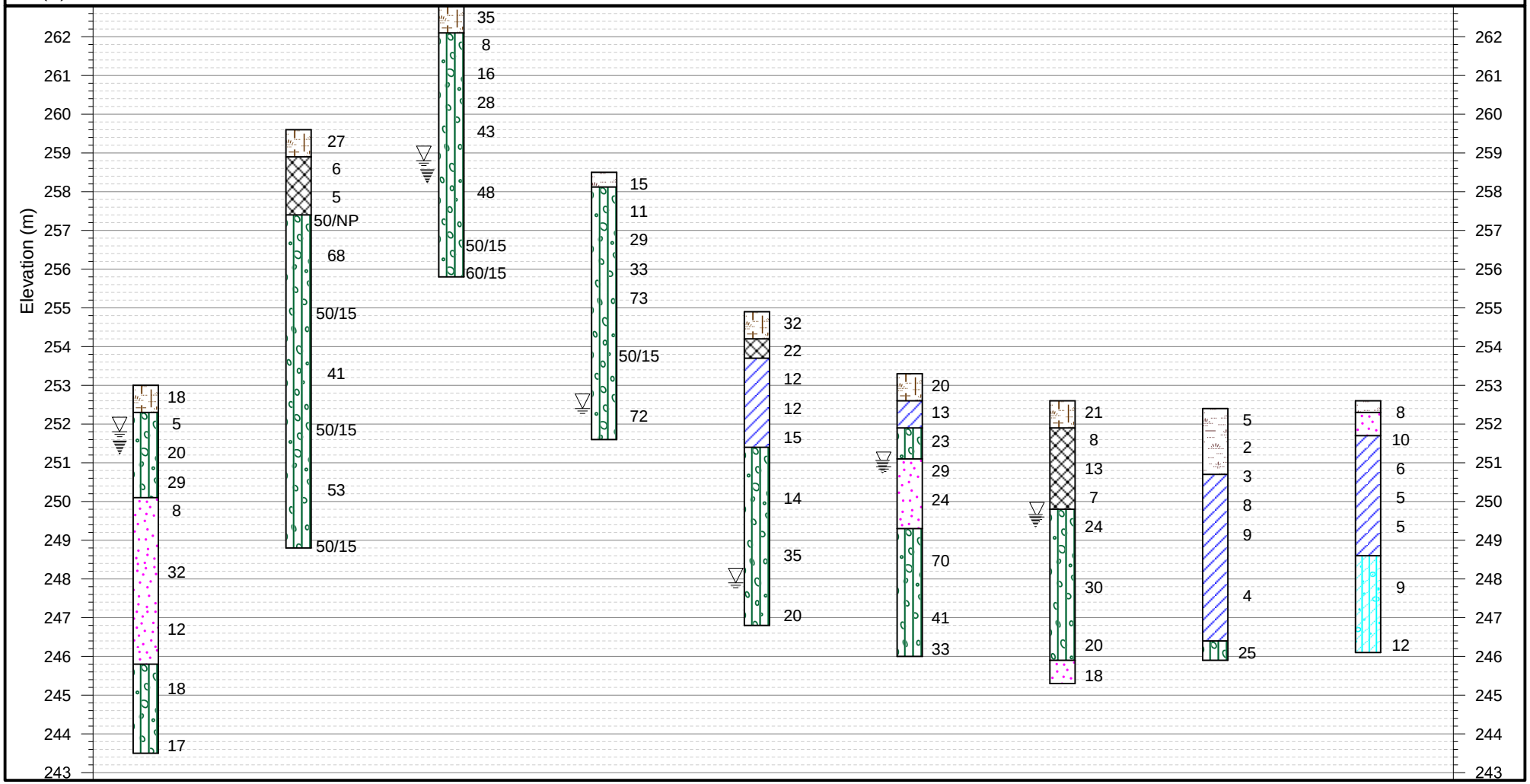
JOB NO.: 1901-S077
REPORT DATE: May 2021
PROJECT DESCRIPTION: Proposed Residential Development

PROJECT LOCATION: Lockhart and Lockhart II
Lockhart Road, City of Barrie

LEGEND

TOPSOIL | FILL | SILTY SAND TILL | SILTY CLAY TILL
PLOUGHED SOIL | SAND | SILTY CLAY

WATER LEVEL (END OF DRILLING) | CAVE-IN



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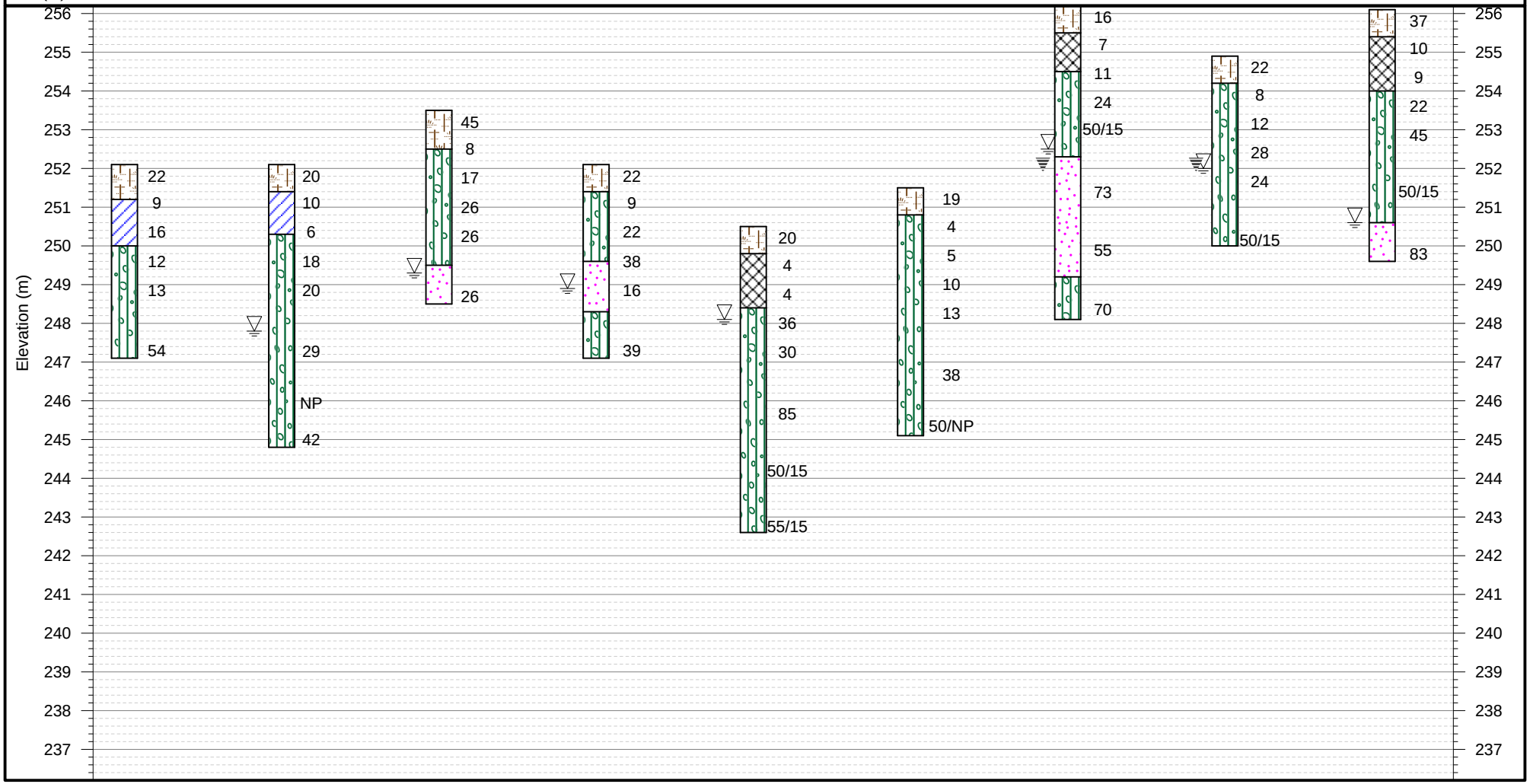
SUBSURFACE PROFILE
DRAWING NO. 3
SCALE: AS SHOWN

JOB NO.: 1901-S077
REPORT DATE: May 2021
PROJECT DESCRIPTION: Proposed Residential Development

PROJECT LOCATION: Lockhart and Lockhart II
Lockhart Road, City of Barrie

LEGEND
PLOUGHED SOIL | SAND | SILTY SAND TILL | SILTY CLAY | FILL

WATER LEVEL (END OF DRILLING) | CAVE-IN



Soil Engineers Ltd.
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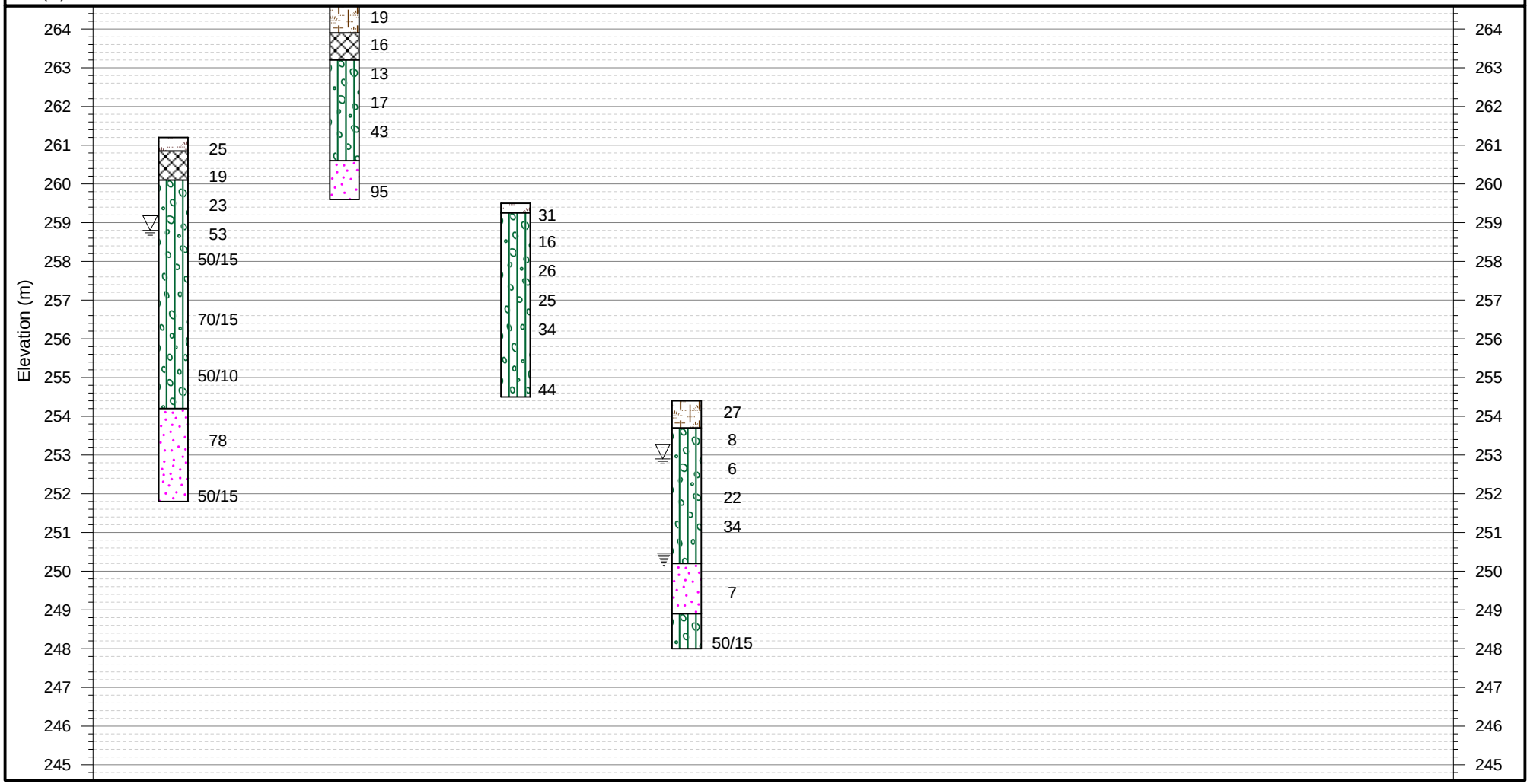
SUBSURFACE PROFILE
DRAWING NO. 4
SCALE: AS SHOWN

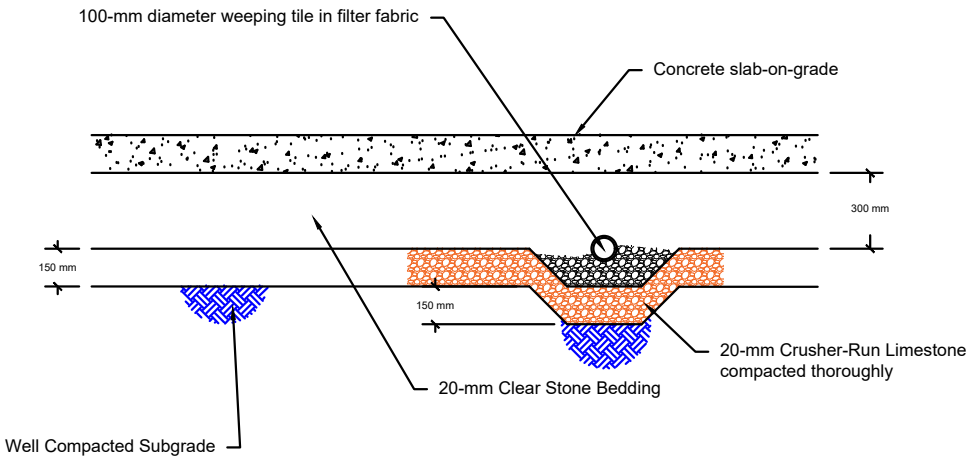
JOB NO.: 1901-S077
REPORT DATE: May 2021
PROJECT DESCRIPTION: Proposed Residential Development

PROJECT LOCATION: Lockhart and Lockhart II
Lockhart Road, City of Barrie

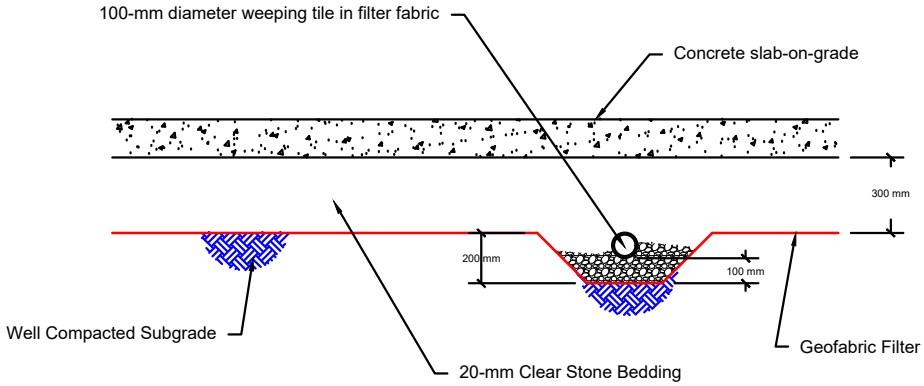
LEGEND
TOPSOIL | FILL | SAND | SILTY SAND TILL | PLOUGHED SOIL

WATER LEVEL (END OF DRILLING) | CAVE-IN

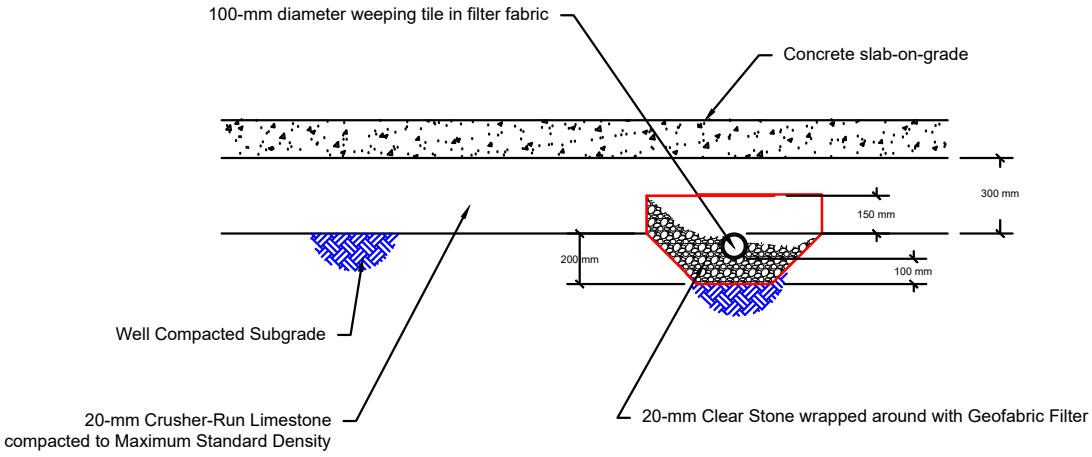




Option 'A'



Option 'B'



Option 'C'

Note:

1. Weepers should be placed in 5 m grids, draining in a positive gradient towards an outlet or a sump pit for removal by pumping.
2. A 6-mil polyethylene sheet should be specified between the gravel bedding and concrete slab.

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 · TEL: (416) 754-8515 · FAX: (416) 754-8516

Details of Under-Floor Weepers

SITE: Lockhart II and Lockhart Lockhart Road, City of Barrie			
DESIGNED BY: N.A	**CHECKED BY:** B.L	**DWG NO.:** 5	
SCALE: N.T.S.	**REF. NO.:** 1901-S077	**DATE:** May 2021	**REV** -

GOL-20538 Lockhart II

5 Year Storm Sewer Sizing

June 2021

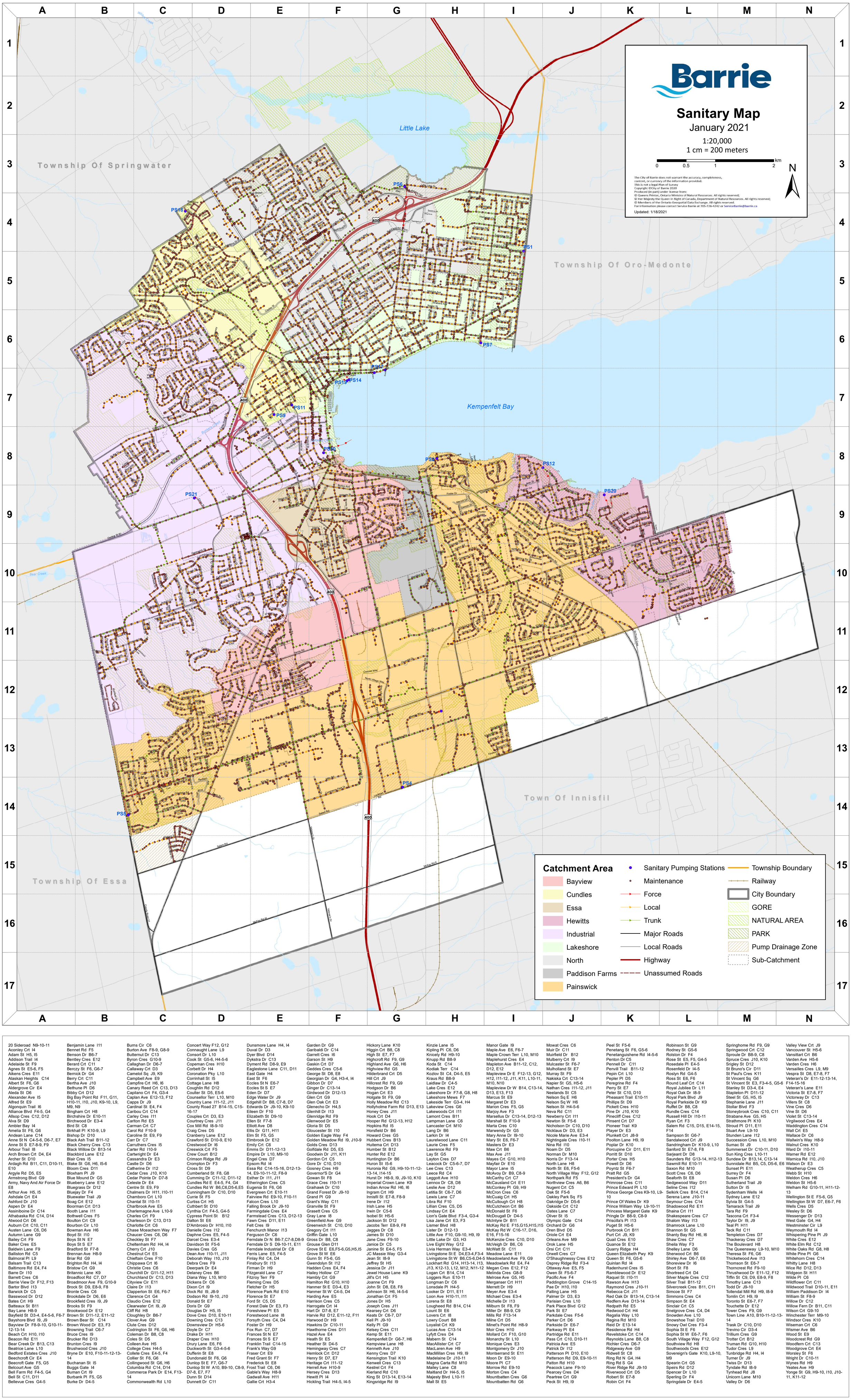
AREAS	Street	MANHOLE		LENGTH	INCREMENT			TOTAL	FLOW TIME (min)		I	TOTAL Q	S	D	Q FULL	V FULL	% FULL
		FROM	TO	(m)	C	A	CA	CA	TO	IN	(mm/h)	(cms)	(%)	(mm)	(cms)	(m/s)	
201	Street 'E'	STM 1	STM 2	80.2	0.77	0.30	0.23	0.23	10.00	0.56	109	0.070	3.00	300	0.167	2.37	***41.7***
202	Street 'E'	STM 2	STM 3	66.3	0.83	0.28	0.23	0.46	10.56	0.48	106	0.135	2.80	300	0.162	2.29	***83.6***
	Street 'E'	STM 3	STM 4	19.0			0	0.46	11.05	0.25	103	0.132	0.50	450	0.202	1.27	***65.5***
203	Street 'E'	STM 4	STM 5	32.0	0.78	0.29	0.23	0.69	11.30	0.38	102	0.195	0.50	525	0.304	1.40	***64.2***
204	Street 'F'	STM 6	STM 7	81.2	0.83	0.70	0.58	0.58	10.00	0.50	109	0.175	2.90	375	0.299	2.70	***58.6***
205	Street 'F'	STM 7	STM 5	67.8	0.83	0.33	0.27	0.85	10.50	0.47	106	0.250	1.80	450	0.383	2.41	***65.5***
206	Street 'E'	STM 5	STM 8	46.0	0.71	0.12	0.08	1.62	11.68	0.42	100	0.451	0.60	675	0.651	1.82	***69.3***
207	Street 'E'	STM 9	STM 10	38.8	0.69	0.15	0.10	0.10	10.00	0.34	109	0.031	1.90	300	0.133	1.89	***23.2***
	Street 'E'	STM 10	STM 11	9.3			0	0.10	10.34	0.08	107	0.030	1.90	300	0.133	1.89	***22.8***
208	Street 'E'	STM 11	STM 12	78.9	0.73	0.45	0.33	0.43	10.43	0.55	107	0.128	2.30	375	0.266	2.41	***48.2***
209	Street 'E'	STM 12	STM 13	71.5	0.83	0.61	0.50	0.94	10.97	0.44	104	0.269	2.90	375	0.299	2.70	***90.2***
210	Street 'E'	STM 13	STM 8	81.8	0.83	0.39	0.33	1.26	11.41	0.54	102	0.356	2.00	450	0.403	2.54	***88.3***
211	Street 'E'	STM 8	STM 14	50.9	0.72	0.18	0.13	3.01	12.10	0.40	98	0.823	0.70	750	0.931	2.11	***88.3***
212	FENCHURCH	STM 15	STM 16	93.5	0.76	0.35	0.26	0.26	10.00	0.66	109	0.080	3.00	300	0.167	2.37	***47.5***
213	FENCHURCH	STM 16	STM 14	85.1	0.72	0.85	0.61	0.87	10.66	0.53	105	0.256	2.80	375	0.293	2.66	***87.2***
	FENCHURCH	STM 14	STM 18	54.3			0	3.89	12.50	0.45	97	1.042	0.50	900	1.280	2.01	***81.4***
214	FENCHURCH	STM 17	STM 18	74.0	0.65	0.19	0.12	0.12	10.00	0.82	109	0.037	1.20	300	0.106	1.50	***35.0***
215	SWMF BLK 219	STM 18	STM 19	16.9	0.65	0.89	0.58	4.59	12.95	0.15	95	1.207	**0.40**	975	1.417	1.90	***85.1***
	SWMF BLK 219	STM 19	STM HW 20	18.4			0	4.59	13.10	0.16	94	1.199	**0.40**	975	1.417	1.90	***84.6***
- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
301	Street 'C'	STM 21	STM 22	84.9	0.65	0.81	0.52	0.52	10.00	0.68	109	0.158	1.70	375	0.229	2.07	***69.3***
302	Street 'C'	STM 22	STM 23	44.7	0.65	0.52	0.34	0.86	10.68	0.32	105	0.252	1.70	450	0.372	2.34	***67.9***
303	Street 'C'	STM 23	STM 24	67.4	0.65	0.48	0.31	1.18	11.00	0.50	104	0.339	1.60	450	0.361	2.27	***94.0***
304	THICKETWOOD	STM 24	STM 25	48.5	0.65	0.15	0.10	1.27	11.50	0.53	101	0.358	0.50	600	0.434	1.54	***82.4***
305	THICKETWOOD	STM 25	STM 26	50.5	0.65	0.40	0.26	1.53	12.02	0.50	99	0.421	0.60	600	0.476	1.68	***88.4***
306	Street 'B'	STM 27	STM 28	29.1	0.65	0.75	0.49	0.49	10.00	0.23	109	0.147	1.70	375	0.229	2.07	***64.5***
307	Street 'B'	STM 28	STM 29	46.3	0.65	0.48	0.31	0.80	10.23	0.32	108	0.239	1.80	450	0.383	2.41	***62.5***
	Street 'B'	STM 29	STM 30	41.5			0	0.80	10.56	0.29	106	0.235	1.80	450	0.383	2.41	***61.5***
308	Street 'B'	STM 30	STM 26	39.0	0.65	0.60	0.39	1.19	10.84	0.31	104	0.344	1.10	525	0.451	2.08	***76.3***
	THICKETWOOD	STM 26	STM 31	34.7			0	2.72	12.52	0.32	96	0.729	0.50	750	0.787	1.78	***92.6***
	THICKETWOOD	STM 31	STM 34	18.2			0	2.72	12.85	0.17	95	0.719	0.50	750	0.787	1.78	***91.3***
309	THICKETWOOD	STM 32	STM 33	58.3	0.65	0.85	0.55	0.55	10.00	0.77	109	0.167	0.50	450	0.202	1.27	***83.0***
	THICKETWOOD	STM 33	STM 34	54.0			0	0.55	10.77	0.71	105	0.161	0.50	450	0.202	1.27	***79.9***
310	SWMF BLK 221	STM 34	STM 35	35.0	0.65	0.62	0.40	3.68	13.02	0.10	94	0.965	5.00	750	2.489	5.63	***38.7***
	SWMF BLK 221	35	HW 36	20.6			0	3.68	13.12	0.06	94	0.960	5.00	750	2.489	5.63	***38.6***

Q= C*I*A/360 (cms); C=RUNOFF COEFFICIENT; I-RAINFALL INTENSITY (5 Year) =853.608/(T.C. + 4.699)^0.766; A=AREA (ha)

Note:

Appendix C

Sanitary Servicing Information



20 Sideroad N9-10-11
Aconley Crt I4
Adam St H5, I5
Addison Trail I4
Adelaide St F9
Agnes St E5-6, F5
Aikens Cres E11
Alaskan Heights C14
Albert St F6, G6
Aldergrove Cir E4
Aleda St D6
Alexander Ave I5
Alfred St E9
Algonquin Trail I6
Alliance Blvd F4-5, G4
Allsop Cres C12, D12
Alva St D9
Ambler Bay I4
Amelia St F6, G6
Andean Lane C14
Anne St N C4-5-6, D6-7, E7
Anne St S E7-8-9, F9
Arbour Trail I8
Arch Brown Crt D4, E4
Archer St D10
Ardagh Rd B11, C11, D10-11, E10
Argyle Rd D5, E5
Armstrong Blvd G9
Army, Navy And Air Force Dr E8
Arthur Ave H5, I5
Ashdale Crt E4
Ashford Dr J10
Aspen Dr E4
Assiniboine Dr C14
Athabaska Rd C14, D14
Atwood Crt D6
Auburn Crt C10, C11
Austen Lane C6, D6
Autumn Lane G9
Bailey Crt F9
Baker Cres E5
Baldwin Lane F9
Balliston Rd C5
Balmoral Pl L9
Balsam Trail C13
Baltimore Rd E4, F4
Barre Dr I10
Barrett Cres C6
Barrie View Dr F12, F13
Bartor Blvd I13
Barwick Dr C5
Basswood Dr D12
Bates Crt H9
Batteaux St B11
Bay Lane H8-9
Bayfield St D3-4, E4-5-6, F6-7
Bayshore Blvd I9, J9
Bayview Dr F8-9-10, G10-11-12-13-14
Beach Crt H10, I10
Beacon Rd E11
Bear Creek Dr B13, C13
Beatrice Lane L10
Bedford Estates Cres J10
Beechcroft Cir E4
Beecroft Gate F5, G5
Belcourt Ave G5
Bell Farm Rd F4-5, G4
Bell St C11, D11
Bellevue Cres G4-5
Benjamin Lane I11
Bennet Rd F5
Benson Dr B6-7
Bentley Cres E12
Berard Crt C11
Berczy St F6, G6-7
Bernick Dr G4
Berry Crt C11
Bertha Ave J10
Bethune Pl D6
Bibby Crt D12
Big Bay Point Rd F11, G11, H10-11, I10, J10, K9-10, L9, M9, N9
Bingham Crt H8
Birchshire Dr E10-11
Birchwood Dr E3-4
Bird St C8
Birkhall Pl K10-9, L9
Bishop Dr D10
Black Ash Trail B11-12
Black Cherry Cres C13
Black Willow Dr B13-14
Blackbird Lane E12
Blair Cres I5
Blake St G6, H6, I5-6
Bloom Cres D11
Bloxham Pl J9
Blue Mound Dr G5
Blueberry Lane E12
Bluegrass Dr D12
Bluejay Dr F4
Bluewater Trail J9
Boag Crt E12
Boorman Crt D13
Booth Lane I11
Bothwell Cres F5
Boulton Crt C9
Bourbon Cir L10
Bowman Ave H6
Boyd St I10
Boys St N E7
Boys St S E7
Bradford St F7-8
Brennan Ave H8-9
Briar Rd G9
Brighton Rd H4, I4
Bristow Crt G9
Britannic Lane K9
Broadfoot Rd C7, D7
Broadmoor Ave F9, G10-9
Brock St D9, E8-9, F8
Bronte Cres C6
Brookdale Dr D6, E6
Brookfield Cres I9, J9
Brooks St F9
Brookwood Dr E12
Brown St D11-12, E11-12
Brown Bear St C14
Brown Wood Dr E3, F3
Browning Trail C6-7
Bruce Cres I9
Brucker Rd D13
Brunton Cres I9
Brushwood Cres J10
Bryne Dr E10, F10-11-12-13-14
Buchanan St I5
Buggs Gate I4
Buman Crt I9
Burbank Pl F5, G5
Burke Dr D4-5
Burns Cir C6
Burton Ave F8-9, G8-9
Butternut Dr C13
Byron Cres G10-9
Callaghan Dr D6-7
Callaway Crt D3
Camelot Sq J9, K9
Campbell Ave E9
Campfire Crt H6, I6
Canary Reed Crt C13, D13
Capilano Crt F4, G3-4
Caplan Ave E12-13, F12
Capps Dr J9
Cardinal St E4, F4
Caribou Crt C14
Carley Cres I11
Carlton Rd E5
Carman Crt C7
Carol Rd F10-9
Caroline St E9, F9
Carr Dr C7
Carruthers Cres I5
Carter Rd I10-9
Cartwright Dr E4
Cassandra Dr E3
Castle Dr D6
Catherine Dr I12
Cedar Cres J10, K10
Cedar Pointe Dr D7-8
Celeste Dr E4
Centre St E9, F9
Chalmers Dr H11, I10-11
Chamboro Crt L10
Chantal St I10-11
Charlbrook Ave E5
Charlemagne Ave L10-9
Charles Crt F9
Charleson Dr C13, D13
Charlotte Crt C6
Chase Mceachern Way F7
Chaucer Cres C6, D6
Checkley St F7
Cheltenham Rd H4, I4
Cherry Crt J10
Chestnut Crt E5
Chieftain Cres F10
Chippawa Crt I6
Christie Cres C6
Churchill Dr G11-12, H11
Churchland Dr C13, D13
Cityview Cir E11
Claire Dr I13
Clapperton St E6, F6-7
Clarence Crt G4
Claudio Cres E12
Clearwater Crt I9, J9
Cliff Rd H8
Cloughley Dr B6-7
Clover Ave G9
Clute Cres D12
Codrington St F6, G6, H6
Coleman Dr B8, C8
Coles St D5
Colleen Ave H5
College Cres H4-5
Collete Cres E4-5, F4
Collier St F6, G6
Collingwood St G6, H6
Columbia Rd C14, D14
Commerce Park Dr E14, F13-14
Commonwealth Rd L10
Concert Way F12, G12
Connaught Lane L9
Consort Dr L10
Cook St G5-6, H4-5-6
Copeman Cres H10
Corbett Dr H4
Coronation Pky L10
Corrinhall St I5
Cottage Lane H8
Coughlin Rd D12
Coulter St D5, E5-6
Counsellor Terr L10, M10
Country Lane I11-12, J11
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Couples Crt D3, E3
Courtney Cres J11
Cox Mill Rd I8-9-10
Craig Cres D5
Cranberry Lane E12
Crawford St D10-9, E10
Crestwood Dr I6
Creswick Crt F5
Crew Court B12
Crimson Ridge Rd J9
Crompton Dr F3
Cross St D9
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Cumming Dr C11-12, D11-12
Cundles Rd E E4-5, F4, G4
Cundles Rd W B6,C6,D5-6,E5
Cunningham Dr C10, D10
Currie St F5
Curtiss Crt H5
Cuthbert St D10
Cynthia Crt F4-5, G4-5
Cypress Point St B12
Dalton St E6
D'Ambrosio Dr H10, I10
Danielle Cres I12
Daphne Cres E5, F4-5
Darcel Cres E3-4
Davidson St F5-6
Davies Cres G5
Dean Ave I10-11, J11
Deborah Way I10, J10
Debra Cres F9
Deerpark Dr E4
Delaney Cres B6
Diana Way L10, M10
Dickens Dr C6
Dixon Crt I9
Dock Rd I9, J8-9
Dodson Rd I9-10, J10
Donald St E7
Doris Dr G9
Douglas Dr H5, I5
Dove Cres D10, E10-11
Downing Cres C13
Downsview Dr H5-6
Doyle Dr C7
Drake Dr H11
Draper Cres H10
Drury Lane E6, F6
Duckworth St G3-4-5-6
Dufferin St E8
Dundonald St F6, G6
Dunlop St E F7, G6-7
Dunlop St W A10, B9-10, C8-9, D7-8, E7, F7
Dunn St D14
Dunnett Dr C11
Dunsmore Lane H4, I4
Duval Dr D3
Dyer Blvd D14
Dykstra Dr C13
Dyment Rd D8-9, E9
Eaglestone Lane C11, D11
East Gate H4
East St F6
Eccles St N E6-7
Eccles St S E7
Eden Dr D7
Edge Water Dr J9
Edgehill Dr B8, C7-8, D7
Edwards Dr J9-10, K9-10
Eileen Dr F10
Elizabeth St D9-10
Ellen St F7-8
Elliott Ave D8
Ellis Dr G11, H11
Elm St F5, G5
Elmbrook Dr E12
Emily Crt C6
Emms Dr D11-12-13
Empire Dr L10, M9-10
Engel Cres D7
Epsom Rd I4
Essa Rd C14-15-16, D12-13-14, E9-10-11-12, F8-9
Esther Dr I11, J11
Etherington Cres C5
Eugenia St F6, G6
Evergreen Crt E10-11
Fairview Rd E9-10, F10-11
Falcon Cres L10
Falling Brook Dr J9-10
Farmingdale Cres E4
Farmstead Cres C13, D12-13
Fawn Cres D11, E11
Felt Cres I9
Fenchurch Manor I13
Ferguson Dr C6
Ferndale Dr N B6-7,C7-8,D8-9
Ferndale Dr S D9-10-11, E11
Ferndale Industrial Dr C8
Ferris Lane E5, F4-5
Finlay Rd C4, D4
Finsbury St I13
Firman Dr H9
Fitzgerald Lane C7
Fitzroy Terr F9
Fleming Cres D5
Fletcher Dr H5
Florence Park Rd E10
Florence St E7
Ford St C5, D5
Forest Dale Dr E3, F3
Forestview Pl E5
Forestwood Lane I8
Forsyth Cres C4, D4
Foster Dr H9
Fox Run C7, D7
Frances St N E7
Frances St S E7
Franklin Trail C14-15
Frank's Way G9
Fraser Crt E9
Fred Grant St F7
Frederick St E8
Frost Trail C6, D6
Gable's Way H8-9
Gadwall Ave H11
Gallie Crt H3-4
Garden Dr G9
Garibaldi Dr C14
Garrett Cres G6
Garson St H9
Gaskin Crt D7
Geddes Cres C5-6
George St D8, E8
Georgian Dr G4, H3-4, I4
Gibbon Dr D7
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Glen Crt G9
Glen Oak Crt E3
Glenecho Dr H4,5
Glenhill Dr I13
Glenridge Rd F9
Glenwood Dr E5
Gloria St D5
Gloucester St I10
Golden Eagle Way F4
Golden Meadow Rd I9, J10-9
Golds Cres D13
Golfdale Rd D5, E5
Goodwin Dr J11, K11
Gordon Crt C5
Gore Dr C10, D10
Gosney Cres H9
Governor'S Dr G4
Gowan St F8
Grace Cres I10-11
Graihawk Dr C10
Grand Forest Dr J9-10
Grand Pl G9
Grant's Way C11
Granville St F9
Grasett Cres C5
Gray Lane I8
Greenfield Ave G9
Greenwich St C10, D10
Gregory Crt I11
Griffin Gate L10
Gross Dr B8, C8
Grouse Glen D11
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Grove St W E6
Gunn St F5-6, G5
Gwendolyn St I12
Hadden Cres E4, F4
Hailey Hollow C7
Hambly Crt G9
Hamilton Rd G10, H10
Hanmer St E D3-4, E3
Hanmer St W D4-5, D4
Harding Ave E5
Harrison Cres C5
Harrogate Crt I4
Hart Dr D7-8, E7
Harvie Rd D12, E11-12, F11
Harwood Dr H9
Hawkins Dr C10-11
Hawthorne Cres D11
Hazel Ave E4
Heath St E5
Heather St D4-5
Hemingway Cres C7
Hemlock Crt D12
Henry St D7, E7
Heritage Crt I11-12
Herrell Ave H10-9
Hersey Cres D13
Hewitt Pl I4
Hickling Trail H4-5, I4-5
Hickory Lane K10
Higgin Crt B8, C8
High St E7, F7
Highcroft Rd F9, G9
Highland Ave G6, H6
Highview Rd G5
Hilderbrand Crt D5
Hill Crt J9
Hillcrest Rd F9, G9
Hodgson Dr B6
Hogan Crt E3
Holgate St F9, G9
Holly Meadow Rd C13
Hollyholme Farm Rd D13, E13
Honey Cres J11
Hook Crt D4
Hooper Rd G12-13, H12
Hopkins Rd I5
Horsfield Dr B6
Howard Cres G5
Hubbert Cres B13
Huitema Crt D13
Humber St B12
Hunter Rd E12
Huntington Dr B6
Huron St I5-6
Huronia Rd G9, H9-10-11-12-13-14, I14-15
Hurst Dr H8-9, I9, J9-10, K10
Imperial Crown Lane K9
Indian Arrow Rd H6, I6
Ingram Crt H9
Innisfil St E7-8, F8-9
Irene Dr I12
Irish Lane H5
Irwin Dr C5-6
Isobel St H5-6
Jackson St D12
Jacobs Terr E8-9, F8
Jagges Dr C8
James St D10
Jane Cres F9-10
Janice Dr C5
Janine St E4-5, F5
JC Massie Way G3-4
Jean St I8-9
Jeffrey St H5
Jessica Dr J11
Jewel House Lane K9
Jill's Crt H5
Joanne Crt F9
John St D8, E8, F8
Johnson St H6, I4-5-6
Jonathan Crt F5
Jones Dr H5
Joseph Cres J11
Kearsey Crt D6
Keats Dr C6-7, D7
Kell Pl J9-10
Kelly Pl G9
Kelsey Cres C11
Kemp St E11
Kempenfelt Dr G6-7, H6
Kempview Lane H8
Kenneth Ave J10
Kenny Cres D7
Kensington Trail K10
Kenwell Cres C13
Kestrel Crt F4
Kierland Rd C10
King St D13-14, E13-14
Kingsridge Rd I9
Kinzie Lane I5
Kipling Pl C6, D6
Knicely Rd H9-10
Knupp Rd B8-9
Koda St C14
Kodiak Terr C14
Kozlov St C4, D4-5, E5
Kraus Rd B8-9
Laidlaw Dr C4-5
Lake Cres E12
Lakeshore Dr F7-8, G8, H8
Lakeshore Mews F7
Lakeside Terr G3-4, H4
Lakeview Cres G6
Lakewoods Crt I11
Lamont Cres B11
Lampman Lane C6
Lancaster Crt M10
Lang Dr B6
Larkin Dr I4
Laurelwood Lane C11
Laurie Cres F5
Lawrence Rd F9
Lay St G5
Layton Cres D7
Leacock Dr C5-6-7, D7
Lee Cres C13
Leece Rd C4
Leggott Ave H10
Lennox Dr C8, D8
Leslie Ave D12
Letitia St C6-7, D6
Lewis Lane C7
Libra Rd F10
Lillian Cres C5, D5
Lindsay Crt E4
Lion's Gate Blvd F3-4, G3-4
Lisa Jane Crt E3, F3
Lismer Blvd H8
Lister Dr D12-13
Little Ave F10, G9-10, H9, I9
Little Lake Dr G3, H3
Live Eight Way G12
Livia Herman Way E3-4
Livingstone St E D4,E3-4,F3-4
Livingstone St W B6,C5-6,D4-5
Lockhart Rd G14, H13-14, I13, J13, K12-13, L12, M12, N11-12
Logan Crt B14, C14
Loggers Run E10-11
Longman Dr C6
Lonsdale Pl H4-5
Looker Dr D11, E11
Loon Ave H10-11, I11
Lorena St E8
Lougheed Rd B14, C14
Lount St E6
Lovers Crt I8
Lowry Court B8
Loyalist Crt K9
Lucas Ave C13-14
Lyfytt Cres D4
Mabern St C14
MacAllister Crt C7
MacLaren Ave H9
MacMillan Cres H9, I9
Madelaine Dr J10-11
Magna Carta Rd M10
Mailey Lane C8
Maitland Dr H4-5, I5
Majesty Blvd L10-11
Mall St E5
Manor Gate I9
Maple Ave E6, F6-7
Maple Crown Terr L10, M10
Maplehurst Cres E4
Mapleton Ave B11-12, C12, D12, E12
Mapleview Dr E F12-13, G12, H12, I11-12, J11, K11, L10-11, M10, N10
Mapleview Dr W B14, C13-14, D13, E13, F13
Marcus St E9
Margaret Dr E3
Marion Cres F5, G5
Marjoy Ave F3
Marsellus Dr C13-14, D12-13
Marshall St F10-9
Marta Cres C10
Marwendy Dr G5
Mary Anne Dr I9-10
Mary St E6, F6-7
Masters Dr E3
Maw Crt B6
Max Ave J11
Mayes Crt G10, H10
Mayfair Dr E10
Mayor Lane I5
McAvoy Dr B9, C8-9
McCarthy Crt C7
McCausland Crt E11
McConkey Pl G9, H9
McCron Cres C6
McCuaig Crt H5
McCullough Crt H8
McCutcheon Crt B6
McDonald St F6
McDougall Dr D4-5
McIntyre Dr B11
McKay Rd E F15,G15,H15,I15
McKay Rd W C16-17, D16, E16, F15-16
McKenzie Cres C10, D10
McVeigh Dr B6, C6
McWatt St C11
Meadow Lane E11
Meadowland Ave F9, G9
Meadowlark Rd E4, F4
Megan Cres E12, F12
Melinda Cres G8-9
Melrose Ave G5, H5
Merganser Crt H11
Merrett Dr H9
Meyer Ave E3-4
Michael Cres E3-4
Michelle Dr I13
Milburn St F8, F9
Miller Dr B8-9, C9
Mills Rd F13-14
Milne Crt D5
Minet's Point Rd H8-9
Moir Cres H10
Mollard Crt F10, G10
Monarchy St L10
Monique Cres E3
Montgomery Dr J10
Montserrand St E11
Moon Dr E9-10
Moore Pl C7
Morrow Rd E9-10
Morton Cres C4
Mountbatten Cres G6
Mountbatten Rd G6
Mowat Cres C6
Muir Dr C11
Muirfield Dr B12
Mulberry Crt I9
Mulcaster St F6-7
Mulholland St E7
Murray St F9
Nakiska Crt C13-14
Napier St G5, H5-6
Nathan Cres I11-12, J11
Neelands St C5
Nelson Sq E H6
Nelson Sq W H6
Nelson St H4-5-6
Neva Rd C11
Newberry Crt I11
Newton St F5-6
Nicholson Dr C10, D10
Nicklaus Dr D3, E3
Nicole Marie Ave E3-4
Nightingale Cres I10-11
Nina Rd I10
Noam Dr D5
Norman Dr M10
Norris Dr F13-14
North Lane H8
North St E6, F5-6
North Village Way F12, G12
Northpark Rd F5
Northview Cres A6, B6
Nugent Crt C5
Oak St F5-6
Oakley Park Sq F5
Oakridge Dr D5-6
Oakside Crt C12
Oates Lane C7
Oliver St I5
Olympic Gate C14
Orchard Dr G6
Oren Blvd D5
Oriole Crt E4
Orleans Ave M9
Orok Lane H5
Orsi Crt C11
Orwell Cres C7
O'Shaughnessy Cres E12
Osprey Ridge Rd F3-4
Ottaway Ave E5, F5
Owen St F5-6-7
Pacific Ave F4
Paddington Grove C14-15
Pae Dr H10, I10
Palling Lane H5
Palmer Dr D3, E3
Parisian Cres L10
Park Place Blvd G12
Park St E7
Parkdale Cres F5-6
Parker Crt D6
Parkside Dr E6-7
Parkway Pl E4
Partridge Rd E11
Pass Crt C10, D10-11
Patricia Ave E5
Patrick Dr I12
Patterson Pl D10, E10
Patterson Rd D9, E9-10-11
Patton Rd H10
Peacock Lane F9-10
Pearcey Cres D4
Peartree Crt G9
Peck St H9, I9
Peel St F5-6
Penetang St F6, G5-6
Penetanguishene Rd I4-5-6
Penton Dr C5
Pennell Dr C11
Penvill Trail B11-12
Pepin Crt L10
Pepler Pl D5
Peregrine Rd F4
Perry St E7
Peter St C10, D10
Pheasant Trail E10-11
Phillips St D9
Pickett Cres H10
Pine Dr J10, K10
Pinecliff Cres C12
Pinsent Crt D7
Pioneer Trail K9
Player Dr E3
Plunkett Crt J8-9
Poolton Lane H9, I9
Poplar Dr K10
Porcupine Cir D11, E11
Porritt St D10
Porter Cres H5
Powell Dr D6
Poyntz St F6-7
Pratt Rd G5
President's Dr G4
Primrose Cres C11
Prince Edward Pl L10
Prince George Cres K9-10, L9-10
Prince Of Wales Dr K9
Prince William Way L9-10-11
Princess Margaret Gate K9
Pringle Dr B8-9, C8-9
Priscilla's Pl I13
Puget St H5-6
Purbrook Crt B11
Purt Crt J9, K9
Quail Cres E10
Quance St E12
Quarry Ridge H4
Queen Elizabeth Pwy K9
Queen St F6, G5-6
Quinlan Rd I4
Radenhurst Cres I5
Ramblewood Dr E12
Raquel St I10-11
Rawson Ave H13
Raymond Cres J10-11
Rebecca Crt J11
Red Oak Dr B13-14, C13-14
Redfern Ave D13-14
Redpath Rd E5
Redwood Crt H4
Regalia Way L10
Regina Rd M10
Reid Dr E13-14
Residence Rd H4
Revelstoke Crt C14
Reynolds Lane B8, C8
Richler Cres D6-7
Ridgeway Ave G9
Ridwell St C8
Ring Rd N G4, H4
Ring Rd S G4
River Ridge Rd J9-10
Riverwood Crt D5
Robert St E7-8
Robin Crt F4
Robinson St G9
Rodney St G5-6
Roiston Dr F4
Rose St E5, F5, G4-5
Rosedale Pl E4-5
Rosenfeld Dr I4-5
Roslyn Rd G4-5
Ross St E6, F6
Round Leaf Crt C14
Royal Jubilee Dr L11
Royal Oak Dr I8-9
Royal Park Blvd J9
Royal Parkside Dr K9
Ruffet Dr B8, C8
Rundle Cres C14
Russell Hill Dr I10-11
Ryan Crt F3
Salem Rd C15, D15, E14-15, F14
Sampson St G6-7
Sandalwood Crt J9
Sandringham Dr K10-9, L10
Sanford St E7-8, F8
Sarjeant Dr D8
Saunders Rd G13-14, H12-13
Sawmill Rd E10-11
Saxon Rd M10
Scott Cres C6, D6
Seaforth St E8
Sedgewood Way D11
Seline Cres I12
Selkirk Cres B14, C14
Serena Lane J10-11
Seymour Cres C14
Shadowood Rd E11
Shaina Crt I11
Shakespeare Cres C7
Shalom Way I13
Shamrock Lane L10
Shannon St G5
Shanty Bay Rd H6, I6
Shaw Cres C7
Sheila Way F3
Shelley Lane D6
Sherwood Crt B6
Shirley Ave D6-7, E6
Shoreview Dr I6
Short St F8
Shortreed Crt D4
Silver Maple Cres C12
Silver Trail B11-12
Silvercreek Cres B11, C11
Simcoe St F7
Simmons Cres C4
Simpson St E4
Sinclair Crt C5
Snelgrove Cres C4, D4
Snowden Ave L10
Snowshoe Trail D10
Snowy Owl Cres F3-4
Sophia St E F6
Sophia St W E6-7, F6
South Village Way F12, G12
Southview Rd H8
Southwoods Cres E12
Sovereign's Gate K10, L9-10, M9
Spearin Crt G5
Speirs Rd D12
Spencer Dr L10
Sperling Dr F4
Springdale Dr E4-5
Springhome Rd F9, G9
Springwood Crt C12
Sproule Dr B8-9, C8
Spruce Cres J10, K10
Srigley St D12
St Bruno's Cir D11
St Paul's Cres K11
St Vincent Sq G6
St Vincent St E3, F3-4-5, G5-6
Stanley St D3-4, E4
Stapleton Pl D11-12
Steel St G5, H5, I5
Stephanie Lane J11
Stollar Blvd F3
Stoneybrook Cres C10, C11
Strabane Ave G5, H5
Strathmore Pl K10
Stroud Pl D11, E11
Stuart Ave L9-10
Stunden Lane I12
Succession Cres L10, M10
Sumac St J9
Summerset Dr C10-11, D10
Sun King Cres L10-11
Sundew Dr B13,14, C13-14
Sunnidale Rd B5, C5, D5-6, E6
Sunset Pl E11
Surrey Dr F4
Susan Pl D6
Sutherland Trail J9
Sutton Dr I5
Sydenham Wells I4
Sydney Lane E12
Sylvia St G4-5
Tamarack Trail J9
Tara Rd F9
Tascona Crt F3-4
Taylor Dr I9, J9
Teal Pl H11
Teck Rd C11
Templeton Cres D7
Thackeray Cres D7
The Boulevard H8
The Queensway L9-10, M10
Theresa St F6, G6
Thicketwood Ave I13
Thomson St E6-7
Thorncrest Rd F9-10
Thrushwood Dr E11-12, F12
Tiffin St C9, D9, E8-9, F8
Timothy Lane C13
Todd Dr J9-10
Tollendal Mill Rd H9, I8-9
Tomlin Crt H9, I9
Toronto St E6-7, F7
Touchette Dr E12
Tower Cres F9, G9
Town Line A10, B10-11-12-13-14
Trask Dr C10, D10
Trevino Cir D3-4
Trillium Cres G9
Trotter Crt B12
Truman Rd G10, H10
Tudor Cres L9
Tunbridge Rd H4, I4
Turner Dr J9
Twiss Dr D13
Tyndale Rd I8-9
Tynhead Rd J8
Unicorn Lane M10
Valley Dr D6
Valley View Crt J9
Vancouver St H5-6
Vansittart Crt B6
Varden Ave H5-6
Varden Cres H6
Versailles Cres L9, M9
Vespra St D8, E7-8, F7
Veteran's Dr E11-12-13-14, F14-15-16
Veteran's Lane E11
Victoria St E7-8, F7
Victorway Dr C13
Villers St C8
Vine Cres D6
Vine St D6
Violet St C13-14
Virgilwood Cres E4
Waddington Cres C14
Wall Crt E5
Wallace Dr C6
Wallwin's Way H8-9
Walnut Cres K10
Ward Dr I10-11
Warner Rd E12
Warnica Rd I10, J10
Watson Dr E3
Weatherup Cres C5
Webb St H10
Weldon Cres H6
Weldon St H5-6
Welham Rd G10-11, H11-12-13
Wellington St E F5-6, G5
Wellington St W D7, E6-7, F6
Wells Cres D5
Wesley St D6
Wessenger Dr D13
West Gate G4, H4
Westminster Cir L9
Weymouth Rd I4
Whispering Pine Pl J9
White Cres E12
White Elm Rd C12
White Oaks Rd G8, H8
White Pine Pl G6
Whitehorn Cres C14
Whitty Lane H8
Wice Rd D12, D13
Widgeon St H11
Wilde Pl C6
Wildflower Crt C11
Wildwood Trail D10-11, E11
William Paddison Dr I4
William St F8-9
Willow Dr C12
Willow Fern Dr B11, C11
Wilson Crt G9-10
Winchester Terr M9-10
Windsor Cres K10
Wiseman Crt C6
Wismer Ave B6
Wood St E9
Woodcrest Rd G9
Woodfern Crt C13
Woodgrove Crt E4
Worsley St F6
Wright Dr C10-11
Wynes Rd H9
Yeates Ave H9
Yonge St G9, H9-10, I10, J10-11, K11-12

SANITARY SEWER DESIGN - LOCAL SEWER

Development Details Basis

DESIGN SHEET

FILE NO GOL-20538

CONTRACT / PROJECT LOCKHART INNISFIL INVESTMENTS (II) LIMITED

n ≥ 0.013
M = 5/P^0.2 Babbit
M=1+[14/(4+P^0.5)] Harmon
Q_p = P*q*M/86.4
Q_i = I*A
$Q_{tot} = Q_p + Q_i$

Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; M ≥ 2), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

(Peak population flow where; q = 225 L/day/person; P = population in thousands) 225 litres/person/day
(Peak extraneous flow: I= 0.1L/s/ha over development area)
(Total peak flow as the sum of peak population flow and peak extraneous flow)

STREET	AREA	MAINTENANCE HOLE		DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBIT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Q_p (l/s)	AREA (ha)	AREA (ACC) (ha)	Q_i (l/s)	Q_{tot} (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	d/D[2]	d/D[3] >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial[1] (m/s)	Velocity[4] > 0.6 (m/s)
		FROM	TO																						
Street E	3	SAN 01A	SAN 02A	6	6	2.57	15.42	15.42	11.517	4.395	11.517	0.462	0.20	0.20	0.020	0.482	38.8	200	2.00	46.384	0.071	Ok	1.476	0.472	Check
Street E	4	SAN 02A	SAN 03A	2	8	2.57	5.14	20.56	10.873	4.379	10.873	0.582	0.09	0.29	0.029	0.611	15.8	200	2.00	46.384	0.080	Ok	1.476	0.506	Check
Street E	5	SAN 03A	SAN 04A	16	24	2.57	41.12	61.68	8.729	4.295	8.729	1.402	0.34	0.63	0.063	1.465	110.0	200	1.70	42.764	0.126	Ok	1.361	0.625	Ok
Street E	6	SAN 04A	SAN 05A	14	38	2.57	35.98	97.66	7.962	4.246	7.962	2.025	0.31	0.94	0.094	2.119	102.0	200	2.90	55.854	0.133	Ok	1.778	0.841	Ok
Street E	7	SAN 05A	SAN 06A	1	39	2.57	2.57	100.23	7.921	4.243	7.921	2.067	0.03	0.97	0.097	2.164	15.2	200	1.10	34.399	0.170	Ok	1.095	0.602	Ok
Street E	8	SAN 06A	SAN 07A	5	44	3.25	16.25	116.48	7.686	4.225	7.686	2.332	0.20	1.17	0.117	2.449	34.5	200	1.10	34.399	0.180	Ok	1.095	0.624	Ok
Street F	9	SAN 01A	SAN 08A	16	16	2.57	41.12	41.12	9.466	4.331	9.466	1.014	0.30	0.30	0.030	1.044	70.0	200	3.00	56.809	0.094	Ok	1.808	0.688	Ok
Street F	10	SAN 08A	SAN 09A	32	48	2.57	82.24	123.36	7.599	4.217	7.599	2.441	0.50	0.80	0.080	2.521	110.0	200	3.00	56.809	0.143	Ok	1.808	0.900	Ok
Street F	11	SAN 09A	SAN 07A	14	62	2.57	35.98	159.34	7.219	4.182	7.219	2.996	0.24	1.04	0.104	3.100	57.7	200	2.20	48.648	0.171	Ok	1.549	0.858	Ok
Street E	12	SAN 07A	SAN 10A	5	111	3.25	16.25	292.07	6.395	4.083	6.395	4.864	0.20	2.41	0.241	5.105	46.0	200	0.60	25.406	0.304	Ok	0.809	0.623	Ok
Street E	13	SAN 01A	SAN 11A	6	6	2.57	15.42	15.42	11.517	4.395	11.517	0.462	0.19	0.19	0.019	0.481	37.0	200	2.00	46.384	0.071	Ok	1.476	0.472	Check
Street E	14	SAN 11A	SAN 12A	2	8	2.57	5.14	20.56	10.873	4.379	10.873	0.582	0.09	0.28	0.028	0.610	11.8	200	2.00	46.384	0.080	Ok	1.476	0.506	Check
Street E	15	SAN 12A	SAN 13A	20	28	2.57	51.40	71.96	8.464	4.280	8.464	1.586	0.38	0.66	0.066	1.652	76.2	200	2.20	48.648	0.126	Ok	1.549	0.708	Ok
Street E	16	SAN 13A	SAN 14A	29	57	2.57	74.53	146.49	7.342	4.194	7.342	2.801	0.51	1.17	0.117	2.918	110.0	200	2.90	55.854	0.155	Ok	1.778	0.926	Ok
Street E	17	SAN 14A	SAN 10A	10	67	2.57	25.70	172.19	7.108	4.171	7.108	3.187	0.18	1.35	0.135	3.322	43.4	200	2.20	48.648	0.176	Ok	1.549	0.873	Ok
Street E	18	SAN 10A	SAN 15A	4	182	3.25	13.00	477.26	5.797	3.985	5.797	7.205	0.20	3.96	0.396	7.601	50.8	200	0.50	23.192	0.393	Ok	0.738	0.651	Ok
Fenchurch Manor	19A			9		3.25	29.25																		
Fenchurch Manor	19B	SAN 16A	SAN 17A	14	23	2.57	35.98	65.23	8.631	4.290	8.631	1.466	0.84	0.84	0.084	1.550	100.0	200	2.00	46.384	0.125	Ok	1.476	0.668	Ok
Fenchurch Manor	20A			7		3.25	22.75																		
Fenchurch Manor	20B	SAN 17A	SAN 18A	10	40	2.57	25.70	113.68	7.724	4.228	7.724	2.287	0.65	1.49	0.149	2.436	100.0	200	3.00	56.809	0.141	Ok	1.808	0.880	Ok
Fenchurch Manor	21A			8		3.25	26.00																		
Fenchurch Manor	21B	SAN 18A	SAN 15A	8	56	2.57	20.56	160.24	7.211	4.182	7.211	3.009	0.48	1.97	0.197	3.206	67.5	200	3.50	61.360	0.155	Ok	1.953	1.009	Ok
Fenchurch Manor	22	SAN 15A	SAN 19A	4	242	3.25	13.00	650.50	5.449	3.913	5.449	9.231	0.26	6.19	0.619	9.850	55.8	200	0.50	23.192	0.454	Ok	0.738	0.696	Ok
Fenchurch Manor	23	SAN 20A	SAN 19A	4	4	3.25	13.00	13.00	11.917	4.403	11.917	0.403	0.32	0.32	0.032	0.435	54.2	200	2.00	46.384	0.068	Ok	1.476	0.454	Check
Thicketwood Avenue	25	SAN 19A	SAN 22A	4	250	3.25	13.00	676.50	5.407	3.903	5.407	9.525	0.28	6.79	0.679	10.204	68.9	200	0.40	20.744	0.495	Ok	0.660	0.646	Ok
Thicketwood Avenue	26	SAN 22A	SAN 23A	6	256	3.25	19.50	696.00	5.376	3.896	5.376	9.744	0.33	7.12	0.712	10.456	40.8	250	0.40	37.611	0.360	Ok	0.766	0.643	Ok
Street C	27	SAN 24A	SAN 25A	14	14	3.25	45.50	45.50	9.276	4.323	9.276	1.099	0.76	0.76	0.076	1.175	106.3	200	2.00	46.384	0.109	Ok	1.476	0.615	Ok
Street C	28	SAN 25A	SAN 26A	18	32	3.25	58.50	104.00	7.863	4.239	7.863	2.129	0.76	1.52	0.152	2.281	98.5	200	1.40	38.808	0.164	Ok	1.235	0.662	Ok
Street C	29	SAN 26A	SAN 23A	7	39	3.25	22.75	126.75	7.558	4.214	7.558	2.495	0.38	1.90	0.190	2.685	68.8	200	2.80	54.882	0.150	Ok	1.747	0.884	Ok
Thicketwood Avenue	30	SAN 23A	SAN 27A	7	302	3.25	22.75	845.50	5.171	3.846	5.171	11.385	0.34	9.36	0.936	12.321	50.3	250	0.40	37.611	0.393	Ok	0.766	0.671	Ok
Thicketwood Avenue	31	SAN 27A	SAN 28A	7	309	3.25	22.75	868.25	5.143	3.839	5.143	11.629	0.37	9.73	0.973	12.602	49.2	250	0.40	37.611	0.398	Ok	0.766	0.675	Ok
Street B	32	SAN 29A	SAN 30A	14	14	3.25	45.50	45.50	9.276	4.323	9.276	1.099	0.75	0.75	0.075	1.174	105.4	200	2.00	46.384	0.109	Ok	1.476	0.615	Ok
Street B	33	SAN 30A	SAN 31A	7	21	3.25	22.75	68.25	8.554	4.285	8.554	1.520	0.33	1.08	0.108	1.628	42.6	200	1.90	45.210	0.129	Ok	1.439	0.664	Ok
Street B	34	SAN 31A	SAN 32A	4	25	3.25	13.00	81.25	8.260	4.267	8.260	1.748	0.28	1.36	0.136	1.884	37.2	200	1.90	45.210	0.139	Ok	1.439	0.694	Ok
Street B	35	SAN 32A	SAN 28A	1	26	3.25	3.25	84.50	8.196	4.263	8.196	1.804	0.11	1.47	0.147	1.951	39.7	200	1.90	45.210	0.141	Ok	1.439	0.700	Ok
Thicketwood Avenue	36	SAN 28A	SAN 33A	3	338	3.25	9.75	962.50	5.038	3.811	5.038	12.629	0.17	11.37	1.137	13.766	30.9	250	0.40	37.611	0.418	Ok	0.766	0.690	Ok
Thicketwood Avenue	37	SAN 33A	SAN 34A	2	340	3.25	6.50	969.00	5.032	3.809	5.032	12.697	0.16	11.53	1.153	13.850	12.3	250	0.40	37.611	0.420	Ok	0.766	0.691	Ok
Thicketwood Avenue	38	SAN 34A	SAN 35A	14	354	3.25	45.50	1014.50	4.986	3.796	4.986	13.172	0.64	12.17	1.217	14.389	86.3	250	0.40	37.611	0.429	Ok	0.766	0.698	Ok
Thicketwood Avenue	39	SAN 35A	SAN 36	12	366	3.25	39.00	1053.50	4.948	3.785	4.948	13.575	0.60	12.77	1.277	14.852	77.1	250	0.40	37.611	0.436	Ok	0.766	0.704	Ok
Thicketwood Avenue	40 (Trunk)	SAN 36	SAP33945		366			1053.50	4.948	3.785	4.948	13.575	0.38	13.15	1.315	14.890	55.5	250	0.40	37.611	0.437	Ok	0.766	0.704	Ok
Thicketwood Avenue	40 (Local)	SAN 36	SAP33945	9	9	3.25	29.25	29.25	10.133	4.356	10.133	0.772		0.38	0.038	0.810	55.5	200	2.00	46.384	0.091	Ok	1.476	0.550	Check
Thicketwood Avenue	41 (Trunk)	SAP33945	SAP33921		375			1082.75	4.921	3.777	4.921	13.876	0.14	13.29	1.329	15.205	16.2	250	0.50	42.050	0.415	Ok	0.857	0.768	Ok
Thicketwood Avenue	41 (Local)	SAP33945	SAP33921	3	3	3.25	9.75	9.75	12.623	4.416	12.623	0.321		0.14	0.014	0.335	16.2	200	2.00	46.384	0.060	Ok	1.476	0.422	Check

SANITARY SEWER DESIGN - LOCAL SEWER

Development Details Basis

DESIGN SHEET

FILE NO GOL-20538

CONTRACT / PROJECT LOCKHART INNISFIL INVESTMENTS (II) LIMITED

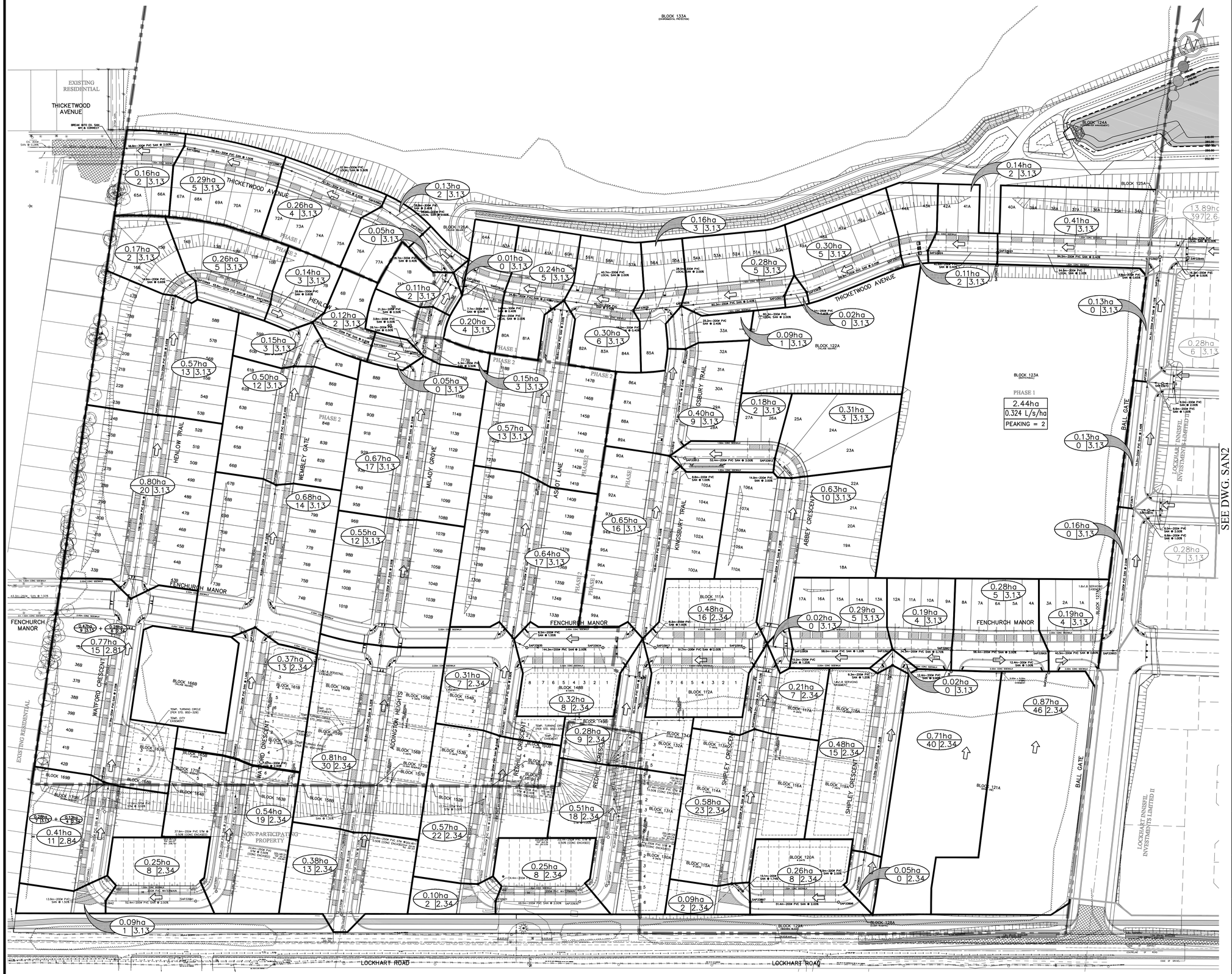
n ≥ 0.013
M = 5/P^0.2 Babbit
M=1+[14/(4+P^0.5)] Harmon
$Q_p = P*q*M/86.4$
$Q_i = I*A$
$Q_{tot} = Q_p + Q_i$

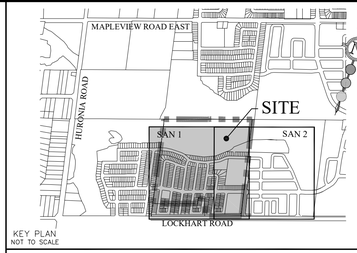
Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; M ≥ 2), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

(Peak population flow where; q = 225 L/day/person; P = population in thousands) 225 litres/person/day
(Peak extraneous flow: I= 0.1L/s/ha over development area)
(Total peak flow as the sum of peak population flow and peak extraneous flow)

STREET	AREA	MAINTENANCE HOLE		DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBIT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Q_p (l/s)	AREA (ha)	AREA (ACC) (ha)	Q_i (l/s)	Q_{tot} (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	d/D[2]	d/D[3] >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial[1] (m/s)	Velocity[4] > 0.6 (m/s)
		FROM	TO																						
Fenchurch Manor	EXT1	SAP33905	SAP33903	4	55	3.25	13.00	147.47	7.332	4.193	7.332	2.816	0.20	1.35	0.135	2.951	40.5	200	0.60	25.406	0.230	Ok	0.809	0.532	Check
Ball Gate	2	SAP33903	SAP33971		55			147.47	7.332	4.193	7.332	2.816	0.14	1.49	0.149	2.965	83.1	200	2.00	46.384	0.171	Ok	1.476	0.815	Ok
Street C	42	SAN 24A	PLUG	7	7	3.25	22.75	22.75	10.655	4.373	10.655	0.631	0.26	0.26	0.026	0.657	33.3	200	2.00	46.384	0.083	Ok	1.476	0.518	Check
Street C	43	PLUG	SAP33970	1	8	3.25	3.25	26.00	10.375	4.364	10.375	0.702	0.05	0.31	0.031	0.733	8.0	200	2.00	46.384	0.087	Ok	1.476	0.534	Check
Street C	44	SAP33970	SAP33971		8			26.00	10.375	4.364	10.375	0.702	0.01	0.32	0.032	0.734	8.8	200	1.00	32.798	0.103	Ok	1.044	0.421	Check
Ball Gate	45	SAP33971	SAP33973		63			173.47	7.098	4.170	7.098	3.206	0.13	1.81	0.181	3.387	74.2	200	2.00	46.384	0.182	Ok	1.476	0.847	Ok
Street B	46	SAN 29A	PLUG	7	7	3.25	22.75	22.75	10.655	4.373	10.655	0.631	0.28	0.28	0.028	0.659	34.3	200	2.00	46.384	0.083	Ok	1.476	0.518	Check
Street B	47	PLUG	SAP33972	1	8	3.25	3.25	26.00	10.375	4.364	10.375	0.702	0.05	0.33	0.033	0.735	8.0	200	2.00	46.384	0.087	Ok	1.476	0.534	Check
Street B	48	SAP33972	SAP33973		8			26.00	10.375	4.364	10.375	0.702	0.01	0.34	0.034	0.736	8.8	200	1.00	32.798	0.103	Ok	1.044	0.421	Check
Ball Gate	49	SAP33973	SAP33974		71			199.47	6.902	4.148	6.902	3.585	0.11	2.26	0.226	3.811	64.3	200	1.15	35.172	0.222	Ok	1.120	0.719	Ok
Ball Gate	50	SAP33974	SAP33921		71			199.47	6.902	4.148	6.902	3.585	0.01	2.27	0.227	3.812	8.8	200	0.65	26.443	0.256	Ok	0.842	0.587	Check
Thicketwood Avenue	51 (Trunk)	SAP33921	SAP33923		449			1291.97	4.750	3.726	4.750	15.982	0.41	16.11	1.611	17.593	94.5	250	0.40	37.611	0.480	Ok	0.766	0.735	Ok
Thicketwood Avenue	51 (Local)	SAP33921	SAP33923	7	7	3.25	22.75	22.75	10.655	4.373	10.655	0.631		0.41	0.041	0.672	94.5	200	2.00	46.384	0.084	Ok	1.476	0.518	Check

PROJECT #2000 - BARRIE LOCKHART ROAD-SORBARA - CITY OF BARRIE - SECOND SUBMISSION - NOVEMBER 13, 2020





LEGEND

- LIMIT OF SUBDIVISION
- LIMIT OF PHASE
- SANITARY MANHOLE/SEWER
- SANITARY MANHOLE/SEWER (BY-OTHERS)
- SINGLE SANITARY (MIN. 100mm PVC) CONNECTION AS PER CITY OF BARRIE STD. BSD-25
- SANITARY DRAINAGE BOUNDARY
- EXTERNAL SANITARY DRAINAGE BOUNDARY
- RETAINING WALL
- 0.15ha | 6 | 3.4 — CATCHMENT AREA (ha); PERSONS PER UNIT; NUMBER OF UNITS
- 0.30ha | 1ppha — EXTERNAL (RESIDENTIAL) CATCHMENT AREA (ha); POPULATION DENSITY (PEOPLE PER HECTARE)
- 0.40ha | 50 ppha — EXTERNAL (MAJOR SYSTEM) DRAINAGE AREA (ha); POPULATION DENSITY (PEOPLE PER HECTARE)
- 0.30ha | 1000 — EXTERNAL (INSTITUTIONAL) DRAINAGE AREA; POPULATION
- SANITARY FLOW DIRECTION

NOTES:

- ALL LOTS TO BE EQUIPPED WITH SUMP PUMPS AND INDIVIDUAL PRVS (SEE DETAIL ON DET SERIES DRAWINGS)

BENCH MARKS

TOPOGRAPHIC SURVEY PROVIDED BY JoeTOPO SURVEYS AND CADD DATE: 12-DEC-2013

ELEVATIONS SHOWN HEREON ARE GEODETIC BASED ON NAD83(CSRS) AND ARE DERIVED FROM GPS REAL TIME NETWORK OBSERVATIONS USING THE 'CAN-NET' VRS NETWORK, IN UTM 17N.

LEGAL INFORMATION AND BOUNDARIES SHOWN ARE PER DRAWING PROVIDED BY CLIENT.

LOCAL SITE BENCHMARKS:

BM1: TOP OF SIB, NORTH WEST CORNER OF SITE AT SOUTHWEST LIMIT OF EXIST. WALKWAY BLOCK, AS INDICATED ON PLAN, ELEV. 248.65

BM2: TOP NUT OF HYDRANT, SOUTH WEST CORNER OF SITE AS INDICATED ON PLAN, ELEV. 261.66

BM3: TOP OF IB, SOUTH EAST CORNER OF SITE, AS INDICATED ON PLAN.

CITY OF BARRIE CONTROL MONUMENTS:

HORIZONTAL

01019860405 N: 4911111.934 E: 608244.931

031910017 N: 4909253.265 E: 606886.130

VERTICAL AND HORIZONTAL

031201100I3 N: 4909870.258 E: 608733.580 EL: 252.807

NO.	REVISIONS	DATE

CITY OF BARRIE
ACCEPTED
DATE. . . . . .
. . . . . .
DIRECTOR OF ENGINEERING

scs consulting group ltd
30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

SORBARA group of companies
3700 STEELES AVE WEST,
SUITE 800
VAUGHAN, ONTARIO L4L 8M9
TEL: (905) 850-6154

BARRIE
LOCKHART ROAD GP INC.

SANITARY
DRAINAGE PLAN

LICENCED PROFESSIONAL ENGINEER
R. S. HAYES
100517803
PROVINCE OF ONTARIO

Barrie
ENGINEERING DEPARTMENT

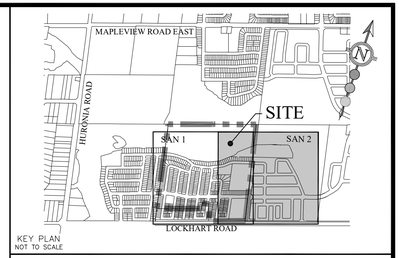
SCALE	1:1000			CONTRACT NO.	2000
DESIGN	R.S.H./M.A.M.	DRAWN	M.T.C.	SHEET NO.	SAN1
REVIEWED	M.R.C./P.S.	DATE	NOVEMBER 2020		

File: P:\2000 Barrie Lockhart Road – Sorbara\Drawings\Phase 1\Dr\2000D-SANI-SAN1.dwg – Revised by <MORECCHIA> : Fri, Nov 13 2020 – 12:32pm

PROJECT #2000 - BARRIE LOCKHART ROAD-SORBARA - CITY OF BARRIE - SECOND SUBMISSION - NOVEMBER 13, 2020

SEE DWG. SAN1





LEGEND

- LIMIT OF SUBDIVISION
- LIMIT OF PHASE
- SANITARY MANHOLE/SEWER
- SANITARY MANHOLE/SEWER (BY-OTHERS)
- SINGLE SANITARY (MIN. 100mm PVC) CONNECTION AS PER CITY OF BARRIE STD. BSD-25
- SANITARY DRAINAGE BOUNDARY
- EXTERNAL SANITARY DRAINAGE BOUNDARY
- RETAINING WALL
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- 0.30ha / 1ppha — EXTERNAL (RESIDENTIAL) CATCHMENT AREA (ha); POPULATION DENSITY (PEOPLE PER HECTARE)
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BENCH MARKS

TOPOGRAPHIC SURVEY PROVIDED BY JoeTOPO SURVEYS AND CADD
DATE: 12-DEC-2013

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031910017 N: 4909253.265 E: 606886.130

VERTICAL AND HORIZONTAL
03120110013 N: 4909870.258 E: 608733.580 EL: 252.807

NO.	REVISIONS	DATE

CITY OF BARRIE
ACCEPTED
DATE. . . . . .
. . . . . .
DIRECTOR OF ENGINEERING

scs consulting group ltd
30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
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BARRIE
LOCKHART ROAD GP INC.

LICENSED PROFESSIONAL ENGINEER
R. S. HAYES
100517803
PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN 2

Barrie
ENGINEERING DEPARTMENT

SCALE	1:1000			CONTRACT NO.	2000
DESIGN	R.S.H./M.A.M.	DRAWN	M.T.C.	SHEET NO.	SAN2
REVIEWED	M.R.C./P.S.	DATE	NOVEMBER 2020		

File: P:\2000 Barrie Lockhart Road – Sorbara\Drawings\Phase 1\Dr\2000-SAN-SAN2.dwg – Revised by <MORECHIA> : Fri, Nov 13 2020 – 12:32pm

PROJECT #2000 - BARRIE LOCKHART ROAD-SORBARA - CITY OF BARRIE - SECOND SUBMISSION - NOVEMBER 13, 2020

SCS consulting group ltd

Sanitary Design Sheet
BARRIE LOCKHART ROAD GP INC.
City of Barrie

Project: BARRIE LOCKHART ROAD
Project No. 2000
Date: 06-Nov-20
Designed By: R.S.H./M.A.M
Reviewed By: P.S

Minimum Sewer Diameter (mm) =	200	Avg. Domestic Flow (l/cap/day) =	225
Mannings n =	0.013	Inflow and Infiltration Rate (l/s/ha) =	0.1
Minimum Velocity (m/s) =	0.60	Max. Harmon Peaking Factor =	None
Maximum Velocity (m/s) =	3.00	Min. Harmon Peaking Factor =	2.0
Minimum Pipe Slope (%) =	0.40	NOMINAL PIPE SIZE USED	

Legend:
0.648 INSTITUTIONAL PEAKING FACTOR OF 2 APPLIED AS PER BARRIE STDS.

P:\2000 Barrie Lockhart Road - Sorbara\Design\Pipe Design\Sanitary\Sanitary Sheet Design - MASTER_v.xlsDesign

LOCATION			RESIDENTIAL							INDUSTRIAL/COMMERCIAL/INSTITUTIONAL					FLOW CALCULATIONS										PIPE DATA					
	MANHOLE					DENSITY																								
STREET	FROM	TO	AREA (ha)	ACCUM. AREA (ha)	UNITS (#)	PER UNIT (p/unit)	PER HA (p/ha)	RESIDENTIAL POPULATION	ACCUM. RESIDENTIAL POPULATION	AREA (ha)	ACCUM. AREA (ha)	POPULATION DENSITY (p/ha)	FLOW RATE (l/s/ha)	ACCUM. EQUIV. POPULATION	INFILTRATION (L/s)	TOTAL ACCUM. POPULATION	AVG. DOMESTIC FLOW (L/s)	ACCUM. AVG. DOMESTIC FLOW (L/s)	4/D	HARMON/ BABBIT	MAX PEAKING FACTOR	PEAKED RESIDENTIAL FLOW (L/s)	ICI FLOW (L/s)	TOTAL FLOW (L/s)	LENGTH (m)	PIPE DIAMETER (mm)	SLOPE (%)	FULL FLOW CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)
SHIPLEY CRESENT	SAP33896	SAP33897	0.26	0.26	8	2.34		19	19	0	0	0	0	0	0.0	19	0.0	0.0	0.075	BABBIT	11.08	0.5	0.0	0.6	51.4	200	2.00	46.36	1.48	0.49
SHIPLEY CRESENT	SAP33897	SAP33898	0.09	0.35	2	2.34		5	23	0	0	0	0	0	0.0	23	0.0	0.1	0.085	BABBIT	10.60	0.6	0.0	0.7	15.1	200	1.74	43.2	1.38	0.50
SHIPLEY CRESENT	SAP33898	SAP33899	0.58	0.93	23	2.34		54	77	0	0	0	0	0	0.1	77	0.1	0.2	0.144	BABBIT	8.34	1.7	0.0	1.8	90.9	200	1.30	37.4	1.19	0.60
SHIPLEY CRESENT	SAP33899	SAP33900	0.21	1.14	7	2.34		16	94	0	0	0	0	0	0.1	94	0.0	0.2	0.160	BABBIT	8.03	2.0	0.0	2.1	49.2	200	1.15	35.2	1.12	0.60
SHIPLEY CRESENT	SAP33900	SAP33901	0.10	0.10	4	2.34		9	9	0	0	0	0	0	0.0	9	0.0	0.0	0.058	BABBIT	12.73	0.3	0.0	0.3	23.5	200	2.00	46.4	1.48	0.42
SHIPLEY CRESENT	SAP33901	SAP33902	0.64	0.74	33	2.34		77	87	0	0	0	0	0	0.1	87	0.2	0.2	0.153	BABBIT	8.16	1.8	0.0	1.9	110.0	200	1.20	35.9	1.14	0.60
SHIPLEY CRESENT	SAP33902	SAP33908	0.02	0.76	0	3.13		0	87	0	0	0	0	0	0.1	87	0.0	0.2	0.153	BABBIT	8.16	1.8	0.0	1.9	9.3	200	1.20	35.9	1.14	0.60
BLOCK 121A (MIXED USE)	SAP33906	SAP33907 WEST	0.71	0.71	40	2.34		94	94	0	0	0	0	0	0.1	94	0.2	0.2	0.140	BABBIT	8.03	2.0	0.0	2.0	12.6	200	2.00	46.4	1.48	0.73
FENCHURCH MANOR	SAP33907 WEST	SAP33908	0.19	0.9	4	3.13		13	106	0	0	0	0	0	0.1	106	0.0	0.3	0.189	BABBIT	7.83	2.2	0.0	2.3	42.1	200	0.70	27.4	0.87	0.52
FENCHURCH MANOR	SAP33908	SAP33909	0.29	1.95	5	3.13		16	208	0	0	0	0	0	0.2	208	0.0	0.5	0.217	BABBIT	6.84	3.7	0.0	3.9	58.0	200	1.20	35.9	1.14	0.74
FENCHURCH MANOR	SAP33909	SAP33910	0.02	1.97	0	3.13		0	208	0	0	0	0	0	0.2	208	0.0	0.5	0.214	BABBIT	6.84	3.7	0.0	3.9	15.2	200	1.25	36.7	1.17	0.75
ABBEY CRESENT	SAP33910	SAP33911	0.83	3.74	10	3.13		31	313	0	0	0	0	0	0.4	333	0.1	0.9	0.232	BABBIT	6.23	5.4	0.0	5.8	98.5	200	1.95	45.8	1.46	0.98
ABBEY CRESENT	SAP33911	SAP33912	0.31	4.05	3	3.13		9	343	0	0	0	0	0	0.4	343	0.0	0.9	0.210	BABBIT	6.19	5.5	0.0	5.9	34.9	200	3.00	56.8	1.81	1.14
ABBEY CRESENT	SAP33912	SAP33913	0.18	4.23	2	3.13		6	349	0	0	0	0	0	0.4	349	0.0	0.9	0.212	BABBIT	6.17	5.6	0.0	6.0	52.4	200	3.00	56.8	1.81	1.15
ABBEY CRESENT	SAP33913	SAP33919	0.00	4.23	0	3.13		0	349	0	0	0	0	0	0.4	349	0.0	0.9	0.279	BABBIT	6.17	5.6	0.0	6.0	8.8	200	1.00	32.8	1.04	0.78
REDHILL CRESCENT	SAP33914	SAP33915	0.51	0.51	32	2.34		75	75	0	0	0	0	0	0.1	75	0.2	0.2	0.128	BABBIT	8.40	1.6	0.0	1.7	70.2	200	2.00	46.4	1.48	0.69
REDHILL CRESCENT	SAP33915	SAP33916	0.28	0.79	9	2.34		21	96	0	0	0	0	0	0.1	96	0.1	0.2	0.160	BABBIT	7.99	2.0	0.0	2.1	73.8	200	1.20	35.9	1.14	0.61
FENCHURCH MANOR	SAP33916	SAP33917	0.48	0.48	16	2.34		37	37	0	0	0	0	0	0.0	37	0.1	0.1	0.098	BABBIT	9.65	0.9	0.0	1.0	51.7	200	2.00	46.4	1.48	0.58
FENCHURCH MANOR	SAP33917	SAP33918	0	0.48	0			0	37	0	0	0	0	0	0.0	37	0.0	0.1	0.104	BABBIT	9.65	0.9	0.0	1.0	8.3	200	1.60	41.5	1.32	0.54
KINGSBURY TRAIL	SAP33918	SAP33919	0.65	1.92	16	3.13		50	183	0	0	0	0	0	0.2	183	0.1	0.5	0.164	BABBIT	7.02	3.4	0.0	3.5	108.9	200	3.00	56.8	1.81	0.99
KINGSBURY TRAIL	SAP33919	SAP33920	0.40	6.55	9	3.13		28	561	0	0	0	0	0	0.7	561	0.1	1.5	0.271	BABBIT	5.61	8.2	0.0	8.8	62.9	200	2.40	50.8	1.62	1.19
KINGSBURY TRAIL	SAP33920	SAP33928	0.09	6.64	1	3.13		3	564	0	0	0	0	0	0.7	564	0.0	1.5	0.272	BABBIT	5.61	8.2	0.0	8.9	25.2	200	2.40	50.8	1.62	1.19
FENCHURCH MANOR	SAP33907 EAST	SAP33905	0.28	0.28	5	3.13		16	16	0	0	0	0	0	0.0	16	0.0	0.0	0.070	BABBIT	11.48	0.5	0.0	0.5	38.3	200	2.00	46.4	1.48	0.47
BLOCK 121A (MIXED USE)	SAP33904	SAP33905	0.87	0.87	46	2.34		108	108	0	0	0	0	0	0.1	108	0.3	0.3	0.147	BABBIT	7.81	2.2	0.0	2.3	12.4	200	2.00	46.4	1.48	0.75
FENCHURCH MANOR	SAP33905	SAP33903	0.19	1.34	4	3.13		13	136	0	0	0	0	0	0.1	136	0.0	0.4	0.217	BABBIT	7.45	2.6	0.0	2.8	50.9	200	0.60	25.4	0.81	0.52
BALL GATE	SAP33903	SAP33971	0.16	1.5	0	3.13		0	136	0	0	0	0	0	0.2	136	0.0	0.4	0.161	BABBIT	7.45	2.6	0.0	2.8	83.1	200	2.00	46.4	1.48	0.80
STREET C	SAP33970	SAP33971	0.3	0.28	7	3.13		22	22	0	0	0	0	0	0.0	22	0.1	0.1	0.000	BABBIT	10.74	0.6	0.0	0.6	8.8	200	1.00	32.8	1.04	0.40
BALL GATE	SAP33971	SAP33973	0.13	1.91	0	3.13		0	158	0	0	0	0	0	0.2	158	0.0	0.4	0.158	BABBIT	7.23	3.0	0.0	3.2	74.2	200	2.80	54.9	1.75	0.93
STREET B	SAP33972	SAP33973	0.28	0.28	6	3.13		19	19	0	0	0	0	0	0.0	19	0.0	0.0	0.000	BABBIT	0.00	0.0	0.0	0.0	8.8	200	1.00	32.8	1.04	#N/A
BALL GATE	SAP33973	SAP33974	0.13	2.32	0	3.13		0	177	0	0	0	0	0	0.2	177	0.0	0.5	0.205	BABBIT	7.07	3.3	0.0	3.5	64.3	200	1.15	35.2	1.12	0.70
BALL GATE	SAP33974	SAP33921	0	2.32	0			0	177	0	0	0	0	0	0.2	177	0.0	0.5	0.182	HARJ/OJN	4.17	1.9	0.0	2.1	8.8	200	0.65	26.4	0.84	0.49
THICKETWOOD AVENUE	EXT 1	SAP33921	13.89	13.89	397	2.68		1063.96	1063.96	0	0	0	0	0	1.4	1063.96	2.8	2.8	0.474	HARJ/OJN	3.78	10.5	0.0	11.9	16.2	200	0.50	23.2	0.74	0.72
THICKETWOOD AVENUE	SAP33921	SAP33923	0.41	16.42	7	3.13		22	1282	0	0	0	0	0	1.7	1282	0.1	3.3	0.393	HARJ/OJN	3.73	12.3	0.0	13.9	94.5	250	0.40	37.6	0.77	0.68
BLOCK 123A (SCHOOL)	SAP33922	SAP33923	0	0	0			0	0	2.44	2.44	0	0.648	0	0.2	0	0.0	0.0	0.000	BABBIT	0.00	0.0	1.6	1.8	7.6	200	2.00	46.4	1.48	0.68
THICKETWOOD AVENUE	SAP33923	SAP33924	0.14	16.76	2	3.13		6	1289	0	2.44	0	0	0	1.9	1289	0.0	3.3	0.421	HARJ/OJN	3.73	12.3	1.6	15.8	40.6	250	0.40	37.6	0.77	0.71
THICKETWOOD AVENUE	SAP33924	SAP33925	0.11	16.87	2	3.13		6	1295	0	2.44	0	0	0	1.9	1295	0.0	3.3	0.422	HARJ/OJN	3.73	12.4	1.6	15.9	16.0	250	0.40	37.6	0.77	0.71
THICKETWOOD AVENUE	SAP33925	SAP33926	0.3	17.17	5	3.13		16	1291	0	2.44	0	0	0	2.0	1291	0.0	3.4	0.424	HARJ/OJN	3.73	12.5	1.6	16.1	58.8	250	0.40	37.6	0.77	0.71
THICKETWOOD AVENUE	SAP33926	SAP33927	0.02	17.19	0	3.13		0	1291	0	2.44	0	0	0	2.0	1291	0.0	3.4	0.424	HARJ/OJN	3.73	12.5	1.6	16.1	13.1	250	0.40	37.6	0.77	0.71
THICKETWOOD AVENUE	SAP33927	SAP33928	0.28	17.47	5	3.13		16	1306	0	2.44	0	0	0	2.0	1306	0.0	3.4	0.426	HARJ/OJN	3.72	12.7	1.6	16.2	60.3	250	0.40	37.6	0.77	0.71
THICKETWOOD AVENUE	SAP33928	SAP33929	0.16	24.27	3	3.13		9	1879	0	2.44	0	0	0	2.7	1879	0.0	4.9	0.385	HARJ/OJN	3.61	17.7	1.6	21.9	28.0	300	0.40	61.1	0.86	0.77
THICKETWOOD AVENUE	SAP33929	SAP33938	0.3	24.57	6	3.13		19	1898	0	2.44	0	0	0	2.7	1898	0.0	4.9	0.387	HARJ/OJN	3.60	17.8	1.6	22.1	40.7	300	0.40	61.1	0.86	0.77
REDHILL CRESENT	SAP33930	SAP33931	0.25	0.25	8	2.34		19	19	0	0	0	0	0	0.0	19	0.0	0.0	0.075	BABBIT	11.08	0.5	0.0	0.6	49.0	200	2.00	46.4	1.48	0.49
REDHILL CRESENT	SAP33931	SAP33932	0.1	0.35	2	2.34		5	23	0	0	0	0	0	0.0	23	0.0	0.1	0.089	BABBIT	10.60	0.6	0.0	0.7	14.4	200	1.40	38.8	1.23	0.46
REDHILL CRESENT	SAP33932	SAP33933	0.57	0.92	22	2.34		51	75	0	0	0	0	0	0.1	75	0.1	0.2	0.155	BABBIT	8.40	1.6	0.0	1.7	87.1	200	0.90	30.1	0.99	0.52
REDHILL CRESENT	SAP33933	SAP33936	0.31	1.23	7	2.34		16	91	0	0	0	0	0	0.1	91	0.0	0.2	0.173	BABBIT	8.07	1.9	0.0	2.0	55.8	200	0.80	29.3	0.93	0.53
FENCHURCH MANOR	SAP33934	SAP33935	0.32	0.32	8	2.34		19	19	0	0	0	0	0	0.0	19	0.0	0.0	0.075	BABBIT	11.08	0.5	0.0	0.6	44.3	200	2.00	46.4	1.48	0.49
FENCHURCH MANOR	SAP33935	SAP33936	0	0.32	0	3.13		0	19	0	0	0	0	0	0.0	19	0.0	0.0	0.080	BABBIT	11.08	0.5	0.0	0.6	8.5	200	1.55	40.8	1.30	0.45
ASCOT LANE	SAP33936	SAP33937	0.64	2.19	17	3.13		53	163	0	0	0	0	0	0.2	163	0.1	0.4	0.173	BABBIT	7.19	3.1	0.0	3.3	94.7	200	2.00	46.4	1.48	0.83
ASCOT LANE	SAP33937	SAP33938	0.57	2.76	13	3.13		41	204	0	0	0	0	0	0.3	204	0.1	0.5	0.171	BABBIT	6.87	3.6	0.0	3.9	105.6	200	3.00	56.8	1.81	1.01
THICKETWOOD AVENUE	SAP33938	SAP33939	0.24	27.57	5	3.13		16	2118	0	2.44	0	0	0	3.0	2118	0.0	5.5	0.496	HARJ/OJN	3.57	19.7	1.6	24.2	34.8	300	0.40	61.1	0.86	0.79
THICKETWOOD AVENUE	SAP33939	SAP33940	0.2	27.77	4	3.13		13	2130	0	2.44	0	0	0	3.0	2130	0.0	5.5	0.497	HARJ/OJN	3.56	19.8	1.6	24.4	24.4	300	0.40	61.1	0.86	0.79
THICKETWOOD AVENUE	SAP33940	SAP33964	0.01	27.78	0	3.13		0	2130	0	2.44	0	0	0	3.0	2130	0.0	5.5	0.383	HARJ/OJN	3.56	19.8	1.6	24.4	7.7	300	0.50	68.3	0.97	0.85
WATFORD CRESENT	SAP33941	SAP33942	0.25	0.25	8	2.34		19	19	0	0	0	0	0	0.0	19	0.0	0.0	0.075	BABBIT	11.08	0.5	0.0	0.6	52.4	200	2.00	46.4	1.48	0.49
WATFORD CRESENT	SAP33942	SAP33943	0.09	0.34	1	3.13		3	22	0	0	0	0	0	0.0	22	0.0	0.1	0.086	BABBIT	10.74	0.6	0.0	0.6	13.9	200	1.50	40.1	1.28	0.47
WATFORD CRESENT	SAP33943	SAP33944	0.41	0.75	11	2.84		31	53	0	0	0	0	0	0.1	53	0.1	0.1	0.133	BABBIT	8.99	1.2	0.0	1.3	60.0	200	1.00	32.8	1.04	0.50
WATFORD CRESENT	SAP33944	SAP33946	0.77	1.52	15	2.81		42	95	0	0	0	0	0	0.2	95	0.1	0.2	0.137	BABBIT	8.00	2.0	0.0	2.1	107.9	200	2.25	49.2	1.57	0.76
HENLOW TRAIL	SAP33946	SAP33947	0.8	2.32	20	3.13		63	158	0	0	0	0	0	0.2	158	0.2	0.4	0.226	BABBIT	7.23	3.0	0.0	3.2	108.1	200	0.65	26.4	0.84	0.56
HENLOW TRAIL	SAP33947	SAP33948	0.57	2.89	13	3.13		41	199	0	0	0	0	0	0.3	199	0.1	0.5	0.248	BABBIT	6.91	3.6	0.0	3.9	70.1	200	0.65	26.4	0.84	0.59
HENLOW TRAIL	SAP33948	SAP33949	0.17	3.06	2	3.13		6	205	0	0	0	0	0	0.3	205	0.0	0.5	0.251	BABBIT	6.87	3.7	0.0	4.0	14.6	200	0.65	26.4	0.84	0.59
HENLOW TRAIL	SAP33949	SAP33950	0.26	3.32	5	3.13		16	220	0	0	0	0	0	0.3	220	0.0	0.6	0.264	BABBIT	6.77	3.9	0.0	4.2	45.6	200	0.60	25.4	0.81	0.58
HENLOW TRAIL	SAP33950	SAP33956	0.14	3.46	3	3.13		9	230	0	0	0	0	0	0.3	230	0.0	0.6	0.268	BABBIT	6.71	4.0	0.0	4.4	26.6	200	0.60	25.4	0.81	0.59
WATFORD CRESENT	SAP33951	SAP33952	0.54	0.54	19	2.34		44	44	0	0	0	0	0	0.1	44	0.1	0.1	0.105	BABBIT	9.32	1.1	0.0	1.1	77.9	200	2.00	46.4	1.48	0.61
WATFORD CRESENT	SAP33952	SAP33953	0.37	0.91	13	2.34		30	75	0	0	0	0	0	0.1	75	0.1	0.2	0.140	BABBIT	8.40	1.6	0.0	1.7	77.3	200	1.40	38.8	1.23	0.61
WEMBLEY GATE	SAP33953	SAP33954	0.68	1.59	14	3.13		44	119	0	0	0	0	0	0.2	119	0.1	0.3	0.181	BABBIT	7.66	2.4	0.0	2.5	83.8	200	1.00	32.8	1.04	0.60
WEMBLEY GATE	SAP33954	SAP33955	0.5	2.09	12	3.13		38	156	0	0	0	0	0	0.2	156	0.1	0.4	0.162	BABBIT	7.25	2.9	0.0	3.2	69.8	200	2.45	51.3	1.63	0.88
WEMBLEY GATE	SAP33955	SAP33956	0.15	2.24	3	3.13		9	166	0	0	0	0	0	0.2	166	0.0	0.4	0.158	BABBIT	7.16	3.1	0.0	3.3	27.9	200	3.00	56.8	1.81	0.96
HENLOW TRAIL	SAP33956	SAP33957	0.12	5.82	2	3.13		6	402	0	0	0	0	0	0.6	402	0.0	1.0	0.355	BABBIT	6.00	6.3	0.0	6.9	39.9	200	0.50	23.2	0.74	0.63
HENLOW TRAIL	SAP33957	SAP33969	0.05	5.87	0	3.13		0	402	0	0	0	0	0	0.6	402	0.0	1.0	0.355	BABBIT	6.00	6.3	0.0	6.9	25.3	200	0.50	23.2	0.74	0.63
HENLOW TRAIL	SAP33969	SAP33962	0	5.87	0			0	402	0	0	0	0	0	0.6	402	0.0	1.0	0.355	BABBIT	6.00	6.3	0.0	6.9	3.8	200	0.50	23.2	0.74	0.63
ADDINGTON HEIGHTS	SAP33958	SAP33959	0.38	0.38	13	2.34		30	30	0	0	0	0	0	0.0	30	0.1	0.1	0.094	BABBIT	10.05	0.8	0.0	0.8	48.3	200	2.00	46.4	1.48	0.56
ADDINGTON HEIGHTS	SAP33959	SAP33960	0.81	1.19	30	2.34		70	101	0	0	0	0	0	0.1	101	0.2	0.3	0.158	BABBIT	7.91	2.1	0.0	2.2	109.9	200	1.35	38.1	1.21	0.65
MILADY GROVE	SAP33960	SAP33961	0.55	1.74	12	3.13		38	138	0	0	0	0	0	0.2	138	0.1	0.4	0.154	BABBIT	7.43	2.7	0.0	2.8	74.1	200	2.50	51.8	1.65	0.87
MILADY GROVE	SAP33961	SAP33962	0.67	2.41	17	3.13		53	191	0	0	0	0	0	0.2	191	0.1	0.5	0.165	BABBIT	6.96	3.5	0.0	3.7	98.9	200	3.20	58.6	1.87	1.02
MILADY GROVE	SAP33962	SAP33963	0.15	8.43	3	3.13		9	603	0	0	0	0	0	0.8	603	0.0	1.6	0.352	HARJ/OJN	3.93	8.2	0.0	7.0	26.5	200	0.50	23.2	0.74	0.62
MILADY GROVE	SAP33963	SAP33964	0.11	8.54	2	3.13		6	609	0	0	0	0	0	0.9	609	0.0	1.6	0.354	HARJ/OJN	3.93	8.2	0.0	7.1	23.2	200	0.50	23.2	0.74	0.63
THICKETWOOD AVENUE	SAP33964	SAP33965	0.05	36.37	0	3.13		0	2759	0	2.44	0	0	0	3.9	2759	0.0	7.1	0.459	HARJ/OJN	3.48	24.8	1.6	30.3	28.7	300	0.40	61.1	0.86	0.83
THICKETWOOD AVENUE	SAP33965	SAP33966	0.13	36.5	2	3.13		6	2745	0	2.44	0	0	0	3.9	2745	0.0	7.1	0.459	HARJ/OJN	3.47	24.8	1.6	30.3	28.8	300	0.40	61.1	0.86	0.83
THICKETWOOD AVENUE	SAP33966	SAP33967	0.26	36.76	4	3.13		13	2758	0	2.44	0	0	0	3.9	2758	0.0	7.2	0.460	HARJ/OJN	3.47	24.9	1.6	30.4	61.9	300	0.40	61.1	0.86	0.83
THICKETWOOD AVENUE	SAP33967	SAP33968	0.29	37.05	5	3.13		16	2773	0	2.44	0	0	0	3.9	2773	0.0	7.2	0.322	HARJ/OJN	3.47	25.1	1.6	30.6	58.4	300	1.50	118.4	1.67	1.35
THICKETWOOD AVENUE	SAP33968	EXT 2	0.16	37.21	2	3.13		6	2780	0	2.44	0	0	0	4.0	2780	0.0	7.2	0.299	HARJ/OJN	3.47	25.1	1.6	30.7	34.7	300	2.00	136.7	1.93	1.50

GENERAL NOTES

REFER TO CURRENT CITY OF BARRIE STANDARDS FOR APPLICABLE GENERAL NOTES.

BENCH MARKS

NO.	REVISIONS	DATE	APPROVED

SCS consulting group ltd
30 CENTURIAN DRIVE, SUITE 100
MARKHAM, ONTARIO L3R 8B8
TEL: (905) 475-1900
FAX: (905) 475-8335

SORBARA group of companies
3700 STEELES AVE WEST, SUITE 800
VAUGHAN, ONTARIO L4L 8M9
TEL: (905) 850-6154

LICENSED PROFESSIONAL ENGINEER
R. S. HAYES
100517803
PROVINCE OF ONTARIO

CITY OF BARRIE
ACCEPTED
DATE. . . . . .
. . . . . .
DIRECTOR OF ENGINEERING

BARRIE LOCKHART ROAD GP INC.

SANITARY SEWER DESIGN SHEET

Barrie
ENGINEERING DEPARTMENT

SCALE HOR. AS SHOWN			CONTRACT NO. 2000
DESIGN R.S.H./M.A.M.	DRAWN M.T.C.		SHEET NO. SAN3
REVIEWED M.R.C./P.S.	DATE NOVEMBER 2020		

REFER TO FIGURE 14

REFER TO FIGURE 14

HERITAGE CT
NATHAN CRESCENT
MADELAINE DR
DEAN AVENUE
MAPLEVIEW DRIVE
CONNECTION E4-C
EX. 250Ø OBV: 265.38
DEPTH: 3.62m
CONNECTION E4-B
EX. 250Ø OBV: 263.33
DEPTH: 4.15m
CRES
DANIELLE
STUNDEN LANE
CATHERINE DRIVE
SELINE CRESCENT
IRENE DRIVE
PATRICK DRIVE
BEMP II
139.2ha
SWMF #4
CONNECTION E3
EX. 450Ø OBV: 244.00
DEPTH: 4.65m
LOVER'S CREEK
LOCKMAPLE INNISFIL INVESTMENTS LTD.
SOBEY
PHASE 1
PHASE 2
RAINSONG LAND DEVELOPMENT INC.
NON PARTICIPANT
CONNECTION E2
EX 3750 OBV: 242.24
DEPTH: 3.46m
SWMF #2
BEMP I
31.0ha
MICHELLE DRIVE
BARTOR BOULEVARD
CONNECTION E1
EX 2500 OBV: 253.91
DEPTH: 3.4m
PRISCILLAS PLACE
9.9ha
VAN DER HEYDEN
LOCKHART ROAD
LOCKHART INNISFIL INVESTMENTS (II) LTD.
LOCKHART INNISFIL INVESTMENTS LTD.
SWMF #1
SWMF #3
IRVING

LEGEND

- SURVEYED NHS LIMIT (2015)
- NHS BUFFER LIMIT
- 2031 PHASE LIMITS
- DEV. LIMITS
- PHASING LIMITS
- 2031 PHASE LIMITS
- EXISTING 100 YR FLOOD LIMITS
- EXISTING REGIONAL FLOOD LIMITS
- PROPOSED DRAINAGE BOUNDARY

NOTE:
THE REGULATORY EVENT IS THE REGIONAL STORM EVENT

- FLOW DIRECTION ARROW
- SANITARY DC TRUNK SEWER
- SANITARY LOCAL TRUNK SEWER
- SANITARY LOCAL COLLECTOR SEWER
- SANITARY FORCEMAIN
- SANITARY MANHOLE
- EXISTING SANITARY SEWER
- FLOW DIRECTION ARROW DEPICTS SEWER CONTINUES ON IN ARROW DIRECTION
- P PUMP STATION

0 60 120 180 240
Metres

NOTE: *SCALE ONLY VALID FOR 24" x 36" SIZED PLOTS*

BURNSIDE

Client: HEWITT'S CREEK LANDOWNERS GROUP INC.

Figure Title: HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY
PROPOSED SANITARY SEWER PLAN (1 OF 3)

Drawn	Checked	Date
BH	CC	17/09/14

Scale: H 1:3,000*
Project No.: 300032860
Figure No.: FIG 13

M:\Hamilton\Client Data\300032860 - Watershed Update\11_GIS\2_Products\Figures\300032860_11x17_SWMP_Data Sheet_September 14, 2017 - 10:13 PM

REFER TO DETAIL A ON FIGURE 15

REFER TO FIGURE 15

REFER TO FIGURE 13

REFER TO FIGURE 13

REFER TO FIGURE 15

CONNECTION E4-A
EX. 250Ø OBV: 260.04
DEPTH: 3.0

MAPLEVIEW DRIVE

SUN KING CRESCENT

SUCCESSION CRESCENT

CONNECTION E6-
INV: 256.81

OBV: 260.64
DEPTH: 5.0

30.8ha

OBV: 261.09
DEPTH: 6.2

OBV: 261.71
DEPTH: 6.3

SOBEY'S

OBV: 268.79
DEPTH: 3.0

OBV: 268.85
DEPTH: 3.0

OBV: 262.14
DEPTH: 6.5

OBV: 269.50
DEPTH: 3.0

OBV: 262.80
DEPTH: 6.4

69.06
3.0

2.25%

3.30%

7.67
4.9

OBV: 271.02
DEPTH: 3.0

OBV: 268.01
DEPTH: 3.7

OBV: 263.72
DEPTH: 6.3

GO TRANSIT RAIL

YONGE STREET

NSCNG LAND
EVELOPMENT
INC.

OBV: 269.93
DEPTH: 3.0

NON
PARTICIPANT

OBV: 268.15
DEPTH: 3.6

OBV: 264.18
DEPTH: 3.5

NON PARTICIPANT

PHASE 2

OBV: 248.56
DEPTH: 5.8

60.8ha

SWMF #7

SWMF #10

CRISDAWN
CONSTRUCTION
INC.

OBV: 249.81
DEPTH: 3.0

SWMF #6

2303757
ONTARIO INC.

OBV: 251.37
DEPTH: 3.0

OBV: 254.54
DEPTH: 3.9

OBV: 254.99
DEPTH: 6.4

OBV: 255.40
DEPTH: 7.4

PHASE 1
PHASE 3

PHASE 3

NON PARTICIPANT

OBV: 256.03
DEPTH: 6.3

OBV: 255.68
DEPTH: 7.0

HEWITT'S CREEK TRIBUTARY

SWMF #5

OBV: 260.50
DEPTH: 3.7

LOCKHART ROAD

OBV: 266.69
DEPTH: 3.0

OBV: 263.00
DEPTH: 4.0

OBV: 263.50
DEPTH: 3.4

OBV: 241.75
DEPTH: 6.3

OBV: 242.03
DEPTH: 8.0

85.7ha

OBV: 249.18
DEPTH: 3.0

CRISDAWN
CONSTRUCTION
INC.

NON
PARTICIPANT

CRISDAWN
CONSTRUCTION
INC.

FILL REQUIRED TO
ACHIEVE SERVICING

OBV: 256.72
DEPTH: 4.0

OBV: 251.57
DEPTH: 7.5

OBV: 250.95
DEPTH: 7.3

HEWITT'S CREEK

SWMF #9

SWMF #8

OBV: 248.95
DEPTH: 6.9

OBV: 250.25
DEPTH: 8.5

OBV: 251.35
DEPTH: 7.6

9.8ha

24.4ha

OBV: 253.83
DEPTH: 5.8

OBV: 260.13
DEPTH: 3.0

BULUT LANDS
109369 ONTARIO INC

OBV: 260.39
DEPTH: 4.2

OBV: 253.30
DEPTH: 3.0

NON
PARTICIPA

SWMF #11

OBV: 258.76
DEPTH: 3.0

OBV: 257.00
DEPTH: 3.2

OBV: 247.36
DEPTH: 8.9

OBV: 257.06
DEPTH: 3.8

CRISDAWN
CONSTRUCTION
INC.

OBV: 253.87
DEPTH: 6.9

OBV: 255.87
DEPTH: 3.0

OBV: 248.59
DEPTH: 7.5

CREEK CROSSING DEPTH @ 2.5m

OBV: 255.71
DEPTH: 3.0

NON PARTI

OBV: 249.99
DEPTH: 7.1

OBV: 251.23
DEPTH: 3.0

CREEK CROSSING DEPTH @ 2m

LEGEND

- SURVEYED NHS LIMIT (2015)
- NHS BUFFER LIMIT
- 2031 PHASE LIMITS
- DEV. LIMITS
- PHASING LIMITS
- 2031 PHASE LIMITS
- PROPOSED 100 YR FLOOD LIMITS
- PROPOSED REGIONAL FLOOD LIMITS
- PROPOSED DRAINAGE BOUNDARY

DASHED FLOOD LINES ARE APPROXIMATE ONLY, BASED ON INTERPOLATED DATA BETWEEN FINGERLAKES AND 1091369 ONTARIO INC. DETAILED TOPOGRAPHIC DATA. FLOODLINES ARE SUBJECT TO CHANGE BASED ON ADDITION OF DETAILED TOPOGRAPHIC SURVEY.

- FLOW DIRECTION ARROW
- SANITARY DC TRUNK SEWER
- SANITARY LOCAL TRUNK SEWER
- SANITARY LOCAL COLLECTOR SEWER
- SANITARY FORCEMAIN
- SANITARY MANHOLE
- EXISTING SANITARY SEWER
- FLOW DIRECTION ARROW DEPICTS SEWER CONTINUES ON IN ARROW DIRECTION
- P PUMP STATION

NOTE:
THE REGULATORY EVENT IS THE REGIONAL STORM EVENT

0 60 120 180 240
Metres

NOTE: "SCALE ONLY VALID FOR 24" x 36" SIZED PLOTS"

BURNSIDE

Client: HEWITT'S CREEK LANDOWNERS GROUP INC.

Figure Title: HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY
PROPOSED SANITARY SEWER PLAN (2 OF 3)

Drawn	Checked	Date
BH	CC	17/09/14

Scale: H 1:3,000"
Project No.: 300032860
Figure No.: FIG 14

N:\Hamilton\Current Work\300032860 - Hewitts Landowners\13 SUBWS\1 Drawings\Figures\300032860 - SUBWS.MXD Greg Pender September 18, 2014 - 12:12 PM

REFER TO FIGURE 14

REFER TO FIGURE 14

DETAIL A

HEWITT'S CREEK

CONNECTION E5
EX 825Ø OBV: 238.69

OBV: 241.75
DEPTH: 6.3

NAPLEVIEW DRIVE

SUN KING CRESENT

DIANA WAY

WINCHESTER TERRACE

VERSAILLES CRESCENT

MAGNA CARTA RD

CONNECTION E6
INV: 256.90

CONNECTION E7
INV: 259.87

CONNECTION E8
INV: 255.53

SWMF #11

SWMF #12

SWMF #13

SWMF #14

SWMF #15

SWMF #16

SWMF #17

SWMF #18

24.4ha

7.8ha

19.8ha

4.0ha

3.0ha

1.0ha

21.8ha

24.3ha

3.5ha

4.7ha

11.0ha

PHASE 1
PHASE 3

PHASE 1
PHASE 3

FINGER LAKES ESTATES INC.

DIV DEVELOPMENT (BARRIE) LTD

2121191 / LM BARRIE

BLUE SKY 159722 ONTARIO INC.

BLUE SKY 159722 ONTARIO INC.

NON PARTICIPANT

NON PARTICIPANT

NON PARTICIPANT

20TH SIDEROAD

OBV: 253.30
DEPTH: 3.0

OBV: 257.10
DEPTH: 3.2

OBV: 258.78
DEPTH: 3.0

OBV: 253.83
DEPTH: 5.8

OBV: 251.35
DEPTH: 7.6

OBV: 260.54
DEPTH: 3.0

OBV: 261.83
DEPTH: 3.0

OBV: 255.63
DEPTH: 5.9

OBV: 253.48
DEPTH: 3.0

OBV: 251.90
DEPTH: 3.6

OBV: 256.76
DEPTH: 7.8

OBV: 256.55
DEPTH: 5.5

OBV: 254.87
DEPTH: 7.1

OBV: 255.28
DEPTH: 6.3

OBV: 255.55
DEPTH: 5.7

OBV: 260.81
DEPTH: 3.0

OBV: 261.74
DEPTH: 3.0

OBV: 262.54
DEPTH: 3.0

OBV: 261.66
DEPTH: 3.0

OBV: 261.31
DEPTH: 3.0

OBV: 262.42
DEPTH: 3.0

OBV: 291.20
DEPTH: 3.0

OBV: 251.03
DEPTH: 3.6

OBV: 248.75
DEPTH: 5.4

OBV: 256.59
DEPTH: 3.0

OBV: 257.89
DEPTH: 3.3

OBV: 259.33
DEPTH: 3.0

OBV: 261.98
DEPTH: 3.0

OBV: 261.66
DEPTH: 3.0

OBV: 249.45
DEPTH: 3.3

OBV: 248.25
DEPTH: 6.2

OBV: 249.22
DEPTH: 3.0

OBV: 255.39
DEPTH: 3.0

OBV: 248.01
DEPTH: 3.0

0.40%

1.0%

LEGEND

- SURVEYED NHS LIMIT (2015)
- NHS BUFFER LIMIT
- 2031 PHASE LIMITS
- DEV. LIMITS
- PHASING LIMITS
- 2031 PHASE LIMITS
- PROPOSED 100 YR FLOOD LIMITS
- PROPOSED REGIONAL FLOOD LIMITS
- PROPOSED DRAINAGE BOUNDARY

DASHED FLOOD LINES ARE APPROXIMATE ONLY, BASED ON INTERPOLATED DATA BETWEEN FINGERLAKES AND 1091369 ONTARIO INC. DETAILED TOPOGRAPHIC DATA. FLOODLINES ARE SUBJECT TO CHANGE BASED ON ADDITION OF DETAILED TOPOGRAPHIC SURVEY.

- FLOW DIRECTION ARROW
- SANITARY DC TRUNK SEWER
- SANITARY LOCAL TRUNK SEWER
- SANITARY LOCAL COLLECTOR SEWER
- SANITARY FORCEMAIN
- SANITARY MANHOLE
- EXISTING SANITARY SEWER
- FLOW DIRECTION ARROW DEPICTS SEWER CONTINUES ON IN ARROW DIRECTION

P PUMP STATION

NOTE:
THE REGULATORY EVENT IS THE REGIONAL STORM EVENT

N

0 60 120 180 240
Metres

NOTE: "SCALE ONLY VALID FOR 24" x 36" SIZED PLOTS"

BURNSIDE

Client: HEWITT'S CREEK LANDOWNERS GROUP INC.

Figure Title: HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY
PROPOSED SANITARY SEWER PLAN (3 OF 3)

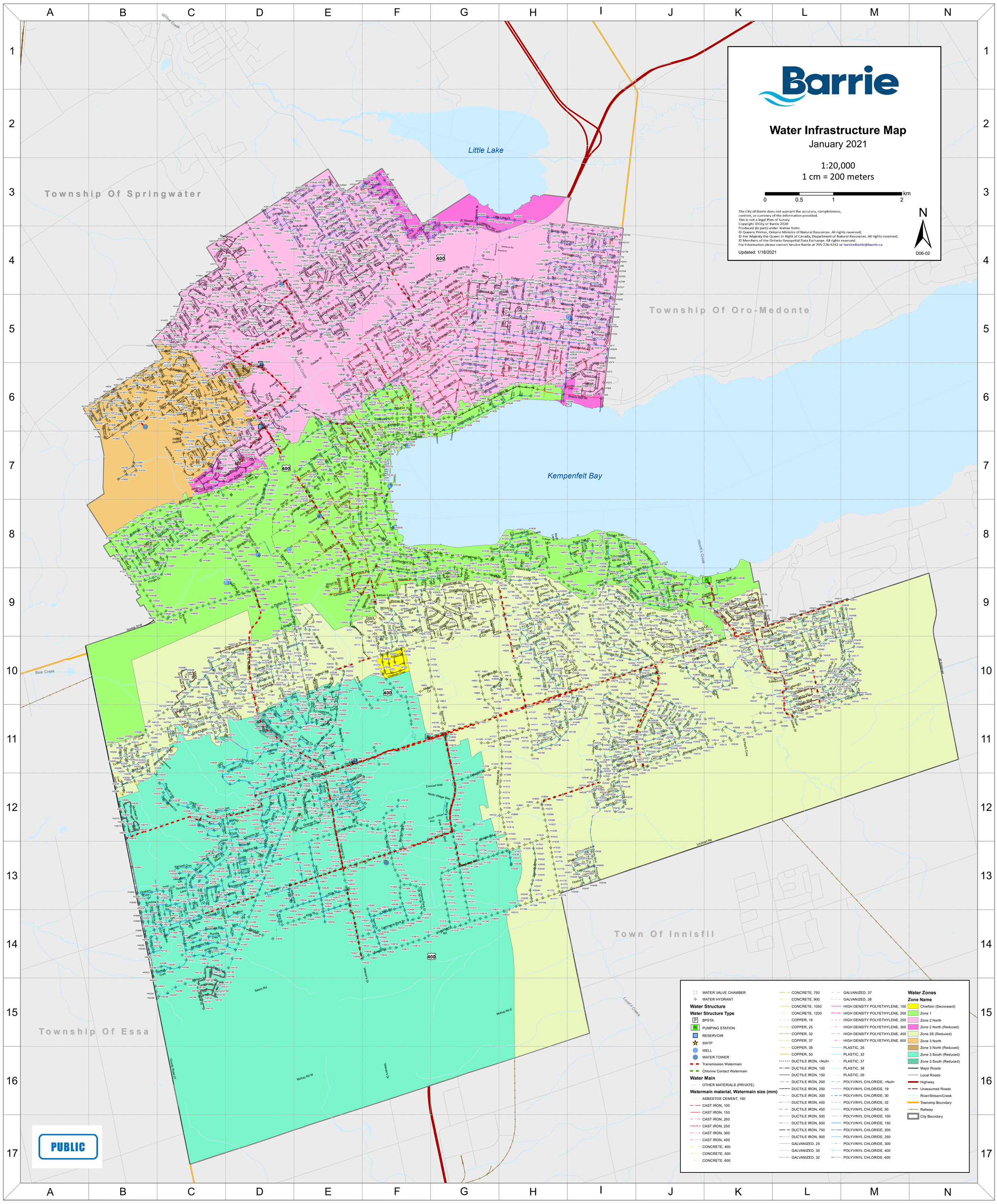
Drawn	Checked	Date
BH	CC	17/09/14
Scale		Project No.
H 1:3,000"		300032860

Figure No. FIG 15

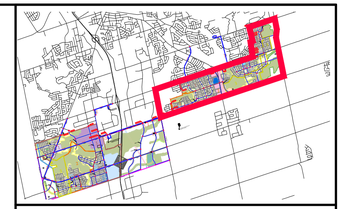
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Appendix D

Water Servicing Information



20 Sideroad N9-10-11
Aconley Crt I4
Adam St H5, I5
Addison Trail I4
Adelaide St F9
Agnes St E5-6, F5
Aikens Cres E11
Alaskan Heights C14
Albert St F6, G6
Aldergrove Cir E4
Aleda St D6
Alexander Ave I5
Alfred St E9
Algonquin Trail I6
Alliance Blvd F4-5, G4
Allsop Cres C12, D12
Alva St D9
Ambler Bay I4
Amelia St F6, G6
Andean Lane C14
Anne St N C4-5-6, D6-7, E7
Anne St S E7-8-9, F9
Arbour Trail I8
Arch Brown Crt D4, E4
Archer St D10
Ardagh Rd B11, C11, D10-11, E10
Argyle Rd D5, E5
Armstrong Blvd G9
Army, Navy And Air Force Dr E8
Arthur Ave H5, I5
Ashdale Crt E4
Ashford Dr J10
Aspen Dr E4
Assiniboine Dr C14
Athabaska Rd C14, D14
Atwood Crt D6
Auburn Crt C10, C11
Austen Lane C6, D6
Autumn Lane G9
Bailey Crt F9
Baker Cres E5
Baldwin Lane F9
Balliston Rd C5
Balmoral Pl L9
Balsam Trail C13
Baltimore Rd E4, F4
Barre Dr I10
Barrett Cres C6
Barrie View Dr F12, F13
Bartor Blvd I13
Barwick Dr C5
Basswood Dr D12
Bates Crt H9
Batteaux St B11
Bay Lane H8-9
Bayfield St D3-4, E4-5-6, F6-7
Bayshore Blvd I9, J9
Bayview Dr F8-9-10, G10-11-12-13-14
Beach Crt H10, I10
Beacon Rd E11
Bear Creek Dr B13, C13
Beatrice Lane L10
Bedford Estates Cres J10
Beechcroft Cir E4
Beecroft Gate F5, G5
Belcourt Ave G5
Bell Farm Rd F4-5, G4
Bell St C11, D11
Bellevue Cres G4-5
Benjamin Lane I11
Bennet Rd F5
Benson St B6-7
Bentley Cres E12
Berard Crt C11
Berczy St F6, G6-7
Bernick Dr G4
Berry Crt C11
Bertha Ave J10
Bethune Pl D6
Bibby Crt D12
Big Bay Point Rd F11, G11, H10-11, I10, J10, K9-10, L9, M9, N9
Bingham Crt H8
Birchshire Dr E10-11
Birchwood Dr E3-4
Bird St C8
Birkhall Pl K10-9, L9
Bishop Dr D10
Black Ash Trail B11-12
Black Cherry Cres C13
Black Willow Dr B13-14
Blackbird Lane E12
Blair Cres I5
Blake St G6, H6, I5-6
Bloom Cres D11
Bloxham Pl J9
Blue Mound Dr G5
Blueberry Lane E12
Bluegrass Dr D12
Bluejay Dr F4
Bluewater Trail J9
Boag Crt E12
Boorman Crt D13
Booth Lane I11
Bothwell Cres F5
Boulton Crt C9
Bourbon Cir L10
Bowman Ave H6
Boyd St I10
Boys St N E7
Boys St S E7
Bradford St F7-8
Brennan Ave H8-9
Briar Rd G9
Brighton Rd H4, I4
Bristow Crt G9
Britannic Lane K9
Broadfoot Rd C7, D7
Broadmoor Ave F9, G10-9
Brock St D9, E8-9, F8
Bronte Cres C6
Brookdale Dr D6, E6
Brookfield Cres I9, J9
Brooks St F9
Brookwood Dr E12
Brown St D11-12, E11-12
Brown Bear St C14
Brown Wood Dr E3, F3
Browning Trail C6-7
Bruce Cres I9
Brucker Rd D13
Brunton Cres I9
Brushwood Cres J10
Bryne Dr E10, F10-11-12-13-14
Buchanan St I5
Buggs Gate I4
Buman Crt I9
Burbank Pl F5, G5
Burke Dr D4-5
Burns Cir C6
Burton Ave F8-9, G8-9
Butternut Dr C13
Byron Cres G10-9
Callaghan Dr D6-7
Callaway Crt D3
Camelot Sq J9, K9
Campbell Ave E9
Campfire Crt H6, I6
Canary Reed Crt C13, D13
Capilano Crt F4, G3-4
Caplan Ave E12-13, F12
Capps Dr J9
Cardinal St E4, F4
Caribou Crt C14
Carley Cres I11
Carlton Rd E5
Carman Crt C7
Carol Rd F10-9
Caroline St E9, F9
Carr Dr C7
Carruthers Cres I5
Carter Rd I10-9
Cartwright Dr E4
Cassandra Dr E3
Castle Dr D6
Catherine Dr I12
Cedar Cres J10, K10
Cedar Pointe Dr D7-8
Celeste Dr E4
Centre St E9, F9
Chalmers Dr H11, I10-11
Chamboro Crt L10
Chantal St I10-11
Charlbrook Ave E5
Charlemagne Ave L10-9
Charles Crt F9
Charleson Dr C13, D13
Charlotte Crt C6
Chase Mceachern Way F7
Chaucer Cres C6, D6
Checkley St F7
Cheltenham Rd H4, I4
Cherry Crt J10
Chestnut Crt E5
Chieftain Cres F10
Chippawa Crt I6
Christie Cres C6
Churchill Dr G11-12, H11
Churchland Dr C13, D13
Cityview Cir E11
Claire Dr I13
Clapperton St E6, F6-7
Clarence Crt G4
Claudio Cres E12
Clearwater Crt I9, J9
Cliff Rd H8
Cloughley Dr B6-7
Clover Ave G9
Clute Cres D12
Codrington St F6, G6, H6
Coleman Dr B8, C8
Coles St D5
Colleen Ave H5
College Cres H4-5
Collete Cres E4-5, F4
Collier St F6, G6
Collingwood St G6, H6
Columbia Rd C14, D14
Commerce Park Dr E14, F13-14
Commonwealth Rd L10
Concert Way F12, G12
Connaught Lane L9
Consort Dr L10
Cook St G5-6, H4-5-6
Copeman Cres H10
Corbett Dr H4
Coronation Pky L10
Corrinhall St I5
Cottage Lane H8
Coughlin Rd D12
Coulter St D5, E5-6
Counsellor Terr L10, M10
Country Lane I11-12, J11
County Road 27 B14-15, C15-16-17
Couples Crt D3, E3
Courtney Cres J11
Cox Mill Rd I8-9-10
Craig Cres D5
Cranberry Lane E12
Crawford St D10-9, E10
Crestwood Dr I6
Creswick Crt F5
Crew Court B12
Crimson Ridge Rd J9
Crompton Dr F3
Cross St D9
Cumberland St F8, G8
Cumming Dr C11-12, D11-12
Cundles Rd E E4-5, F4, G4
Cundles Rd W B6,C6,D5-6,E5
Cunningham Dr C10, D10
Currie St F5
Curtiss Crt H5
Cuthbert St D10
Cynthia Crt F4-5, G4-5
Cypress Point St B12
Dalton St E6
D'Ambrosio Dr H10, I10
Danielle Cres I12
Daphne Cres E5, F4-5
Darcel Cres E3-4
Davidson St F5-6
Davies Cres G5
Dean Ave I10-11, J11
Deborah Way I10, J10
Debra Cres F9
Deerpark Dr E4
Delaney Cres B6
Diana Way L10, M10
Dickens Dr C6
Dixon Crt I9
Dock Rd I9, J8-9
Dodson Rd I9-10, J10
Donald St E7
Doris Dr G9
Douglas Dr H5, I5
Dove Cres D10, E10-11
Downing Cres C13
Downsview Dr H5-6
Doyle Dr C7
Drake Dr H11
Draper Cres H10
Drury Lane E6, F6
Duckworth St G3-4-5-6
Dufferin St E8
Dundonald St F6, G6
Dunlop St E F7, G6-7
Dunlop St W A10, B9-10, C8-9, D7-8, E7, F7
Dunn St D14
Dunnett Dr C11
Dunsmore Lane H4, I4
Duval Dr D3
Dyer Blvd D14
Dykstra Dr C13
Dyment Rd D8-9, E9
Eaglestone Lane C11, D11
East Gate H4
East St F6
Eccles St N E6-7
Eccles St S E7
Eden Dr D7
Edge Water Dr J9
Edgehill Dr B8, C7-8, D7
Edwards Dr J9-10, K9-10
Eileen Dr F10
Elizabeth St D9-10
Ellen St F7-8
Elliott Ave D8
Ellis Dr G11, H11
Elm St F5, G5
Elmbrook Dr E12
Emily Crt C6
Emms Dr D11-12-13
Empire Dr L10, M9-10
Engel Cres D7
Epsom Rd I4
Essa Rd C14-15-16, D12-13-14, E9-10-11-12, F8-9
Esther Dr I11, J11
Etherington Cres C5
Eugenia St F6, G6
Evergreen Crt E10-11
Fairview Rd E9-10, F10-11
Falcon Cres L10
Falling Brook Dr J9-10
Farmingdale Cres E4
Farmstead Cres C13, D12-13
Fawn Cres D11, E11
Felt Cres I9
Fenchurch Manor I13
Ferguson Dr C6



KEY PLAN

PROPOSED 600mmØ WATERMAIN TO CONNECT TO EXISTING 1200mmØ TRUNK WATERMAIN AT ASHFORD DRIVE & BIG BAY POINT

SWTP

ID 12100 900mm

ID 11150 600mm

ID 11152 750mm

ID 11232 750mm

ID 11231 750mm

ID 11151 600mm

ID 12110 400mm

ID 12115 400mm

ID 12401 400mm

2S435

2S444

2S442

2S620

2S523

2S514

2S488

2S518

2S481

2S576

2S430

2S425

2S02-0004

2S637

2S633

2S619

2S607

2S057

B40

STREET N

STREET M

STREET P

20 SIDEROAD

1

2

3

PROPOSED CONNECTIONS REFER TO DWG 1 OF 4

Natural Heritage System
Secondary School
Recreation Centre
Community Park
Existing Non-developable
Industrial/Business Park
Low/Med Density
Med/High Density
Essa/Salem Mixed-Use
Yonge Corridor Mixed-Use
Neighborhood Mixed-Use
TransCanada Pipeline Easement
Hydro Corridor
Future Interchange
School/Park Block
Village Square
Pressure Reducing Valve (PRV)
Pumping Station
Reservoir
Proposed Local Watermain
Proposed Trunk Watermain
ID 11230 Watermain ID
2S121 Connection Points ID
Connection Points to Existing System

No.	DATE	BY	REVISIONS	MAN	CAD
2	10/11/13	P.D	REVISED PER CITY COMMENTS		X
1	07/12/13	P.D	REVISED PER CITY COMMENTS		X

APPROVALS

Municipal

Engineer

Date

Design	T.R.W.	Checked	P.D.S.
Drawn	P.D	Checked	T.R.W.

Scale N.T.S.

Date OCTOBER 2013

WATER STORAGE & DISTRIBUTION MASTER PLAN
DRAFT FINAL
HEWITT'S SECONDARY PLAN

The City of BARRIE

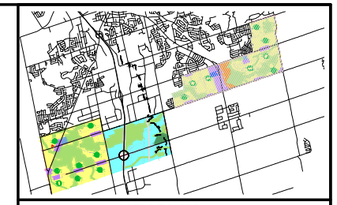
amec

Contract No. 2011-29

Consultant File No. 110135

Drawing No. SHEET 2 OF 4

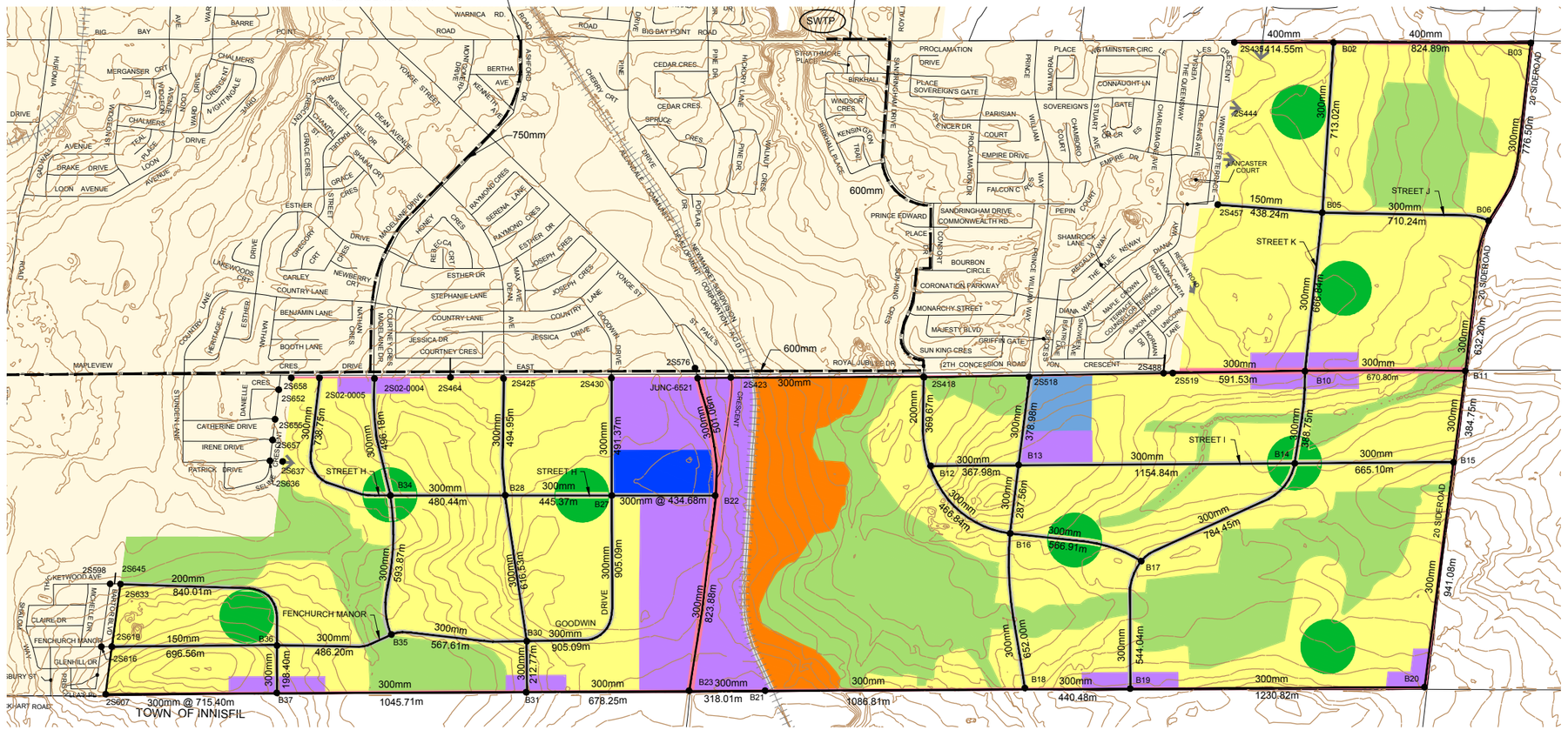
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PROPOSED 750mmØ WATERMAIN TO CONNECT TO EXISTING 1200mmØ TRUNK WATERMAIN AT ASHFORD DRIVE & BIG BAY POINT

PRESSURE ZONE 2 SOUTH

PROPOSED 600mmØ WATERMAIN TO CONNECT TO EXISTING SWTP



Natural Heritage System
Community Park
School/Park Block
High School
Recreation Centre
Industrial/Business Park
Proposed Collector Right-of-Way
Existing Arterial/Collector Right-of-Way
Low/Medium Density Residential
Medium/High Density Residential
Mixed-Use
Village Square
Proposed Local Road Connection
Major Gateway
Secondary Gateway
Inactive Landfill Site
TransCanada Pipeline Easement
Future Interchange
Pressure Zone 3 South
Pressure Zone 2 South
Pressure Reducing Valve (PRV)
Pumping Station
Reservoir
A23 Node ID

No.	DATE	BY	REVISIONS	MAN	CAD

APPROVALS

Municipal

Engineer

Date

Design	T.R.W.	Checked	L.J.
Drawn	J.M.	Checked	T.R.W.

Scale N.T.S.

Date OCTOBER 2013

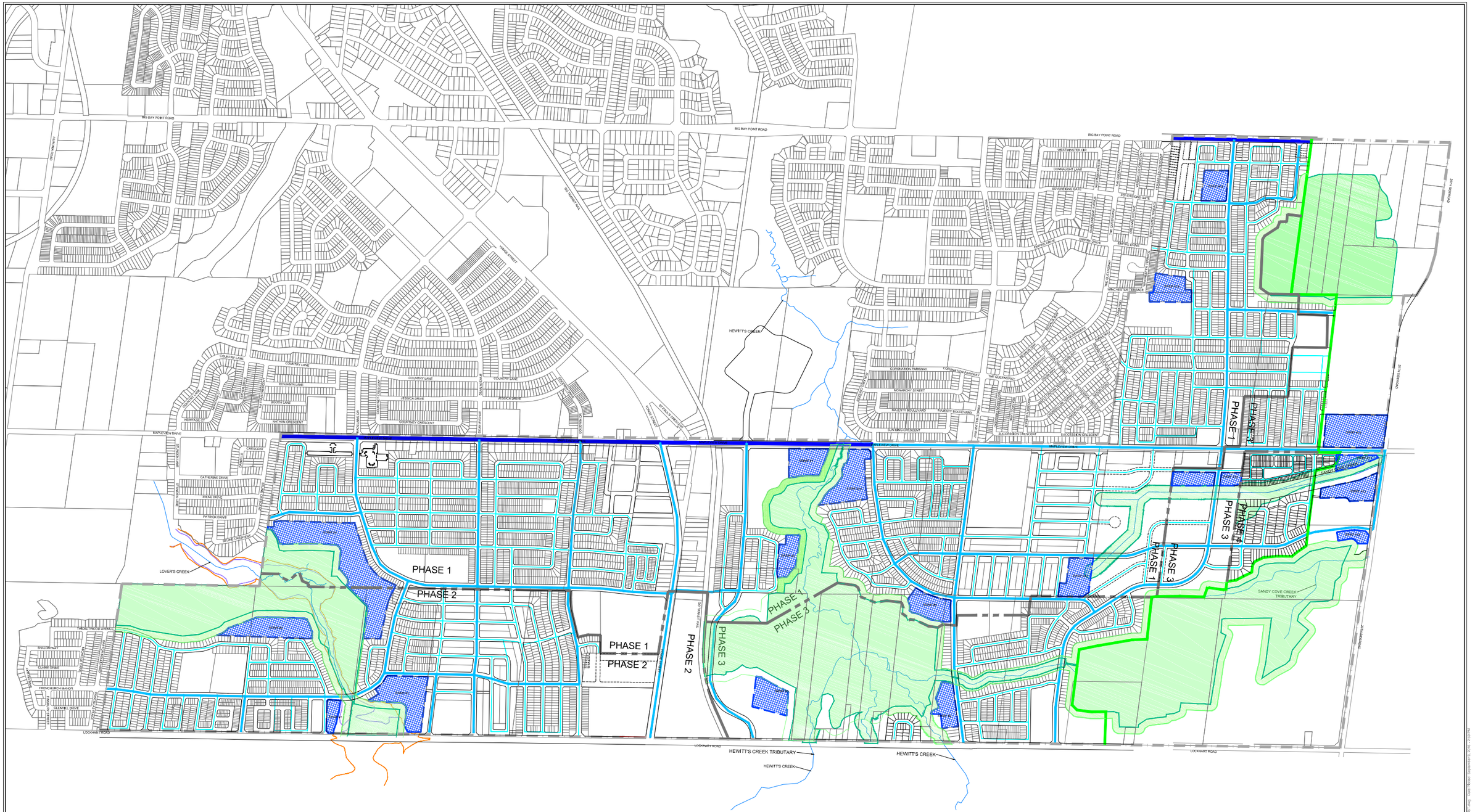
WATER STORAGE & DISTRIBUTION MASTER PLAN
DRAFT FINAL
ANNEXED AREA
EAST LAND USE OPTION 1-ALT 1

The City of BARRIE

amec

Contract No. 2011-29
Consultant File No. 110135
Drawing No. SHEET 2 OF 18

P:\Work\110135\1hwy\dwg\Contract\WATER\First_Submission\Water_Opt-1_Alt1.dwg



LEGEND

- DC TRUNK WATERMAIN
- LOCAL TRUNK WATERMAIN
- LOCAL WATERMAIN
- SURVEYED NHS LIMITS (2015)
- NHS BUFFER LIMITS
- 2031 PHASE LINE
- PHASING LIMITS
- LIMIT OF HEWITT'S CREEK SECONDARY PLAN
- STAKED 2015 NHS LIMITS
- NHS BUFFER LIMITS

N

0 100 200 400 600
Metres

NOTE: "SCALE ONLY VALID FOR 24" x 36" SIZED PLOTS"

BURNSIDE

Figure Title
HEWITT'S SECONDARY PLAN AREA SUBWATERSHED IMPACT STUDY
PROPOSED WATER DISTRIBUTION PLAN

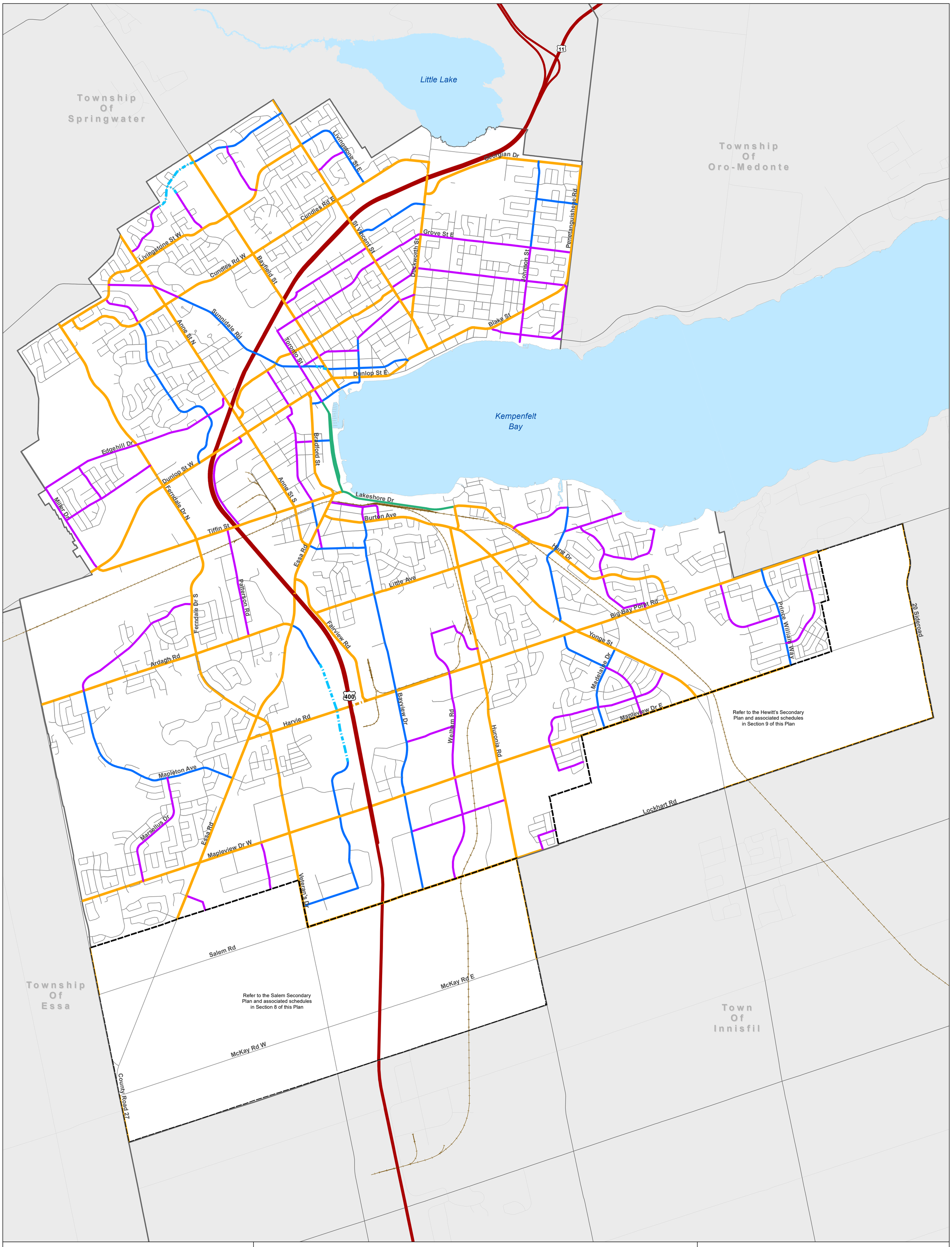
Client
HEWITT'S CREEK LANDOWNERS GROUP INC.

Drawn	Checked	Date
AO	BH	16/01/28

Scale: H 1:4,000"
Project No.: 300032860
Figure No.: **FIG 12**

Appendix E

Traffic Information



OFFICIAL PLAN

Schedule D
Roads Plan

Office Consolidation
January 2018

- Provincial Highway
- Arterial
- Major Collector
- Minor Collector
- Parkway
- Local
- FUTURE ARTERIAL
- Future Collector
- Railway

Barrie

1:20,000

0 0.5 1 2 km

N

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For information please contact Service Barrie at 705-726-4242 or ServiceBarrie@barrie.ca

GIS Branch 4/27/2018

Township Of Springwater

Township Of Oro-Medonte

Township Of Essa

Town Of Innisfil

Little Lake

Kempenfelt Bay

11

400

Livingstone St E
Georgian Dr
Cundles Rd E
St Vincent St
Grove St E
Duckworth St
Johnson St
Penetanguishene Rd
Livingstone St W
Cundles Rd W
Bayfield St
Blake St
Sunnidale Rd
Anne St N
Iroquois St
Dunlop St E
Bradford St
Edgehill Dr
Dunlop St W
Ferndale Dr N
Miller Dr
Anne St S
Lakeshore Dr
Burton Ave
Hurst Dr
Tiffin St
Essa Rd
Little Ave
Ferndale Dr S
Patterson Rd
Fairview Rd
Big Bay Point Rd
Prince William Way
20 Sideroad
Ardagh Rd
Yonge St
Madelaine Dr
Bayview Dr
Wellham Rd
Huronia Rd
Mapleview Dr E
Harvie Rd
Mapleton Ave
Marsellus Dr
Essa Rd
Mapleview Dr W
Veteran's Dr
Lockhart Rd
Salem Rd
McKay Rd E
McKay Rd W
County Road 27

Refer to the Hewitt's Secondary Plan and associated schedules in Section 9 of this Plan

Refer to the Salem Secondary Plan and associated schedules in Section 8 of this Plan

OFFICIAL PLAN

Schedule E
Road Widening Plan

Office Consolidation
January 2018

Road Right of Way Width

20m	25m	29m	33m	Other Streets
22m	26m	30m	34m	Railway
23m	27m	31m	37m	
24m	28m	32m	41m	

Barrie

1:20,000

0 0.5 1 2 km

N

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For information please contact Service Barrie at 705-726-4242 or ServiceBarrie@barrie.ca

GIS Branch 4/27/2018

BIG BAY POINT ROAD

YONGE STREET

Defined Policy Area 1
Section 9.3.3.2 c

MAPLEVIEW DRIVE EAST

Defined Policy Area 3
Section 9.3.3.2 e

LOCKHART ROAD

Defined Policy Area 2
Section 9.3.3.2 d

Defined Policy Area 4
Section 9.3.3.2 f

20 SIDEROAD

Secondary Plan Boundary
Existing Parcel Fabric
Railway
Stream
Arterial
Major Collector
Minor Collector
Pathway System
Potential Grade Separation
Natural Heritage System
Defined Policy Area

0 0.25 0.5 1 km

Schedule 9D-1
Transportation Plan

City of Barrie
Hewitt's Secondary Plan

May 2016

BIG BAY POINT ROAD

YONGE STREET

Defined Policy Area 1
Section 9.3.3.2 c

MAPLEVIEW DRIVE EAST

Defined Policy Area 3
Section 9.3.3.2 e

LOCKHART ROAD

Defined Policy Area 2
Section 9.3.3.2 d

Defined Policy Area 4
Section 9.3.3.2 f

20 SIDEROAD

Secondary Plan Boundary

Existing Parcel Fabric

Railway

Stream

Arterial

Major Collector

Minor Collector

Pathway System

Maximum Width (m)
41
27
24

Potential Grade Separation

Natural Heritage System

Defined Policy Area

0 0.25 0.5 1 km

Schedule 9D-2

Street Widening Plan

City of Barrie
Hewitt's Secondary Plan

May 2016

Appendix F

Utility Information

Enbridge Gas Distribution Inc.
500 Consumers Rd.
North York, ON, M2J 1P8
Canada
www.enbridge.com/gas

Mark-ups@enbridge.com

EGD File Number: 12576120

Re: GOL-14134 service area markups

- By law utility locates must be obtained prior to starting any excavation or ground disturbance activity, such as pile driving, boring, auguring or digging.
- Contact Ontario One Call at 1-800-400-2255 or www.on1call.com at least 5 business days before beginning work to obtain utility locates.
- Please refer to the **"Third Party Requirements In the Vicinity of Natural Gas Facilities**" for requirements and precautions for working safely in the vicinity of natural gas pipelines. The most recent version of this document is available at: https://www.enbridgegas.com/gas-safety/pipeline-safety.aspx
- Enbridge's responses are based on the information available and are valid for a period of 6 months from issue.

☐ **VITAL MAIN**

- You are working within 3m of a Vital Main Pipeline. In order to accommodate Enbridge vital main standby requirements, our Damage Prevention department must be contacted a minimum of three business days prior to commencing any excavation at 1-866-922-3622 to schedule a site meeting.

☐ **NEB PERMIT REQUIRED**

- When crossing or working within 30m of the right-off-way of an NEB regulated natural gas pipeline, a permit must be obtained from the pipeline company (attached).
- Completed permit applications may be submitted to the Enbridge Gas Distribution Inc. Engineering Dept. at alexander.hadjis@enbridge.com.

☐ **CONFLICT**

- We have an **OBJECTION** to your proposed plant as indicated. Please refer to the attached drawings for information on our existing or proposed gas plant.
- You must submit a revised design for our approval that meets the requirements detailed in the Third Party Requirement book before proceeding.
- If relocation of our plant is required, please contact:

☐	Toronto Region	Tara Kuuskman	416-254-7813	tara.kuuskman@enbridge.com
☐	Central Region West	Paul Giovannetti	905-458-2103	paul.giovannetti@enbridge.com
☐	Central Region East	Neerajah Raviraj	905-927-3156	neerajah.raviraj@enbridge.com
☐	Niagara Region	Dennis Stolfi	905-641-4815	dennis.stolfi@enbridge.com
☐	Eastern Region Ottawa	Sonia Padamadan	613-748-6861	sonia.padamadan@enbridge.com
☐	Proposed work is crossing an Enbridge easement. Please contact Anissa Trenholm in our Land Department at 416-753-6937			

☐ **NO-CONFLICT**

- We have **NO OBJECTION** to your proposed plant as indicated. Please refer to the attached drawings for information on our existing and/or proposed gas plant. GAS MAINS MUST BE FIELD LOCATED. Before digging, please call ONTARIO ONE CALL at 1-800-400-2255 for free gas locates.

☒ **GENERAL LOCATION**

- Refer to the attached drawings for information on our existing and/or proposed gas plant within the road allowance.
- The information provided is for **GENERAL LOCATION ONLY** and is not an approval. Detailed plans must be submitted for our review before an approval will be granted.

Kind Regards,

Plate: IN73

Plate: IN91

Plate: IN56

Plate: IN92

Plate: IN75

MAPLEVIEW DRIVE

MAPLEVIEW DR

HOOPER RD

WELHAM RD

HURONIA RD

RAWSON AVE

SAUNDERS RD

STUNDEN LANE

CATHERINE DR

IRENE DR

PATRICK DR

SELINE CRES

THICKETWOOD AVE

SHALOM WAY

CLAIRE DR

MICHELLE DRIVE

BARTOR BLVD

FENCHURCH MANOR

BARRIE NATIONAL GOLF CLUB

N

Network Numbers and Pressure Types:
5320 - IP, 5543 - IP, 5381 - XHP

ENBRIDGE

Atlas Plate Record

Plotted By: gisadmin	Date of Last Revision: 2015 Feb 06	Date Plotted: 2015 May 26
Scale: 2400	Reviewed By: matelav	Plate Number: IN74
	Region: Area 50 - Barrie	

Plate: IN74

Plate: IN57

Plate: IN93

Plate: IN76

N

Network Numbers and Pressure Types:
5381 - XHP, 5543 - IP, 5320 - IP

ENBRIDGE

Atlas Plate Record

Plotted By: gisadmin	Date of Last Revision: 2015 Feb 06	Date Plotted: 2015 Jun 01
Scale: 2400	Reviewed By: matelav	Plate Number: IN75
	Region: Area 50 - Barrie	

Plate: IN91

Plate: IN108

Plate: IN74

Plate: IN109

Plate: IN93

Atlas Plate Record

Plotted By: gisadmin	Date of Last Revision: 2015 Feb 06		Date Plotted: 2015 Feb 19
Scale: 2400	Reviewed By: matelav		Plate Number: IN92
	Region: Area 50 - Barrie		

Network Numbers and Pressure Types:
5320 - IP

ENBRIDGE

Plate: IN92

Plate: IN75

Plate: IN110

LOCKHART ROAD

11TH LINE LOCKHART RD

NPS 8 SC XHP 5N743-6

NPS 8 SC XHP 5N744-1

NPS 4 SC XHP 5N304-2

5N304-1 NPS 4 SC XHP

NPS 4 SC XHP 5N303-6

243

246

0.7m

1.5m

2.5m

2.0m

Regional Road 27

WEBB STREET

WEBB ST

5-78-21 to 22 NPS 2 PE IP

DEMPSTER AVE

5-78-20 NPS 2 PE IP

5-78-23 NPS 2 PE IP

LYNN STREET

LYNN ST

5-78-19 NPS 2 PE IP

5-78-147 NPS 2 PE IP

5-78-14 to 15 NPS 2 PE IP

SMALL AVE

5-78-17 NPS 2 PE IP

Plate: IN94

N

Network Numbers and Pressure Types:
5371 - IP, 5381 - XHP

ENBRIDGE

Atlas Plate Record

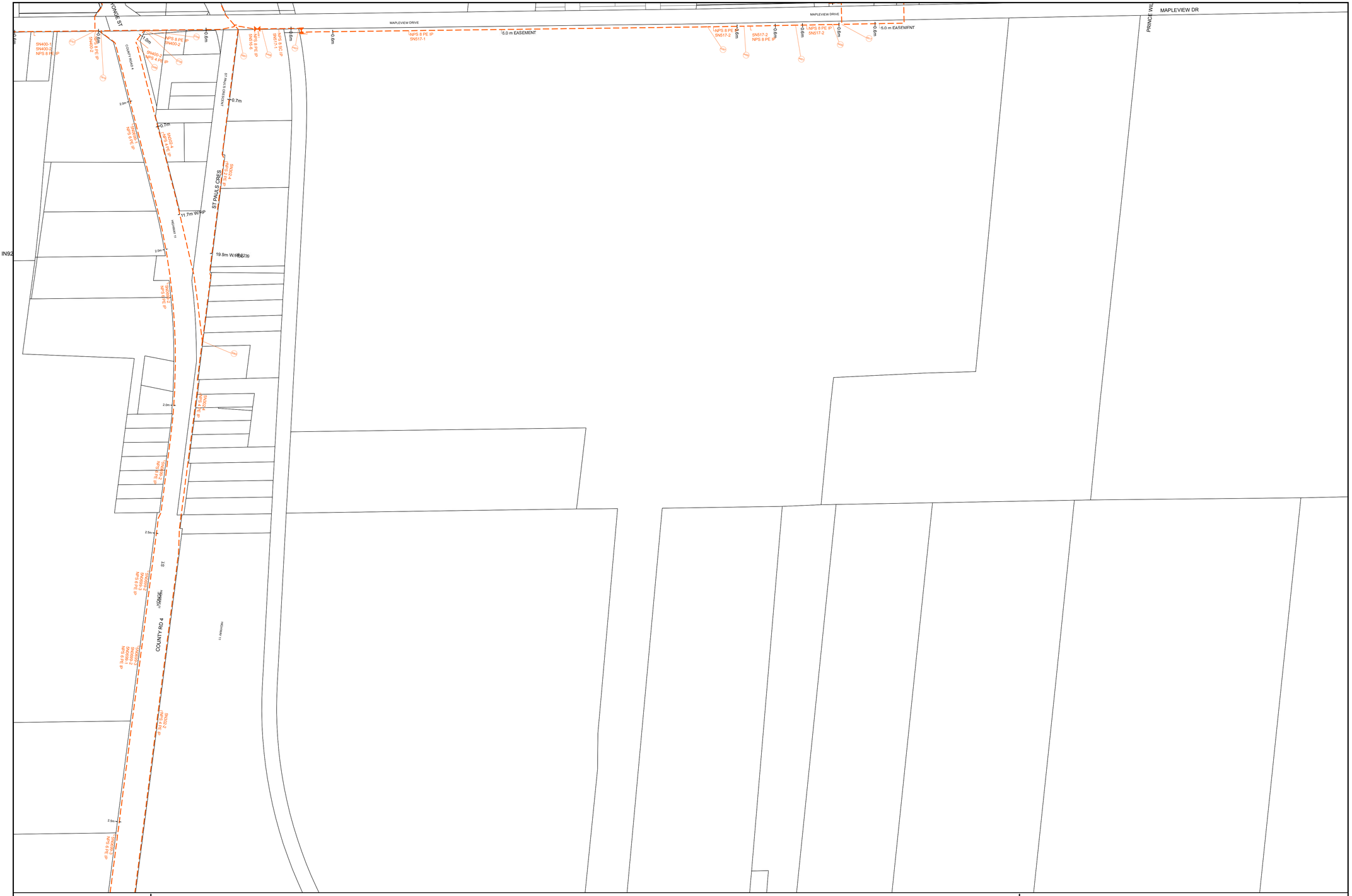
Plotted By: gisadmin	Date of Last Revision: 2013 Apr 23	Date Plotted: 2013 Jun 26
Scale: 2400	Reviewed By: dasgups1	Plate Number: IN93
	Region: Area 50 - Barrie	

Plate: IN108

Plate: IN126

Plate: IN92

Plate: IN110



N

Network Numbers and Pressure Types:
5320 - IP

ENBRIDGE

Atlas Plate Record

Plotted By: gisadmin	Date of Last Revision: 2011 Mar 30	Date Plotted: 2015 May 22
Scale: 2400	Reviewed By: morihovh	Plate Number: IN109
	Region: Area 50 - Barrie	

Plate: IN109

Plate: IN93

Plate: IN128

Plate: IN111

LOCKHART RD

11TH LINE

NELSON CRES

NORTHGATE STREET

NELSON CRESCENT

NEWHOLME CIR

NEWHOLME CRESCENT

PARKSIDE CRES

LYNN ST

COUNTY RD 4

HWY No. 11

5N302-1
NPS 4 SC XHP

5N303-5
NPS 4 SC XHP

NPS 8 SC XHP
5N744-2

LNPS 4 SC XHP
5N302-1

NPS 4 SC XHP
5N302-1

NPS 4 SC XHP
5N707-6

5N78-2
(NPS 2 PE IP

5N78-3
(NPS 1 1/4 PE IP

5N78-2 to 5
NPS 1 1/4 PE IP

5N78-3 to 6
(NPS 3 PE IP

5N78-6
5N79-1
(NPS 1 1/4 PE IP

GPS 2 PE IP
5N781-6

2087 Lockhart Rd
2075 Lockhart Rd
2067 Lockhart Rd
2021 Lockhart Rd
2013 Lockhart Rd
1993 Lockhart Rd
1987 Lockhart Rd
1945 Lockhart Rd
1935 Lockhart Rd
1915 Lockhart Rd
1893 Lockhart Rd
822 Lockhart Rd
808 Lockhart Rd
800 Lockhart Rd
794 Lockhart Rd
790 Lockhart Rd
788 Lockhart Rd
781 Lockhart Rd
812 Lockhart Rd

N

Network Numbers and Pressure Types:
5371 - IP, 5381 - XHP, 5320 - IP

ENBRIDGE

Atlas Plate Record

Plotted By: gisadmin	Date of Last Revision: 2011 Dec 18	Date Plotted: 2015 Feb 27
Scale: 2400	Reviewed By: khant1	Plate Number: IN110
	Region: Area 50 - Barrie	

Jon Ingram

From: Kate Coppin
Sent: Monday, September 27, 2021 9:48 AM
To: Jon Ingram
Subject: FW: Lockhart Subdivisions Enbridge

Kate Coppin, E.I.T.
Junior Engineering Designer
The Jones Consulting Group Ltd.
229 Mapleview Drive East, Unit 1 Barrie, ON L4N 0W5
Phone (705) 734-2538 ext 242 Fax (705) 734-1056
Email kcoppin@jonesconsulting.com
www.jonesconsulting.com



From: Xinyi Wang <Xinyi.Wang@rci.rogers.com>
Sent: Monday, September 27, 2021 9:47 AM
To: Kate Coppin <KCoppin@jonesconsulting.com>
Subject: RE: Lockhart Subdivisions Enbridge

Hi Kate,

No issue with the draft plan.

Regards,

Xinyi Wang
System Planner Outside Plant Engineering
xinyi.wang@rci.rogers.com

ROGERS.

From: Kate Coppin <KCoppin@jonesconsulting.com>
Sent: June 9, 2021 2:38 PM
To: Xinyi Wang <Xinyi.Wang@rci.rogers.com>
Subject: Lockhart Subdivisions Enbridge

Good Afternoon,

The Jones Consulting Group Ltd., has 2 new residential subdivisions proposed for the north side of Lockhart Road in Barrie. I have attached the draft plan of subdivisions, could you let me know if you have any concerns or conflicts with servicing these developments? Let me know if you have any questions or need any further information.

Thank you,

Kate Coppin, E.I.T.
Junior Engineering Designer
The Jones Consulting Group Ltd.
229 Mapleview Drive East, Unit 1 Barrie, ON L4N 0W5
Phone (705) 734-2538 ext 242 Fax (705) 734-1056
Email kcoppin@jonesconsulting.com
www.jonesconsulting.com

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RESTRICTED ACCESS BUSINESS OPERATIONS

As the health and safety of our clients, suppliers, staff and families is our top priority during this period of uncertainty, commencing April 5th 2020, and until further notice, the Jones Consulting Group Ltd. office will be closed.

We are closely monitoring the situation and are following the practices recommended by local and international authorities to minimize the risk of exposure to the novel coronavirus (COVID-19) while doing everything in our power to ensure that our services continue uninterrupted.

Therefore, please note, until further notice, the Jones Consulting Group staff will be working remotely and will respond by e-mail and/or phone only. The office access will be closed.

We remain committed to providing the service you have come to expect from us, however, during this time, the Jones Consulting Group Ltd. may be rescheduling non-essential or non-urgent services as deemed appropriate in order to reduce exposure to the virus and protect everyone's health.

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---

Jon Ingram

From: Kate Coppin
Sent: Thursday, October 7, 2021 4:22 PM
To: Jon Ingram
Subject: FW: Lockhart Subdivisions Enbridge
Attachments: Request For Information Form Feb 2019 .xlsx

Kate Coppin, E.I.T.
Junior Engineering Designer
The Jones Consulting Group Ltd.
229 Mapleview Drive East, Unit 1 Barrie, ON L4N 0W5
Phone (705) 734-2538 ext 242 Fax (705) 734-1056
Email kcoppin@jonesconsulting.com
www.jonesconsulting.com

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS

From: Fournier, Andrew <andrew.fournier@bell.ca>
Sent: Thursday, June 10, 2021 2:17 PM
To: Phil Kuurstra <pkuurstra@rtgsystems.com>; Kate Coppin <KCoppin@jonesconsulting.com>
Cc: Elliott, Brandon <brandon.elliott@bell.ca>
Subject: RE: Lockhart Subdivisions Enbridge

Thanks Phil

Kate, I do not see a problem servicing these developments. Once the sites move forward please complete the attached RFI and provide phasing plans/Hydro Design and I will submit to our Greenfield Governance team that will review and provide an official serve.

Thank you

Bell
Andrew Fournier
Implementation Manager, Network Provisioning
136 Bayfield St, Flr 2. Barrie, ON L4M 3B1
T: 705-797-9977 M: 705-627-0897

From: Phil Kuurstra <pkuurstra@rtgsystems.com>
Sent: June-09-21 4:44 PM
To: Fournier, Andrew <andrew.fournier@bell.ca>; Kate Coppin <KCoppin@jonesconsulting.com>
Cc: Elliott, Brandon <brandon.elliott@bell.ca>
Subject: [EXT]RE: Lockhart Subdivisions Enbridge

Sorry Andrew,
As requested.

Appendix G

Reduced Engineering Submission Drawings

LOCKHART INNISFIL INVESTMENTS (II) LIMITED
460 LOCKHART ROAD, CITY OF BARRIE

DRAWING LEGEND

TITLE	TITLE PAGE
G-1	GENERAL SERVICING PLAN
GP-1	GRADING PLAN
GP-2	GRADING PLAN
GP-3	GRADING PLAN
GP-4	GRADING PLAN
GP-5	GRADING PLAN
STM-1	STORM SEWER SUBCATCHMENT PLAN
SWM-1	POST-DEVELOPMENT DRAINAGE AREA PLAN SWM FACILITIES 1 & 2
LID-1	LID DRY SWALE SUBCATCHMENT PLAN
LID-2	LID SECTIONS AND DETAILS DRY SWALES
SAN-1	SANITARY DRAINAGE AREA PLAN
DS-1	STORM SEWER DESIGN SHEET
DS-2	SANITARY SEWER DESIGN SHEET
PND-1	SWM FACILITY No. 1 PLAN VIEW
PND-2	SWM FACILITY NO. 1 SECTIONS AND DETAILS
PP-1	PLAN AND PROFILE STREET 'B' STA 0+000 TO 0+287
PP-2	PLAN AND PROFILE STREET 'C' STA 0+000 TO 0+334
PP-3	PLAN AND PROFILE STREET 'D' STA 0+000 TO 0+292
PP-4	PLAN AND PROFILE STREET 'E' STA 0+000 TO 0+180
PP-5	PLAN AND PROFILE STREET 'E' STA 0+180 TO 0+440
PP-6	PLAN AND PROFILE STREET 'E' STA 0+440 TO 0+705
PP-7	PLAN AND PROFILE STREET 'F' STA 0+000 TO 0+249
PP-8	PLAN AND PROFILE THICKETWOOD AVENUE STA 0+980 TO 1+260
PP-9	PLAN AND PROFILE THICKETWOOD AVENUE STA 1+260 TO 1+503
PP-10	PLAN AND PROFILE FENCHURCH MANOR STA 0+960 TO 1+240
PP-11	PLAN AND PROFILE FENCHURCH MANOR STA 1+240 TO 1+520



MUNICIPALITY:

CITY OF BARRIE
70 COLLIER STREET (BOX 400)
BARRIE, ON L4M 4T5
PH. 705.726.4242
FAX 705.739.4243

CLIENT:

LOCKHART INNISFIL INVESTMENTS (II) LIMITED

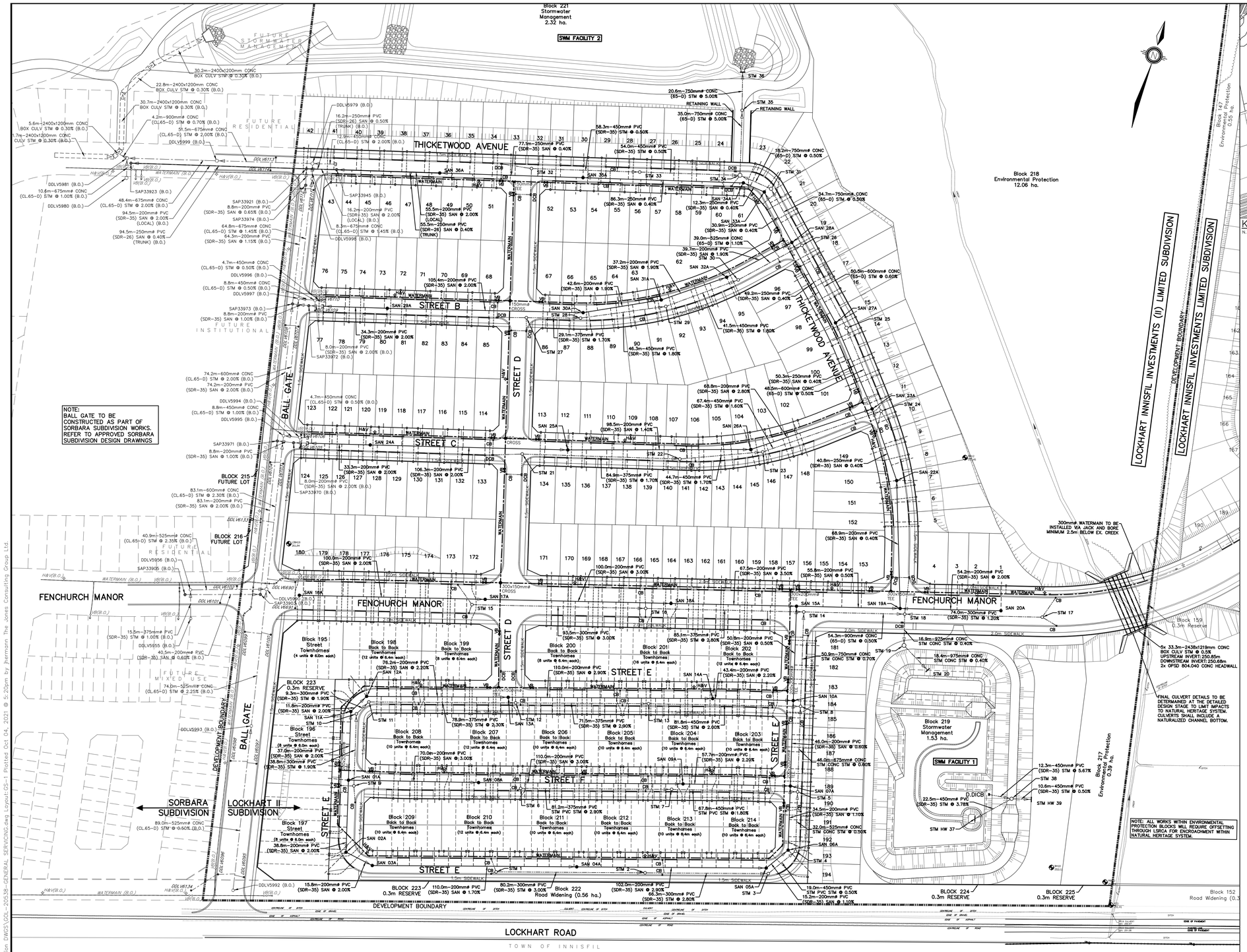
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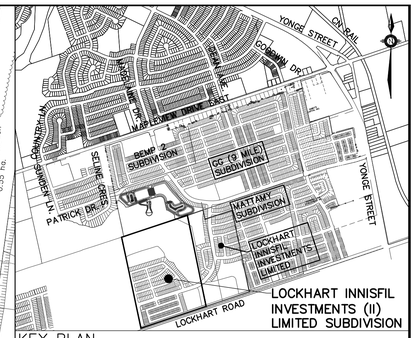
JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

TJCG PROJECT # GOL-20538

SUBMISSION FOR DRAFT PLAN APPROVAL - OCTOBER 2021

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-COVER PAGE.dwg, Layout: Title, Plotted: Oct 06, 2021 @ 4:27pm, by jhermann, The Jones Consulting Group Ltd.





LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN
N.T.S.

LEGEND

- SAN 01A (B.O.) — SANITARY MAINTENANCE HOLE (B.O.)
- SANITARY SEWER & DIRECTION OF FLOW (B.O.)
- STM 01 (B.O.) — STORM MAINTENANCE HOLE (B.O.)
- STORM SEWER & DIRECTION OF FLOW (B.O.)
- H4692 (B.O.) — HYDRANT AND VALVE (B.O.)
- V9709 (B.O.) — VALVE AND BOX (B.O.)
- WATERMAIN (B.O.)
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- WATER SERVICE
- PROPOSED WATERMAIN
- SAN 10A — SANITARY MAINTENANCE HOLE
- SANITARY SERVICE
- SANITARY SEWER & DIRECTION OF FLOW
- STM 25 — STORM MAINTENANCE HOLE
- CB — CATCH BASIN
- DCB — DOUBLE CATCH BASIN
- STORM SEWER & DIRECTION OF FLOW
- DEPRESSED CURB
- BH 2 252.68 — BOREHOLE
- LIMIT OF SUBDIVISION

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE, EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JW

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

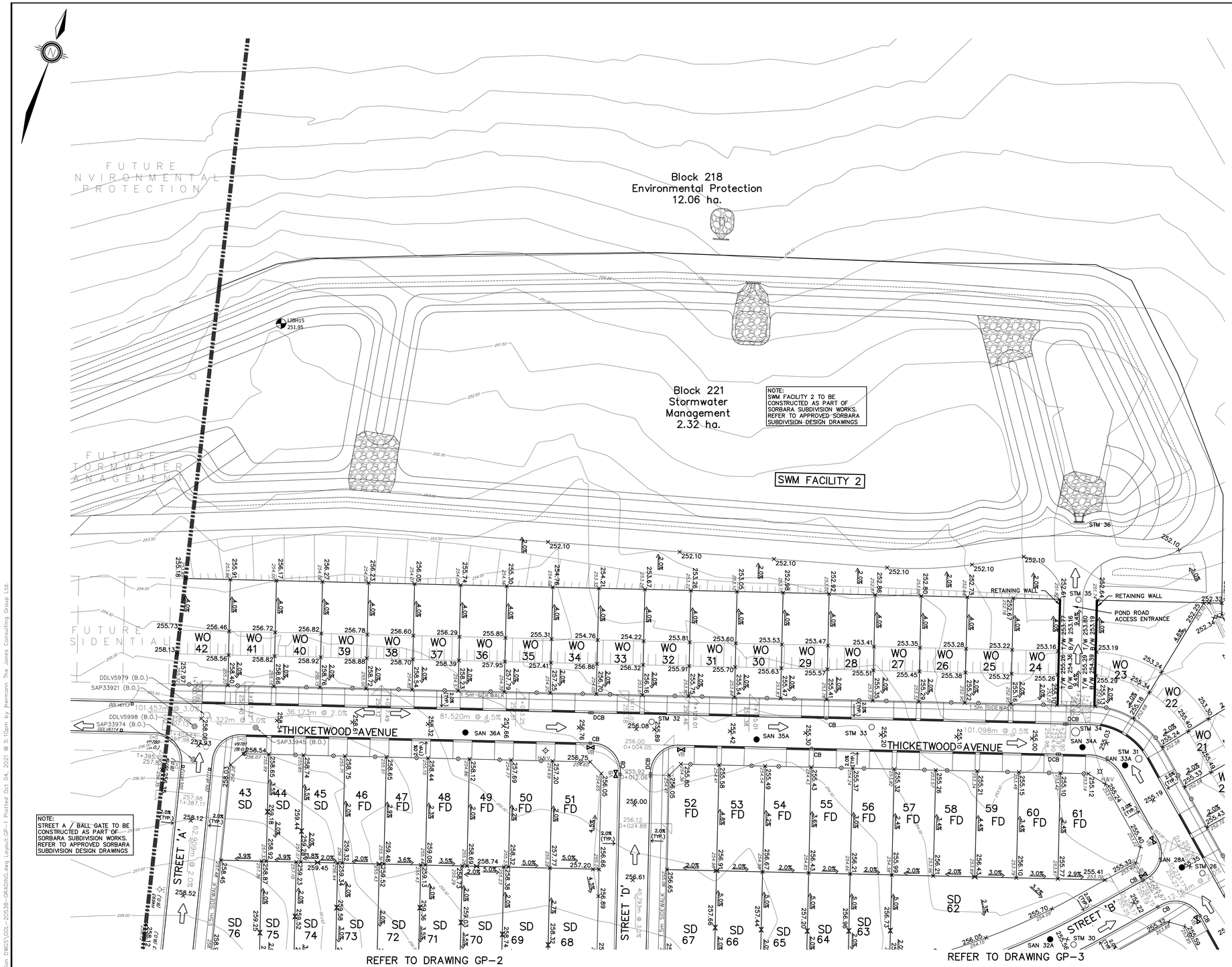
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

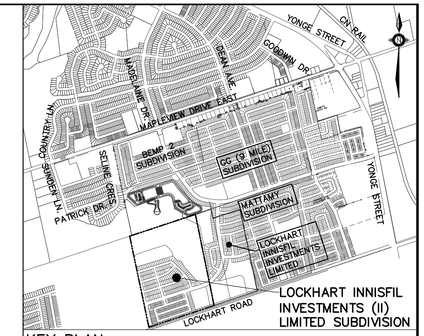
GENERAL SERVICING PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KC	SCALE: 1:1000	DATE MAY 2021
DRAWN	KC	PROJECT GOL-20538	DWG. Nº GS-1
CHECKED	JI		

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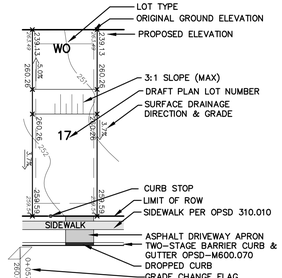


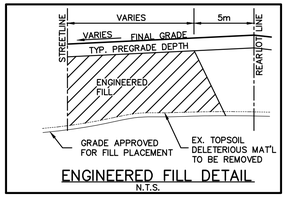


KEY PLAN
N.T.S.

LEGEND

- LIMIT OF SUBDIVISION
- LSRCA REGULATED BOUNDARY
- EX. CONTOUR
- EX. VEGETATION
- EX. DITCH
- SANITARY MANHOLE — SAN 5A
- STORM MANHOLE — STM 8
- DOUBLE DITCH INLET — DDI
- CATCHBASIN — CB
- DOUBLE CATCHBASIN — DCB
- TREE PRESERVATION FENCE
- SLOPE (3:1 MAX.)
- HYDRANT AND VALVE — H&V
- VALVE
- CURB STOP
- SIDEWALK TACTILE PLATES
- EX. BOREHOLE LOCATION ID# & GROUNDWATER ELEVATION — BH7 254.60
- TRANSFORMER
- SWITCHGEAR — S
- LIGHT STANDARD
- BELL/ROGERS — BPED
- MAJOR OVERLAND FLOW ROUTE
- LID DRY SWALE
- SPLIT DRAINAGE LOT — SD
- WALK OUT LOT — WO
- LOOK OUT LOT — LO
- FRONT DRAINING LOT — FD
- TRANSITION LOT — TR





ENGINEERED FILL DETAIL
N.T.S.

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 010198654S4 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 010198604O7 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.491072?.688 E.607083.931

BENCHMARK NO: 010198604O4 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.491189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

GRADING PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
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Barrie, ON L4N 0W5
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F. 705.734.1056

DESIGN	VBS	SCALE: 1:500	DATE JULY 2021
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CHECKED	JWI		

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REFER TO DRAWING GP-1

REFER TO DRAWING GP-3

REFER TO DRAWING GP-4

FUTURE RESIDENTIAL

FUTURE INSTITUTIONAL

FUTURE THICKETWOOD AVENUE

THICKETWOOD AVENUE

STREET 'A'

STREET 'B'

STREET 'C'

STREET 'D'

FUTURE SORBARA DEVELOPMENT

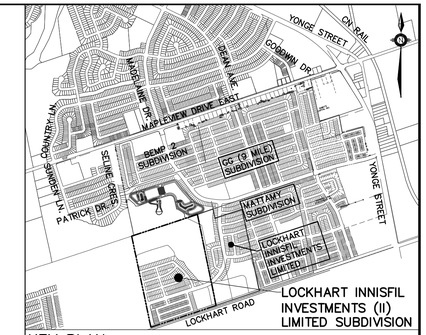
BLOCK 215 FUTURE LOT

NOTE:
BALL GATE TO BE CONSTRUCTED AS PART OF SORBARA SUBDIVISION WORKS. REFER TO APPROVED SORBARA SUBDIVISION DESIGN DRAWINGS

RETAINING WALL

1.5m SIDEWALK

5m SIDEWALK

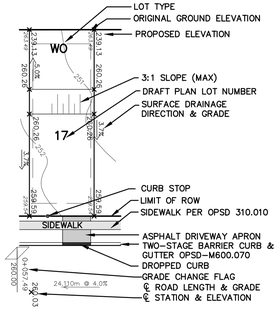


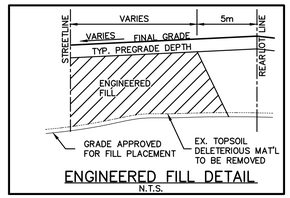
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN
N.T.S.

LEGEND

- LIMIT OF SUBDIVISION
- LSRCA REGULATED BOUNDARY
- EX. CONTOUR
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- EX. DITCH
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- EX. BOREHOLE LOCATION ID# & GROUNDWATER ELEVATION — BH7 254.60
- TRANSFORMER
- SWITCHGEAR — S
- LIGHT STANDARD
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- LID DRY SWALE
- SPLIT DRAINAGE LOT — SD
- WALK OUT LOT — WO
- LOOK OUT LOT — LO
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- TRANSITION LOT — TR





ENGINEERED FILL DETAIL
N.T.S.

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

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BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.491199.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

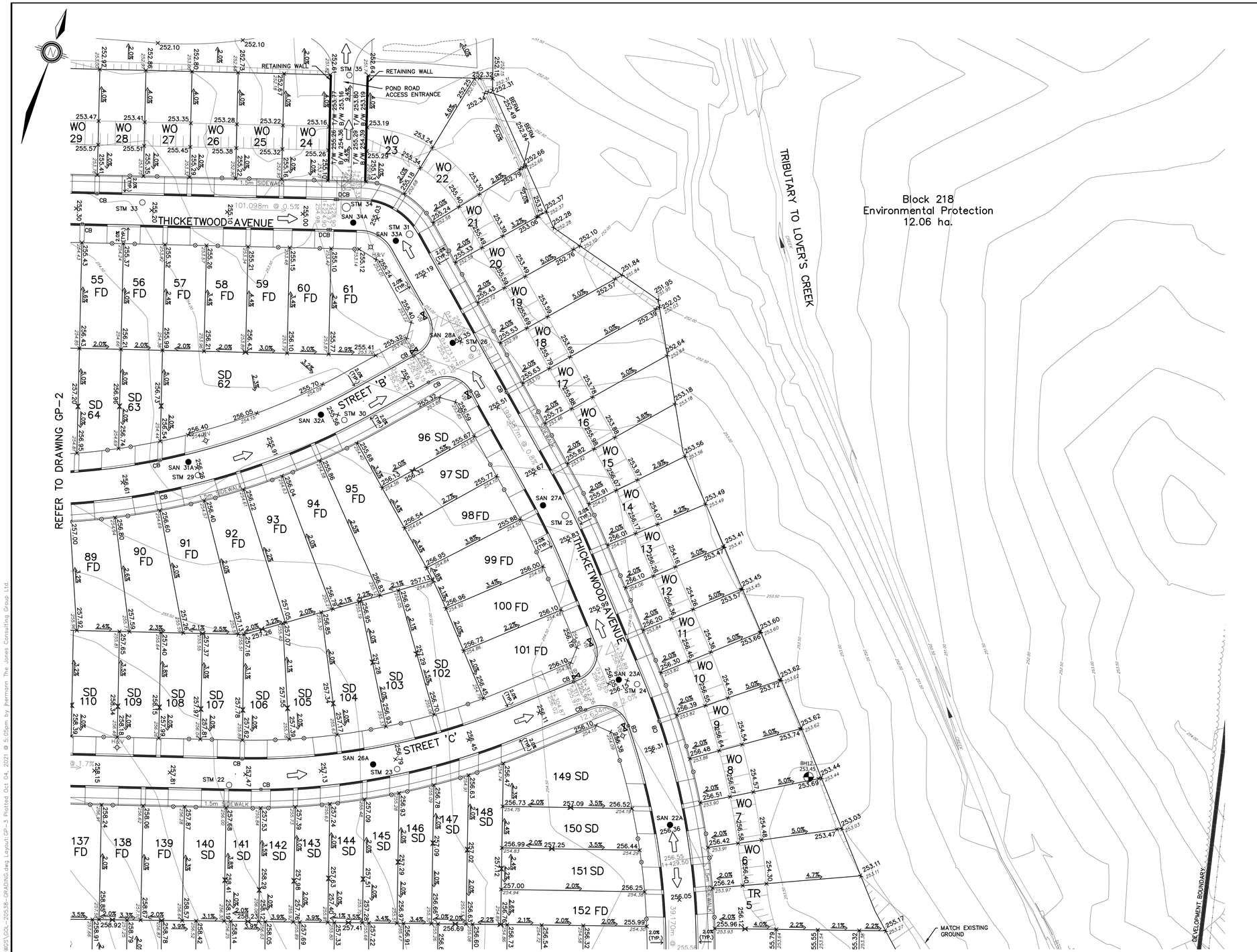
LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

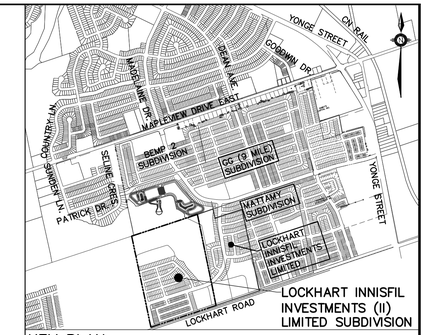
GRADING PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:500	DATE JULY 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº GP-2
CHECKED	JWI		

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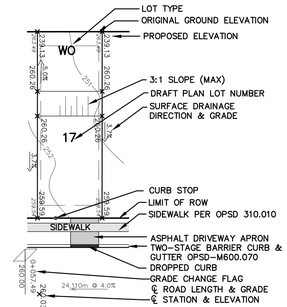


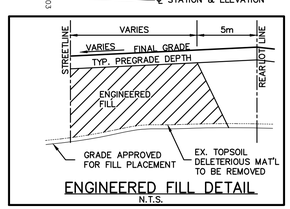
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN
N.T.S.

LEGEND

- LIMIT OF SUBDIVISION
- LSRCA REGULATED BOUNDARY
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- LID DRY SWALE
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- WALK OUT LOT — WO
- LOOK OUT LOT — LO
- FRONT DRAINING LOT — FD
- TRANSITION LOT — TR





ENGINEERED FILL DETAIL
N.T.S.

BENCHMARK:

BENCHMARK NO: 0011931U4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 0101986S454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

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NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENSED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 21-10-06 — PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

GRADING PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
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DESIGN	VBS	SCALE: 1:500	DATE JULY 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº GP-3
CHECKED	JWI		

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REFER TO DRAWING GP-2

REFER TO DRAWING GP-5

FUTURE RESIDENTIAL

FUTURE FENCHURCH MANOR

FUTURE MIXED USE

FUTURE SORBARA DEVELOPMENT

BLOCK 216
FUTURE LOT

STREET 'A'

FENCHURCH MANOR

STREET 'D'

STREET 'E'

STREET 'F'

BALL GATE

NOTE:
STREET A / BALL GATE TO BE CONSTRUCTED AS PART OF SORBARA SUBDIVISION WORKS. REFER TO APPROVED SORBARA SUBDIVISION DESIGN DRAWINGS

TR 180 | WO 179 | WO 178 | WO 177 | WO 176 | WO 175 | TR 174 | SD 173 | SD 172

SD 171 | SD 170 | SD 169 | SD 168 | SD 167 | SD 166 | FD 165

Block 195 Street Townhomes (4 units @ 6.0m each)

Block 198 Back to Back Townhomes (12 units @ 6.4m each)

Block 199 Back to Back Townhomes (8 units @ 6.4m each)

Block 200 Back to Back Townhomes (8 units @ 6.4m each)

Block 196 Street Townhomes (8 units @ 6.0m each)

Block 208 Back to Back Townhomes (10 units @ 6.4m each)

Block 207 Back to Back Townhomes (12 units @ 6.4m each)

Block 206 Back to Back Townhomes (10 units @ 6.4m each)

Block 205 Back to Back Townhomes (10 units @ 6.4m each)

Block 197 Street Townhomes (8 units @ 6.0m each)

Block 209 Back to Back Townhomes (10 units @ 6.4m each)

Block 210 Back to Back Townhomes (12 units @ 6.4m each)

Block 211 Back to Back Townhomes (10 units @ 6.4m each)

Block 212 Back to Back Townhomes (10 units @ 6.4m each)

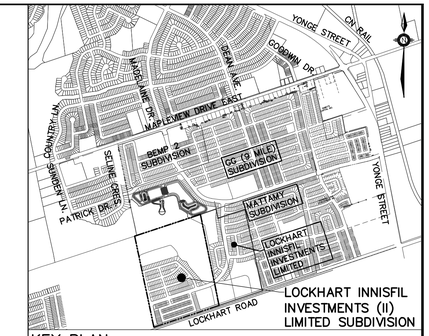
BLOCK 223
0.3m RESERVE

Block 222
Road Widening (0.56 ha.)

LOCKHART ROAD

CENTRELINE OF DITCH
EDGE OF GRAVEL
EDGE OF ASPHALT
CENTRELINE OF ROAD
CULVERT
CENTRELINE OF DITCH
EDGE OF
CENTRELINE

TOWN OF INNISFIL

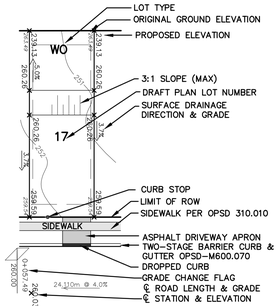


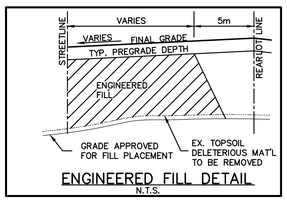
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN
N.T.S.

LEGEND

- LIMIT OF SUBDIVISION
- LSRCA REGULATED BOUNDARY
- EX. CONTOUR
- EX. VEGETATION
- EX. DITCH
- SANITARY MANHOLE — SAN 5A
- STORM MANHOLE — STM 8
- DOUBLE DITCH INLET — DDI
- CATCHBASIN — CB
- DOUBLE CATCHBASIN — DCB
- TREE PRESERVATION FENCE
- SLOPE (3:1 MAX.)
- HYDRANT AND VALVE — H&V
- VALVE — V
- CURB STOP
- SIDEWALK TACTILE PLATES
- EX. BOREHOLE LOCATION ID# & GROUNDWATER ELEVATION — BH7 254.60
- TRANSFORMER — T
- SWITCHGEAR — S
- LIGHT STANDARD
- BELL/ROGERS — BPED
- MAJOR OVERLAND FLOW ROUTE
- LID DRY SWALE
- SPLIT DRAINAGE LOT — SD
- WALK OUT LOT — WO
- LOOK OUT LOT — LO
- FRONT DRAINING LOT — FD
- TRANSITION LOT — TR





ENGINEERED FILL DETAIL
N.T.S.

BENCHMARK:

BENCHMARK NO: 001931U4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV. 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608813.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 21-10-06 — PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

GRADING PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:500	DATE JULY 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº GP-4
CHECKED	JWI		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-GRADING.dwg Layout: GP-4 Plotted: Oct 04, 2021 @ 5:04pm by Jhermann The Jones Consulting Group Ltd

REFER TO DRAWING GP-3

REFER TO DRAWING GP-4

TRIBUTARY TO LOVER'S CREEK

MATCH EXISTING GROUND

THICKETWOOD AVENUE

FENCHURCH MANOR

DEVELOPMENT BOUNDARY

POND ROAD ACCESS ENTRANCE

STREET 'E'

STREET 'F'

Block 201 Back to Back Townhomes (6 units @ 6.4m each)

Block 202 Back to Back Townhomes (12 units @ 6.4m each)

Block 204 Back to Back Townhomes (10 units @ 6.4m each)

Block 203 Back to Back Townhomes (10 units @ 6.4m each)

Block 213 Back to Back Townhomes (10 units @ 6.4m each)

Block 214 Back to Back Townhomes (10 units @ 6.4m each)

Block 219 Stormwater Management 1.53 ha.

SWM FACILITY 1

REFER TO DWG. PND-1 FOR POND 1 GRADING DESIGN

Block 217 Environmental Protection 0.39 ha.

Block 222 Road Widening (0.56 ha.)

BLOCK 224 0.3m RESERVE

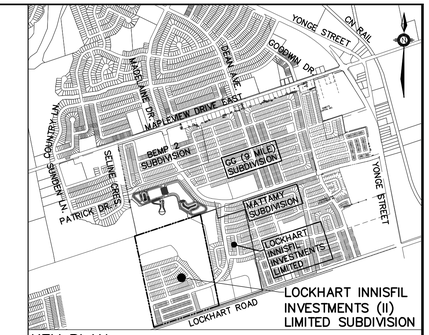
BLOCK 225 0.3m RESERVE

5x 33.3m-2438x1219mm CONC BOX CULV STM @ 0.5%
UPSTREAM INVERT: 250.85m
DOWNSTREAM INVERT: 250.68m
2x OPSD 804.040 CONC HEADWALL

NOTE: ALL WORKS WITHIN ENVIRONMENTAL PROTECTION BLOCKS WILL REQUIRE OFFSETTING THROUGH LSRCA FOR ENCROACHMENT WITHIN NATURAL HERITAGE SYSTEM.

NOTE: EARTHWORKS FOR LOCKHART INNISFIL INVESTMENTS LIMITED AND LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISIONS TO BE COMPLETED SIMULTANEOUSLY

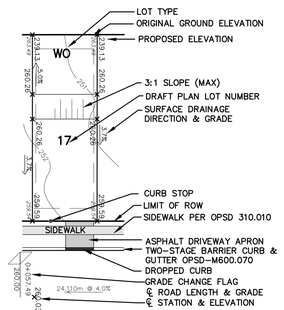
LOCKHART INNISFIL INVESTMENTS LIMITED DEVELOPMENT

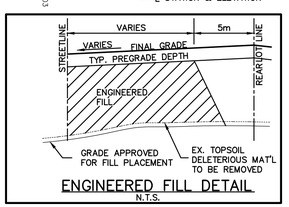


KEY PLAN
N.T.S.

LEGEND

- LIMIT OF SUBDIVISION
- LSRCA REGULATED BOUNDARY
- EX. CONTOUR
- EX. VEGETATION
- EX. DITCH
- SANITARY MANHOLE — SAN 5A
- STORM MANHOLE — STM 8
- DOUBLE DITCH INLET — DDI
- CATCHBASIN — CB
- DOUBLE CATCHBASIN — DCB
- TREE PRESERVATION FENCE
- SLOPE (3:1 MAX.)
- HYDRANT AND VALVE — H&V
- VALVE
- CURB STOP
- SIDEWALK TACTILE PLATES
- EX. BOREHOLE LOCATION ID# & GROUNDWATER ELEVATION — BH7 254.60
- TRANSFORMER
- SWITCHGEAR — S
- LIGHT STANDARD
- BELL/ROGERS — BPED
- MAJOR OVERLAND FLOW ROUTE
- LID DRY SWALE
- SPLIT DRAINAGE LOT — SD
- WALK OUT LOT — WO
- LOOK OUT LOT — LO
- FRONT DRAINING LOT — FD
- TRANSITION LOT — TR





ENGINEERED FILL DETAIL
N.T.S.

BENCHMARK:

BENCHMARK NO: 001931U4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
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LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 21-10-06 — PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

GRADING PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:500	DATE JULY 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº GP-5
CHECKED	JWI		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-GRADING.dwg Layout: GP-5 Plotted: Oct 06, 2021 @ 1:47pm by Jhermann The Jones Consulting Group Ltd

REFER TO SORBARA BY SCS CONSULTING GROUP LTD.

REFER TO LOCKHART INNISFIL INVESTMENTS LIMITED BY JONES CONSULTING GROUP LTD.

Stormwater Management 2.32 ha.
SWMF 2

Block 218 Environmental Protection 12.06 ha.

TRIBUTARY TO LOVER'S CREEK

THICKETWOOD AVENUE

STREET 'A'
STREET 'B'
STREET 'C'
STREET 'D'
STREET 'E'
STREET 'F'

FENCHURCH MANOR

BLOCK 215 FUTURE LOT
BLOCK 216 FUTURE LOT

Block 195 Street Townhomes (4 blks @ 6.0m each)
Block 196 Street Townhomes (5 blks @ 6.0m each)
Block 197 Street Townhomes (4 blks @ 6.0m each)
Block 198 Back to Back Townhomes (12 units @ 6.4m each)
Block 199 Back to Back Townhomes (8 units @ 6.4m each)
Block 200 Back to Back Townhomes (8 units @ 6.4m each)
Block 201 Back to Back Townhomes (10 units @ 6.4m each)
Block 202 Back to Back Townhomes (12 units @ 6.4m each)
Block 203 Back to Back Townhomes (10 units @ 6.4m each)
Block 204 Back to Back Townhomes (10 units @ 6.4m each)
Block 205 Back to Back Townhomes (10 units @ 6.4m each)
Block 206 Back to Back Townhomes (10 units @ 6.4m each)
Block 207 Back to Back Townhomes (12 units @ 6.4m each)
Block 208 Back to Back Townhomes (10 units @ 6.4m each)
Block 209 Back to Back Townhomes (10 units @ 6.4m each)
Block 210 Back to Back Townhomes (12 units @ 6.4m each)
Block 211 Back to Back Townhomes (10 units @ 6.4m each)
Block 212 Back to Back Townhomes (10 units @ 6.4m each)
Block 213 Back to Back Townhomes (10 units @ 6.4m each)
Block 214 Back to Back Townhomes (10 units @ 6.4m each)

BLOCK 223 0.3m RESERVE
BLOCK 224 0.3m RESERVE
BLOCK 225 0.3m RESERVE
Block 222 Road Widening (0.56 ha.)

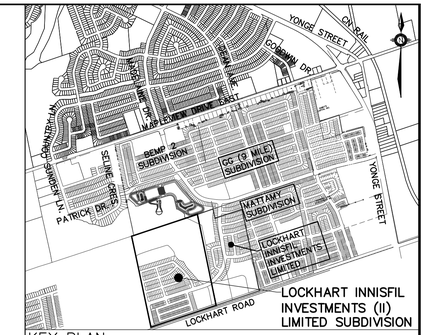
Block 219 Stormwater Management 1.53 ha.
SWMF 1

Block 217 Environmental Protection 0.39 ha.

BALL GATE

LOCKHART ROAD
TOWN OF INNISFIL

FINAL CULVERT DETAILS TO BE DETERMINED AT THE DETAILED DESIGN STAGE TO LIMIT IMPACTS TO NATURAL HERITAGE SYSTEM. CULVERTS SHALL INCLUDE A NATURALIZED CHANNEL BOTTOM.



LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN
N.T.S.

LEGEND

- STM 01 — STORM MAINTENANCE HOLE
- CB — STORM SINGLE CATCHBASIN
- DCB — STORM DOUBLE CATCHBASIN
- STORM SEWER & DIRECTION OF FLOW
- STM 01 (B.O.) — STORM MAINTENANCE HOLE (BY OTHERS)
- PROP. STORM SEWER & DIRECTION OF FLOW (BY OTHERS)
- CATCHMENT BOUNDARY
- LIMIT OF SUBDIVISION
- CATCHMENT AREA ID NUMBER
- RUN-OFF COEFFICIENT
- AREA (ha.)
- DIRECTION OF POST DEVELOPMENT 100 YEAR STORM EVENT OVERLAND FLOW
- EX. CONTOUR AND ELEVATION
- DIRECTION OF EXISTING EXTERNAL OVERLAND FLOW

BENCHMARK:

BENCHMARK NO: 001193U460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 010195B5454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19m BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 010195B6407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 010195B6404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

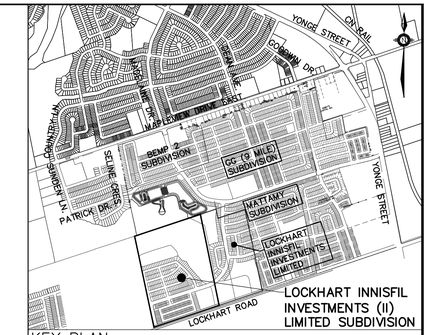
STORM SEWER SUBCATCHMENT PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	VBS	SCALE: 1:1000	DATE JUNE 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº STM-1
CHECKED	JI		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STORM DRAINAGE.dwg Layout:STM-1 Plotted: Oct 04, 2021 @ 4:42pm by jhermann The Jones Consulting Group Ltd.

Stormwater Management 2.32 ha. Block 221
SWMF 2
FUTURE STORMWATER MANAGEMENT
FUTURE RESIDENTIAL
FUTURE INSTITUTIONAL
FUTURE MIXED USE
RETAINING WALL
SWM FACILITY 2 INLET C/W EROSION PROTECTION
THICKETWOOD AVENUE
STREET 'A'
STREET 'B'
STREET 'C'
STREET 'D'
STREET 'E'
STREET 'F'
TRIBUTARY TO LOVER'S CREEK
Block 218 Environmental Protection 12.06 ha.
LIMIT OF SORBARA CATCHMENT AREA 401 REFER TO PROPOSED STORM DRAINAGE PLAN FIGURE 4.1 PREPARED BY SCS CONSULTING DATED NOVEMBER 2020
0.28 HA CATCHMENT AREA OVERLAP DIRECTED TO SWMF2
2A 0.53 40%
2 6.29 65%
AREA REDUCES TO 6.11 HA EXCLUDING AREAS THAT HAVE BEEN PREVIOUSLY ACCOUNTED FOR
REFER TO SORBARA PROPOSED STORMWATER DRAINAGE PLAN (FIG. 4.1) PREPARED BY SCS.
401 22.61 71%
BLOCK 215 FUTURE LOT
BLOCK 216 FUTURE LOT
REFER TO SORBARA BY SCS CONSULTING GROUP LTD.
FENCHURCH MANOR
Block 198 Back to Back Townhomes (12 units @ 6.4m each)
Block 199 Back to Back Townhomes (8 units @ 6.4m each)
Block 200 Back to Back Townhomes (8 units @ 6.4m each)
Block 201 Back to Back Townhomes (16 units @ 6.4m each)
Block 202 Back to Back Townhomes (12 units @ 6.4m each)
Block 203 Back to Back Townhomes (10 units @ 6.4m each)
Block 204 Back to Back Townhomes (10 units @ 6.4m each)
Block 205 Back to Back Townhomes (10 units @ 6.4m each)
Block 206 Back to Back Townhomes (10 units @ 6.4m each)
Block 207 Back to Back Townhomes (12 units @ 6.4m each)
Block 208 Back to Back Townhomes (10 units @ 6.4m each)
Block 209 Back to Back Townhomes (10 units @ 6.4m each)
Block 210 Back to Back Townhomes (12 units @ 6.4m each)
Block 211 Back to Back Townhomes (10 units @ 6.4m each)
Block 212 Back to Back Townhomes (10 units @ 6.4m each)
Block 213 Back to Back Townhomes (10 units @ 6.4m each)
Block 214 Back to Back Townhomes (10 units @ 6.4m each)
Block 196 Street Townhomes (8 units @ 6.0m each)
Block 197 Street Townhomes units @ 6.0m each)
Block 198 Street Townhomes (9 units @ 6.0m each)
BLOCK 223 0.3m RESERVE
0.06 HA CATCHMENT AREA OVERLAP DIRECTED TO SWMF2
AREA REDUCES TO 7.29 HA EXCLUDING AREAS THAT HAVE BEEN PREVIOUSLY ACCOUNTED FOR
1 7.47 65.7%
LIMIT OF SORBARA CATCHMENT AREA 401 REFER TO PROPOSED STORM DRAINAGE PLAN FIGURE 4.1 PREPARED BY SCS CONSULTING DATED NOVEMBER 2020
LIMIT OF SORBARA CATCHMENT AREA 407 REFER TO PROPOSED STORM DRAINAGE PLAN FIGURE 4.1 PREPARED BY SCS CONSULTING DATED NOVEMBER 2020
BALL GATE
0.04 HA CATCHMENT AREA OVERLAP DIRECTED TO SWMF2
BLOCK 223 0.3m RESERVE
Block 222 Road Widening (0.56 ha.)
Block 219 Stormwater Management 1.53 ha.
SWMF 1
1A 0.50 2.8%
Block 217 Environmental Protection 0.39 ha.
BLOCK 224 0.3m RESERVE
BLOCK 225 0.3m RESERVE
REFER TO LOCKHART INNISFIL INVESTMENTS LIMITED BY JONES CONSULTING GROUP LTD.
LOCKHART ROAD
TOWN OF INNISFIL



KEY PLAN
N.T.S.

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

LEGEND

- STM 01 — STORM MAINTENANCE HOLE
- CB — STORM SINGLE CATCHBASIN
- DCB — STORM DOUBLE CATCHBASIN
- STORM SEWER & DIRECTION OF FLOW
- STM 01 (B.O.) — STORM MAINTENANCE HOLE (BY OTHERS)
- PROP. STORM SEWER & DIRECTION OF FLOW (BY OTHERS)
- CATCHMENT BOUNDARY
- LIMIT OF SUBDIVISION
- CATCHMENT AREA ID NUMBER
- PERCENT IMPERVIOUS
- AREA (ha.)
- DIRECTION OF POST DEVELOPMENT 100 YEAR STORM EVENT OVERLAND FLOW
- EX. CONTOUR AND ELEVATION
- DIRECTION OF EXISTING EXTERNAL OVERLAND FLOW

BENCHMARK:

BENCHMARK NO: 001931U460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.606513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

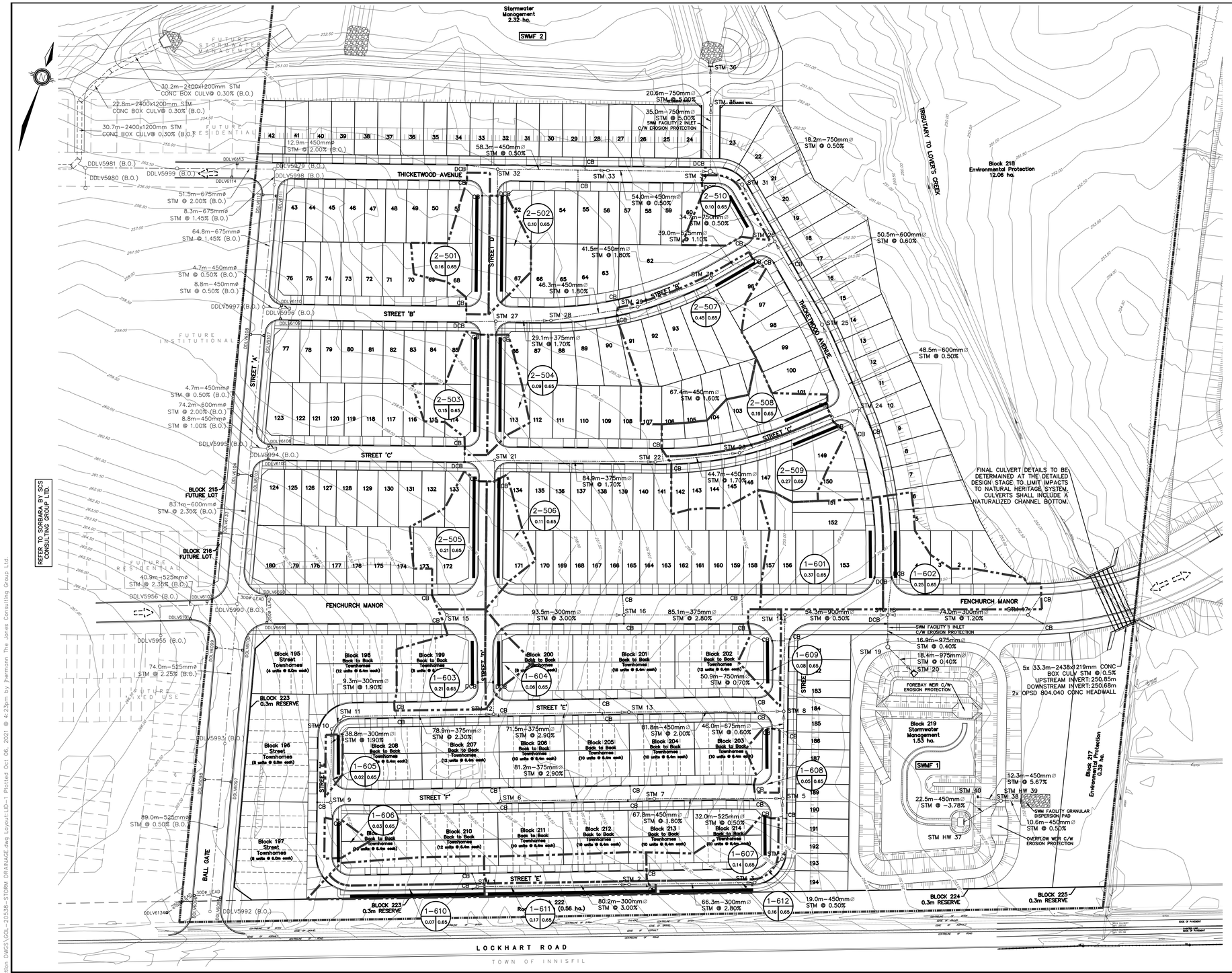
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

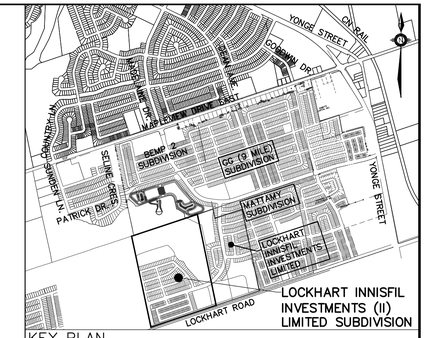
POST-DEVELOPMENT DRAINAGE AREA PLAN SWM FACILITIES 1 & 2

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1066

DESIGN	VBS	SCALE: 1:1000	DATE AUGUST 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº SWM-1
CHECKED	JI		

G:\Eng. 3D\GOL-20538\Production DWGS\GOL-20538-POST-DEVELOPMENT.dwg Layout:SWM-1 Plotted Oct 06, 2021 @ 11:24am by mpollard The Jones Consulting Group Ltd.





LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN
N.T.S.

LEGEND

- STM 01 — STORM MAINTENANCE HOLE
- CB — STORM SINGLE CATCHBASIN
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- STORM SEWER & DIRECTION OF FLOW
- STM 01 (B.O.) — STORM MAINTENANCE HOLE (BY OTHERS)
- PROP. STORM SEWER & DIRECTION OF FLOW (BY OTHERS)
- CATCHMENT BOUNDARY
- LIMIT OF SUBDIVISION
- CATCHMENT AREA ID NUMBER
- RUN-OFF COEFFICIENT
- AREA (ha.)
- DIRECTION OF POST DEVELOPMENT 100 YEAR STORM EVENT OVERLAND FLOW
- 253.00 — EX. CONTOUR AND ELEVATION
- DIRECTION OF EXISTING EXTERNAL OVERLAND FLOW
- LID CATCHMENT BOUNDARY
- LID DRY SWALE

BENCHMARK:

BENCHMARK NO: 001193IU4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

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LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

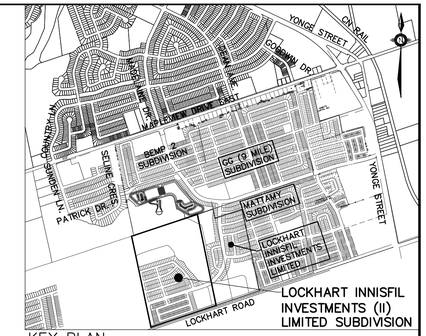
LID DRY SWALE SUBCATCHMENT PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

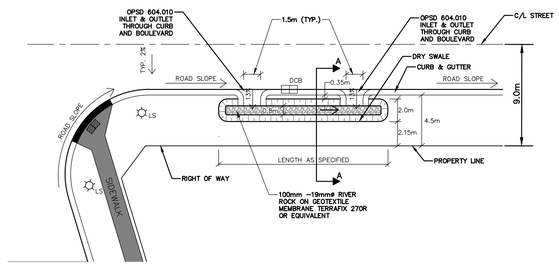
DESIGN	KC	SCALE: 1:1000	DATE JUNE 2021
DRAWN	KC	PROJECT GOL-20538	DWG. Nº LID-1
CHECKED	JI		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STORM DRAINAGE.dwg Layout:LID-1 Plotted: Oct 06, 2021 @ 4:23pm by jhermmon The Jones Consulting Group Ltd.

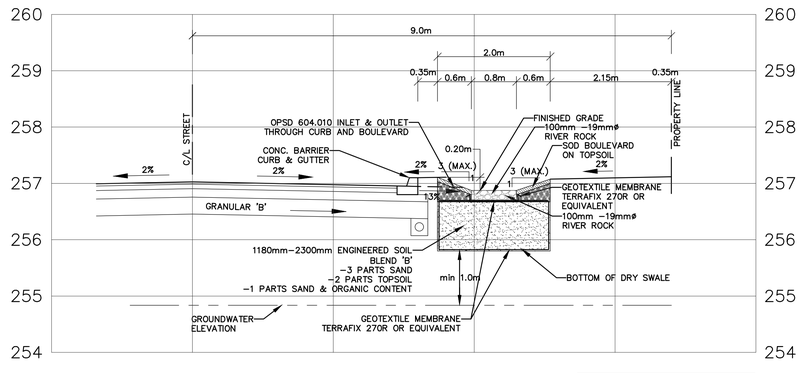
Location	Catchment ID	Area (ha)	Infiltration Rate (mm/hr)	Percent Impervious	Length (m)	Width (m)	Total Depth (m)	North/West End			South/East End		
								Ground Elevation	Water Table Elevation	Distance from Bottom of Swale to Water Table Elevation	Ground Elevation	Water Table Elevation	Distance from Bottom of Swale to Water Table Elevation
Street D	2-501	0.16	13	65%	50.00	2.00	1.70	256.05	253.28	1.00	257.47	253.64	2.06
Street D	2-502	0.10	13	65%	50.00	2.00	1.80	256.05	253.24	1.00	257.47	253.69	1.97
Street D	2-503	0.15	13	65%	50.00	2.00	3.08	257.64	253.56	1.00	258.90	254.11	1.71
Street D	2-504	0.09	13	65%	50.00	2.00	3.15	257.64	253.46	1.00	258.90	254.04	1.68
Street D	2-505	0.21	13	65%	53.00	2.00	3.70	258.99	254.27	1.00	260.01	254.67	1.62
Street D	2-506	0.45	13	65%	53.00	2.00	3.85	258.99	254.14	1.00	260.01	254.56	1.60
Street B	2-507	0.19	13	65%	25.00	2.00	0.78	255.67	253.89	1.00	255.32	253.43	1.11
Street C	2-508	0.27	13	65%	25.00	2.00	1.55	256.45	253.57	1.33	256.10	253.55	1.00
Street C	2-509	0.27	13	65%	26.50	2.00	1.80	256.47	253.37	1.30	256.10	253.30	1.00
Thicketwood	2-510	0.10	13	65%	19.00	2.00	1.70	255.24	252.46	1.07	255.40	252.69	1.00
Thicketwood	1-601	0.37	13	65%	25.00	2.00	1.75	255.99	253.17	1.07	255.34	252.59	1.00
Thicketwood	1-602	0.25	13	65%	25.00	2.00	1.73	255.96	253.12	1.10	255.34	252.60	1.00
Street D	1-603	0.21	13	65%	24.00	2.00	3.95	260.04	254.83	1.26	259.76	254.81	1.00
Street D	1-604	0.02	13	65%	24.00	2.00	4.20	260.05	254.66	1.18	259.76	254.55	1.00
Street E	1-605	0.03	13	65%	21.00	2.00	4.08	261.88	256.79	1.00	262.36	257.15	1.12
Street E	1-606	0.14	13	65%	22.50	2.00	4.20	262.81	257.30	1.30	263.04	257.83	1.00
Street E	1-607	0.14	13	65%	21.00	2.00	2.75	256.58	252.04	1.79	256.72	252.97	1.00
Street E	1-608	0.05	13	65%	22.00	2.00	2.88	255.79	251.91	1.00	256.43	252.05	1.50
Street E	1-609	0.08	13	65%	22.50	2.00	2.98	255.71	251.73	1.00	256.04	251.52	1.54
Street E	1-610	0.07	13	65%	70.00	2.00	3.55	262.82	257.68	1.57	260.84	256.27	1.00
Street E	1-611	0.17	13	65%	88.00	2.00	2.23	260.78	257.27	1.26	258.12	254.87	1.00
Street E	1-612	0.16	13	65%	49.00	2.00	1.88	258.06	254.83	1.33	256.76	253.86	1.00



KEY PLAN
N.T.S.

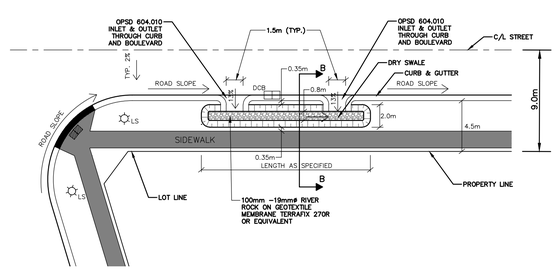


NO SIDEWALK – PLAN VIEW
1:250

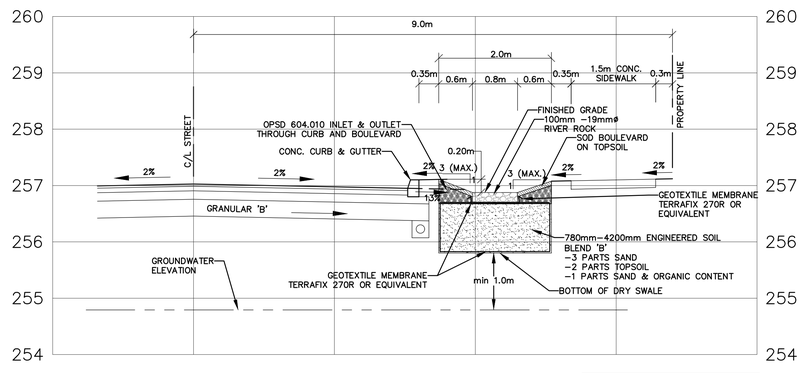


SECTION A–A
1:50

NOTE: ENGINEERED SOIL DEPTH VARIES TO MEET LID'S TOTAL DEPTH OUTLINED IN THE TABLE BELOW



SIDEWALK – PLAN VIEW
1:250



SECTION B–B
1:50

NOTE: ENGINEERED SOIL DEPTH VARIES TO MEET LID'S TOTAL DEPTH OUTLINED IN THE TABLE BELOW

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

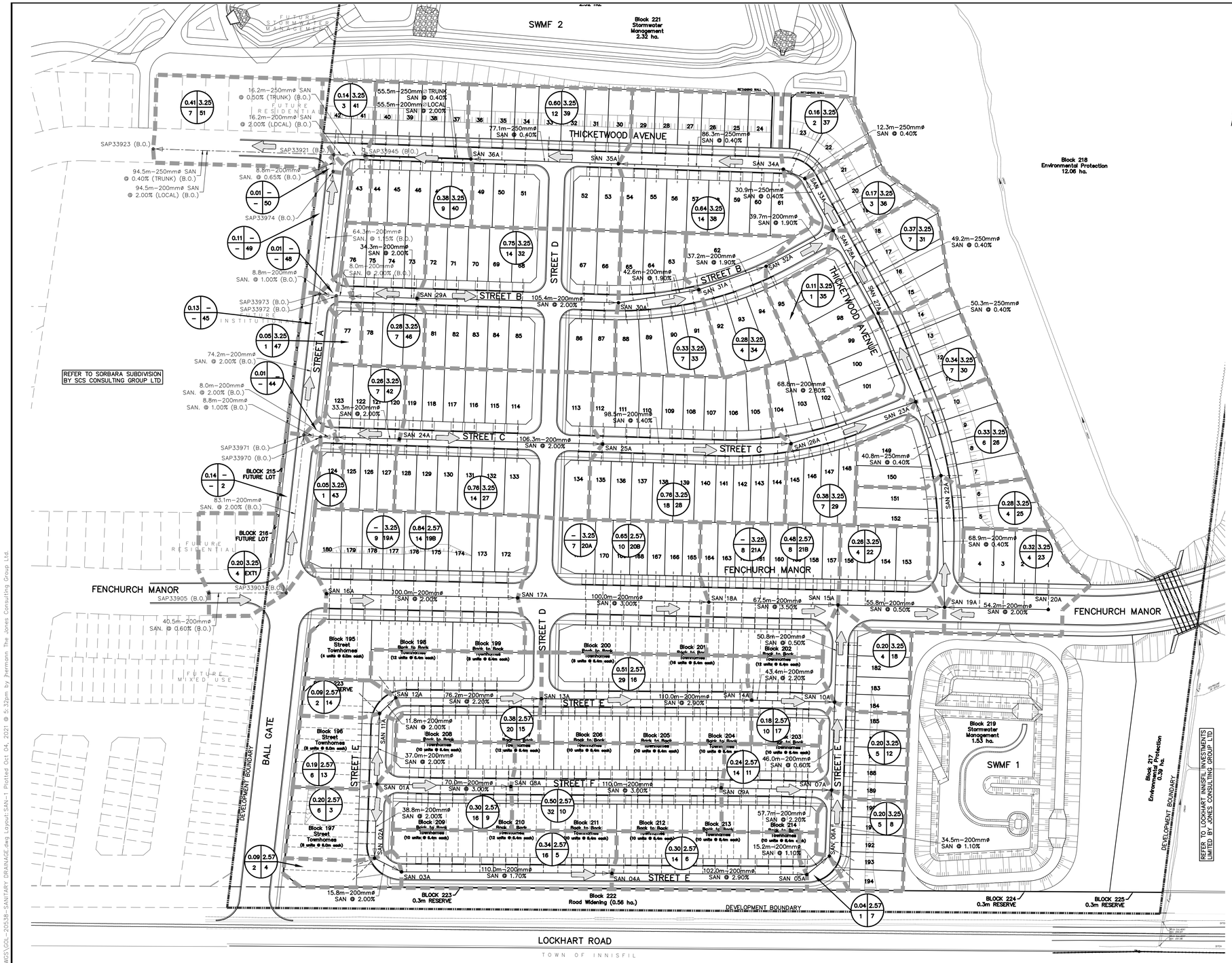
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

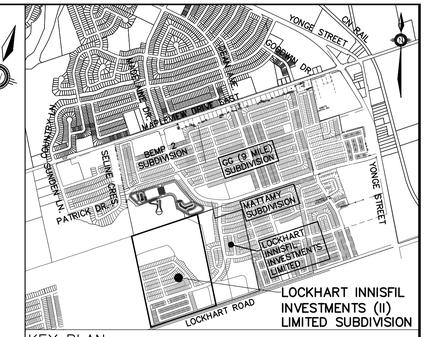
LID SECITIONS AND DETAILS DRY SWALES

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KC	SCALE: 1:1000	DATE JUNE 2021
DRAWN	KC	PROJECT GOL–20538	DWG. Nº LID–2
CHECKED	JI		

G:\Eng_JD\GOL-20538\Production DWGS\GOL-20538-STORM DRAINAGE.dwg Layout:LID-2 Plotted Oct 06, 2021 @ 4:24pm by jhermann The Jones Consulting Group Ltd.





LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

KEY PLAN

N.T.S.

LEGEND

- SAN 27A — SANITARY MAINTENANCE HOLE
- SANITARY SEWER & DIRECTION OF FLOW
- SANITARY SERVICE
- SANITARY SEWER DIRECTION OF FLOW (BY OTHERS)
- SAP33923 (B.O.) — SANITARY MAINTENANCE HOLE (BY OTHERS)
- SUB CATCHMENT BOUNDARY
- LIMIT OF SUBDIVISION
- DIRECTION OF FLOW
- AREA (ha.) — PERSONS PER UNIT — No. OF UNITS — CATCHMENT AREA ID NUMBER

BENCHMARK:

BENCHMARK NO: 001193U1460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

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BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911169.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 21-10-06 — PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

SANITARY DRAINAGE AREA PLAN

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KC	SCALE: 1:1000	DATE MAY 2021
DRAWN	KC	PROJECT GOL–20538	DWG. Nº SAN–1
CHECKED	JI		

G:\Eng_3D\COL-20538\Production DWGS\COL-20538-SANITARY DRAINAGE.dwg Layout:SAN-1 Plotted Oct 04, 2021 @ 5:32pm by Jhermann The Jones Consulting Group Ltd.

					GOL-20538 Lockhart II											June 2021
					5 Year Storm Sewer Sizing											
AREAS	Street	MANHOLE		LENGTH	INCREMENT			TOTAL	FLOW TIME (min)		I	TOTAL Q	S	D	Q FULL	V FULL	% FULL
		FROM	TO	(m)	C	A	CA	CA	TO	IN	(mm/h)	(cms)	(%)	(mm)	(cms)	(m/s)	
201	Street 'E'	STM 1	STM 2	80.2	0.77	0.30	0.23	0.23	10.00	0.56	109	0.070	3.00	300	0.167	2.37	***41.7***
202	Street 'E'	STM 2	STM 3	66.3	0.83	0.28	0.23	0.46	10.56	0.48	106	0.135	2.80	300	0.162	2.29	***83.6***
	Street 'E'	STM 3	STM 4	19.0			0	0.46	11.05	0.25	103	0.132	0.50	450	0.202	1.27	***65.5***
203	Street 'E'	STM 4	STM 5	32.0	0.78	0.29	0.23	0.69	11.30	0.38	102	0.195	0.50	525	0.304	1.40	***64.2***
204	Street 'F'	STM 6	STM 7	81.2	0.83	0.70	0.58	0.58	10.00	0.50	109	0.175	2.90	375	0.299	2.70	***58.6***
205	Street 'F'	STM 7	STM 5	67.8	0.83	0.33	0.27	0.85	10.50	0.47	106	0.250	1.80	450	0.383	2.41	***65.5***
206	Street 'E'	STM 5	STM 8	46.0	0.71	0.12	0.08	1.62	11.68	0.42	100	0.451	0.60	675	0.651	1.82	***69.3***
207	Street 'E'	STM 9	STM 10	38.8	0.69	0.15	0.10	0.10	10.00	0.34	109	0.031	1.90	300	0.133	1.89	***23.2***
	Street 'E'	STM 10	STM 11	9.3			0	0.10	10.34	0.08	107	0.030	1.90	300	0.133	1.89	***22.8***
208	Street 'E'	STM 11	STM 12	78.9	0.73	0.45	0.33	0.43	10.43	0.55	107	0.128	2.30	375	0.266	2.41	***48.2***
209	Street 'E'	STM 12	STM 13	71.5	0.83	0.61	0.50	0.94	10.97	0.44	104	0.269	2.90	375	0.299	2.70	***90.2***
210	Street 'E'	STM 13	STM 8	81.8	0.83	0.39	0.33	1.26	11.41	0.54	102	0.356	2.00	450	0.403	2.54	***88.3***
211	Street 'E'	STM 8	STM 14	50.9	0.72	0.18	0.13	3.01	12.10	0.40	98	0.823	0.70	750	0.931	2.11	***88.3***
212	FENCHURCH	STM 15	STM 16	93.5	0.76	0.35	0.26	0.26	10.00	0.66	109	0.080	3.00	300	0.167	2.37	***47.5***
213	FENCHURCH	STM 16	STM 14	85.1	0.72	0.85	0.61	0.87	10.66	0.53	105	0.256	2.80	375	0.293	2.66	***87.2***
	FENCHURCH	STM 14	STM 18	54.3			0	3.89	12.50	0.45	97	1.042	0.50	900	1.280	2.01	***81.4***
214	FENCHURCH	STM 17	STM 18	74.0	0.65	0.19	0.12	0.12	10.00	0.82	109	0.037	1.20	300	0.106	1.50	***35.0***
215	SWMF BLK 219	STM 18	STM 19	16.9	0.65	0.89	0.58	4.59	12.95	0.15	95	1.207	**0.40**	975	1.417	1.90	***85.1***
	SWMF BLK 219	STM 19	STM HW 20	18.4			0	4.59	13.10	0.16	94	1.199	**0.40**	975	1.417	1.90	***84.6***
301	Street 'C'	STM 21	STM 22	84.9	0.65	0.81	0.52	0.52	10.00	0.68	109	0.158	1.70	375	0.229	2.07	***69.3***
302	Street 'C'	STM 22	STM 23	44.7	0.65	0.52	0.34	0.86	10.68	0.32	105	0.252	1.70	450	0.372	2.34	***67.9***
303	Street 'C'	STM 23	STM 24	67.4	0.65	0.48	0.31	1.18	11.00	0.50	104	0.339	1.60	450	0.361	2.27	***94.0***
304	THICKETWOOD	STM 24	STM 25	48.5	0.65	0.15	0.10	1.27	11.50	0.53	101	0.358	0.50	600	0.434	1.54	***82.4***
305	THICKETWOOD	STM 25	STM 26	50.5	0.65	0.40	0.26	1.53	12.02	0.50	99	0.421	0.60	600	0.476	1.68	***88.4***
306	Street 'B'	STM 27	STM 28	29.1	0.65	0.75	0.49	0.49	10.00	0.23	109	0.147	1.70	375	0.229	2.07	***64.5***
307	Street 'B'	STM 28	STM 29	46.3	0.65	0.48	0.31	0.80	10.23	0.32	108	0.239	1.80	450	0.383	2.41	***62.5***
	Street 'B'	STM 29	STM 30	41.5			0	0.80	10.56	0.29	106	0.235	1.80	450	0.383	2.41	***61.5***
308	Street 'B'	STM 30	STM 26	39.0	0.65	0.60	0.39	1.19	10.84	0.31	104	0.344	1.10	525	0.451	2.08	***76.3***
	THICKETWOOD	STM 26	STM 31	34.7			0	2.72	12.52	0.32	96	0.729	0.50	750	0.787	1.78	***92.6***
	THICKETWOOD	STM 31	STM 34	18.2			0	2.72	12.85	0.17	95	0.719	0.50	750	0.787	1.78	***91.3***
309	THICKETWOOD	STM 32	STM 33	58.3	0.65	0.85	0.55	0.55	10.00	0.77	109	0.167	0.50	450	0.202	1.27	***83.0***
	THICKETWOOD	STM 33	STM 34	54.0			0	0.55	10.77	0.71	105	0.161	0.50	450	0.202	1.27	***79.9***
310	SWMF BLK 221	STM 34	STM 35	35.0	0.65	0.62	0.40	3.68	13.02	0.10	94	0.965	5.00	750	2.489	5.63	***38.7***
	SWMF BLK 221	35	HW 36	20.6			0	3.68	13.12	0.06	94	0.960	5.00	750	2.489	5.63	***38.6***

Q= C*I*A/360 (cms); C=RUNOFF COEFFICIENT; I-RAINFALL INTENSITY (5 Year) =853.608/(T.C. + 4.699)^0.766; A=AREA (ha)

Note:

BENCHMARK:

BENCHMARK NO: 001931U4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

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BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

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1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 21-10-06 — PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

STORM SEWER DESIGN SHEET

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN VBS	SCALE: NTS	DATE JUNE 2021	
DRAWN VBS	PROJECT GOL-20538	DWG. Nº DS-1	
CHECKED JI			

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STORM DRAINAGE.dwg, Layout:DS-1 Plotted Oct 04, 2021 @ 4:41pm by jhermann The Jones Consulting Group Ltd.

SANITARY SEWER DESIGN - LOCAL SEWER

Development Details Basis

DESIGN SHEET
FILE NO GOL-20538
CONTRACT / PROJECT LOCKHART INNISFIL INVESTMENTS (II) LIMITED

n ≥ 0.013
M = 5/P^0.2 Babbit
M=1+[14/(4+P^0.5)] Harmon
Q_p = P*q*M/86.4
Q_I = I*A
Q_{tot} = Q_p + Q_I

Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; M ≥ 2), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

(Peak population flow where; q = 225 L/day/person; P = population in thousands) 225 litres/person/day
(Peak extraneous flow: I= 0.1L/s/ha over development area)
(Total peak flow as the sum of peak population flow and peak extraneous flow)

STREET	AREA	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBIT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Q_p (l/s)	AREA (ha)	AREA (ACC) (ha)	Q_I (l/s)	Q_{tot} (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	d/D[3]	d/D[3] >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial[1] (m/s)	Velocity[4] > 0.6 (m/s)
Street E	3	SAN 01A	SAN 02A	6	6	2.57	15.42	15.42	11.517	4.395	11.517	0.462	0.20	0.20	0.020	0.482	38.8	200	2.00	46.384	0.071	Ok	1.476	0.472	Check
Street E	4	SAN 02A	SAN 03A	2	8	2.57	5.14	20.56	10.873	4.379	10.873	0.582	0.09	0.29	0.029	0.611	15.8	200	2.00	46.384	0.080	Ok	1.476	0.506	Check
Street E	5	SAN 03A	SAN 04A	16	24	2.57	41.12	61.68	8.729	4.295	8.729	1.402	0.34	0.63	0.063	1.465	110.0	200	1.70	42.764	0.128	Ok	1.361	0.625	Ok
Street E	6	SAN 04A	SAN 05A	14	38	2.57	35.98	97.66	7.962	4.246	7.962	2.025	0.31	0.94	0.094	2.119	102.0	200	2.90	55.854	0.133	Ok	1.778	0.841	Ok
Street E	7	SAN 05A	SAN 06A	1	39	2.57	2.57	100.23	7.921	4.243	7.921	2.067	0.03	0.97	0.097	2.164	15.2	200	1.10	34.399	0.170	Ok	1.095	0.602	Ok
Street E	8	SAN 06A	SAN 07A	5	44	3.25	16.25	116.48	7.686	4.225	7.686	2.332	0.20	1.17	0.117	2.449	34.5	200	1.10	34.399	0.180	Ok	1.095	0.624	Ok
Street F	9	SAN 01A	SAN 08A	16	16	2.57	41.12	41.12	9.466	4.331	9.466	1.014	0.30	0.30	0.030	1.044	70.0	200	3.00	56.809	0.094	Ok	1.808	0.688	Ok
Street F	10	SAN 08A	SAN 09A	32	48	2.57	82.24	123.36	7.599	4.217	7.599	2.441	0.50	0.80	0.080	2.521	110.0	200	3.00	56.809	0.143	Ok	1.808	0.900	Ok
Street F	11	SAN 09A	SAN 07A	14	62	2.57	35.98	159.34	7.219	4.182	7.219	2.996	0.24	1.04	0.104	3.100	57.7	200	2.20	48.648	0.171	Ok	1.549	0.858	Ok
Street E	12	SAN 07A	SAN 10A	5	111	3.25	16.25	292.07	6.395	4.083	6.395	4.864	0.20	2.41	0.241	5.105	48.0	200	0.60	25.406	0.304	Ok	0.809	0.623	Ok
Street E	13	SAN 01A	SAN 11A	6	6	2.57	15.42	15.42	11.517	4.395	11.517	0.462	0.19	0.19	0.019	0.481	37.0	200	2.00	46.384	0.071	Ok	1.476	0.472	Check
Street E	14	SAN 11A	SAN 12A	2	8	2.57	5.14	20.56	10.873	4.379	10.873	0.582	0.09	0.28	0.028	0.610	11.8	200	2.00	46.384	0.080	Ok	1.476	0.506	Check
Street E	15	SAN 12A	SAN 13A	20	28	2.57	51.40	71.96	8.464	4.280	8.464	1.586	0.38	0.66	0.066	1.652	76.2	200	2.20	48.648	0.126	Ok	1.549	0.708	Ok
Street E	16	SAN 13A	SAN 14A	29	57	2.57	74.53	146.49	7.342	4.194	7.342	2.801	0.51	1.17	0.117	2.918	110.0	200	2.90	55.854	0.155	Ok	1.778	0.926	Ok
Street E	17	SAN 14A	SAN 10A	10	67	2.57	25.70	172.19	7.108	4.171	7.108	3.167	0.18	1.35	0.135	3.322	43.4	200	2.20	48.648	0.176	Ok	1.549	0.873	Ok
Street E	18	SAN 10A	SAN 15A	4	182	3.25	13.00	477.26	5.797	3.985	5.797	7.205	0.20	3.96	0.396	7.601	50.8	200	0.50	23.192	0.393	Ok	0.738	0.651	Ok
Fenchurch Manor	19A			9		3.25	29.25																		
Fenchurch Manor	19B	SAN 16A	SAN 17A	14	23	2.57	35.98	65.23	8.631	4.290	8.631	1.466	0.84	0.84	0.084	1.550	100.0	200	2.00	46.384	0.125	Ok	1.476	0.668	Ok
Fenchurch Manor	20A			7		3.25	22.75																		
Fenchurch Manor	20B	SAN 17A	SAN 18A	10	40	2.57	25.70	113.68	7.724	4.228	7.724	2.287	0.65	1.49	0.149	2.436	100.0	200	3.00	56.809	0.141	Ok	1.808	0.880	Ok
Fenchurch Manor	21A			8		3.25	26.00																		
Fenchurch Manor	21B	SAN 18A	SAN 15A	8	56	2.57	20.56	160.24	7.211	4.182	7.211	3.009	0.48	1.97	0.197	3.206	67.5	200	3.50	61.360	0.155	Ok	1.953	1.009	Ok
Fenchurch Manor	22	SAN 15A	SAN 19A	4	242	3.25	13.00	650.50	5.449	3.913	5.449	9.231	0.26	6.19	0.619	9.850	55.8	200	0.50	23.192	0.454	Ok	0.738	0.696	Ok
Fenchurch Manor	23	SAN 20A	SAN 19A	4	4	3.25	13.00	13.00	11.917	4.403	11.917	0.403	0.32	0.32	0.032	0.435	54.2	200	2.00	46.384	0.068	Ok	1.476	0.454	Check
Thicketwood Avenue	25	SAN 19A	SAN 22A	4	250	3.25	13.00	676.50	5.407	3.903	5.407	9.525	0.28	6.79	0.679	10.204	68.9	200	0.40	20.744	0.495	Ok	0.660	0.646	Ok
Thicketwood Avenue	26	SAN 22A	SAN 23A	6	256	3.25	19.50	696.00	5.376	3.896	5.376	9.744	0.33	7.12	0.712	10.456	40.8	250	0.40	37.611	0.360	Ok	0.766	0.643	Ok
Street C	27	SAN 24A	SAN 25A	14	14	3.25	45.50	45.50	9.276	4.323	9.276	1.099	0.76	0.76	0.076	1.175	106.3	200	2.00	46.384	0.109	Ok	1.476	0.615	Ok
Street C	28	SAN 25A	SAN 26A	18	32	3.25	58.50	104.00	7.883	4.239	7.883	2.129	0.76	1.52	0.152	2.281	98.5	200	1.40	38.809	0.184	Ok	1.235	0.662	Ok
Street C	29	SAN 26A	SAN 23A	7	39	3.25	22.75	126.75	7.558	4.214	7.558	2.465	0.38	1.90	0.190	2.685	68.8	200	2.80	54.882	0.150	Ok	1.747	0.884	Ok
Thicketwood Avenue	30	SAN 23A	SAN 27A	7	302	3.25	22.75	845.50	5.171	3.846	5.171	11.385	0.34	9.36	0.936	12.321	50.3	250	0.40	37.611	0.393	Ok	0.766	0.671	Ok
Thicketwood Avenue	31	SAN 27A	SAN 28A	7	309	3.25	22.75	868.25	5.143	3.839	5.143	11.629	0.37	9.73	0.973	12.602	49.2	250	0.40	37.611	0.398	Ok	0.766	0.675	Ok
Street B	32	SAN 29A	SAN 30A	14	14	3.25	45.50	45.50	9.276	4.323	9.276	1.099	0.75	0.75	0.075	1.174	105.4	200	2.00	46.384	0.109	Ok	1.476	0.615	Ok
Street B	33	SAN 30A	SAN 31A	7	21	3.25	22.75	68.25	8.554	4.285	8.554	1.520	0.33	1.08	0.108	1.628	42.6	200	1.90	45.210	0.129	Ok	1.439	0.664	Ok
Street B	34	SAN 31A	SAN 32A	4	25	3.25	13.00	81.25	8.260	4.267	8.260	1.748	0.28	1.36	0.136	1.884	37.2	200	1.90	45.210	0.139	Ok	1.439	0.694	Ok
Street B	35	SAN 32A	SAN 28A	1	26	3.25	3.25	84.50	8.196	4.263	8.196	1.804	0.11	1.47	0.147	1.951	39.7	200	1.90	45.210	0.141	Ok	1.439	0.705	Ok
Thicketwood Avenue	36	SAN 28A	SAN 33A	3	338	3.25	9.75	962.50	5.038	3.811	5.038	12.629	0.17	11.37	1.137	13.766	30.9	250	0.40	37.611	0.418	Ok	0.766	0.690	Ok
Thicketwood Avenue	37	SAN 33A	SAN 34A	2	340	3.25	6.50	969.00	5.032	3.809	5.032	12.697	0.16	11.53	1.153	13.850	12.3	250	0.40	37.611	0.420	Ok	0.766	0.691	Ok
Thicketwood Avenue	38	SAN 34A	SAN 35A	14	354	3.25	45.50	1014.50	4.986	3.796	4.986	13.172	0.64	12.17	1.217	14.389	86.3	250	0.40	37.611	0.429	Ok	0.766	0.698	Ok
Thicketwood Avenue	39	SAN 35A	SAN 36	12	366	3.25	39.00	1053.50	4.948	3.785	4.948	13.575	0.60	12.77	1.277	14.852	77.1	250	0.40	37.611	0.436	Ok	0.766	0.704	Ok
Thicketwood Avenue	40 (Trunk)	SAN 36	SAP33945		366			1053.50	4.948	3.785	4.948	13.575	0.38	13.15	1.315	14.890	55.5	250	0.40	37.611	0.437	Ok	0.766	0.704	Ok
Thicketwood Avenue	40 (Local)	SAN 36	SAP33945	9	9	3.25	29.25	29.25	10.133	4.356	10.133	0.772		0.38	0.038	0.810	55.5	200	2.00	46.384	0.091	Ok	1.476	0.550	Check
Thicketwood Avenue	41 (Trunk)	SAP33945	SAP33921		375			1082.75	4.921	3.777	4.921	13.876	0.14	13.29	1.329	15.205	16.2	250	0.50	42.050	0.415	Ok	0.857	0.768	Ok
Thicketwood Avenue	41 (Local)	SAP33945	SAP33921	3	3	3.25	9.75	9.75	12.623	4.416	12.623	0.321		0.14	0.014	0.335	16.2	200	2.00	46.384	0.093	Ok	1.476	0.422	Check

SANITARY SEWER DESIGN - LOCAL SEWER

Development Details Basis

DESIGN SHEET
FILE NO GOL-20538
CONTRACT / PROJECT LOCKHART INNISFIL INVESTMENTS (II) LIMITED

n ≥ 0.013
M = 5/P^0.2 Babbit
M=1+[14/(4+P^0.5)] Harmon
Q_p = P*q*M/86.4
Q_I = I*A
Q_{tot} = Q_p + Q_I

Numbers in blue or text in red are equations
(Harmon or Babbitt peaking factor where; M ≥ 2), the greater of the two is used in the spreadsheet. Please refer to Section 3.3.1.1 of the Barrie Sanitary Design Guidelines for additional guidance on which peaking factor to use.

(Peak population flow where; q = 225 L/day/person; P = population in thousands) 225 litres/person/day
(Peak extraneous flow: I= 0.1L/s/ha over development area)
(Total peak flow as the sum of peak population flow and peak extraneous flow)

STREET	AREA	MAINTENANCE HOLE FROM	MAINTENANCE HOLE TO	DWELL UNITS	DWELL (ACC) UNITS	DENSITY P.P.U.	POP. (P)	POP. (ACC)	M PEAKING FACTOR BABBIT	M PEAKING FACTOR HARMON	Max PEAKING FACTOR	Q_p (l/s)	AREA (ha)	AREA (ACC) (ha)	Q_I (l/s)	Q_{tot} (l/s)	L (m)	D (mm)	S (%)	Qf FULL (l/s)	d/D[3]	d/D[3] >0.5 or >0.7	Velocity FULL (m/s)	Velocity Partial[1] (m/s)	Velocity[4] > 0.6 (m/s)
Fenchurch Manor	EXT1	SAP33905	SAP33903	4	55	3.25	13.00	147.47	7.332	4.193	7.332	2.816	0.20	1.35	0.135	2.951	40.5	200	0.60	25.406	0.230	Ok	0.809	0.532	Check
Ball Gate	2	SAP33903	SAP33971		55			147.47	7.332	4.193	7.332	2.816	0.14	1.49	0.149	2.965	83.1	200	2.00	46.384	0.171	Ok	1.476	0.815	Ok
Street C	42	SAN 24A	PLUG	7	7	3.25	22.75	22.75	10.655	4.373	10.655	0.631	0.26	0.26	0.026	0.657	33.3	200	2.00	46.384	0.083	Ok	1.476	0.518	Check
Street C	43	PLUG	SAP33970	1	8	3.25	3.25	26.00	10.375	4.364	10.375	0.702	0.05	0.31	0.031	0.733	8.0	200	2.00	46.384	0.087	Ok	1.476	0.534	Check
Street C	44	SAP33970	SAP33971		8			26.00	10.375	4.364	10.375	0.702	0.01	0.32	0.032	0.734	8.8	200	1.00	32.798	0.103	Ok	1.044	0.421	Check
Ball Gate	45	SAP33971	SAP33973		63			173.47	7.098	4.170	7.098	3.206	0.13	1.81	0.181	3.387	74.2	200	2.00	46.384	0.182	Ok	1.476	0.847	Ok
Street B	46	SAN 29A	PLUG	7	7	3.25	22.75	22.75	10.655	4.373	10.655	0.631	0.28	0.28	0.028	0.659	34.3	200	2.00	46.384	0.083	Ok	1.476	0.518	Check
Street B	47	PLUG	SAP33972	1	8	3.25	3.25	26.00	10.375	4.364	10.375	0.702	0.05	0.33	0.033	0.735	8.0	200	2.00	46.384	0.087	Ok	1.476	0.534	Check
Street B	48	SAP33972	SAP33973		8			26.00	10.375	4.364	10.375	0.702	0.01	0.34	0.034	0.736	8.8	200	1.00	32.798	0.103	Ok	1.044	0.421	Check
Ball Gate	49	SAP33973	SAP33974		71			199.47	6.902	4.148	6.902	3.585	0.11	2.26	0.226	3.811	64.3	200	1.15	35.172	0.222	Ok	1.120	0.719	Ok
Ball Gate	50	SAP33974	SAP33921		71			199.47	6.902	4.148	6.902	3.585	0.01	2.27	0.227	3.812	8.8	200	0.65	26.443	0.256	Ok	0.842	0.587	Check
Thicketwood Avenue	51 (Trunk)	SAP33921	SAP33923		449			1291.97	4.750	3.726	4.750	15.982	0.41	16.11	1.611	17.593	94.5	250	0.40	37.611	0.480	Ok	0.766	0.735	Ok
Thicketwood Avenue	51 (Local)	SAP33921	SAP33923	7	7	3.25	22.75	22.75	10.655	4.373	10.655	0.631		0.41	0.041	0.672	94.5	200	2.00	46.384	0.084	Ok	1.476	0.518	Check

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV. 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

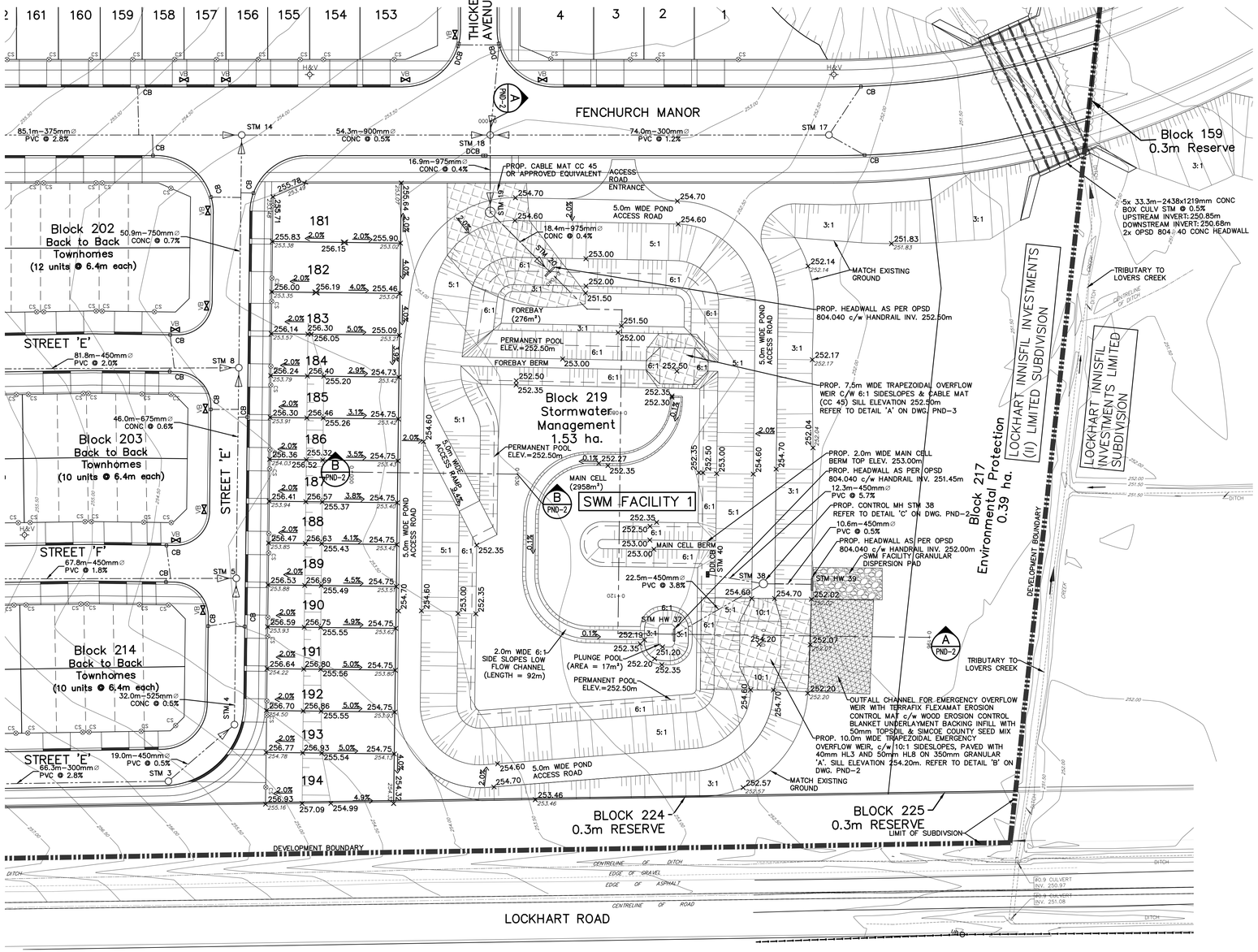
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

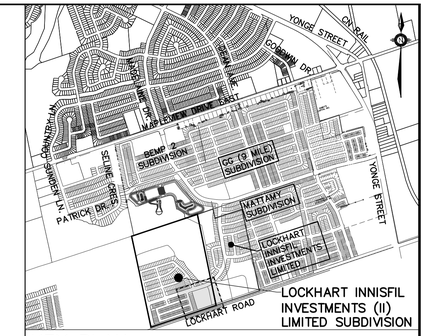
SANITARY SEWER DESIGN SHEET

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KC	SCALE: 1:1000	DATE MAY 2021
DRAWN	KC	PROJECT GOL-20538	DWG. № DS-2
CHECKED	JI		

G:\Eng_30\GOL-20538\Production DWGS\GOL-20538-SANITARY DRAINAGE.dwg Layout:DS-2 Plotted Oct 04, 2021 @ 5:35pm by Jhermann The Jones Consulting Group Ltd.





KEY PLAN
NTS

LEGEND

- STM MH — STORM MAINTENANCE HOLE
- DCB — STORM DOUBLE CATCHBASIN
- DI.CB — DOUBLE DITCH INLET CATCHBASIN
- CB — STORM CATCHBASIN
- PROP. STORM SEWER & DIRECTION OF FLOW
- LIMIT OF SUBDIVISION
- EXISTING CONTOUR AND ELEVATION

24 HR SCS TYPE II STORM WATER ELEVATION	
Storm Event	Elevation (m)
25mm 4hr. Chicago	252.65
2yr. 24hr. SCS	252.84
5yr. 24hr. SCS	252.99
10yr. 24hr. SCS	253.08
25yr. 6hr. SCS	253.20
50yr. 6hr. SCS	253.29
100yr. 6hr. SCS	253.39
Hazel	253.89

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 010198654S4 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28m WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 010198604O7 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 010198604O4 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

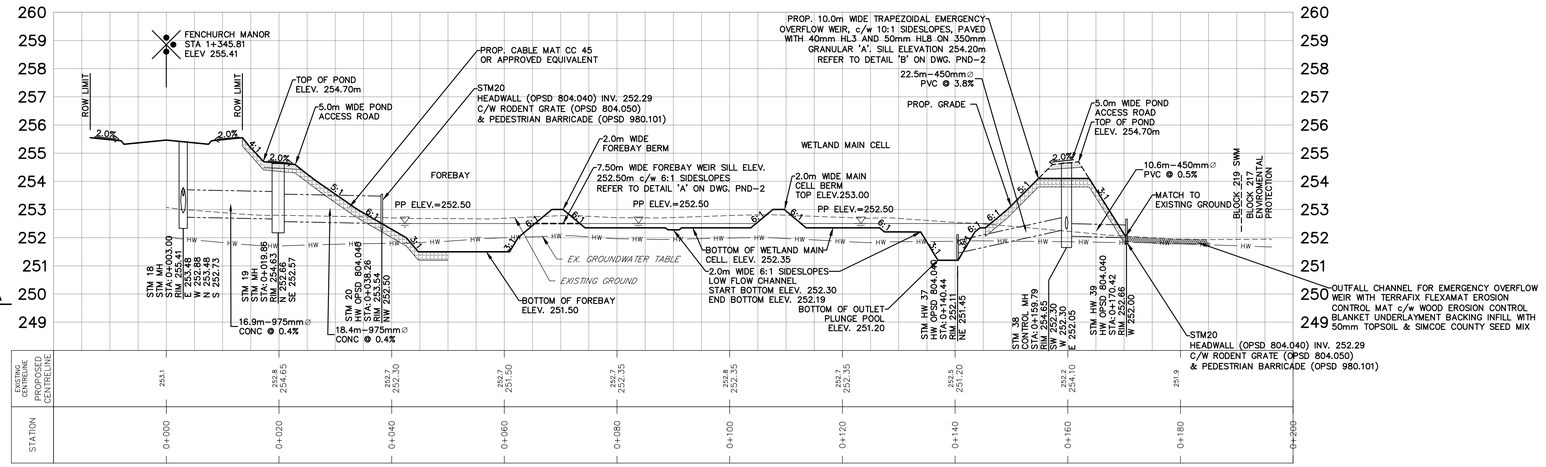
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

SWM FACILITY No. 1 PLAN VIEW

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

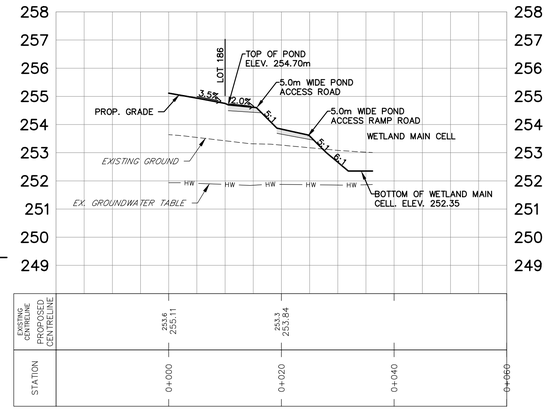
DESIGN	VBS	SCALE: 1:500	DATE JUNE 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº PND-1
CHECKED	JI		

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SECTION A–A
PND-1 HOR. 1:500 VERT. 1:100

24 HR SCS TYPE II STORM WATER ELEVATION	
Storm Event	Elevation (m)
25mm 4hr. Chicago	252.65
2yr. 24hr. SCS	252.84
5yr. 24hr. SCS	252.99
10yr. 24hr. SCS	253.08
25yr. 6hr. SCS	253.20
50yr. 6hr. SCS	253.29
100yr. 6hr. SCS	253.39
Hazel	253.89

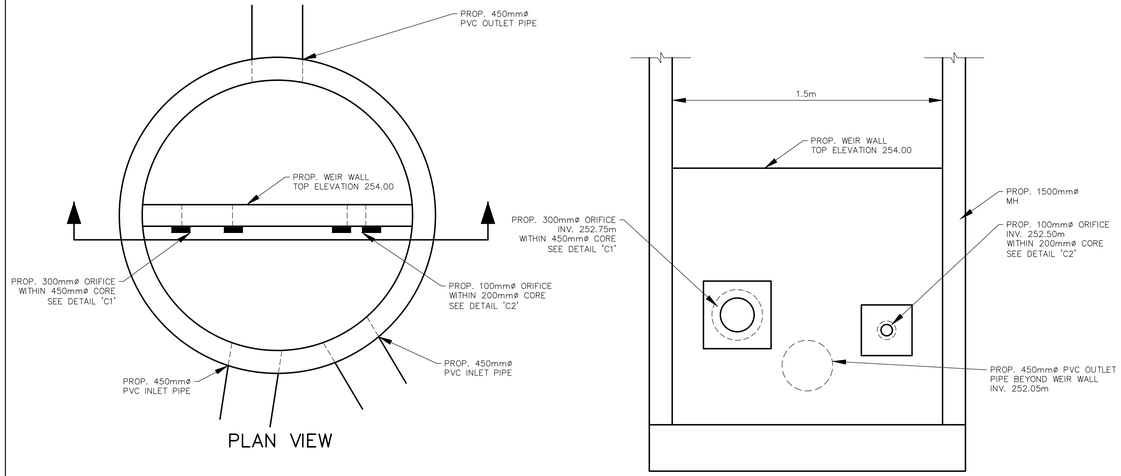


SECTION B–B
PND-1 HOR. 1:500 VERT. 1:100

DETAIL 'C'

1500mmØ CONTROL MANHOLE 38

N.T.S.

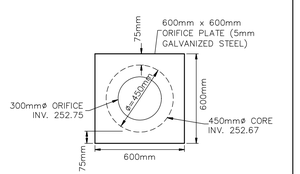


DETAIL 'C1'

300mmØ ORIFICE PLATE

BOLTED TO THE WEST SIDE OF WEIR WALL

N.T.S.

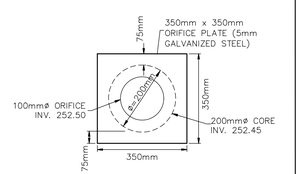


DETAIL 'C2'

100mmØ ORIFICE PLATE

BOLTED TO THE WEST SIDE OF WEIR WALL

N.T.S.



G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-POND.dwg Layout:PND-2 Plotted Oct 07, 2021 @ 10:44am by jhermann The Jones Consulting Group Ltd.

BENCHMARK:

BENCHMARK NO: 001931U4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

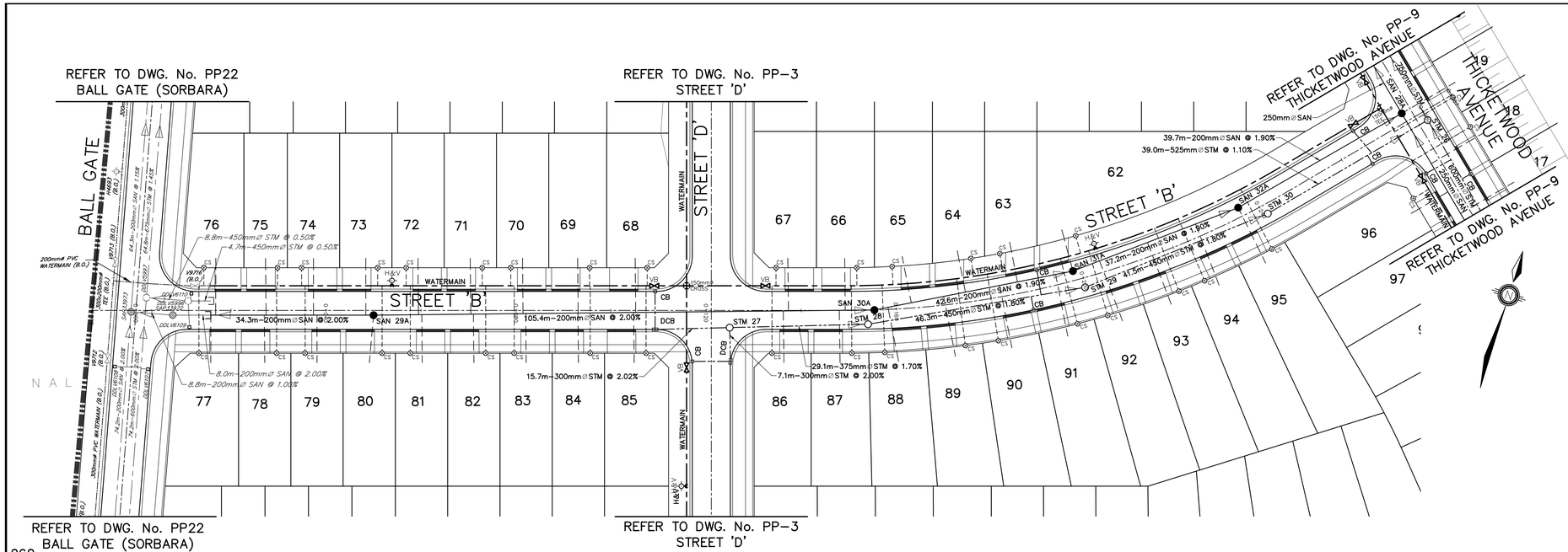
LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

LOCKHART INNISFIL
INVESTMENTS (II) LIMITED
SUBDIVISION

SWM FACILITY No. 1
SECTIONS AND DETAILS

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

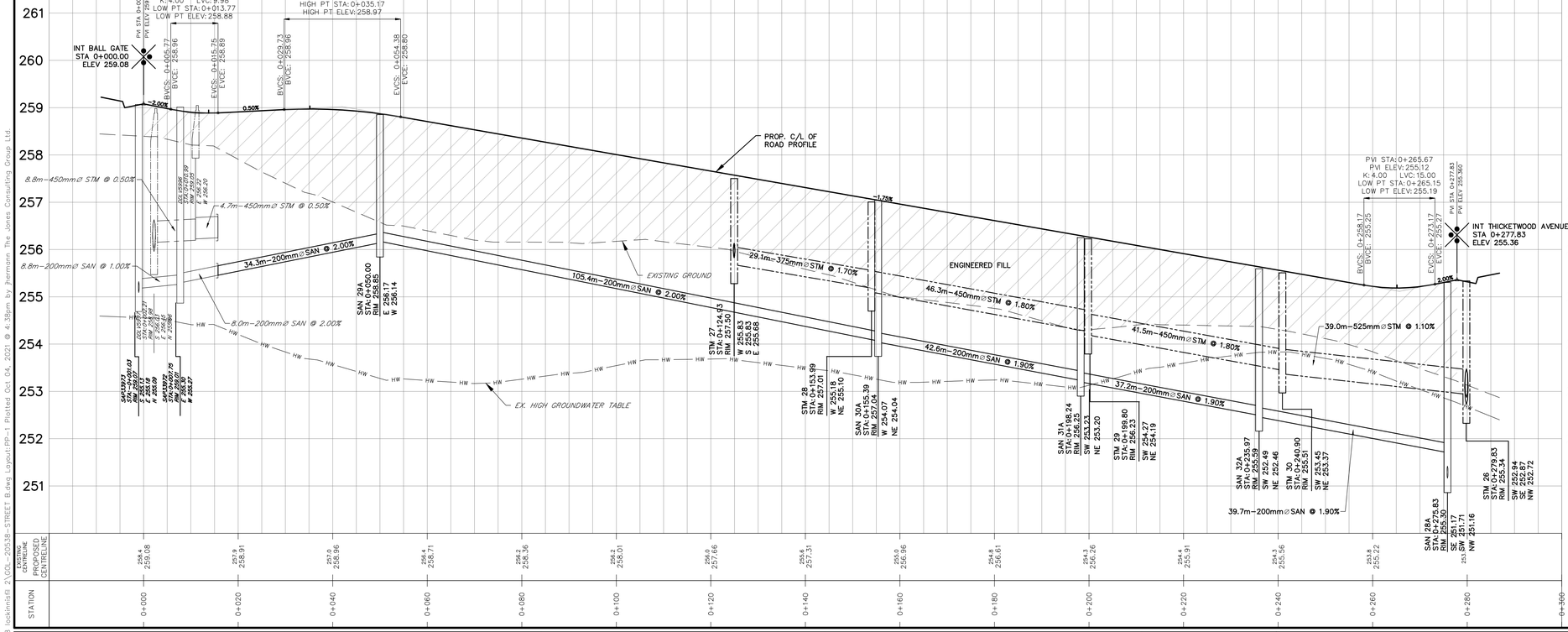
DESIGN	VBS	SCALE: AS NOTED	DATE JUNE 2021
DRAWN	VBS	PROJECT GOL-20538	DWG. Nº PND-2
CHECKED	JI		



KEY PLAN N.T.S.

LEGEND

- SAS13921 — SANITARY MAINTENANCE HOLE (BY OTHERS)
- DOLV5979 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB(12.0) — VALVE & BOX (BY OTHERS)
- H&V(12.0) — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE



BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JW

LICENCED PROFESSIONAL ENGINEER — J. W. INGRAM — 100143779 — 21-10-06 — PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

PLAN AND PROFILE STREET 'B' 0–009 TO 0+287

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JW	SCALE: H=1:500 V=1:50	DATE JUNE 2021
DRAWN	KS	PROJECT GOL–20538	DWG. Nº PP–1
CHECKED	JW		

C:_TJCG\Eng_3D\GOL-20538_lockinnisfil 2\GOL-20538-STREET B.dwg Layout:PP-1 Plotted: Oct 04, 2021 @ 4:35pm by jhermann The Jones Consulting Group Ltd.

REFER TO DWG. No. PP21
BALL GATE (SORBARA)

REFER TO DWG. No. PP-3
STREET 'D'

REFER TO DWG. No. PP-9
THICKETWOOD AVENUE

BALL GATE

STREET 'C'

STREET 'D'

WATERMAIN

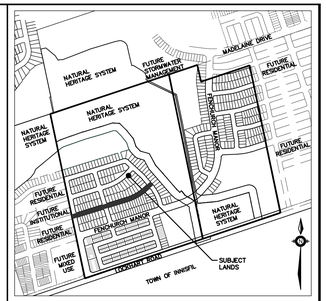
123 122 121 120 119 118 117 116 115 114 113 112 111 110 109 108 107 106 105 104 103 102 101 12

124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149

8.8m–450mmØ STM @ 1.00%
4.7m–450mmØ STM @ 0.50%
8.0m–200mmØ SAN @ 2.00%
8.8m–200mmØ SAN @ 1.00%
33.3m–200mmØ SAN @ 2.00%
106.3m–200mmØ SAN @ 2.00%
98.5m–200mmØ SAN @ 1.40%
84.9m–375mmØ STM @ 1.70%
44.7m–450mmØ STM @ 1.70%
67.4m–450mmØ STM @ 1.60%
68.8m–200mmØ SAN @ 2.80%
150mmØ WATERMAIN
250mmØ WATERMAIN
600mmØ STM
200mmØ WATERMAIN

SAN 25A
SAN 24A
SAN 26A
STM 21
STM 22
STM 23
STM 24

CB
DCB
VB
H&V
CS



KEY PLAN N.T.S.

LEGEND

- SAN1,3921 — SANITARY MAINTENANCE HOLE (BY OTHERS)
- DDLV5979 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB(12.0) — VALVE & BOX (BY OTHERS)
- H&V(12.0) — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE

PVI STA: 0+009.93
PVI ELEV: 260.34
K: 4.00 LVC: 10.02
LOW PT STA: 0+012.93
LOW PT ELEV: 260.36

PVI STA: 0+041.57
PVI ELEV: 260.50
K:11.00 LVC: 24.22
HIGH PT STA: 0+034.98
HIGH PT ELEV: 260.45

INT BALL GATE
STA 0+000.00
ELEV 260.54

INT STREET 'D'
STA 0+126.85
ELEV 259.05

PROP. C/L OF ROAD PROFILE
EXISTING GROUND
ENGINEERED FILL
EX. HIGH GROUNDWATER TABLE

PVI STA: 0+312.26
PVI ELEV: 255.90
K: 4.00 LVC: 14.78
LOW PT STA: 0+311.67
LOW PT ELEV: 255.97

INT THICKETWOOD AVENUE
STA 0+324.89
ELEV 256.15

SAN 24A STA 0+049.00 RIM 260.45 W 257.65 E 257.65

STM 21 STA 0+130.85 RIM 258.92 W 257.24 S 257.24 E 257.09

SAN 25A STA 0+255.34 RIM 258.57 W 255.52 E 255.49

STM 22 STA 0+215.72 RIM 257.48 W 255.65 NE 255.57

SAN 26A STA 0+253.94 RIM 256.89 W 254.11 NE 254.06

STM 23 STA 0+254.89 RIM 256.74 SW 254.81 NE 254.73

STM 24 STA 0+326.88 RIM 256.43 SW 253.85 S 253.85 SE 253.85 NW 253.50

SAN 23A STA 0+322.88 RIM 256.11 SE 252.15 SW 252.15 NW 251.60

STATION	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340
EXISTING CENTRELINE	259.8	259.8	259.8	259.8	258.7	258.4	258.0	257.5	257.0	256.8	256.3	255.9	255.7	255.3	254.9	254.5	254.1	
PROPOSED CENTRELINE	260.54	260.39	260.44	260.19	259.65	259.51	259.17	258.83	258.49	258.15	257.81	257.47	257.13	256.79	256.45	256.11	256.05	

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019865404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911159.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

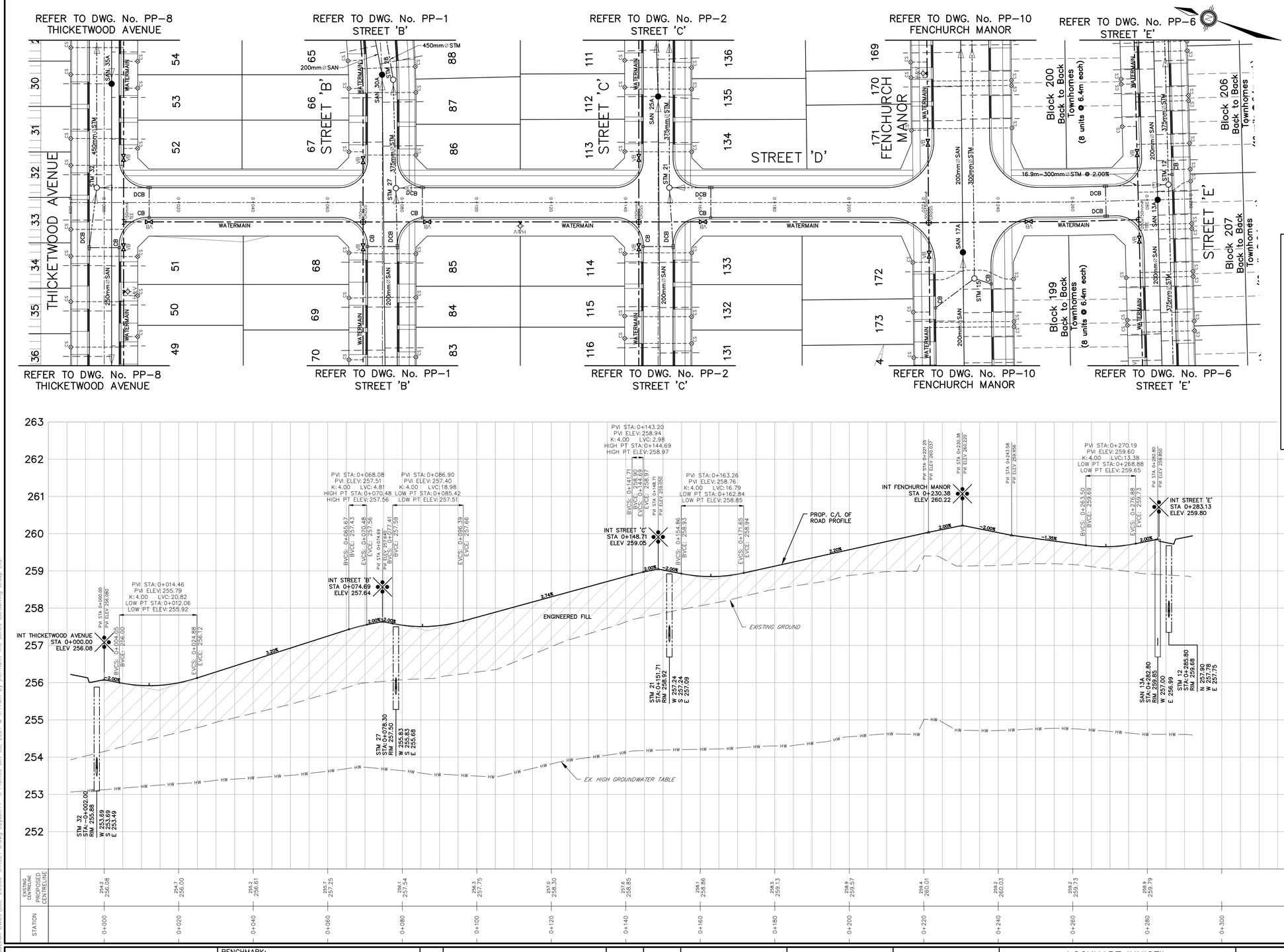
LOCKHART INNISFIL INVESTMENTS (II) LIMITED
SUBDIVISION

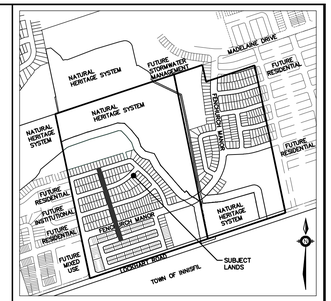
PLAN AND PROFILE
STREET 'C'
0–009 TO 0+334

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JWI	SCALE: H=1:500 V=1:50	DATE JUNE 2021
DRAWN	KS	PROJECT GOL–20538	DWG. Nº PP–2
CHECKED	JWI		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STREET C.dwg, Layout: PP-2 Plotted: Oct 04, 2021 @ 4:35pm by Brennann The Jones Consulting Group Ltd.





KEY PLAN N.T.S.

LEGEND

- SAP13921 ● SANITARY MAINTENANCE HOLE (BY OTHERS)
- DDLV5979 ○ STORM MAINTENANCE HOLE (BY OTHERS)
- CB CATCHBASIN (BY OTHERS)
- DCB DOUBLE CATCHBASIN (BY OTHERS)
- VB VALVE & BOX (BY OTHERS)
- H&V HYDRANT & VALVE (BY OTHERS)
- SAN 23A ● SANITARY MAINTENANCE HOLE
- STM 24 ○ STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V HYDRANT AND VALVE
- VB VALVE AND BOX
- SANITARY SERVICE

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

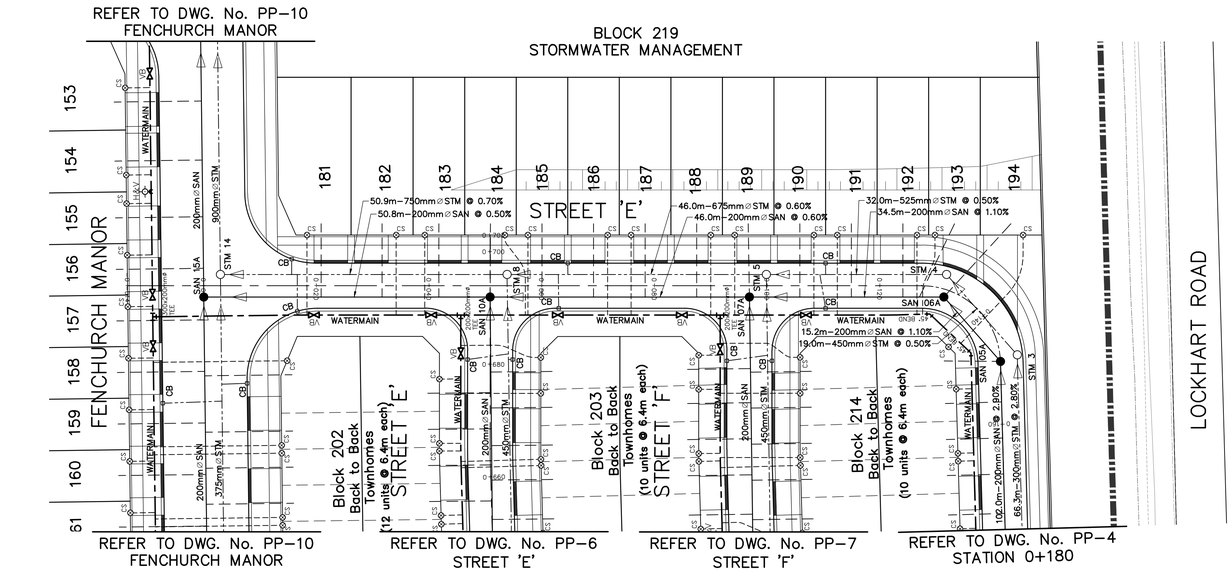
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

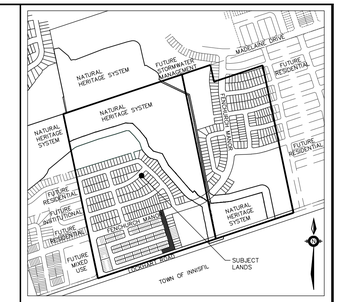
PLAN AND PROFILE STREET 'D' 0-009 TO 0+292

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN KS/JWI	SCALE: H=1:500 V=1:50	DATE JUNE 2021	
DRAWN KS	PROJECT GOL-20538	DWG. Nº PP-3	
CHECKED JWI			

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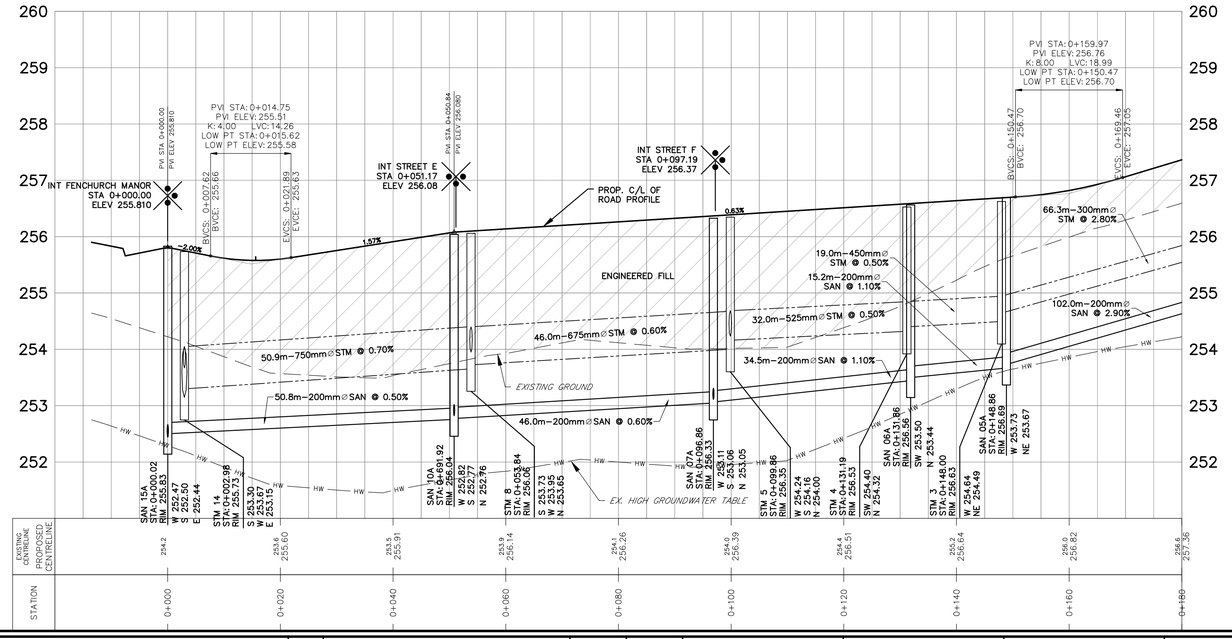




KEY PLAN N.T.S.

LEGEND

- SAN 23A1 — SANITARY MAINTENANCE HOLE (BY OTHERS)
- STM 24 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- V&V — VALVE & BOX (BY OTHERS)
- H&V — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE



BENCHMARK:

BENCHMARK NO: 001193111460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911159.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

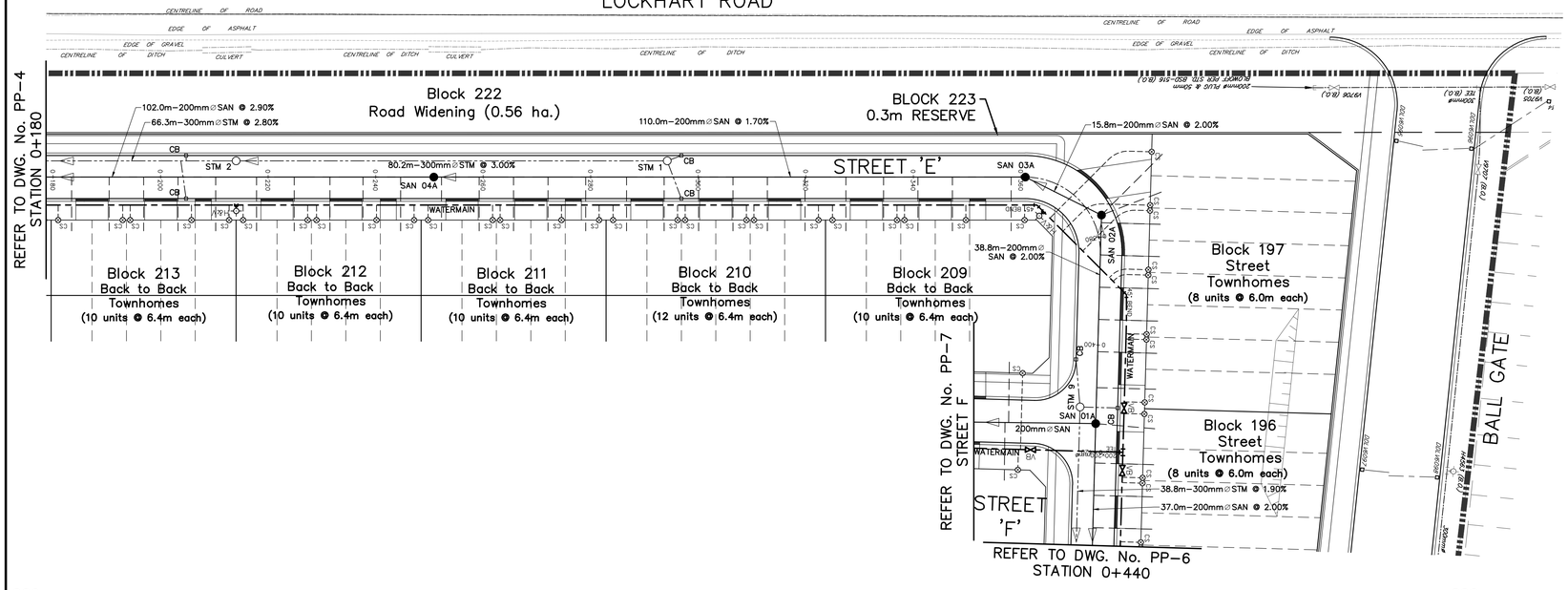
PLAN AND PROFILE STREET 'E' 0-014 TO 0+180

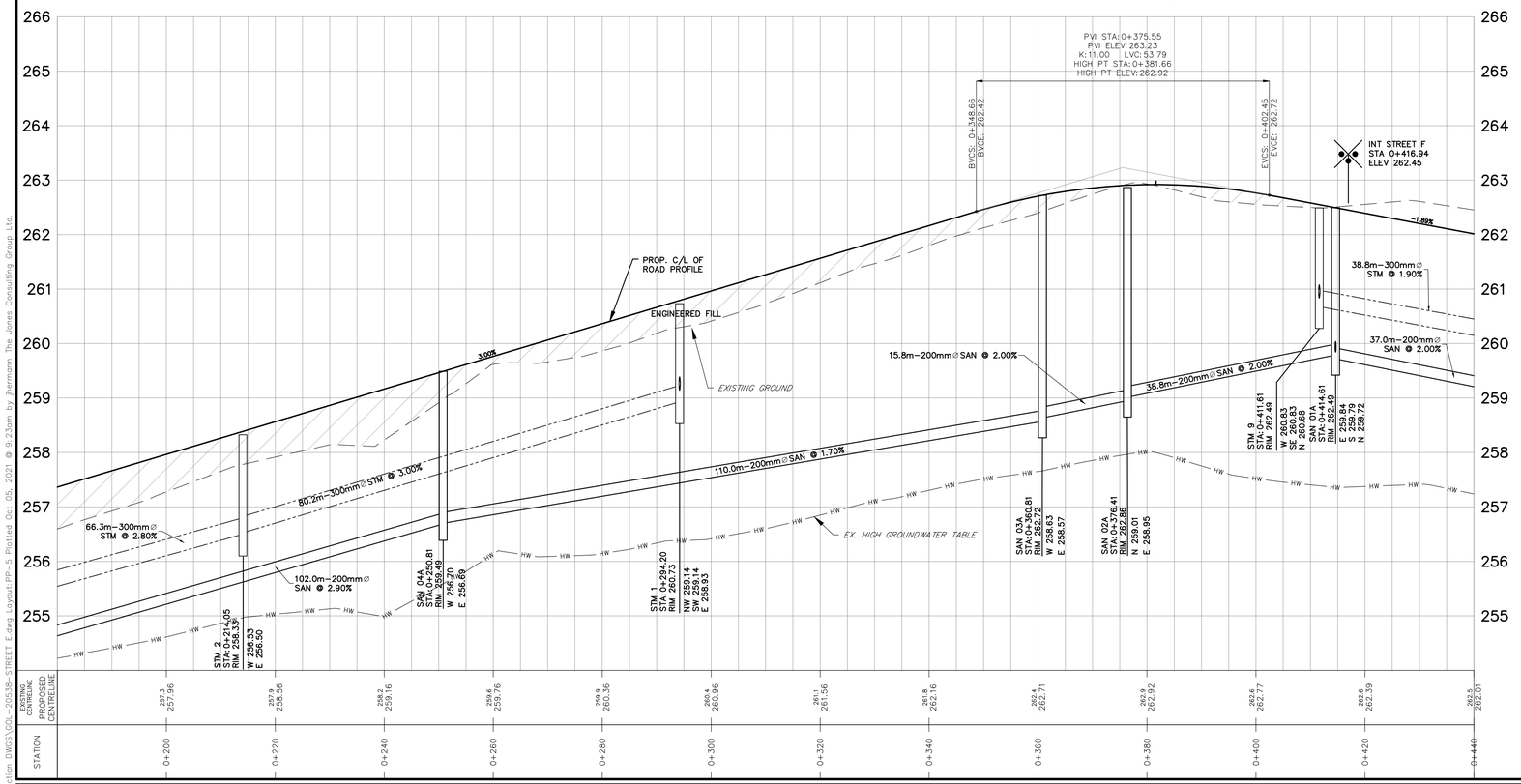
JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

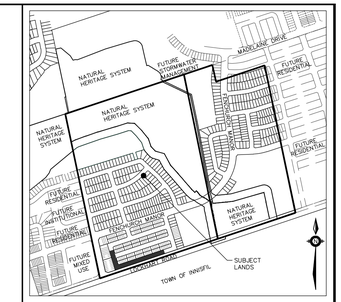
DESIGN KS/JWI	SCALE: H=1:500 V=1:50	DATE JUNE 2021	
DRAWN KS	PROJECT GOL-20538	DWG. Nº PP-4	
CHECKED JWI			

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STREET E.dwg Layout:PP-4 Plotted: Oct 05, 2021 @ 9:25pm by Jeremiah The Jones Consulting Group Ltd.

LOCKHART ROAD







KEY PLAN N.T.S.

LEGEND

- SAN 23A — SANITARY MAINTENANCE HOLE (BY OTHERS)
- STM 24 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB — VALVE & BOX (BY OTHERS)
- H&V — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE

BENCHMARK:

BENCHMARK NO: 001103U460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "Y" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.69km EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

MCENIRE PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

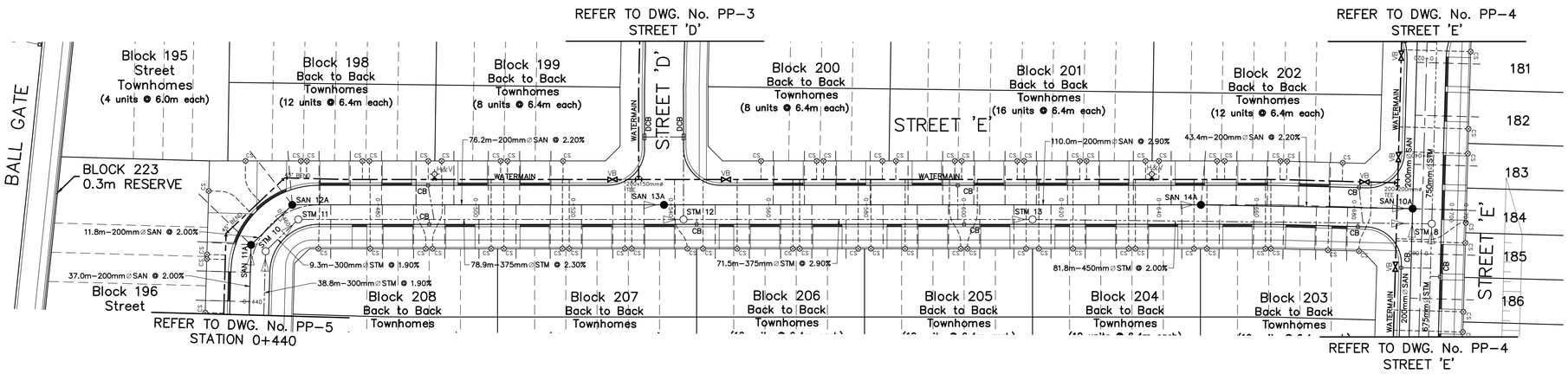
LOCKHART INNISFIL
INVESTMENTS (II) LIMITED
SUBDIVISION

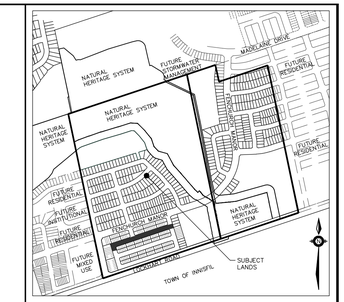
PLAN AND PROFILE
STREET 'E'
0+180 TO 0+440

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN KS/JWI	SCALE: H=1:500 V=1:50	DATE JUNE 2021	
DRAWN KS	PROJECT GOL-20538	DWG. Nº PP-5	
CHECKED JWI			

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STREET E.dwg Layout:PP-5 Plotted Oct 05, 2021 @ 9:23am by jhermann The Jones Consulting Group Ltd.

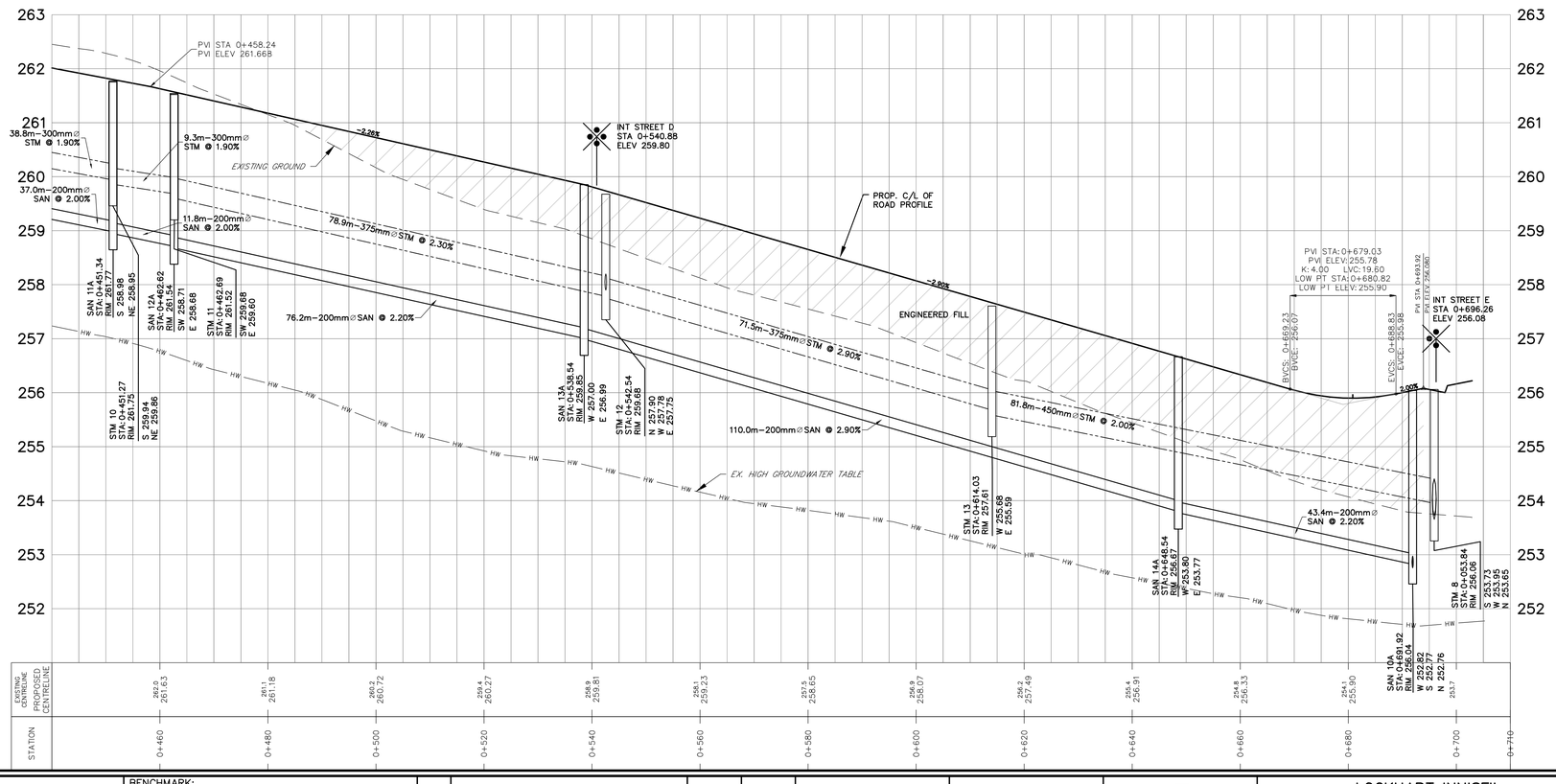




KEY PLAN N.T.S.

LEGEND

- SAN 13A/21 — SANITARY MAINTENANCE HOLE (BY OTHERS)
- DDL V5979 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB/12.0 — VALVE & BOX (BY OTHERS)
- H&V/12.0 — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE



BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911159.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

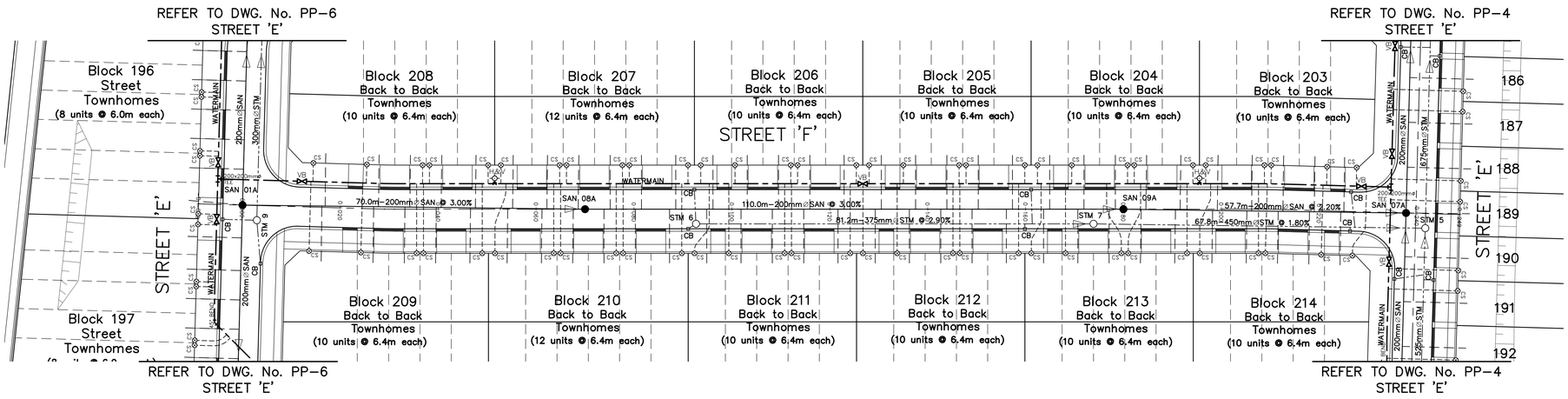
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

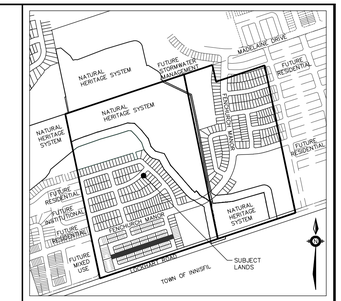
PLAN AND PROFILE STREET 'E' 0+440 TO 0+705

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN KS/JWI	SCALE: H=1:500 V=1:50	DATE JUNE 2021	
DRAWN KS	PROJECT GOL-20538	DWG. Nº PP-6	
CHECKED JWI			

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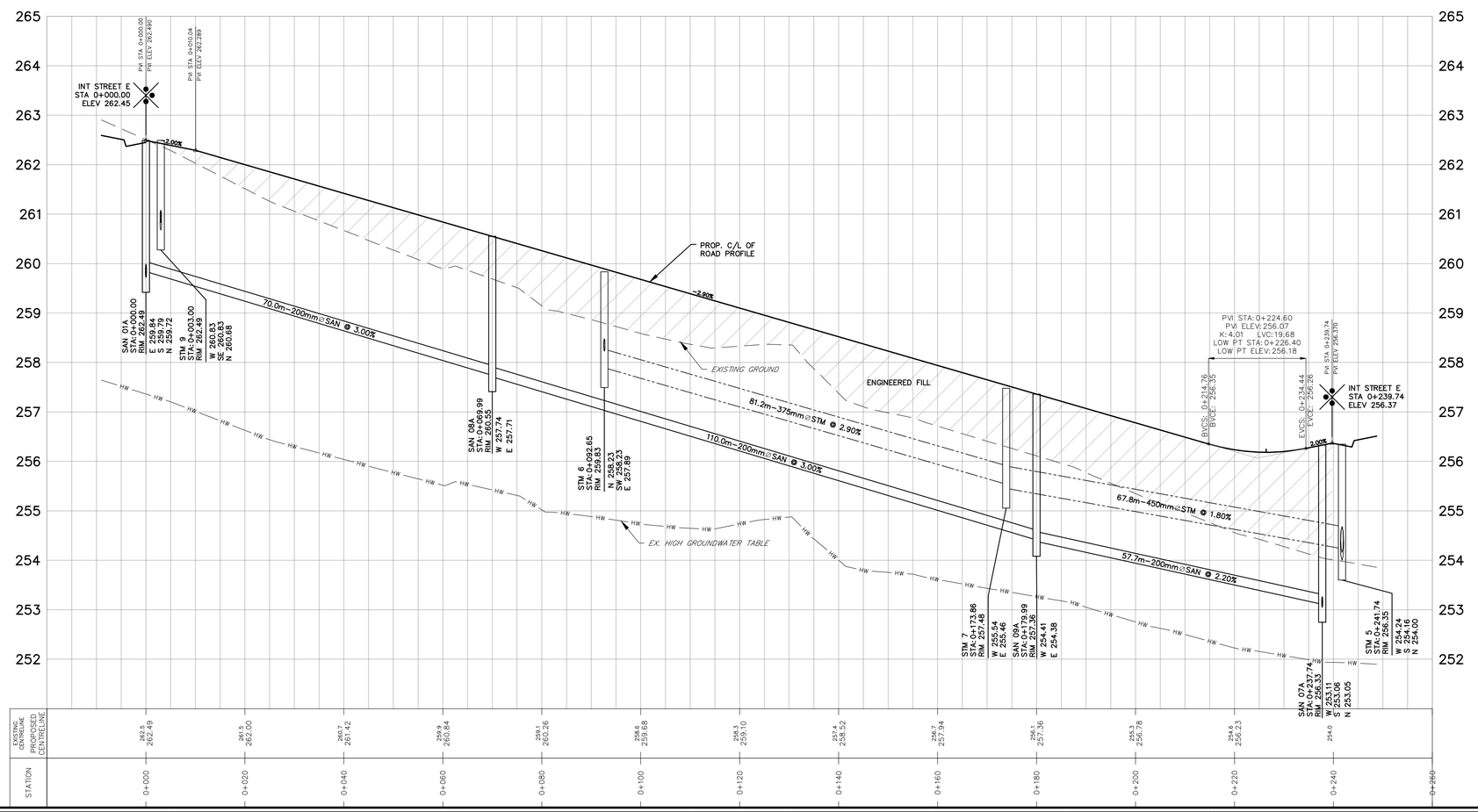




KEY PLAN N.T.S.

LEGEND

- SAP.13921 — SANITARY MAINTENANCE HOLE (BY OTHERS)
- DDL#5979 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB(12.0) — VALVE & BOX (BY OTHERS)
- H&V(12.0) — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE



BENCHMARK:

BENCHMARK NO: 001193IU4460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

PLAN AND PROFILE STREET 'F' 0-009 TO 0+249

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
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F. 705.734.1056

DESIGN	KS/JWI	SCALE: H=1:500 V=1:50	DATE JUNE 2021
DRAWN	KS	PROJECT GOL-20538	DWG. Nº PP-7
CHECKED	JWI		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-STREET F.dwg Layout:PP-7 Plotted Oct 05, 2021 @ 9:37am by Jhermann The Jones Consulting Group Ltd.

BLOCK 221
STORMWATER MANAGEMENT

BLOCK 218
ENVIRONMENTAL
PROTECTION

THICKETWOOD AVENUE

REFER TO DWG. No. PP3
THICKETWOOD AVENUE (SORBARA)

REFER TO DWG. No. PP22
BALL GATE (SORBARA)

REFER TO DWG. No. PP-3
STREET 'D'

REFER TO DWG. No. PP-9
STATION 1+260

BALL GATE

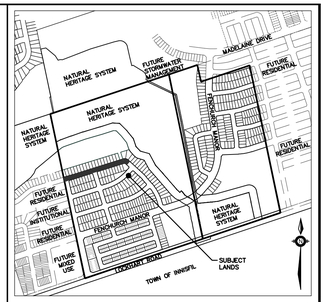
STREET 'D'

WATERMAIN

RETAINING WALL

51.5m–675mm⌀ STM @ 2.00%
94.5m–200mm⌀ SAN @ 2.00% (LOCAL)
94.5m–250mm⌀ SAN @ 0.40% (TRUNK)
12.9m–450mm⌀ STM @ 2.00%
16.2m–200mm⌀ SAN @ 2.00% (LOCAL)
16.2m–250mm⌀ SAN @ 0.50% (TRUNK)
8.3m–675mm⌀ STM @ 1.45%
8.8m–200mm⌀ SAN @ 0.65%
64.3m–200mm⌀ SAN @ 1.15%
64.8m–675mm⌀ STM @ 1.45%
55.5m–200mm⌀ SAN @ 2.00%
55.5m–250mm⌀ SAN @ 0.40%
77.1m–250mm⌀ SAN @ 0.40%
58.3m–450mm⌀ STM @ 0.50%
54.0m–450mm⌀ STM @ 0.50%
86.3m–250mm⌀ SAN @ 0.40%
20.6m–750mm⌀ STM @ 5.00%
35.0m–750mm⌀ STM @ 5.00%
12.3m–250mm⌀ SAN @ 0.40%
18.2m–750mm⌀ STM @ 0.50%
30.9m–250mm⌀ SAN @ 0.40%
34.7m–750mm⌀ STM @ 0.50%

STM 32
STM 33
STM 34
STM 35
SAN 35A
SAN 34A
DCB
CB
VB
H&V



KEY PLAN N.T.S.

LEGEND

- SAN 23A — SANITARY MAINTENANCE HOLE (BY OTHERS)
- STM 24 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB — VALVE & BOX (BY OTHERS)
- H&V — HYDRANT & VALVE (BY OTHERS)
- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE

PVI STA:1+047.49
PVI ELEV:259.12
K:11.00 LVC:71.50
HIGH PT STA:1+033.75
HIGH PT ELEV:258.63

INT BALL GATE
STA 1+000.00
ELEV 258.06

INT STREET 'D'
STA 1+115.23
ELEV 256.08

PVI STA:1+129.01
PVI ELEV:255.46
K:8.00 LVC:32.00
LOW PT STA:1+145.01
LOW PT ELEV:255.38

PVI STA:1+230.11
PVI ELEV:254.95
K:8.00 LVC:10.43
LOW PT STA:1+228.90
LOW PT ELEV:254.97

PROP. C/L OF ROAD PROFILE
EXISTING GROUND
EX. HIGH GROUNDWATER TABLE
ENGINEERED FILL

STATION	PROPOSED CENTRELINE	EXISTING CENTRELINE
1+000	258.06	256.7
1+020	258.54	256.8
1+040	258.61	256.4
1+060	258.32	256.0
1+080	257.66	254.6
1+100	256.76	254.4
1+120	255.89	254.1
1+140	255.42	254.1
1+160	255.30	254.2
1+180	255.20	253.9
1+200	255.10	253.1
1+220	255.00	253.3
1+240	255.03	252.9
1+260	255.19	252.8

BENCHMARK:

BENCHMARK NO: 001193IU4605 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65m EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JWI

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

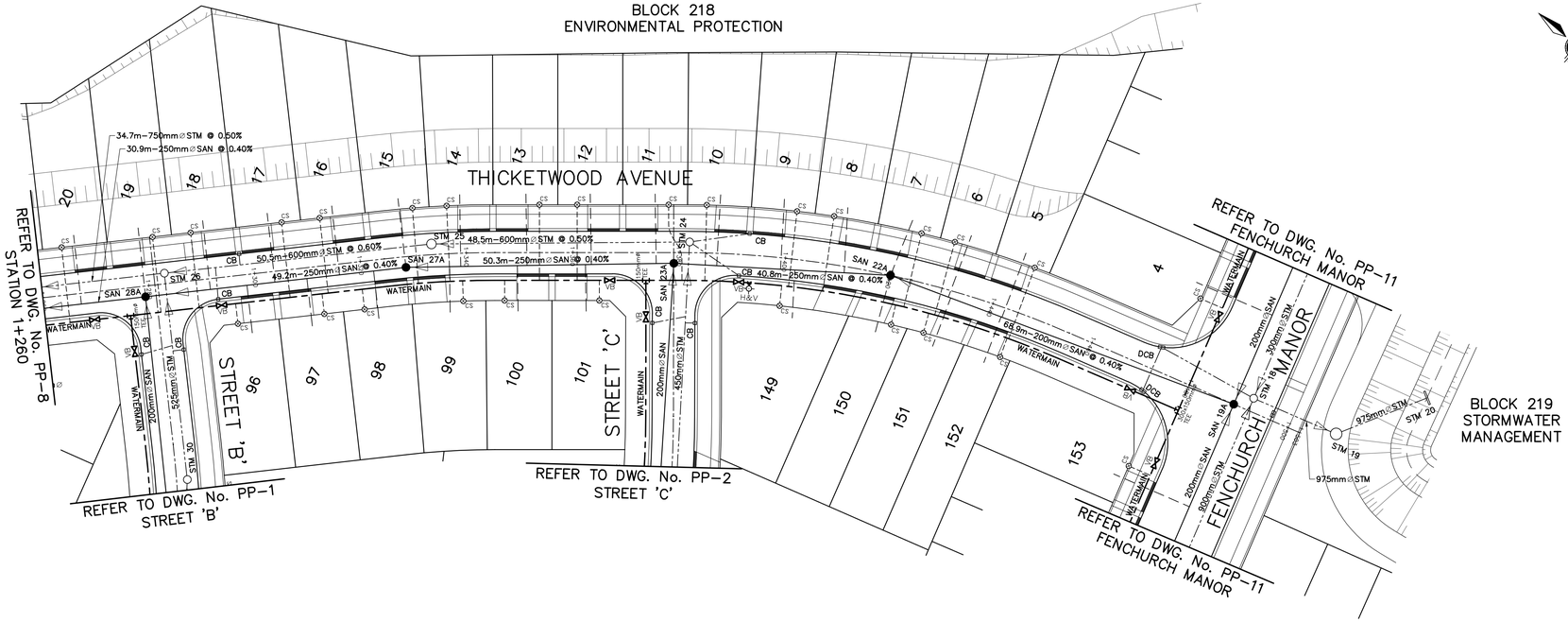
LOCKHART INNISFIL
INVESTMENTS (II) LIMITED
SUBDIVISION

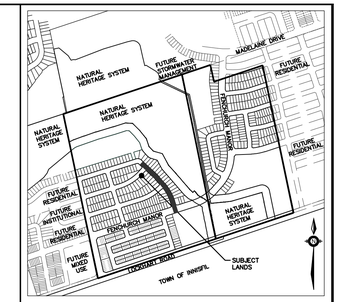
PLAN AND PROFILE
THICKETWOOD AVENUE
0+980 TO 1+260

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JW	SCALE: H=1:500 V=1:50	DATE JUNE 2021
DRAWN	KS	PROJECT GOL–20538	DWG. Nº PP–8
CHECKED	JW		

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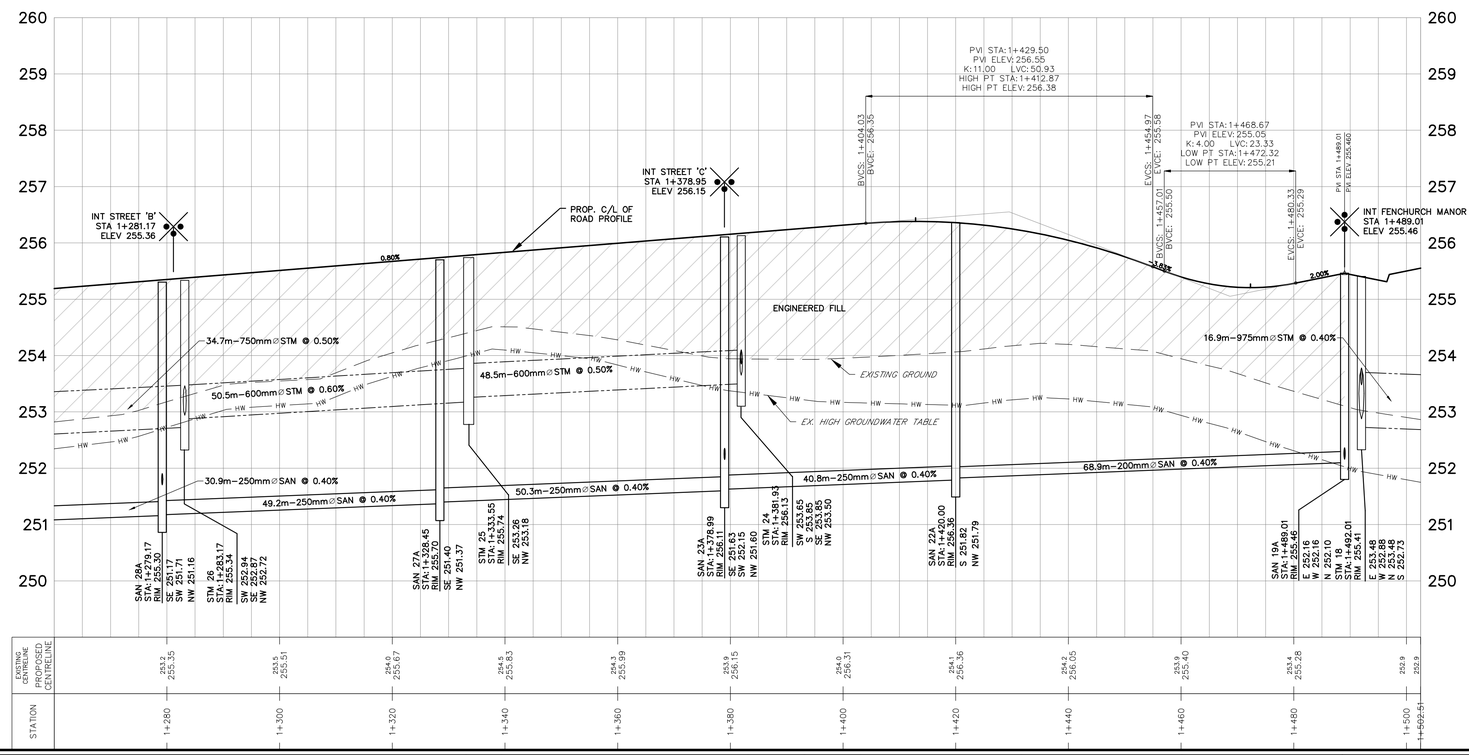




KEY PLAN N.T.S.

LEGEND

- SAN1,13921 ● SANITARY MAINTENANCE HOLE (BY OTHERS)
- DDL#5979 ○ STORM MAINTENANCE HOLE (BY OTHERS)
- CB CATCHBASIN (BY OTHERS)
- DCB DOUBLE CATCHBASIN (BY OTHERS)
- VB(2.0) VALVE & BOX (BY OTHERS)
- H&V(2.0) HYDRANT & VALVE (BY OTHERS)
- SAN 23A ● SANITARY MAINTENANCE HOLE
- STM 24 ○ STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V HYDRANT AND VALVE
- VB VALVE AND BOX
- SANITARY SERVICE



BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWIN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.69m EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JW

LICENCED PROFESSIONAL ENGINEER J. W. INGRAM 100143779 21-10-06 PROVINCE OF ONTARIO

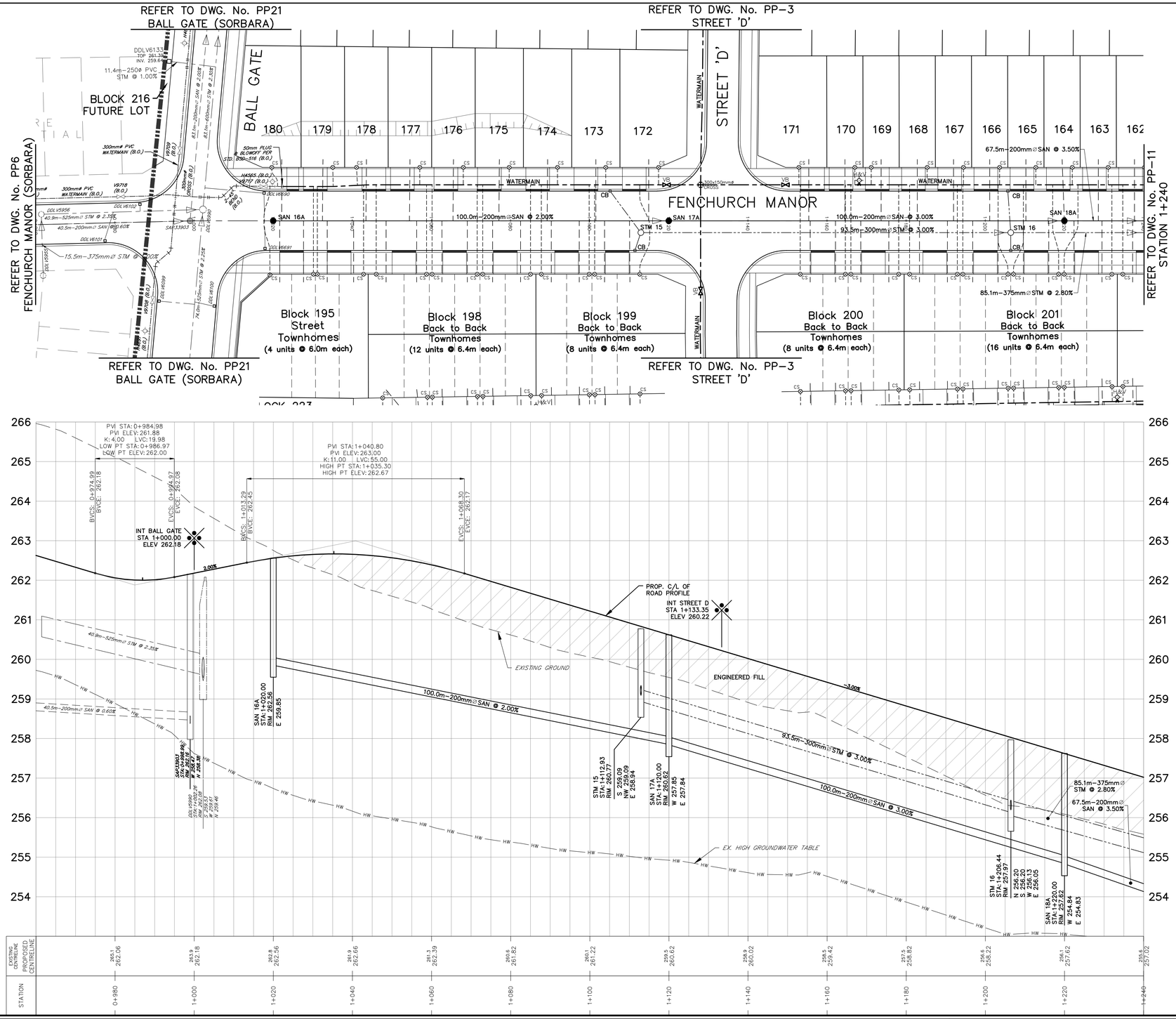
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

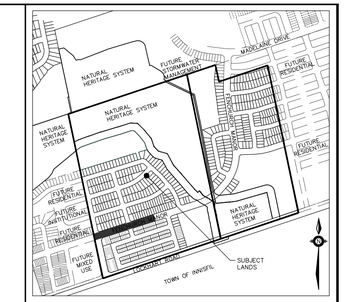
PLAN AND PROFILE THICKETWOOD AVENUE 1+260 TO 1+503

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JW	SCALE: H=1:500 V=1:50	DATE JUNE 2021
DRAWN	KS	PROJECT GOL-20538	DWG. Nº PP-9
CHECKED	JW		

G:\Eng_3D\GOL-20538\Production DWGS\GOL-20538-THICKETWOOD.dwg Layout:PP-9 Plotted: Oct 05, 2021 @ 9:47am by Jhermann The Jones Consulting Group Ltd.





KEY PLAN N.T.S.

LEGEND

- SAN1,3903 ● SANITARY MAINTENANCE HOLE (BY OTHERS)
- DDLV5979 ○ STORM MAINTENANCE HOLE (BY OTHERS)
- CB CATCHBASIN (BY OTHERS)
- DCB DOUBLE CATCHBASIN (BY OTHERS)
- VB(12.0) VALVE & BOX (BY OTHERS)
- H&V(12.0) HYDRANT & VALVE (BY OTHERS)
- SAN 23A ● SANITARY MAINTENANCE HOLE
- STM 24 ○ STORM MAINTENANCE HOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- H&V HYDRANT AND VALVE
- VB VALVE AND BOX
- SANITARY SERVICE

BENCHMARK:

BENCHMARK 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH–EAST OF "V" IN TWN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE, EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH–EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911189.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JW

LICENCED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

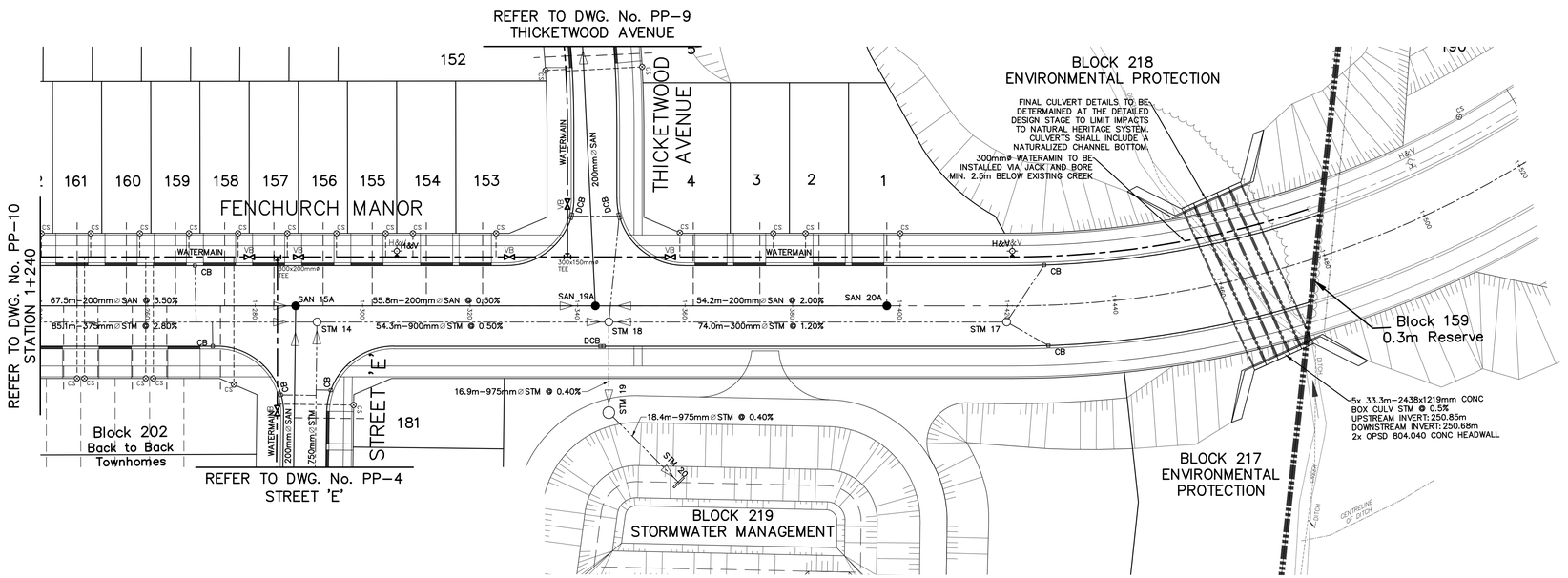
LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

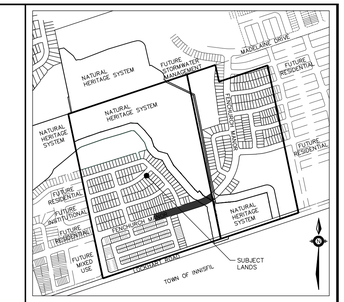
PLAN AND PROFILE FENCHURCH MANOR 0+960 TO 1+240

JONES CONSULTING GROUP LTD. PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN	KS/JW	SCALE: H=1:500 V=1:50	DATE JUNE 2021
DRAWN	KS	PROJECT GOL–20538	DWG. Nº PP–10
CHECKED	JW		

G:\Eng_3D\GOL–20538\Production DWGS\GOL–20538–FENCHURCH.dwg Layout:PP–10 Plotted Oct 05, 2021 @ 10.03am by Jhermann The Jones Consulting Group Ltd

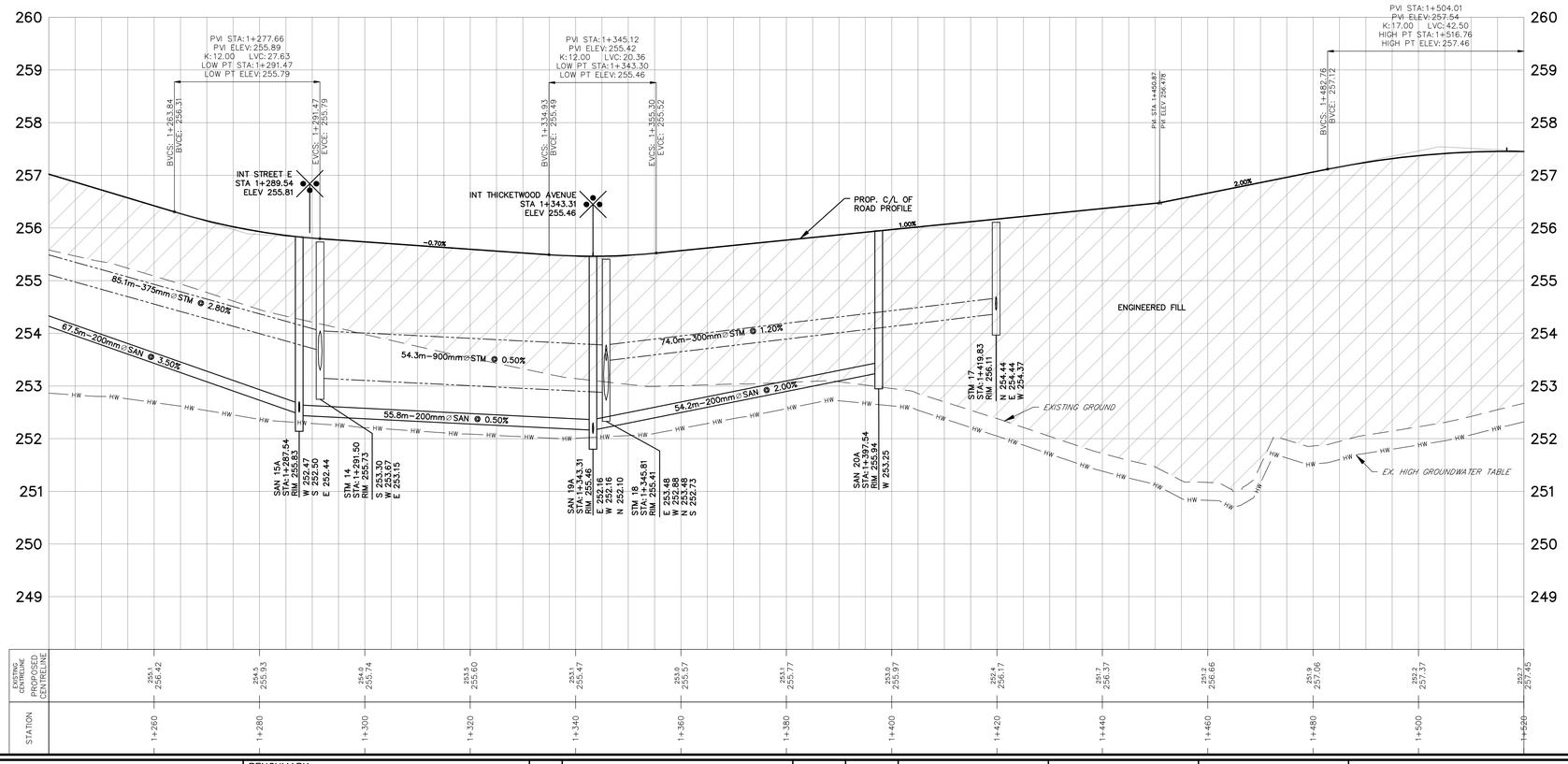




KEY PLAN N.T.S.

LEGEND

- SAN 23A — SANITARY MAINTENANCE HOLE (BY OTHERS)
- STM 24 — STORM MAINTENANCE HOLE (BY OTHERS)
- CB — CATCHBASIN (BY OTHERS)
- DCB — DOUBLE CATCHBASIN (BY OTHERS)
- VB — VALVE & BOX (BY OTHERS)
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- SAN 23A — SANITARY MAINTENANCE HOLE
- STM 24 — STORM MAINTENANCE HOLE
- CB — CATCH BASIN
- DCB — DOUBLE CATCH BASIN
- H&V — HYDRANT AND VALVE
- VB — VALVE AND BOX
- SANITARY SERVICE



BENCHMARK:

BENCHMARK NO: 001193110460S 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) 15.2m WEST OF BELL POLE AND 9.2m SOUTH-EAST OF "V" IN TWN BIRCH TREES 15cm BELOW BRICK. ELEV 263.480

BENCHMARK NO: 01019865454 CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE EAST OVER LOVERS CREEK, 0.65km EAST OF HURONIA ROAD, TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45m NORTH OF CENTRELINE OF ROAD, 28cm WEST OF THE NORTH-EAST END OF BRIDGE, 19cm BELOW TOP OF COPING. ELEV. 241.862

BENCHMARK NO: 01019860407 LOCATED ON THE NORTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 500m EAST OF HURONIA ROAD. N.4910727.688 E.607083.931

BENCHMARK NO: 01019860404 LOCATED ON THE SOUTH SIDE OF MAPLEVIEW DRIVE APPROXIMATELY 930m WEST OF YONGE STREET. N.4911159.897 E.608513.316

NO.	REVISIONS	DATE	INITIAL
1.	SUBMISSION FOR DRAFT PLAN APPROVAL	OCT 2021	JW

LICENSED PROFESSIONAL ENGINEER
J. W. INGRAM
100143779
21-10-06
PROVINCE OF ONTARIO

LOCKHART INNISFIL INVESTMENTS (II) LIMITED SUBDIVISION

PLAN AND PROFILE FENCHURCH MANOR 1+240 TO 1+520

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DESIGN KS/JW	SCALE: H=1:500 V=1:50	DATE JUNE 2021	
DRAWN KS	PROJECT GOL-20538	DWG. Nº PP-11	
CHECKED JW			

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