TATHAM ENGINEERING

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Maple Bridge Subdivision, Phase 2

FUNCTIONAL SERVICING REPORT

Mason Homes Limited

File 4224922 | April 18, 2024

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Issue	Date	Description
1	April 18, 2024	Issued for Draft Plan Approval

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1 Introduction

Tatham Engineering Limited was retained by Mason Homes Limited to prepare a Functional Servicing Report (FSR) in support of a Draft Plan of Subdivision application for Phase 2 of the Maple Bridge Subdivision located northeast of the Centre Road and Oakside Drive intersection in the Township of Uxbridge (Township), within the Regional Municipality of Durham (Region). The location of the development site is illustrated in Figure 1.

1.1 REPORT OBJECTIVE

This report was prepared to demonstrate the servicing feasibility of the proposed development with respect to civil servicing including site grading, sewage collection and treatment, water supply and distribution and utility distribution. The following reports have also been prepared by Tatham Engineering under separate cover with summaries provided herein:

- *Natural Hazard Assessment* (NHA);
- *Preliminary Stormwater Management Report* (SWM); and
- *Transportation Impact Study* (TIS).

1.2 GUIDELINES & BACKGROUND REPORTS

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

- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Stormwater Management Practices Planning and Design Manual* (March 2003);
- The Ministry of the Environment, Conservation, and Parks (MECP, formerly known as Ministry of Environment), *Lake Simcoe Protection Plan* (LSPP) (June 2009);
- Lake Simcoe Region Conservation Authority (LSRCA), *Technical Guidelines for Stormwater Management Submissions* (April 2022);
- Lake Simcoe Region Conservation Authority (LSRCA), *Phosphorus Offsetting Policy* (May 2023); and
- Regional Municipality of Durham, *Design and Construction Specifications for Regional* Services (April 2023).

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

- GHD, *Geotechnical and Hydrogeologic Investigation Report: Proposed Residential Development Centre Road Phase 2 Uxbridge, Ontario* (March 2021);
- Hemson Consulting Ltd., *Uxbridge Urban Area Residential Development Capacity* (January 2019); and
- XCG Consultants Ltd., *Uxbridge WPCP Optimization Study Phase 2 Summary Report* (August 2015).

2 Development Site

2.1 LOCATION

As illustrated in Figure 1, the subject site is located at the property known municipally as 7309 Centre Road, Township of Uxbridge.

As per the boundary survey completed by H.F. Grander Co. Ltd. in October 2022, the site is legally described as:

(Parts 1, 2, 3, Plan 40R-21667
Save & Except Parts 1, 2, 3, & 4, Plan 40R-23402,
Save & Except Parts 1, 2, 3, 4, 5, 6, & 7, Plan 40R-23403,
And Save & Except Plan 40M-2256)
Of Part of Lot 33, Concession 6,
Geographic Township of Uxbridge,
Now in the, Township of Uxbridge,
Regional Municipality of Durham

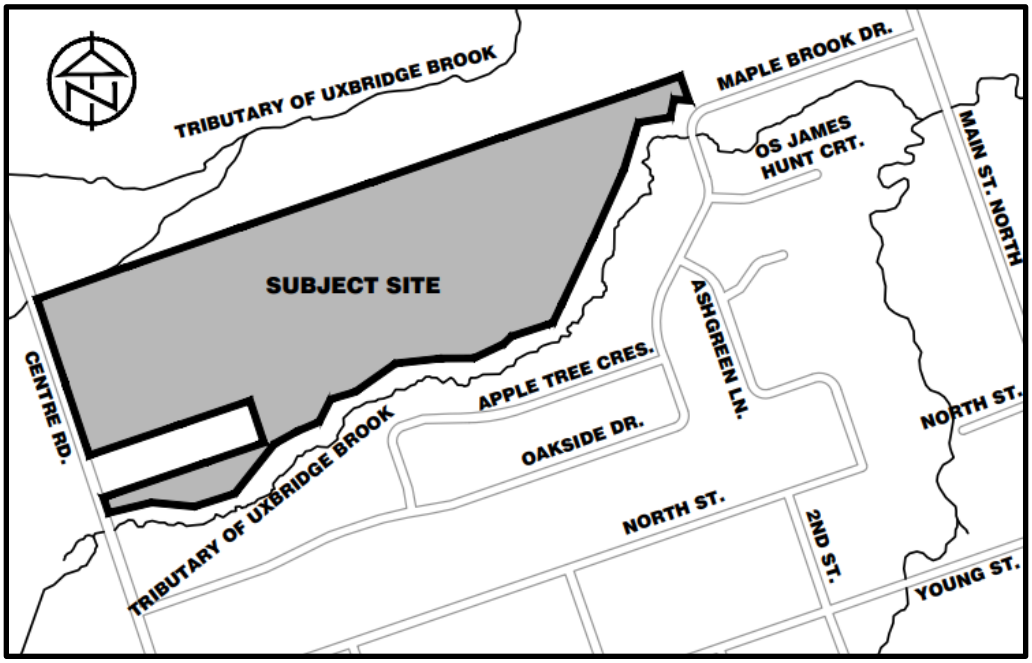


Figure 1: Site Location

2.2 SITE DESCRIPTION

2.2.1 Zoning & Land Uses

Based on the Township's current Official Plan (OP) the property is designated 'Future Residential Area' and 'Natural Hazard Area.' Based on the Township's Zoning By-law the property is within a Rural Zone (RU) and Environmental Protection Zone (EP-27).

The OP identifies the property as being within the Township's 'Phase 2 lands'. 'Phase 1 lands' are the current Urban Area boundary and includes potential infill and intensification areas. The 'Phase 2 lands' include three proposed development properties outside of the Urban Area. Servicing allocation is currently reserved for 'Phase 1 lands' only.

The site is located within the LSRCA watershed and is partially located within the LSRCA regulated area due to natural hazards associated with the Uxbridge Brook.

2.2.2 Topography

Information relating to existing topography, ground cover, and drainage patterns was obtained through a review of relevant background studies, available plans, base mapping, site visit and topographic surveys. A detailed topographic survey of the site was completed by IBW Surveyors Ltd., dated September 10, 2019.

The subject property is approximately 14.5 ha in area and consists of approximately 13.6 ha of agricultural croplands with areas of woodland. It is bound by existing agricultural lands to the north and southwest, Tributary 6.1 of the Uxbridge Brook to the south and east, Tributary 4.0 of the Uxbridge Brook to the north, and Centre Road to the west.

The lands generally slope in an easterly direction towards the bank of the Uxbridge Brook at a moderate slope of approximately 2 to 5%. The Uxbridge Brook flows from southwest to northeast with an average slope of 2.5%.

2.2.3 Geotechnical & Hydrogeological Setting

The *Geotechnical and Hydrogeologic Investigation Report: Proposed Residential Development Centre Road Phase 2 Uxbridge, Ontario* identified the subsurface conditions as a layer of topsoil over silty sand over basal deposits of either glacial till or clayey silt. Topsoil was found at depths ranging from 0.12 to 0.18 mbg.

Groundwater monitoring well readings were recorded in four monitoring wells at depths ranging from 0.9 to 3.3 mbg, indicating groundwater generally flows southeast across the site. Additional groundwater monitoring will be required to establish a seasonal high groundwater table to support the detailed engineering design.

2.3 PROPOSED DEVELOPMENT

The proposed residential development consists of the following:

- 82 townhouse units;
- 154 single family dwellings; and
- a 0.79 ha stormwater management block.

The Draft Plan also includes Open Space blocks, Walkway blocks, an Environmental Protection block and a Future Road Connection Block.

The proposed development surrounds an existing 0.9 ha residential property fronting Centre Road (owned by others). Mason Homes Limited intends to purchase the property in the future with intention of developing it with a similar built form to what is proposed for the subject site. The proposed Draft Plan of Subdivision does not include development of this property, and, therefore, the associated servicing requirements have not been included in our calculations. However, the additional population will not significantly impact the findings of this report.

Refer to Appendix A for the proposed Draft Plan.

3 Sanitary Sewage System

3.1 EXISTING SANITARY SYSTEM

The site is located within an area of the Township serviced by the municipal sanitary sewer system owned and operated by the Region. An existing 250 mm dia. sanitary stub was installed west of 42 Apple Tree Crescent in of Maple Bridge Subdivision Phase 1 for the future Phase 2 connection. The future connection will cross a tributary of the Uxbridge Brook.

The Phase 1 sanitary sewer system discharges to the Uxbridge Brook Water Pollution Control Plant (WPCP) located at 127 Main Street North.

3.1.1 WPCP Capacity

The WPCP has a rated average day flow (ADF) capacity of 5,221 m^3/day and peak flow (PF) capacity of 15,110 m^3/day.

The rated capacity of the Uxbridge Brook WPCP provides wastewater servicing for an estimated population of 15,000 people as referenced in the *Uxbridge WPCP Optimization Study Phase 2 Summary Report* (prepared by XCG Consultants Ltd). Through consultation with the Region's Works department in July 2023 it was confirmed the available capacity in this system is reserved for the Phase 1 lands (refer to Appendix B for records of correspondence).

The Township's Officla Plan projects a total population of 16,480 people for the 2031 planning horizon. We understand optimization upgrades to the WPCP may increase the capacity of the plant to service a population of 16,470 people. Following the optimization, the system will have available capacity to service 1,480 persons in the 'Phase 2 lands'. As the subject development requires servicing allocation for an estimated 785 people, we understand there may be capacity within the WPCP to serve the subject development following the optimization upgrades.

The Region of Durhams's 2023 *Development Charges Background Study* includes a Municipal Class EA to consider an expansion of the WPCP. Through discussions with the Township and Region, it is understood the timing of this study is unknown.

3.2 PROPOSED SANITARY SYSTEM

3.2.1 Sanitary Flows

The following Region design criteria have been utilized to establish the ADF for the subject site:

- Per capita Average Day Demand (ADD) = 364 L/person/day;
- Person per unit (PPU) densities:

- 3.0 for townhouse units; and
- 3.5 for single family detached dwellings;

- Extraneous flow (infiltration) = 0.26 L/s/ha; and
- Harmon Peaking Factor between 1.5 and 3.8.

A summary of the resulting sanitary flows is provided in Table 1 whereas detailed calculations are provided in Appendix C.

Table 1: Summary of Proposed Sanitary Flows

SCENARIO	FLOW (m^3/day)	FLOW (L/s)
Average Day Flow	285.74	3.31
Peak Flow	1,085.81	12.57
Extraneous Flow	308.45	3.57
Total Flow (Peak + Extraneous)	**1,394.26**	**16.14**

3.2.2 Infrastructure

The sanitary sewer system will be design in accordance with Region and MECP design criteria, including but not limited to the following:

- minimum local sewer size is 200 mm dia. for residential areas;
- minimum depth of sewer is 2.75 m, measured to the top of pipe;
- minimum depth of sanitary service is 2.5 m, measured to the top of pipe;
- maximum maintenance hole spacing of 120 m for 200 mm dia. to 750 mm dia. pipes;
- minimum slope of sewer is 0.5%;
- minimum slope of sanitary service is 2%;
- slope of first run to be minimum 1%;
- minimum velocity of 0.6 m/s; and
- maximum velocity of 3.5 m/s.

The preliminary sanitary design includes a gravity sewer system to service individual lots. Each unit will be provided an individual sanitary service connection to the local sewers. The gravity sewers will discharge to the existing sewers on Phase 1.

Refer to Appendix D for the Concept Development Plan.

The Phase 1 sanitary sewer collection system was designed to accommodate sewage flows from Phase 2 (up to 800 persons) (refer to Appendix C for the 2004 Region-approved Phase 1 Sanitary Drainage Area Plan, prepared by Roberts Bell Engineering Limited).

4 Water Supply & Distribution

4.1 EXISTING WATER SYSTEM

The site is located within an area of the Township serviced by the municipal water system owned and operated by the Region. The site is located within Pressure Zone 1, supplied by the Township's groundwater system via three municipal wells (Well Nos. 5, 6 and 7). The Uxbridge Drinking Water System (DWS) is a Class Two Water Distribution and Supply System having an approved combined capacity of 12,182 m^3/day. The water is treated by iron sequestering, disinfection via sodium hypochlorite and chlorine, and ultraviolet disinfection before being pumped to the distribution system and to the Quaker Hill Reservoir (with a storage capacity of 2,841 m^3) located in Pressure Zone 2.

4.1.1 Infrastructure

The existing water distribution system terminates on Centre Road approximately 170 m south of the property at Oakside Drive (300 mm dia. watermain) and on Oakside Drive at James Hunt Court (200 mm dia. watermain).

4.1.2 Water Supply

The Uxbridge DWS has a rated capacity to provide water servicing for an estimated population of 15,000 people. Similar to the sanitary servicing allocation, available capacity in the water supply system is reserved for the 'Phase 1 lands' (refer to Appendix B for records of correspondence).

The Region is currently working to address an operational restriction at one of the wells to increase the rated capacity of the system to service an estimated population of 16,480. Following the improvements, the system will have available capacity to service 1,480 persons in the 'Phase 2 lands'. As the subject development requires servicing allocation for an estimated 785 people, we understand there may be capacity to service the subject development once the operational issues are addressed and the rated capacity of the wells is increased.

4.2 PROPOSED WATER SYSTEM

4.2.1 Water Demands

Water demands for the proposed development have been estimated by applying relevant Region and MECP standards and criteria, including the following:

- Per capita Average Day Demand (ADD): 450 L/person/day (most conservative per capita ADD from MECP design range of 270-450 L/person/day; per capita ADD not stated in Region standards);
- Person per unit (PPU) densities:
  - 3.0 for townhouse units; and
  - 3.5 for single family detached dwellings.

Maximum Day Demand (MDD) and Peak Hour Demand (PHD) factors of 2.75 and 4.13, respectively, have been applied in accordance with Table 3-1 of the MECP *Design Guidelines for Drinking Water Systems* .

A summary of the proposed water demands is provided in Figure 2, with detailed calculations provided in Appendix D.

Table 2: Summary of Proposed Water Demands

SCENARIO	VOLUME (m^3/day)	FLOW (L/s)
Average Day Demand	353.25	4.09
Maximum Day Demand	971.44	11.24
Peak Hour Demand	1,458.92	16.89

4.2.2 Fire Protection

Firefighting water demands have been estimated for the development in accordance with the 2020 Fire Underwriters Survey (FUS) and the Region's design standards. The estimated required fire flows for the common buildings are:

- Townhouse = 183 L/s or 11,000 L/min; and
- Single Detached = 100 L/s or 6,000 L/min.

Reasonable assumptions have been made with respect to building design and construction methods, recognizing the preliminary stage of the development. FUS calculations will be confirmed during the detailed design stage. A hydrant flow test will also need to be conducted during the detailed design stage to ensure the required fire flows and operating pressures are available.

Refer to Appendix B for FUS calculations.

4.2.3 Infrastructure

The water system will be designed in accordance with Region and MECP design criteria, including but not limited to the following:

- minimum watermain size for residential areas is 150 mm dia.;
- minimum depth of watermain is 1.8 m, measured to the top of pipe;
- minimum depth of water service is 1.7 m, measured to the top of pipe;
- single family lots and townhouse lots will be serviced with individual 25 mm dia. water services; and
- maximum fire hydrant spacing of 150 m in residential areas.

A looped watermain system will be provided by the external extension of the existing watermains from Centre Road and Oakside Drive to the development limits. Sizing for the proposed watermain will be confirmed through water modelling prepared in support of detailed design.

Refer to Appendix D for the Concept Development Plan.

5 Stormwater Management Plan

A *Preliminary Stormwater Management* (SWM) has been prepared by Tatham Engineering under separate cover and should be read in conjunction with this report.

The SWM plan ensures the development can be constructed in accordance with all applicable municipal and provincial guidelines while minimizing the impact of the development on local surface water conditions. The SWM design criteria described in Section 5 of this report will be achieved as detailed below.

- Post-development peak flow rates will be controlled to pre-development rates or less for all storm events at Outlet #1 and Outlet #2. Water quantity storage will be provided via wet SWM pond with sufficient storage to attenuate the proposed peak flows to below pre-development levels.
- "Enhanced" Level 1 water quality controls corresponding to 80% TSS removal will be provided for the proposed development via the wet SWM pond.
- The proposed development will have a net increase on infiltration across the site due to the proposed lot level soakaway pits. These LIDs will provide 25 mm of storage for the treated areas resulting in an equivalent of 4.1 mm of volume control across the total impervious area of the site.
- Best efforts have also been provided to mitigate phosphorus loadings on site. The proposed wet SWM pond and lot level LIDs will be utilized to provide approximately 66% reduction in annual phosphorus loadings. Additional treatment options will be explored at detailed design to achieve the required 90% phosphorus removal.
- A series of erosion and sediment controls including heavy duty silt fence and a construction access mats, will be implemented for all construction activities.

6 Natural Hazard Assessment

The *Natural Hazard Assessment*, prepared by Tatham Engineering under separate cover, has established existing conditions natural hazard limits in the vicinity of the subject site, resulting in detailed flood and erosion hazard mapping for the subject area.

The hydraulic model and floodplain mapping demonstrate that the proposed development is generally located outside of the existing Regional floodplain of the adjacent Uxbridge Brook tributaries (Watercourse 4.0 and Watercourse 6.1).

The erosion hazard limit has been delineated in accordance with *Ministry of Natural Resources Technical Guide – River & Stream Systems: Erosion Hazard Limit* to establish the required development setbacks. The erosion hazard limit for Watercourse 6.1 was established through assessment of both the meander belt allowance for an unconfined system, and the toe erosion allowance and stable slope allowance for a confined system.

Based on the site review, no erosion hazard is warranted for Watercourse 4.0 due to the low erosion potential from the small reporting watershed and resulting low flows.

7 Transportation

7.1 ACCESS

The site will be accessed via two new Street 'A' connections to the existing roadways. The west access will connect the development to Centre Road and the east access will connect to Oakside Drive.

7.2 INTERNAL ROADS

The internal roadways will be a combination of 20 m road allowances, 17 m road allowances and 7.5 m laneways. The roads will be assumed by the Township who will undertake routine maintenance and snowplowing activities.

Based on the preliminary geotechnical investigation by GHD, the minimum pavement structure designs for the municipal ROWs are to consist of:

- surface course asphalt 40 mm HL 3;
- base course asphalt 50 mm HL 8;
- granular base 150 mm Granular A; and
- granular subbase 300 mm Granular B.

7.3 SNOW STORAGE

The proposed Draft Plan includes two laneways ('Laneway 1' and Laneway '2') with a reduced road allowance width of 7.5 m. The reduced road allowance width reduces area available for snow storage within the boulevards and an alternative location is expected to be required. Snow storage areas for these two laneways is proposed within Block 168, adjacent to the Street D dead end cul-de-sac.

7.4 TRANSPORTATION IMPACT STUDY

A *Transportation Impact Study* has been prepared by Tatham Engineering under separate cover and should be read in conjunction with this report.

Results of the operational analyses indicate that the study intersections currently provide excellent operations under existing conditions and are expected to provide good operations through the 2038 horizon. No improvements were found to be required to accommodate the proposed development. Also, the future intersection of Centre Road with Street "J" and with Maple Brook Drive were each found to provide excellent operations through the 2038 horizon, both with and without the subject development present.

Overall, the proposed development is not expected to have a material impact on the adjacent road network.

8 Grading & Landscaping

8.1 GRADING

The overall site grading design maintains existing drainage patterns, matches existing grading along the perimeter of the site and limit of developable area, and minimizes earthworks required during construction.

8.1.1 Criteria

Preliminary grading has been reviewed in accordance with the Region design standards and best practices as noted below:

- minimum road slope 0.5%;
- maximum road slope 8%;
- minimum lot grade 2%;
- maximum lot grade 6%;
- minimize the need for retaining walls;
- minimize the volume of earth to be moved and balance on-site cut/fill; and
- achieve drainage and SWM objectives.

Refer to Appendix DE for the Concept Development Plan (Drawing CDP-1). Grading will be refined at the detailed design stage.

8.1.2 Road Grading

Internal road grading has been developed to ensure stormwater runoff is conveyed to the proposed storm sewers. Proposed road grading will also provide sufficient overland flow routes contained within the road allowances. The major overland flow route along the road network terminates at the end of pipe SWM facility located in the eastern portion of the site. The SWM facility outlets to Tributary 6.1 of the Uxbridge Brook.

8.1.3 Lot Grading

Lot grading is designed to provide positive drainage away from the dwellings and will be in accordance with Region engineering standards.

8.2 LANDSCAPING

A detailed landscaping design will be completed at the detailed design stage. Landscape features and plantings will be provided in accordance with Township and Region landscaping standards, and they will be coordinated to ensure there are no conflicts with respect to civil servicing.

9 Erosion & Sediment Control

Erosion and sediment control measures will be implemented for all construction activities within the development site including vegetation clearing, topsoil stripping, stockpiling of materials, site access construction, grading and servicing. The basic principles considered to minimize erosion and sedimentation and the potential negative environmental impacts include:

- minimize disturbance activities where possible;
- expose the smallest possible land area to erosion for the shortest amount of time;
- institute erosion control measures as required immediately;
- implement sediment control measures before the outset of construction activities; and
- carry out regular inspection of erosion/sediment control measures and repair or maintain them, as necessary.

Erosion and sediment control measures shall be implemented in accordance with the *Erosion & Sediment Control Best Management Practices Guide* and are to include the following:

- sediment control fence;
- construction access mat;
- heavy-duty silt fence surrounding stripping and material stock pile areas;
- catch basin filter screens; and
- sediment traps placed in all existing and proposed catch basins adjacent to the site.

Regular inspection of control measures will be completed through a monitoring and mitigation plan, with regular repairs made as necessary. An erosion and sediment control plan will be developed during the detailed design stage.

10 Utilities

The following utility agencies provide services to the proposed development:

- HydroOne/Elexicon Energy;
- Enbridge;
- Bell Canada; and
- Rogers Communication Inc.

All utilities (electrical, gas and telecommunications) are expected to be available to service the proposed development. Utility coordination will be initiated at the detailed design stage.

11 Summary

The proposed development can be supported by the existing municipal infrastructure with external upgrades.

Sewage Collection & Treatment

The development site will be serviced with gravity sanitary sewers discharging to an existing sanitary sewer stub installed on Apple Tree Crescent in Phase 1. The available servicing capacity of the WPCP is reserved for 'Phase 1 lands'. The development site will require servicing allocation for an estimated 785 persons once future upgrades have been completed.

Water Supply & Distribution

The development site will be serviced with municipal watermains. A looped watermain system will be provided by extending the existing watermains from Centre Road and Oakside Drive. The available servicing capacity of the DWS is reserved for 'Phase 1 lands'. The development site will require servicing allocation for an estimated 785 persons once future upgrades have been completed.

Stormwater Management Plan

A *Preliminary Stormwater Management Report* has been prepared under separate cover to detail the stormwater quantity and quality controls required to mitigate negative impacts to neighbouring lands. Water quantity and quality control will be provided through the design of a stormwater management facility (wet pond) and low impact development facilities.

Natural Hazard Assessment

A *Natural Hazard Assessment* has been prepared under separate cover to confirm the proposed site will be developed with consideration of the Uxbridge Brook's Tributary 4.0 and Tributary 6.1 floodplains.

Transportation

A *Transportation Impact Study* has been prepared under separate cover to confirm the internal networks are sufficient for the proposed use and that any adverse impacts that may result to the external road system can be appropriately mitigated.

Grading & Landscaping

A concept grading design was prepared in accordance with Region design standards and best practices to achieve the objectives of the SWM plan and tying into existing grades while respecting the floodplain limits.

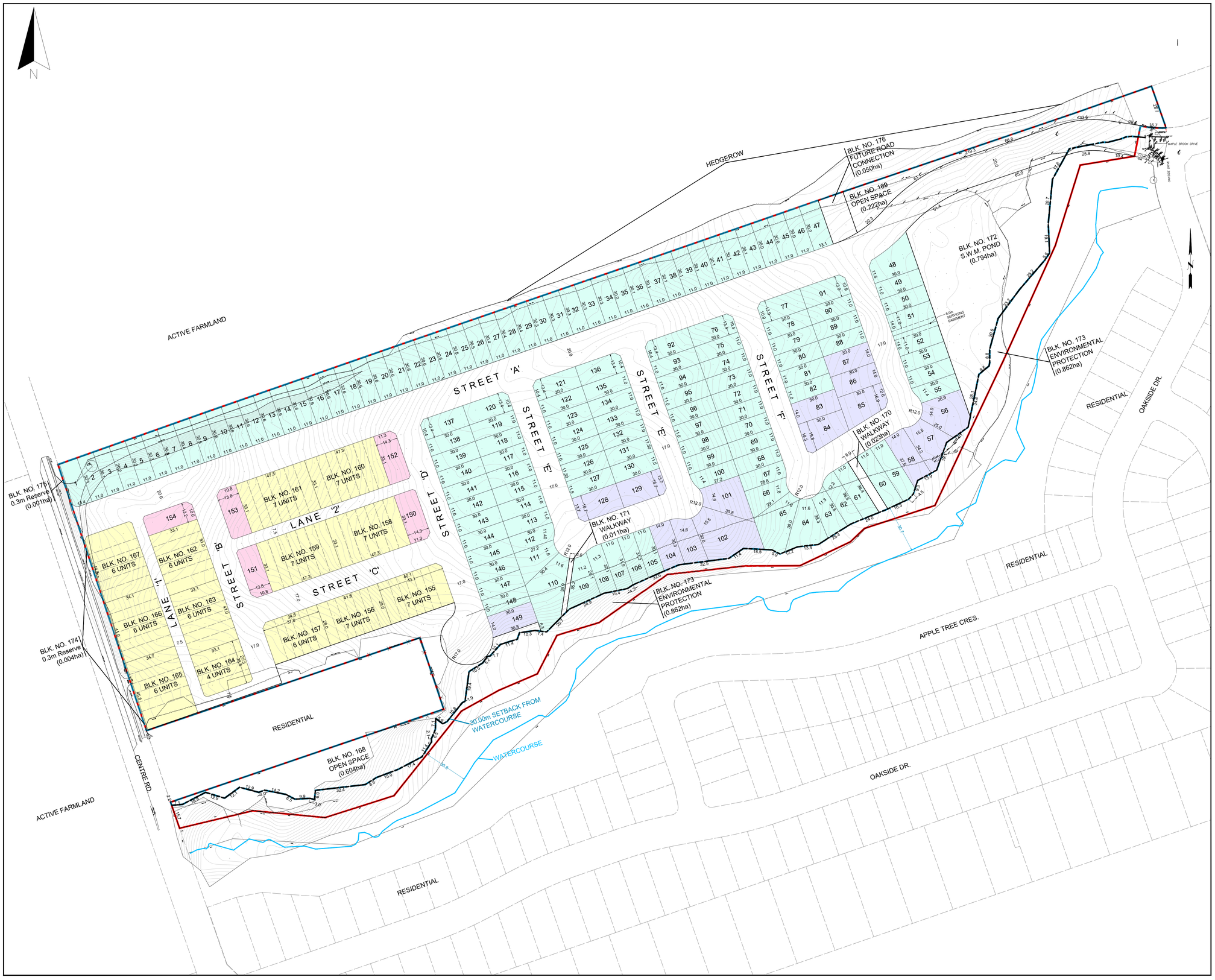
Erosion & Sediment Control

A detailed erosion and sediment control plan will be prepared and executed prior to construction in accordance with the Township, Region, LSRCA and OPSD standards.

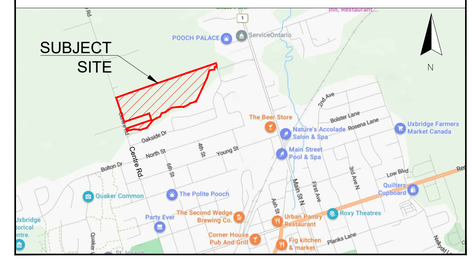
Utilities

Utilities are expected to be available to service the proposed development. Utility coordination and designs will be initiated during the detailed design stage.

Appendix A: Draft Plan



KEY MAP 1:20,000



DRAFT PLAN OF SUBDIVISION

Part of Lot 33, Concession 6,
Township of Uxbridge,
(formerly in the County of Ontario)
Regional Municipality of Durham

Scale

0 25 50 75 100m

LEGEND

SUBJECT LANDS (135,746.80m^2 / 13.575ha)

OWNER'S CERTIFICATE
I HEREBY AUTHORIZE INNOVATIVE PLANNING SOLUTIONS TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

DATE 2001976 ONTARIO LIMITED

SURVEYOR'S CERTIFICATE
I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE IVAN B. WALLACE, O.L.S.

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

a) SHOWN ON PLAN
b) SHOWN ON PLAN
c) SEE KEY PLAN
d) RESIDENTIAL
e) SHOWN ON PLAN
f) SHOWN ON PLAN
g) SHOWN ON PLAN
h) MUNICIPAL WATER
i) SILTY SAND, GLACIAL TILL AND/OR CLAYEY SILT
j) SHOWN ON PLAN
k) MUNICIPAL WATER & SEWAGE
l) NONE

LAND USE STATISTICS

Land Use	Lot / Blk. No.	Units	Area (ha)
Residential Single Lot (10.97m / 36')	1 - 55, 59 -82, 88 - 100, 105 - 127, 130 - 148	134	4.691
Residential Single Lot (14.02m / 46')	56 - 58, 83 - 87, 101 - 104, 128 - 129, 149	15	0.792
Residential Single Lot - Rear Lane (10.97m / 36')	150 - 154	5	0.226
Residential Townhouses (6.30m / 20.76')	155 - 167	82	1.782
Open Space	168 - 169		0.826
3.00m Walkways	170 - 171		0.034
S.W.M. Pond	172		0.794
Environmental Protection	173		0.862
0.3m Reserves	174 - 175		0.005
Future Road Connection	176		0.050
Roads			3.513
TOTAL	**176**	**236**	**13.575**

INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
647 WELHAM ROAD, UNIT 9, BARRIE, ON, L4N 0B7
tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date:	March 11, 2024	Drawn By:	A.S.
File:	21 - 1241	Checked:	K.B.

Appendix B: Correspondence

TATHAM ENGINEERING

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Memo

File	Recipient	Company
422492	**Bryanne Robinson**	**Mason Homes**

Date	Purpose
April 12, 2024	**Maple Bridge Subdivision Phase 2, Township of Uxbridge Water and Wastewater Capacity Analysis**

Message

Introduction

This memorandum provides a summary of the function and available capacity of the Uxbridge Water Pollution Control Plant (WPCP) with respect to treatment of wastewater, as well as a brief assessment of the capacity of the Uxbridge Water Supply and Distribution system (water system). It is noted both the WPCP and the water system are owned and operated by the Region of Durham (Region).

WPCP Capacity Assessment

The Uxbridge WPCP is located approximately 750 m downstream of the subject lands at 127 Main Street North. The WPCP operates under ECA No. 8357-8CTQ5V and has a rated average day flow (ADF) capacity of 5,221 m^3/d and peak flow (PF) capacity of 15,110 m^3/d.

In September 2013, the Region retained XCG Consultants Ltd. to undertake a Process Optimization Study at the Uxbridge Brook WPCP. The following information was provided in Region Report #2016-W-37 (dated March 23, 2016) from the Commissioner of Works:

- XCG determined the WPCP has the capacity to service an equivalent population of 15,292 people (equal to 341 L/person/day), limited by the oxygenation system (blower) capacity, as per XCG's "Uxbridge WPCP Optimization Study Phase 2 Summary Report" (dated August 21, 2015);
- Upgrades to the oxygenation system could increase the capacity to service 16,470 people; and
- Based on existing operational conditions at the time, the Commissioner of Works recommended increasing the serviceable population of the WPCP from 13,000 to 15,000 people.

In 2019, Macaulay Shimoni Howson Ltd. prepared a report to the Mayor and Council of Uxbridge (Report DS-03/19, dated January 21, 2019) on behalf of the Township, recommending Mason Homes' Maple Bridge Phase 2 development should proceed as the next logical parcel to be developed in the Town's "Phase 2" lands (which consist of three development sites: Mason Homes, Bridge Brook, and Furlan), as it could proceed without significant investment in municipal infrastructure improvements. This was based on the understand the WPCP had sufficient capacity to service the Maple Bridge development, but not the entirety of the Township's Phase 2 lands. However, it is understood this recommended phasing was not formally adopted by council.

Appended to Report DS-03/19 was Hemson Consulting Ltd.'s memorandum titled *Uxbridge Urban Area Residential Development Capacity* (dated January 10, 2019)

which was addressed to the Township CAO. The memo provided a population assessment summarized in the following excerpt:

Table 2
Uxbridge Urban Area Population Capacity

Location	Population
Existing and Committed Servicing Allocations	13,050
Phase 1: Unbuilt Residential	
With Regional Servicing Allocation	444
With Township/OMB Approval	680
Under Active Development Application / Pre-consultation	535
Phase 2 Pending Proposals (Pre-consultation)	4,060
Total	**18,769**

Source: Durham Region

As per the above, the existing and committed serviced population is 13,050 people (as of December 2018). The assessment also accounted for the build out of the Township's Phase 1 lands which included Regional allocation, as well as various active development applications, totalling an estimated population of 1,659 people (444+680+565). Therefore, the total estimated population following the build out of Phase 1 lands is 14,709 people.

As the existing WPCP has a capacity to service a population of 15,000 people, based on the 2019 growth projections the WPCP would have residual capacity to service 291 additional people which could be allocated to the Township's Phase 2 lands.

During a phone conversation with Durham Region's Works department on July 6, 2023, it was expressed the Township estimates the actual build out of the Phase 1 lands will result in a population closer to 15,000 people, compared to 14,709 people estimated in Hemson's 2019 assessment. As such, we understand the Township/Region is dedicating the available capacity in the WPCP for the full build-out of the Phase 1 lands. Therefore, under existing conditions the WPCP has insufficient capacity to service any development within the Township's Phase 2 lands.

Following the above-mentioned call, the Region provided a follow-up email stating the Township's current Official Plan projects a total population for the Township of 16,480 people for the 2031 planning horizon. The previously mentioned optimization upgrades are expected to increase the capacity of the WPCP to be able to service a population of 16,470 people; however, further analysis is required to determine the precise increase in capacity (if any) that will be realized following the optimization upgrades. Other than the optimization improvements, there are no current capital plans for additional WPCP improvement or expansions.

Therefore, assuming the plant does not undergo additional expansions or improvements, but the optimization project is successful, the serviceable population of the Township's Phase 2 lands is approximately 1,480 people.

However, as per the Region's email, we understand the recent Municipal Comprehensive Review (MCR) has been adopted by Region Council. The MCR estimated the 2051 population will exceed 16,480 people (estimated to be closer to 19,000 people, including the full build out of Township Phase 2 lands). Therefore, we understand the 2023 DC Background Study includes a Municipal Class EA to consider an expansion of the WPCP. The timing of this study is unknown.

Proposed Maple Bridge

Based on the current concept plan for the Maple Bridge Phase 2 development, and calculated in accordance with The Regional Municipality of Durham *Design*

Phase 2 Development

Specifications for Sanitary Sewers (April 2021) criteria, the proposed population has estimated to be 785 persons, as per the following:

- Single Family: 3.5 persons/unit (PPU); and
- Townhouse 3.0 PPU.

Population = (154 detached x 3.5 PPU) + (82 towns x 3.0 PPU)
= 785 persons

Therefore, assuming the optimization improvements result in an increase in capacity at the WPCP by at least 785 people, the proposed development will be able to be serviced without additional upgrades (or the completion of a Class EA).

It is noted based on the available Bridge Brook draft plan, their site proposes a population of approximately 1,749 people (462 single family units and 44 townhouse units). Therefore, there will be insufficient capacity to service the entirety of the Bridge Brook development without additional upgrades or expansion of the WPCP.

Sanitary Sewer Capacity

In addition to the assessment of the WPCP, it is noted based on work completed in support of MHL's adjacent downstream development (Maple Bridge Phase 1) we understand the downstream sanitary sewers are sufficiently sized to convey the sewage from the proposed development, however they are not sized to convey additional peak flow from other Phase 2 lands (i.e. the Bridge Brook development lands).

As per Section 5.1 of Cole Engineering's *Functional Servicing Report: Uxbridge OPA 19 Planning Area – Mason Homes, Maple Bridge Residential Subdivision, Phase II* (dated April 2016):

> *The existing sanitary sewer consists of the sewer required for Maple Bridge Phase 1 component and is stubbed at the south side of Tributary 6.1 at the east end of Apple Tree Crescent. This stub was specifically designed to be extended under the creek to the north side to service Phase II lands. The main is a 250 mm diameter set at an invert suitable for the creek crossing.*

Sizing of the downstream sewers through Phase 1 of the Maple Bridge Subdivision assumed a design population of 800 people for the Phase 2 lands, which is less than the proposed population of 785 people.

Water Supply

The existing rated capacity of the Region's water system can provide water servicing up to the population of 15,000 people, inline with the capacity of the WPCP. An increase to the rated capacity of the water supply system will be required in order to provide service to the Official Plan projection of 16,480 population in 2031.

It is noted similar to the Class EA expected to be required to assess expansion options of the WPCP, a Class EA will likely also be required for the expansion of the municipal water system to ensure there is sufficient supply and storage for the 2051 development horizon.

From

John-Lui Marra, B.Eng., EIT
Engineering Intern
Tatham Engineering Limited

Lisa Cowan, C.Tech.
Senior Technologist, Project Manager
Tatham Engineering Limited

John-Lui Marra

Subject: Uxbridge/Durham - Servicing Background Reports

From: Aaron Christie <Aaron.Christie@durham.ca>
Sent: Thursday, July 6, 2023 3:11 PM
To: Lisa Cowan <lcowan@tathameng.com>
Subject: RE: Uxbridge/Durham - Servicing Background Reports

Hello Lisa,

As per our discussion, below are some points related to servicing capacities in Uxbridge for your reference. Let me know if you have any questions or wish to discuss further.

Uxbridge Water Pollution Control Plant

The Uxbridge Water Pollution Control Plant (WPCP) currently has a rated capacity of 5,221 m^3/day and the Region is permitting a service population of up to 15,000 people.

The Region hopes that the planned upgrades at the plant, in combination with the future review of plant performance and flow data, may permit a future increase in the service population of 16,480 without exceeding the rated capacity of 5,221 m^3/day.

If it is determined that the service population can be increased, further analysis will be required by the Township and the Region to confirm the amount of sewage capacity availability for the proposed development within the Uxbridge Phase 1 and Phase 2 lands. There is no guarantee that this will be successful in getting all the way up to a new service population of 16,480.

Based on the Official Plan projection of 16,480 population in 2031, there is no plan (i.e. capital budget items) for additional plant improvements beyond this population.

If a higher projection is provided via the current Municipal Comprehensive Review (MCR) process, a budget item for a Class Environmental Assessment (EA) to consider an expansion to the Uxbridge Brook WPCP will be added to the applicable Post-MCR Regional Development Charge Background Study. *The MCR has recently been adopted by Region Council. The 2051 population is more than 16,480 and the 2023 DC Background Study does identify a project for the expansion of the Uxbridge WPCP.*

Based on past work, we caution that the expansion to the Uxbridge WPCP is not expected to be straight forward and may even prove to be technically or economically not feasible. It is our understanding that Uxbridge Brook is a sensitive and low flow capacity outlet and expansions within the Lake Simcoe watershed are complex.

Past analysis by Uxbridge has indicated that they believe that the Uxbridge Phase 1 Lands can reach a population close to 15,000 without development proceeding in the Phase 2 lands. Full build out population of the Phase 1 and Phase 2 lands is estimated to be approximately 19,000.

Uxbridge Water Supply System

The existing rated capacity of the Region's Water Supply System can currently provide water servicing up to the population of 15,000, inline with the Water Pollution Control Plant service population. The Region is currently working to address an operational restriction at one of the existing wells. An increase to the rated capacity of the water supply system will be required in order to provide service to the Official Plan projection of 16,480 population in 2031.

If a higher projection is provided via the current Municipal Comprehensive Review (MCR) process, a capital budget item for a Class EA to consider an expansion to the Uxbridge Water Supply System will be added to the applicable Post-MCR Regional Development Charge Background Study. This potential expansion could include construction of additional wells to provide an increase to the rated capacity of the supply system and/or an expansion to the existing Zone 1 water reservoir. As noted above, past analysis by Uxbridge has indicated that they believe that the Uxbridge Phase 1 Lands can reach a population close to 15,000 without development proceeding in the Phase 2 lands. Full build out population of the Phase 1 and Phase 2 lands is estimated to be approximately 19,000.

Sanitary Servicing:

The existing downstream sanitary sewer does not have capacity for the lands at 7370 Centre Road and other planned developments (Mason) in the area. If both areas are to proceed with development downstream improvements to the sanitary sewer system will need be made.

Servicing Allocation

Currently the service population for this facility is limited to 15,000. If the upgrades are proven to be successful and the service population can be increased some of, or all the way up to, the 2031 projected population of 16,480, there will need to be further discussion with the Township of Uxbridge on how this additional capacity is allocated.

Aaron Christie, P.Eng.| Manager, Engineering Planning & Studies
Works Department
The Regional Municipality of Durham
Aaron.Christie@durham.ca | 905-668-4113 extension 3608 | durham.ca
My pronouns are he/his

From: Lisa Cowan <lcowan@tathameng.com>
Sent: July 5, 2023 3:25 PM
To: Aaron Christie <Aaron.Christie@durham.ca>
Subject: Uxbridge/Durham - Servicing Background Reports

Good afternoon Aaron,

I am working on a servicing report for a development within the Township of Uxbridge. I was wondering if you could assist me, I am looking for some documentation that would support our study:

- Design criteria documents for the Region and Township;
- any available Master Servicing Plans for the Region or Township;
- design brief and drawings for the Uxbridge Brook WPCP; and
- any recent information related to planned infrastructure upgrades within the Township.

I understand there are servicing capacity constraints and we would like to assess the impact as it relates to the development and include discussion in our report that specifically addresses this. I am available at your convenience for a call if that helps.

Thank you in advance for your assistance.

Kind regards,
Lisa

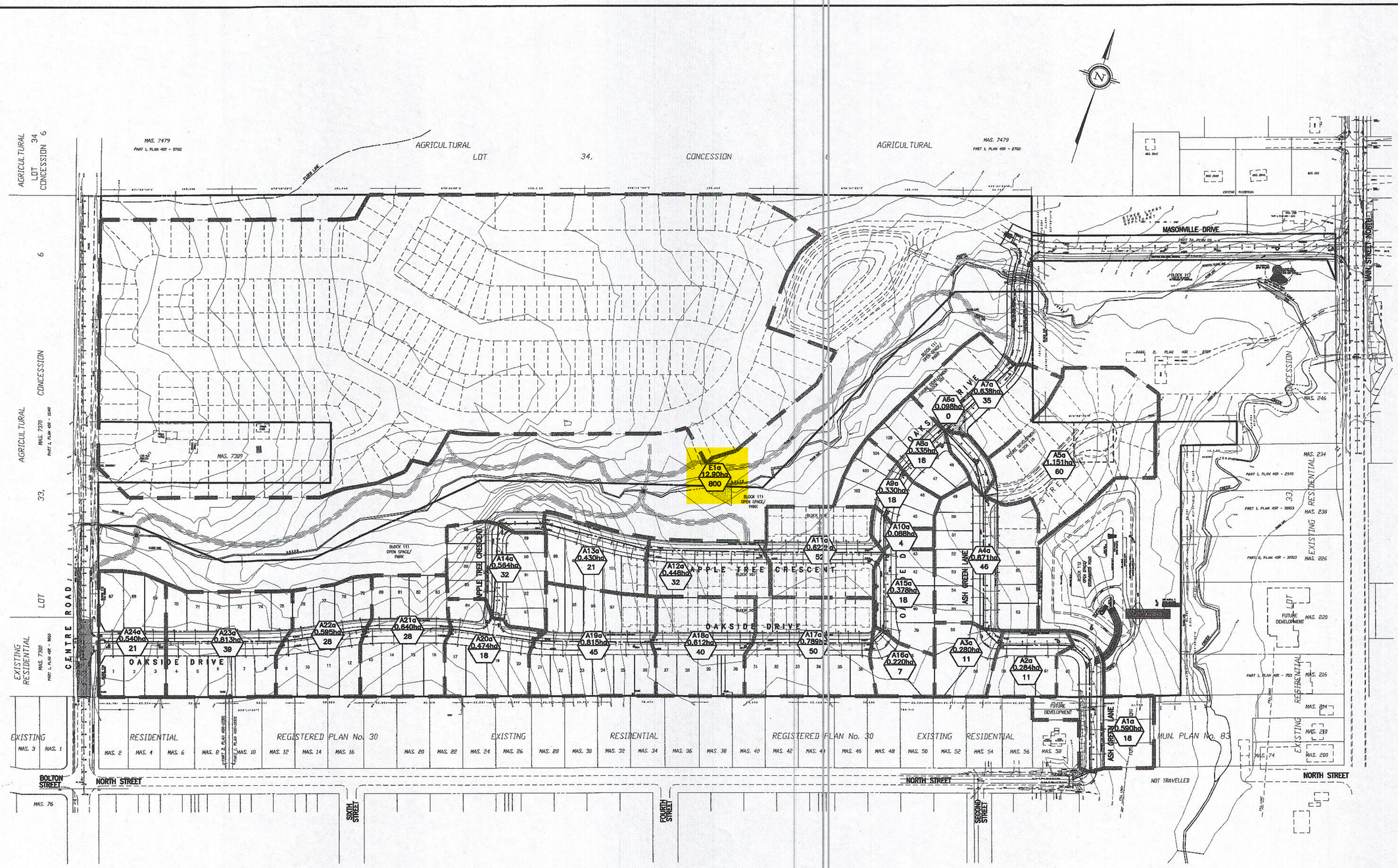
TATHAM ENGINEERING

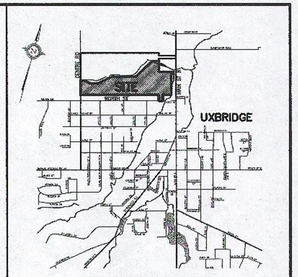
Lisa Cowan C.Tech.
Senior Technologist, Project Manager

lcowan@tathameng.com **T** 705-733-9037 x2019 **C** 705-717-5077
41 King Street, Unit 4, Barrie, Ontario L4N 6B5

tathameng.com

Appendix C:
Sanitary Calculations





LOCATION PLAN
SCALE 1:30,000

LEGEND

- EXISTING CONTOUR 265.00
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED CATCHBASIN/RESTRICTED
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED SANITARY SERVICE
- SANITARY DRAINAGE BOUNDARY
- SANITARY DRAINAGE AREA NUMBER — A1a
- DRAINAGE AREA (ha) — 0.513ha
- POPULATION — 14

NOTE:
REFER TO DWGS DE1 TO DE6 FOR NOTES & DETAILS

SURVEY INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY H.F. GRANDER O.L.S.

BENCHMARK

UXBRIDGE, UNITED CHURCH, TABLET IN SOUTH SIDEWALL, 17.2m FROM SOUTHEAST CORNER, 1.57m BELOW BRICKWORK, MIDWAY BETWEEN TWO LARGE BASEMENT WINDOWS.
GSC – 31U517S – ELEV. 272.440 (1978 ADJUSTED)
GSC – 31U517S – ELEV. 272.528 (1931 ADJUSTED)

ACCEPTED TO BE IN GENERAL CONFORMANCE WITH THE TOWNSHIP OF UXBRIDGE STANDARDS. THIS ACCEPTANCE IS NOT TO BE CONSIDERED AS VERIFICATION OF ENGINEERING CONTENT.

J. DAVIDSON, P.ENG
KORTEN SIMS HUBICKI ASSOCIATES (1977) LIMITED
DATE Oct. 20, 2004

APPROVAL
DEPARTMENT OF WORKS
REGIONAL MUNICIPALITY OF DURHAM
DATE Oct 20, 2004

NO.	REVISIONS	DATE	BY
4.	4th SUBMISSION REVISION	04/08/27	Y.K.
3.	3rd SUBMISSION REVISION	04/07/28	Y.K.
2.	2nd SUBMISSION REVISION	04/05/03	Y.K.
1.	REVISED AS PER COMMENTS BY T.S.H.	04/03/12	DLT

LICENSED PROFESSIONAL ENGINEER
MICHAEL A. BELL
Sept. 2, 1977
PROVINCE OF ONTARIO

TOWNSHIP OF UXBRIDGE
REGION MUNICIPALITY OF DURHAM

SANITARY DRAINAGE AREA PLAN

PROPOSED RESIDENTIAL SUBDIVISION
MASON HOMES
PART OF LOT 33, CONCESSION 6

Roberts Bell Engineering Limited
PROFESSIONAL ENGINEERS & LAND DEVELOPMENT SERVICES
www.rbeng.ca
37 SANDIFORD DRIVE UNIT 102 STOUFFVILLE ONTARIO L4A 7X5
T: 905.640.2100 F: 905.640.5100 E: info@rbeng.ca

SCALE: 1:1500	PROJECT NO: 02–1579
DRAWN BY: DLT	
DESIGNED BY: ALX	DRAWING NO: SAN
CHECKED BY: MAB	
DATE: JUNE 1, 2003	

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision, Phase 2, Uxbridge	FILE	422492
		DATE	11/13/2023
SUBJECT	Sanitary Flow Calculations	NAME	JLM
		PAGE	1 OF 1

Design Criteria (as per Durham Region's *Design Specifications for Sanitary Sewers*)

Demands				Population Densities			
Per Capita Flow	=	364	L/cap/day	Single Family Dwelling	=	3.5	PPU
				Townhouse	=	3.0	PPU
Extraneous Flow (Infiltration)	=	0.26	L/s/ha	Total Population	=	785	persons

Site Information			Peaking Factors		
Single Family Dwellings	=	154	Residential	=	Harmon
Townhouse Units	=	82		=	1+14/(4+.688^0.5)
Development Area*	=	13.7 ha		=	3.90 → 3.80 maximum

*Used for Extraneous Flow only

Average Day Flow (ADF)

ADF	=	285,740	L/day	=	285.74	m^3/day	=	3.31 L/s

Peak Flow (PF)

PF	=	285,740	L/day	x	3.80				
	=	1,085,812	L/day	=	1,085.81	m^3/day	=	12.57	L/s
Extraneous Flow	=	308,448	L/day	=	308.45	m^3/day	=	3.57	L/s
Total PF (incl. Extraneous Flow)	=	1,394,260	L/day	=	1,394.26	m^3/day	=	16.14	L/s

Appendix D:
Water Calculations

TATHAM ENGINEERING

PROJECT	Maple Bridge Subdivision, Phase 2, Uxbridge	FILE	422492
		DATE	April 12, 2024
SUBJECT	Water Demand Calculations	NAME	NB
		PAGE	1 OF 1

Design Criteria (as per Durham Region and MECP design standards)

Demands

Per Capita Flow = 450 L/cap/day

Population Densities

Single Family Dwelling = 3.5 PPU

Townhouse = 3.0 PPU

Peaking Factors (from MOE Design Guidelines for Drinking Water Systems - Table 3-1)

Maximum Day Factor = 2.75

Peak Hour Factor = 4.13

Site Information

Single Family Dwellings = 154

Townhouse Units = 82

Total Population = 785 persons

Average Day Demand (ADD)

ADD = 353,250 L/day = 353.25 m^3/day = 4.09 L/s

Maximum Day Demand (MDD)

MDD = 353,250 L/day x 2.75

= 971,438 L/day = 971.44 m^3/day = 11.24 L/s

Peak Hour Demand (PHD)

PHD = 353,250 L/day x 4.13

= 1,458,923 L/day = 1,458.92 m^3/day = 16.89 L/s

Fire Flow (FF)

Required Fire Flow (FF)* = 183.00 L/s

*Calculation based on *Water Supply for Public Fire Protection* (2020) by Fire Underwriters Survey (FUS) for the 7-unit townhouse Block 159, assuming a 2-hour fire-rated demising wall after 4 units.

MDD + FF = 194.24 L/s

TATHAM ENGINEERING	Project: Maple Bridge Subdivision, Phase 2, Uxbridge	Date:	April 12, 2024
	File No.: 422492	Designed:	JLM
	Subject: Fire Flow Calculations - Single Detached	Checked	LC
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for a single detached lot.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**150**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**	**150**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
		Total Effective Area				**300**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)							4,000
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(600)	3,400
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	3,400
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	No				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	10.1 to 20.0 m	0.15	0.7	%	2,380	5,780
			East Side	3.1 to 10.0 m	0.20				
			South Side	10.1 to 20.0 m	0.15				
			West Side	3.1 to 10.0 m	0.20				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	5,780
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							6,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							100
		Required Duration of Fire Flow of 6,000 L/min (hrs):							2
		Required volume for Fire Flow of 6,000 L/min (m^3):							720

TATHAM ENGINEERING	Project: Maple Bridge Subdivision, Phase 2, Uxbridge	Date:	April 12, 2024
	File No.: 422492	Designed:	JLM
	Subject: Fire Flow Calculations - Townhouse Block	Checked	LC
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

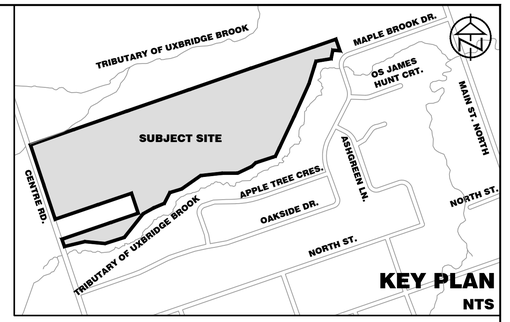
Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS) for a 7-unit townhouse block (Block 159) with a 2-hour fire-rated demising wall after 4 units.

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**685**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**	**685**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
		Total Effective Area				**1370**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)							8,000
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,200)	6,800
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	6,800
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	No				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	10.1 to 20.0 m	0.15	0.55	%	3,740	10,540
			East Side	0 to 3.0 m	0.25				
			South Side	10.1 to 20.0 m	0.15				
			West Side	Greater than 30.0 m	0.00				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	10,540
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							11,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							183
		Required Duration of Fire Flow of 11,000 L/min (hrs):							2
		Required volume for Fire Flow of 11,000 L/min (m^3):							1,320

Appendix E:
Concept Development Plan

LEGEND

- EXISTING CONTOUR
- EXISTING PROPERTY LINE
- REGIONAL FLOOD HAZARD LIMIT
- PROPOSED PROPERTY LINE
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- TRIBUTARY OF UXBRIDGE BROOK
- SAN MH — EXISTING SANITARY MAINTENANCE HOLE
- STM MH — EXISTING STORM MAINTENANCE HOLE
- PROPOSED SANITARY MAINTENANCE HOLE
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED OVERLAND FLOW DIRECTION
- 275.08 — PROPOSED ELEVATION



UXBRIDGE BROOK TRIBUTARY 4.0

CENTRE ROAD

PR. WATERMAIN

SPLIT LOT DRAINAGE

BLOCK 176 FUTURE ROAD CONNECTION

BLOCK 169 OPEN SPACE

BLOCK 172 SWM POND REFER TO DWG. PND-1

STM INV: 266.50

STM INV: 267.00

STM INV: 268.21

CONNECT TO EX. 200ø WATERMAIN

REGIONAL FLOODLINE

OAKSIDE DRIVE

EXISTING RESIDENTIAL

BLOCK 167 6 UNITS

BLOCK 166 6 UNITS

BLOCK 165 6 UNITS

BLOCK 162 6 UNITS

BLOCK 163 6 UNITS

BLOCK 164 4 UNITS

LANE '1'

STREET 'B'

BLOCK 161 7 UNITS

BLOCK 160 7 UNITS

LANE '2'

BLOCK 159 7 UNITS

BLOCK 158 7 UNITS

STREET 'C'

BLOCK 157 6 UNITS

BLOCK 156 7 UNITS

BLOCK 155 7 UNITS

STREET 'A'

STREET 'D'

STREET 'E'

STREET 'E'

STREET 'F'

PHASE 2

SAN INV: 284.79
STM INV: 285.79

SAN INV: 281.63
STM INV: 282.63

SAN INV: 274.67
STM INV: 275.67

SAN INV: 272.53
STM INV: 273.53

SAN INV: 271.11
STM INV: 272.11

SAN INV: 269.70
STM INV: 270.70

SAN INV: 268.57
STM INV: 269.57

SAN INV: 282.13
STM INV: 283.13

SAN INV: 275.60
STM INV: 276.60

SAN INV: 277.25
STM INV: 278.25

SAN INV: 282.97
STM INV: 283.97

SAN INV: 274.24
STM INV: 275.24

SAN INV: 268.07

STM INV: 269.34

SAN INV: 267.63

SAN INV: 267.50
CREEK INV: 270.03

BLOCK 168 OPEN SPACE

BLOCK 173 ENVIRONMENTAL PROTECTION

BLOCK 171 WALKWAY

BLOCK 170 WALKWAY

EX. TRAIL GRANULAR

UXBRIDGE BROOK TRIBUTARY 6.1

EX. CONC. BOX CULVERT

EX. STM HEADWALL

APPLE TREE CRESCENT

CONNECT TO EX. 250ø SANITARY

EX. 250ø SAN STUB INV. 267.29

CONNECT TO EX. 300ø WATERMAIN

PHASE 1

EXISTING RESIDENTIAL

EXISTING RESIDENTIAL

OAKSIDE DRIVE

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

DRAWING REFERENCES

TOPOGRAPHIC FEATURES, CONTOURS AND LEGAL BOUNDARIES SHOWN ON THIS PLAN BASED ON SURVEY COMPLETED BY IBW SURVEYORS LTD., COMPLETED ON SEPTEMBER 10, 2019 AND H.F.GRANDER Co. LTD., COMPLETED AND APRIL 6, 2023.

SUPPLEMENTARY SURVEY DATA GENERATED FROM LSRCA DIGITAL TERRAIN MODEL. REFER TO NATURAL HAZARD ASSESSMENT PREPARED BY TATHAM ENGINEERING LIMITED FOR DETAILS.

DRAFT PLAN INFORMATION SHOWN ON THIS PLAN BASED ON PLAN PROVIDED BY IPS, DATED MARCH 11, 2024.

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR DRAFT PLAN APPROVAL	APR. 17/24

ENGINEER STAMP

MAPLE BRIDGE RESIDENTIAL DEVELOPMENT - PHASE 2
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
MASON HOMES LIMITED

CONCEPT DEVELOPMENT PLAN

TATHAM ENGINEERING

DESIGN: LC/JLM	FILE: 422492	DWG: CDP-1
DRAWN: LQ/NB	DATE: JUNE 2023	
CHECK: NM	SCALE: 1:1,000	

Drawing Name: 422492-CDP01.dwg, Plotted: Apr 19, 2024