Court File No. CV-24-00713711-0000

***ONTARIO***
**SUPERIOR COURT OF JUSTICE**

B E T W E E N:

**1000171168 ONTARIO INC.**

**Plaintiff**
**(Defendant by Counterclaim)**

**- and -**

**PORT SEVERN HEIGHTS INC.**

**Defendant**
**(Plaintiff by Counterclaim)**

# MOTION RECORD OF THE MOVING PARTY, PORT SEVERN HEIGHTS INC. (re Receivership Motion returnable September 20, 2024)

## Volume 2 of 2

July 5, 2024

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This is Exhibit “D” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

*Commissioner for Taking Affidavits (or as may be)*

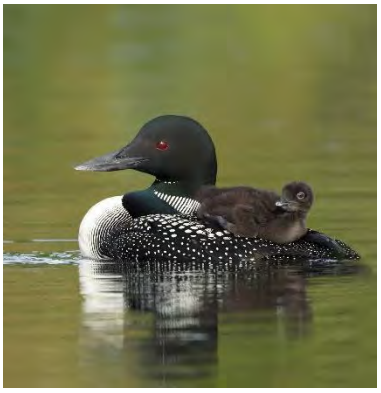
**ROBERT B. COHEN**

TULLOCH ENGINEERING

# PRELIMINARY FUNCTIONAL SERVICING REPORT UPDATE

## Port Severn Heights Phase 1

January 2022 Project # 14-4022

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## LIST OF APPENDICES

# 1.0 INTRODUCTION

## 1.1 General

Port Severn Heights Inc. has retained Tulloch Engineering Inc. to assist with a preliminary servicing study update in support of red lined changes to the Port Severn Heights Phase 1 Draft Plan S2007-4 prepared for submission by Wayne Simpson and Associates, dated January 4th, 2022.

The property is located in part of Lot 29, Concession 3, Baxter Ward, Township of Georgian Bay; District Municipality of Muskoka. The property abuts Muskoka Road 5 to the south, Violet Drive to the west and developed residential lands to the east and west.

Phase 1 covers an approximate area of 48.8 acres / 19.77 hectares and is comprised of 223 units. The proposed Draft Plan updates change the development entrance to the southwest limit and replaces the previous buildout sub-phasing for Phase 1.

This report will address updates to the previous servicing report prepared by Pinestone Engineering Ltd. in 2012. The previous report addressed the Phase 1(S2007-4) development plan for the subject lands, which included 277 residential units at that time.

# 2.0 TRANSPORTATION

## 2.1 Residential

A network of roadways constructed to Municipal Standards will provide access to all the lots in the subdivision.

Knightsbridge Drive and Aston Road are proposed having single residential lot frontages will be built to a semi-urban cross section. This semi-urban roadways will have a 20 m wide right of way with an asphalt width of 6.7 m, 1.2 m granular shoulders, and open ditches. There will be no sidewalks.

Don Ridge Drive is proposed with higher density residential frontages and a full urban roadway cross section. The right of way width will remain at 20 m for the urban roadways with the urban section made up of a pavement width of 6.7 m between curb and gutter. Grassed boulevards are proposed without sidewalks.

A geotechnical investigation was prepared by Jacques Whitford, dated January 25, 2007, in Appendix C. The pavement cross section recommended in the

geotechnical investigation is 40 mm of HL3 surface course asphalt, 50 mm of HL8 binder course asphalt, 150 mm of Granular A, and 450 mm of Granular B in areas of native silty clay, sand or structural fill. Preliminary detail drawings of the proposed roadway cross sections are found in Appendix D.

With the current draft plan update, it is important to note that the proposed subdivision entrance from Muskoka Road 5 has been shifted further west to intersect with Knightsbridge Drive and is now located approximately 515 m west of the southbound highway off ramp.

In accordance with the updated Traffic Impact Study, *TIS,* completed by JD Northcote Engineering, dated November 2021. The intersection of Knightsbridge Drive with Muskoka Road 5 will have two (2) lanes at the residential entrance. One (1) north travelling entrance lane and one (1) south travelling exiting lane. According to section 3.2 in the TIS, “a left-turn lane is not warranted at the intersection”.

The updated Traffic Impact Study (under separate cover) re-evaluates the effect that the proposed development will have on Muskoka Road 5, particularly at the revised subdivision entrance and at offsite intersections including Hwy 400 ramps.

The updated TIS will be submitted under separate cover.

## 3.0 SITE SERVICING

### 3.1 Residential

As stated in the 2012 servicing report, the serviceable areas include the proposed subdivision and external undeveloped lands to the North comprised of the Phase1 Draft Plan S2007-4, Phase 2 Draft Plan S2016-1 and Phase 3 lands that are not currently draft plan approved being outside the settlement boundary. The red lined Phase 1 Draft Plan S2007-4 has been included in Appendix D for reference being the main subject of this review.

Previously in 2012 a total development population of 1695 was estimated between phase 1 and 2 draft plans. With the proposed phase 1 red lined revisions, phase 1 and 2 combined now includes a population of 1313 as shown below in Table 1. The current Master Development Plan demonstrating phase1 and 2 combined can also be found in Appendix D.

Preliminary servicing models for both water and wastewater were completed as part of this FSR update. As such, service loading for the preliminary models includes all projected water and sewer loads form all three subdivision phases that will pass though Phase 1 services having connectivity with Muskoka Road 5. The current description of servicing populations used in the models are as follow, with the populations summarized on Table 1 below.

The most recent versions of Phase 1, 2 and Phase 3 equivalent residential units, *ERU,* configurations were used. Phase 1 has been modelled according to the current red lined Draft Plan S2007-4 including 223 ERU. Phase 2 loading was modelled according to the most recent Phase 2 red lined Draft Plan S2016-1, approved November 24th, 2016, including 152 ERU. Phase 3 loading was modelled according to the most recent Phase 2 & 3 Preliminary Functional Servicing Report Master Development Plan, dated September 2015, including 59 ERU.

**Table 1**
**Summary of Service Population**

| Number of ERU's | Number of Persons Per Household | Population |
|---|---|---|
| (2012 Servicing Phase 1)277 | 3 | 831 |
| (2012 Servicing Future) 288 | 3 | 864 |
| ***(2012 Servicing Total)565*** | ***3*** | ***1695*** |
| (2021 Servicing Phase 1) 223 | 3.5 | 781 |
| (2021 Servicing Phase 2) 152 | 3.5 | 532 |
| ***(2021 Servicing Total) 375*** | ***3.5*** | ***1313*** |
| (2021 Modelled Phase 1) 223 | 3.5 | 781 |
| (2021 Modelled Phase 2 & 3) 211 | 3.5 | 739 |
| ***(2021 Modelled Total) 434*** | ***3.5*** | ***1519*** |

### 3.2 Daily Design Flows (Water and Wastewater)

As previously stated in the 2012 servicing report, the average per capita flows for this report have been based on 450 liters/capita/day (l/c/d). This is the MECP's maximum allowable per capita flow in the given range outlined in Section 3.4.2 of the MECP Design Guideline for Drinking Water Systems, 2008. 450 L/cap/d is substantially greater than the flows identified in the Water and Sewage Improvement Project Port Severn Design Brief prepared for the District Municipality of Muskoka by Paragon Engineering Limited in 1995. Using the maximum per capita design flow, domestic services were conservatively sized to account for additional loading from future phases to help ensure suitable capacity. Table 2 identifies the updated per capita flows used in the preliminary design of the water and sanitary services.

**Table 2**
**Summary of Servicing Flows**

| Description | Historic and Residential Domestic Flow (l/c/d) | Max Day and Harmon Peaking Factor (P.F.) | Extraneous Flow (l/c/d) | Per Capita Flows (Inc. P.F. & Extraneous Flow) (l/c/d) | ERU Flows (Inc. P.F. & Extraneous Flow) (m3/d/ERU) |
|---|---|---|---|---|---|
| **Paragon Design Brief** | | | | | |
| Water | 360 | 3.4 | | 1224 | 3.2 |
| Sewer | 360 | 3.3 | 90 | 1278 | 3.3 |

| Table 2<br>Summary of Servicing Flows | | | | | |
|---|---|---|---|---|---|
| **Description** | **Historic and Residential Domestic Flow (l/c/d)** | **Max Day and Harmon Peaking Factor (P.F.)** | **Extraneous Flow (l/c/d)** | **Per Capita Flows (Inc. P.F. & Extraneous Flow) (l/c/d)** | **ERU Flows (Inc. P.F. & Extraneous Flow) (m3/d/ERU)** |
| **Port Severn Heights Updated Servicing Report Flows** | | | | | |
| Phase 1 Water | 450 | 2.75 | - | 1237.5 | 4.33 |
| Phase 1 Sanitary | 450 | 3.87 | 327.5 | 2069 | 7.24 |
| Phase 1 Plus Phase 2 and 3 Water | 450 | 2.5 | - | 1125 | 3.94 |
| Phase 1 Plus Phase 2 and 3 Sanitary | 450 | 3.68 | 337.0 | 1993 | 6.98 |

### 3.3 Water and Wastewater (Sanitary) Treatment Capacity

As stated in the 2012 servicing study, according to the District Municipality of Muskoka Engineering and Public Works the water and wastewater treatment plants at Port Severn have been constructed to the “Phase 1A” design capacity as per the original Design Brief prepared by Paragon Engineering Ltd in 1995. Phase 1A has been designated for 600 ERU peak hour treatment and pumping capacity of which there are approximately 186 ERU available at the water and wastewater plants subject to verification by Engineering and Public Works. If this remains true today there would be a capacity deficit of 37 ERU (223-186) at the water and wastewater plants for Phase 1 to move ahead. In addition, there would be a capacity deficit of 189 ERU (375-186) at the plants for phase 1 and 2 combined to move ahead. The current capacities at the water and wastewater treatment plants are to be verified by District Municipality of Muskoka Engineering and Public Works.

It is understood that the water and wastewater treatment plants are operating at their current capacity with the remaining capacity available on a first come first serve basis. This servicing strategy was adopted in 2011 opening up the previously reserved plant capacity to all development within the settlement boundary on a phase by phase basis.

## 4.0 WATER SUPPLY

As previously reported in 2012 the preliminary water analysis included the entire development area. The updated analysis has also included the entire development area to ensure infrastructure sizing through phase 1.

The following Design Criteria and Flow Determinations were used in the preliminary design review calculations. The preliminary model calculations are included in Appendix A for reference:

- Average per capita water flow = 450 L/c/d.
- Phase 1 Max day peak factor = 2.75.
- Phase 1 Peak hour factor = 4.13.
- Phase 1 Fire Flow = 38 L/s.
- Phase 1 Plus Phase 2 & 3 Max day peak factor = 2.5.
- Phase 1 Plus Phase 2 & 3 Peak hour factor = 3.75.
- Phase 1 Plus Phase 2 & 3 Fire flow = 79 L/s.

Preliminary water servicing design criteria was obtained from the District Municipality of Muskoka Engineering Design Criteria and Standards Manual, 2019, and the MECP Design Guidelines for Drinking Water Systems, 2008. A summary of determined flows is provided in Table 3.

**Table 3**
**Summary of Domestic Water Flows**

| | Average Flow (L/s) | Max day flow (L/s) | Peak Hour Flow (L/s) | Design Flow: Max Day Demand Plus Fire Flow (Phase 1: 38 L/s. Phase 1, 2 & 3: 79 L/s) |
|---|---|---|---|---|
| Phase 1 | 4.07 | 11.18 | 16.79 | 49.18 |
| Phase 1 Plus Phase 2 and 3 | 7.91 | 20.74 | 31.10 | 98.78 |

### 4.1 Storage Requirement

The updated water supply storage requirement for the proposed development is summarized in Table 4. This storage capacity would be required should there be inadequate flow capacity at the water treatment plant (WTP) for fire protection:

**Table 4**
**Storage Requirement**

| Phase | Phase 1 | Phase 1 Plus Phase 2 & 3 |
|---|---|---|
| Fire Flow (A) | 38 L/s @ 2 hr = 273.6 $m^3$ | 79L/s @ 2 hr = 568.8$m^3$ |
| Balancing (B = 25% Max day) | 20.1 $m^3$ | 37.3 $m^3$ |
| Equalization (C = 25%(A+B)) | 73.4 $m^3$ | 151.5 $m^3$ |
| **Total (A+B+C)** | **367.1 $m^3$** | **727.6 $m^3$** |

### 4.2 Hydraulic (Water) Analysis

Similar to the 2012 water servicing model, a current model was completed with the updated demand. The proposed water service model is included in Appendix A. The preliminary watermain layout for Phase 1 is shown on Drawing S3 included in Appendix D.

Vipond Inc. completed a flow test on January 29, 2015, at both hydrants located south of the commercial lands bordering MR 5. The static pressure on the existing watermain along MR 5 was 648 kPa (94 psi), which is to be confirmed by the District Municipality of Muskoka and GHD. The minimum pipe size for the proposed servicing connection is 200 mm diameter. The MECP accepted pressure range for average day, max day, and peak hour demand is between 275-689 kPa (40-100 psi). All nodes during Phase 1 average day, maximum day, and peak hour demand are within the acceptable, 275-689 kPa, pressure requirement. Average day, maximum day, and peak hour demand pressures are therefore satisfied. The MECP minimum accepted pressure during fire flow plus maximum day demand is 138 kPa (20 psi). Minimum acceptable pressure of 138 kPa is satisfied at all nodes during Phase 1 only maximum day demand plus fire flow of 38 L/s. Fire flow was applied at JU8, furthest and worst-case scenario for both water service models. The pressure losses to the furthest point, JU8, on development lands away from MR 5 during, Phase 1 only, max day demand plus fire flow was calculated at approximately 205 kPa (29.8 psi).

The maximum average per capita demand in the allowable range was utilized in this preliminary design to provide a conservative result. Upon final design more recent historical loading rates may be used once confirmed by the District Municipality of Muskoka Engineering and Public Works.

### 4.3 Hydraulic Modelling Conclusions – Preliminary

- All minimum and maximum acceptable pressures are satisfied for all scenarios during Phase 1 only according to the modelled pump curve.
- All nodes during Phase 1 plus Phase 2 and 3 average day, maximum day, and peak hour demand are within the acceptable pressure requirement.
- While a minimum 20 psi supply pressure and a fire flow of 38 L/s can be achieved for Phase 1 alone, a modelled fire flow of approximately 36.06 L/s results at JU8 during Phase 1, 2, and 3 maximum day demand plus fire flow. This is not adequate, as populations, during Phases 1, 2 and 3, >1500 people, require 20 psi during 79 L/s of fire flow protection plus maximum day demands.

# 5.0 WASTEWATER (SANITARY) SERVICING

## 5.1 Service Requirements

Table 5 summarizes the preliminary daily sewage design flows for the residential lands. Preliminary Servicing drawings in Appendix D identify the residential servicing areas considered. Drawing S2 found in Appendix A provides the sanitary drainage areas used to determine extraneous flow.

**Table 5**
**Summary of Sanitary Service Requirements**

| | Residential ERU /Population | Per Capita Flows (Inc. P.F. & Extraneous Flow) (m3/c/d) | Total Flows (m3/d) |
|---|---|---|---|
| Phase 1 | 223/781 | 2.07 | 1686.5 |
| Phase 1 Plus Phase 2 & 3 | 434/1519 | 1.99 | 3208.0 |

## 5.2 Design Criteria

- Average per capita sewage flow = 450 L/c/d.
- Peak factor – Harmon's Formula used.
- Peak extraneous flow rate = 0.28 L/ha/s.

Preliminary wastewater servicing design criteria was obtained from the District Municipality of Muskoka Engineering Design Criteria and Standards Manual, 2019, and the MECP Design Guidelines for Sewage Works, 2008. Summary of determined flows is given in the following Table 6.

**Table 6**
**Summary of Wastewater Sewage Flows**

| Population (ERU/Pop) | Extraneous flow (L/s) | Harmon Peak Factor | Peak flow (L/s) |
|---|---|---|---|
| Phase 1 – 223/781 | 2.96 | 3.87 | 19.52 |
| Phase 1 & 2 – 434/1519 | 5.93 | 3.68 | 37.13 |

**** The flows are based on maximum design flows from the MECP Guidelines**

## 5.3 Hydraulic (Sanitary) Analysis – Preliminary

Similar to the 2012 sewer servicing model a current model was completed with the updated demand. The proposed sanitary sewer sizing and sanitary drainage areas are included in Appendix A. The sewer system layout is shown on Drawings S1 included in Appendix D.

As before, the sanitary sewer sizing was based on flows from the entire development. The flow rate utilized in the updated preliminary review was 450

L/c/d plus the Harmon peaking factor and extraneous flows as indicated in the above tables.

The development will drain via a proposed 300 mm diameter sanitary sewer along Knightsbridge Drive and connect to the existing MH located on MR 5 (at the boundary between Lot 30, Concession 3 and Lot 31, Concession 3).

The preliminary analysis indicates that there is adequate flow capacity in the existing sanitary sewer on MR5 for Phase 1 and 2 peak flows. Existing additional sanitary sewage flows should be considered in the existing sanitary sewer on MR5 and confirmed by the District Municipality of Muskoka Engineering and Public Works.

The maximum average per capita loading rate in the allowable range was utilized in this preliminary design to provide conservative sizing. Upon final design more recent historical loading rates may be used as confirmed by the District Municipality of Muskoka Engineering and Public Works.

#### 5.3.1. **Sanitary Pumping Station**

As reported in 2012, wastewater from the entire development will be collected via an existing 300mm diameter sanitary sewer system on MR5 discharging to an existing sewage pumping (PS1) located south of Muskoka Rd 5, which in turn pumps wastewater to the Sewage Treatment facility located on old Hwy 69.

Also as report in 2012, the pumping station wet well and forcemain has been sized for ultimate Port Severn Master Plan peak flows. However, the pumping capacity was designed for Phase 1 peak flows from the Port Severn Master Plan which may not allow for the increased flows required from Phase 1 of the proposed development. It remains our understanding that the pumps in PS1 are currently at or near capacity. Further assessment of the pumping station capacity by District Municipality of Muskoka Engineering and Public Works will be required to determine appropriate pump upgrades with final design.

## 6.0 UTILITIES

There is a major hydro service line located along Muskoka Road 5 that includes Bell and wireless fiber plants on the same pole line. It is understood that the infrastructure is adequate to support the proposed development. However, infrastructure capacity and the need for any related upgrades is subject to final design by the utility provider.

## 7.0 STORMWATER MANAGEMENT

This stormwater management updated review should be read in conjunction with the most recent stormwater management reviews prepared by Tulloch Engineering dated August 22, 2014, and the previous updated stormwater

management plan prepared by Pinestone Engineering dated May 9, 2013. Copy of both reports have been included in Appendix B.

The 2014 stormwater update included single residential lots 20-64. The 2013 updated stormwater management plan for Phase 1 included 47 townhouse dwellings, 112 multi-residential dwellings, and single residential lots 1-19. Single residential lots 1-15 were not accounted for in either of the previous reports from 2013 and 2014. Therefore, the same methodology used in the 2014 stormwater review has been applied to the unaccounted for lots located along Ashton Road (Robins Drive) and included in this update. This report provides an updated review of the 2013 Pinestone Engineering Stormwater Management Report and the 2014 Tulloch Stormwater Management review. Revised catchments and modelling are discussed further in section 7.2 of this report.

### 7.1 Design Criteria

For site plan development of Phase 1, both quantity and quality control of post development storm run-off will be required. As well, the Municipality will require development proponents to identify the mitigation measures that will be put in place during construction to address erosion and sediment control.

In accordance with both the Ministry of Environment Conservation and Parks SWM Planning and Design Manual, 2003, and the District Municipality of Muskoka Engineering Design Criteria and Standards Manual, 2019, the level of quality control to be applied to any given development site is dictated by the sensitivity of the receiving main watercourse. The main watercourse which traverses the central portion of the site ultimately discharges to Georgian Bay. Accordingly, the receiving main watercourse has been designated as being *sensitive*, thereby requiring an "Enhanced" level of quality control protection.

Therefore, the preliminary design criteria for the proposed residential development have been designated as follows:

- Peak Flow attenuation to pre-development levels for all storm events up to the 100-year Muskoka Storm event.
- Conveyance of post development 100-year regional peak flows safely from the site.
- Water quality treatment to an 'Enhanced' level of protection, 80% suspended solids removal, using accepted low-impact-design, *LID,* and conventional control techniques such as enhanced grass swales, level spreaders spillways, grass-lined roadside ditches, infiltration facilities, retention storage, and oil / grit separators.
- Preparation of a detailed erosion and sediment control and construction mitigation plan to be implemented as part of the construction program.

## 7.2 Hydrology

Updated peak runoff rate estimates of both existing (pre-development) and proposed development (post-development) conditions have been provided with this report. The following is a summary of Tulloch's review and analysis for the proposed updates.

Hydrologic modeling of the site was conducted using Visual OTTHYMO, version 6.1 software. The Visual OTTHYMO model is an update of the HYMO model which was originally developed by the United States Department of Agriculture in the early 1970's and is used throughout North America and the world for hydrologic modeling of rural and urban watersheds. The program was utilized to compute dynamic rainfall-runoff for single storm events. A detailed output of the Visual OTTHYMO results can be found in Appendix B.

A 12-hour Soil Conservation Service, *SCS,* Type-II, rainfall distribution was selected as the rainfall input for the model. This rainfall distribution is compatible with the SCS Curve Number (CN) procedure to model well-draining soils, such as those located within the development area, in order to consider infiltration abstractions from peak runoff rates. This methodology is appropriate for modelling a moderate sized semi-urban site where the time of concentration for runoff within the site is less than the time to peak of the storm. The selected design storm distribution was scaled to represent the 2, 5, 10, 25, 50 and 100-year return periods utilizing the Intensity Duration Frequency Curve Look Up application published by the Ontario Ministry of Transportation (MTO) for the development location.

With current catchment areas revisions, runoff coefficients and curve numbers (*CN*), were updated with this report. The Ontario Surficial Geology Map was used to determine localized site soils, seen in Appendix B. The site soils can be categorized as fine textured lacustrine silt and clay with minor sand and gravel. Site soils were also confirmed from the geotechnical investigation. The hydrologic soil group, *HSG*, throughout the site was determined to be *BC* from design chart 1.08 of the MTO Drainage Management Manual, *DMM*, 1997, for clay, silt, and fine sand in lowlands, 4a/b. Curve numbers were then selected from the MTO DMM design chart 1.09. The City of Barrie Storm Drainage and Stormwater Management Policies and Design Guidelines, 2020, based on a HSG of BC was also consulted a point of reference for post development CN values for residential areas.

### 7.2.1. Drainage Catchments

Under pre-development conditions, the drainage area west of the central watercourse and within the site limits has been updated as Catchment 101. Catchment 101 is approximately 11 ha. Pre-development catchment 102 has also been updated as the drainage area east of the central watercourse. Additional external lands east of the site limits, taken from sketch SK-1 of the 2013 Pinestone stormwater review, was also included in Catchment 102. Catchment 102 is

approximately 14 ha. Pre-development catchments can be seen on Drawing S5 in Appendix A.

Under post-development conditions, the drainage area west of the central watercourse has been updated as Catchment 201. This revised catchment corresponds with parts of previous catchments 201, 203, and 204 from the 2014 Tulloch stormwater review. The entirety of previous catchments 202 and 205 from the 2014 Tulloch stormwater review also corresponds with proposed catchment 201. According to the updated draft plan, proposed catchment 201 considers runoff from single residential lots 20-64 and all internal open space west of the central watercourse. Runoff from proposed catchment 201 drains east towards the central watercourse.

Under post-development conditions, the drainage area east of the central watercourse has been updated as catchment 202. This updated catchment corresponds with parts of previous catchment 201 from the 2014 Tulloch stormwater review, and the previous catchment shown in sketch SK-1 from the 2013 Pinestone stormwater review. According to the updated draft plan, proposed catchment 202 considers runoff from single residential lots 1-19, all 47 townhouse dwellings, all 112 multi residential dwellings, any internal open space east of the central watercourse, and any external open space east site draining west toward the central watercourse. Runoff from proposed Catchment 202 drains west towards the central watercourse.

Under post-development conditions, catchment 203 corresponds with part of catchment 204 from the 2014 Tulloch stormwater review. Catchment 203 considers the drainage area within the entrance right-of-way from the intersection with Muskoka Road 5 to single residential lot 64, approximately station 0+000 to 0+137 of Knightsbridge Drive. Runoff from proposed catchment 203 drains south towards the Muskoka Road 5 roadside ditch. Post-development catchments can be seen on Drawing S6 in Appendix A.

As per the previous reviews stormwater management facilities A & B (ponds) described in the 2012 servicing report are no longer viable within the main watercourse / open space due to environmental constraints within Catchment 205. The stormwater management design methodology has been revised described in the sectio0n 7.3 below.

Peak run-off rates were modelled for the 2, 10 and 100 year return period storm event for corresponding catchment. See Table 7 below for a description of each modelled catchment.

| Table 7<br>Pre and Post Development Drainage Catchments | | | | | | | |
|---|---|---|---|---|---|---|---|
| Catchment ID | | Area (ha) | Runoff Coefficient (C) | Curve Number (CN) | Peak Uncontrolled Runoff ($m^3/s$) | | |
| | | | | | 2-Year | 10-year | 100-year |
| Pre-Development | 101 | 10.9 | 0.20 | 71.0 | 0.07 | 0.15 | 0.28 |
| | 102 | 13.8 | 0.21 | 72.7 | 0.13 | 0.30 | 0.55 |
| | 103 | 0.26 | 0.20 | 71.0 | 0.003 | 0.007 | 0.01 |
| Post-Development | 201 | 10.9 | 0.26 | 74.4 | 0.09 | 0.20 | 0.37 |
| | 202 | 13.8 | 0.36 | 78.6 | 0.21 | 0.45 | 0.82 |
| | 203 | 0.26 | 0.53 | 85.3 | 0.02 | 0.03 | 0.06 |

## 7.3 Stormwater Management Plan

As per previous reviews, stormwater management facilities A & B (ponds) described in the 2012 servicing report are no longer viable within the main watercourse / open space due to environmental constraints. Quantity and quality control facilities utilizing Low Impact Design elements (LID) and conventional stormwater management conveyance controls are proposed to treat runoff from developed areas prior to reaching the environmentally constrained open space within proposed catchments 201 and 202. Quantity and quality controls are also proposed to treat runoff from development areas prior to crossing the site boundaries.

Therefore, it is proposed to attenuate runoff rate increases within enhanced rear yard swales on the single residential lots and semi-detached lots. The proposed enhanced swales will include infiltration trench along its length to accomplish quality control. The townhouse and multi-residential catchment area on Don Ridge Drive / Street A will utilize parking lot storage, such as superpipes or stormwater chambers, for quantity control and oil / grit separator manholes for quality control. Storm sewers will convey storm water along Don Ridge Drive and between multi-residential catchments. Specific discharge details are to be part of final design with preliminary quantity and quality model calculations and methodologies as presented in the following report sub-sections.

### 7.3.1. Quantity Control

Based on the results of the Visual OTTHYMO hydrological model, an increase in peak stormwater run-off rates can be expected during all storm events. See appended hydrologic analysis for preliminary calculation results for each case.

Attenuation of peak run-off rates to pre-development levels will be achieved using the following LID and conventional stormwater management practices:

- Enhanced rear yard swales complete with infiltration trench and level spreader spillways along the perimeter of all single residential lot groups and townhouse lot groups.

- Enhanced grass-lined roadside ditches along Knightsbridge Drive and Ashton Road complete with rock flow check dams.
- Roof leader soakaway pits at all buildings.
- Roof top storage, such as green roofs, at all multi-residential buildings.
- Peak flow attenuation, with the addition of parking lot detention storage in catchment 202. Depressed parking lots including super pipe/stormwater chamber storage within parking lots.

All runoff from an altered land use due to post development conditions in catchment 201 will be conveyed through an enhanced swale complete with infiltration trench or enhanced grass-lined roadside ditch, prior to discharging into the main watercourse. Enhanced rear yard swales complete with infiltration trench and level spreader spillway will perimeter groups of lots within catchment 201 as detailed in Drawing S4 in Appendix D. Enhanced grass-lined roadside ditches will convey roadway runoff in catchment 201. Peak runoff attenuation, within catchment 201 will be completed within the proposed enhanced rear yard swales.

Runoff from single residential lots 1-19, in catchment 202, will be attenuated in enhanced rear yard swales complete with infiltration trench and level spreader spillways. All enhanced rear yard swales around the perimeter of single residential lot groups 1-19 will discharge to the central watercourse. Enhanced grass-lined roadside ditches along Ashton Road from Lots 4-7 and 11-19, will convey roadway runoff to the central watercourse. Controlled drainage from the multi-residential Blocks 67, 71 and 73 on Don Ridge Drive will utilize parking lot storage facilities, such as superpipes or stormwater chambers. The parking lot storage facilities will discharge through the proposed storm sewer system conveying stormwater through two oil/grit separator manholes prior to discharging to catchment 202 internal open space. The runoff from Don Ridge Drive urban roadway will be conveyed through storm sewers, utilizing two separate oil/grit separator manholes prior to discharging to catchment 202 internal open space. Enhanced rear yard swales behind townhouse Blocks 76-79 will discharge to the urban storm sewer system within Don Ridge Drive. Peak runoff attenuation from townhouse Block 76-79 will occur within the enhanced rear yard swales. Enhanced rear yard swales behind townhouse dwelling Blocks 65, 66, 69, 70, 72, 74, and 75 will also be utilized for peak runoff attenuation and discharge to catchment 202 internal open space. Enhanced roadside ditches along single residential Lots 1-3 and 8-10 will discharge into the urban storm sewer system proposed on Don Ridge Drive, ultimately discharging to catchment 202 internal open space from an Oil / Grit Separator.

Peak runoff from the Knightsbridge Drive right-of-way within catchment 203 will be attenuated in the grass-lined roadside ditches complete with rock flow check dams prior to discharging across the site boundaries.

Preliminary enhanced rear yard swales, enhanced grass-lined roadside ditches, and parking lot storage sizing calculations were completed to ensure the practices were suitable for the site. Enhanced rear yard swales complete with infiltration

trench will be 1 m bottom width, 0.55 m depth, with 3:1 (H:V) side slopes at 0.5%. Providing 150 mm of freeboard during the 100-year storm event. The infiltration trench beneath the entire length of enhanced rear yard swales has been sized as being 1.0 m wide, 0.5 m deep, and filled with 50 mm clear stone as the storage layer. The 50 mm clear stone provides a void space of approximately 40%. Grass-lined roadside ditches will be a minimum 850 mm deep from the proposed asphalt surface, with 2:1 (H:V) side slopes at 0.5%, to ensure bottom of ditch is minimum 150 mm below sub-grade. However, peak runoff only requires a maximum depth of approximately 500 mm during the 100-year storm event. This will provide and 350 mm freeboard. The Armtec HydroStor HS180 stormwater chamber was used to provide preliminary parking lot storage sizing. The HS180 provides approximately 2.35 $m^3$/m length of storage. At proposed 30 m long per length of HS180 and 3 lengths per parking lot, the 7 parking lots will provide sufficient peak runoff attenuation to pre-development rates. Specific discharge design details and calculations of quantity control facilities, storm sewers, and oil and grit separators will be provided at final design. Preliminary peak runoff attenuation volumes required in each catchment are shown in Table 8.

**Table 8**
**Quantity Control Parameters for 100-Year Storm Event**

| Catchment ID | Total Uncontrolled Peak Flow ($m^3$/s) | Total Allowable Peak Flow ($m^3$/s) | Total Quantity Control Storage Volume Required ($m^3$) | Stormwater Management Facilities Storage Volumes Provided | | | |
|---|---|---|---|---|---|---|---|
| | | | | Enhanced Rear Yard Swales ($m^3$) | Enhanced Grass-Lined Ditches ($m^3$) | Parking Lot Detention Storage ($m^3$) | Total Storage Volume Provided ($m^3$) |
| **201** | 0.37 | 0.28 | 1434.24 | 962.7 | 604.0 | 0 | 1566.7 |
| **202** | 0.82 | 0.55 | 2202.33 | 1128.2 | 193.0 | 1480.5 | 2801.7 |
| **203** | 0.06 | 0.01 | 103.79 | 0 | 137.0 | 0 | 137.0 |

### 7.3.2. **Quality Control**

Quality control of the runoff will meet the requirements for Enhanced Protection level (80% TSS removal) through enhanced grass-lined ditches providing infiltration, enhanced rear yard swales complete with clear stone infiltration trench

Based on the results of this hydrological analysis, water quality protection of post development run-off will be achieved through implementation of a “treatment train” of approved measures. The measure required to provide enhanced protection level (80% TSS removal) is as follows:

- Enhanced grass lined roadside ditches complete with rock flow check dams will promote infiltration and runoff attenuation.
- Enhanced rear yard swales complete with clearstone infiltration trench and rock flow check dam / level spreader spillway will promote infiltration and runoff attenuation.
- Vegetated filter strips following all level spreader spillway outlets.

- Oil / Grit Separator units at the parking lot storage facilities.
- Oil / Grit Separator units at the discharge of the urban roadway, Don Ridge Drive, storm sewers.
- Suitable erosion / sediment control and construction mitigation measures to be utilized during the site development, see Drawing S7 in Appendix D.

The proposed enhanced rear yard swales, enhanced roadside ditches, and oil/grit separators are to be designed to meet both quantity and quality control design criteria for enhanced treatment levels at the final design stage; thereby avoiding the need for a central stormwater management facility.

Water quality volumes (*WQV)* were determined using Table 3.2 in the MECP Stormwater Management Planning and Design Manual, 2003. Table 3.2 considers the catchment imperviousness, stormwater management practice type, and level of protection (80% TSS removal). The resultant from table 3.2 gives a WQV per hectare of catchment area. The result is then be factored by each catchment for the total water quality storage volume required. The volume within the infiltration trench of the enhanced rear yard swales is considered as the treatment location.

The infiltration trenches are sized to accommodate the required WQV with consideration of a stone layer of 50 mm clear stone providing approximately 40% void space. Peak runoff will be treated in the infiltration trench through infiltration of the surrounding native soils. 0.5 m depth rock flow check dams will be provided at the outlet of all grass-lined roadside ditches. This will attenuate peak runoff, meeting the required WQV, promoting infiltration through the grass-lined swale. Oil and grit separators will treat the required volume from the multi-residential dwellings and Don Ridge Drive storm sewer system. See table 9 for WQV design details.

**Table 9**
**Quality Control Parameters**

| Catchment ID | Catchment Area (ha) | % Impervious | WQV Required ($m^3$) | Stormwater Management Facilities Treatment Volumes Provided | | | |
|---|---|---|---|---|---|---|---|
| | | | | Enhanced Rear Yard Swale Infiltration Trench ($m^3$) | Enhanced Grass-Lined Ditch Infiltration ($m^3$) | Oil and Grit Separator ($m^3$) | Total Treatment Volume Provided ($m^3$) |
| **201** | 10.9 | 12.8 | 211.9 | 218.8 | 604.0 | - | 822.8 |
| **202** | 13.8 | 28.8 | 323.6 | 256.4 | 193.0 | 881.2 | 1330.6 |
| **203** | 0.26 | 42.3 | 6.98 | - | 137.0 | - | 137.0 |

### 7.3.3. **Conveyance Controls / Flooding**

The Stormwater management plan outlined in the 2007 URS Assessment, referred to in the 2013 Pinestone Engineering Updated Stormwater Management Plan, included calculations of flood line elevations along the main watercourse and

recommended the upsizing of the existing 950mm dia. CSP downstream on Muskoka Road 5 to a 1200mm dia. HDPE in order to reduce flood hazard associated with the back-water effect caused by the 950mm dia. CSP. The flood line mapping has not been changed with this review, but remains in effect. The original calculations have not been reproduced with this report.

### 7.3.4. Erosion and Sediment Controls

Erosion and sediment control measures should be provided with final design plans and implemented for all construction activities within the development. including vegetation clearing, topsoil stripping, grading and stockpiling of materials. Sediment and erosion control measures are required during construction and until such time as all phases of construction are complete, vegetation is established, SWM facilities are complete and stabilized and roadways are complete to finished surface.

The use of siltation control measures should be implemented to protect adjacent properties and receiving waterbodies from sediment migration.
These works include, but are not limited to the following:

- Silt control fences to be erected before any grading operations to control sediment movement, and their locations should be reviewed with the engineer prior to site work commencing.
- As a minimum, silt fencing should be heavy duty type with reinforced backing located along top of bank of all drainage swales and the watercourse down gradient of the development area.
- The use of sediment control flow check should be employed in all drainage ditches and watercourses within the site and their locations should be reviewed with the engineer prior to site work commencing.
- Expose the smallest possible land area to erosion for the shortest possible time.
- Immediately institute erosion control measures as required.
- Reinstate all disturbed areas upon completion of work.
- Confine refueling and servicing of equipment to areas well away from the drainage systems.
- Regular inspection of control measures should be instituted through a mitigation plan involving monitoring and regular maintenance. Bi-weekly inspections of the site erosion and sediment control should be completed. Inspections should be conducted after any major storm event.

***During Construction***

Silt control barrier noted above should be in place prior to construction start. Temporary installations of silt fence or related sediment and erosion control measures may be required during grading operations to minimize sediment migration. The measures may need to be removed and replaced or relocated during the construction period to achieve a desirable result.
During construction all stockpiled material is to be placed up-gradient of the silt controls.

All site work left in place over the winter and spring months should be reviewed and maintained to ensure that the facilities are adequate and in good working order. The owner is responsible for maintenance of the silt controls and should contact the engineer and contractor for regular review of the measures in place. All reasonable methods to control erosion and sediment should be employed by the contractor and owner during construction.

### 7.3.5. **Monitoring and Maintenance**

It is the responsibility of the owner and contractor to maintain all siltation control devices until all surfaces are stabilized and suitable vegetation cover has been established.
A regular review of the siltation control facilities should be conducted by the contractor during the construction period to ensure that they are properly performing. Regular maintenance, repair and replacement should be completed as needed.
Inspection and maintenance of the facilities should be carried out after significant rainstorm events. Damaged or poor performing siltation devices should be repaired immediately, and additional devices installed as needed to achieve proper control.

### 7.3.6. **Contingency Plan**

Should erosion control and silt control measures fail causing sediment migration beyond the control limits, the following measures should be taken as a minimum response:

- The Town of Huntsville and District of Muskoka should be notified of the event. The control breach will be assessed and cleaned up to the satisfaction of the overseeing agencies.
- Additional erosion control and silt control facilities should be installed in the failed area, as well a down gradient to contain any sediment migration.
- The Ministry of Natural Resources and Forestry should be contacted in the event that sediment or silt reaches any adjacent water bodies, creeks or streams

## 8.0 CONCLUSIONS

Port Severn Heights Inc. has retained Tulloch Engineering Inc. to assist with preparation of a Updated Preliminary Functional Servicing Report in support of red lined changes to the Port Severn Heights Phase 1 Draft Plan S2007-4.

It is Tulloch's opinion that he above noted review provides viable parameters and criteria to support Municipal acceptance of the proposed draft plan updates. Full consideration of the parameters presented will be required with final servicing design as established by the preliminary criteria and review presented.

All of which is respectfully submitted,

**TULLOCH Engineering Inc.**

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# APPENDIX A

## Preliminary Watermain Servicing Design

## Preliminary Wastewater (Sanitary) Servicing Design

| Project: | Port Severn Heights | Date: | 22-Dec-21 | WM1 |
|---|---|---|---|---|
| File No: | 14-4022 | Designed: | BB | |
| Subject: | Preliminary Watermain Node Demands | Checked: | TM | |

**Phase 1 - Average Day, Maximum Day Demand, Peak Hour Demand and Maximum Day Demand Plus Fire Flow.**

| | | | |
|---|---|---|---|
| Residential Domestic Flow | 450 | L/Cap/D | From MECP Design Guidelines-2008 |
| Commercial Land Use Flow | 0.32 | L/ha/s | |
| People/Unit | 3.5 | | Normal pressure is 350kPa to 480 kPa under maximum day demand |
| Proposed Development Unit Count | 223 | | Minimum pressure is 275 kPa (40 psi) under maximum day demand |
| Max Day Peaking Factor | 2.75 | | Minimum presssure under max day demand plus fire flow is 138 kPa |
| Peak Hour Peaking Factor | 4.13 | | Maximum pressure is 700 kPa (100 psi) |
| Max Day Flow Rate | 11.179 | L/s | Pressure below "Normal" |
| Fire Flow Demand | 38.000 | L/s | Pressure exceeds maximum |
| Design Flow (Peak Hour) | 16.789 | L/s | Pressure below minimum |
| Design Flow (Max Day + Fire) | 49.179 | L/s | |
| Average Day Flow Rate | 4.065 | L/s | |

Max day plus fire flow design flow is greater than peak hour design flow. Therefore use the max day plus fire to be conservative.

**Phase 1**

| Node Identifier | Node Elevations (m) | Residential Units (ERU) | Commercial Units (ha) | Average Day Demand (L/s) | Maximum Day Demand (L/s) | Peak Hour Demand (L/s) | Maximum Day Demand Plus Fire Flow at JU8, Wost Case (L/s) |
|---|---|---|---|---|---|---|---|
| JU1 | 182.00 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| JU2 | 178.55 | 3 | 1.07 | 0.397 | 1.092 | 1.640 | 1.092 |
| JU3 | 180.15 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| JU4 | 179.76 | 31 | 0 | 0.565 | 1.554 | 2.334 | 1.554 |
| JU5 | 179.54 | 14 | 0 | 0.255 | 0.702 | 1.054 | 0.702 |
| JU6 | 179.51 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| JU7 | 180.02 | 19 | 0 | 0.346 | 0.952 | 1.430 | 0.952 |
| JU8 | 180.30 | 150 | 0 | 2.734 | 7.520 | 11.293 | 45.520 |
| JU9 | 181.98 | 9 | 0 | 0.164 | 0.451 | 0.678 | 0.451 |

Note: 0.32 L/ha/s (28 $m^3$/ha/d) was used for average daily design flow the one (1) commercial property located on Muskoka Road 5 between Node 1 and 2. The resultant design flow was added to the Node 2 demand.

| Project: | Port Severn Heights | Date: | 22-Dec-21 | WM1 |
|---|---|---|---|---|
| File No: | 14-4022 | Designed: | BB | |
| Subject: | Preliminary Watermain Node Demands | Checked: | TM | |

**Phase 1 Plus Phase 2 & 3 - Average Day, Maximum Day Demand, Peak Hour Demand and Maximum Day Demand Plus Fire Flow.**

| | | | |
|---|---|---|---|
| Residential Domestic Flow | 450 | L/Cap/D | From MECP Design Guidelines-2008 |
| Commercial Land Use Flow | 0.32 | L/ha/s | |
| People/Unit | 3.5 | | Normal pressure is 350kPa to 480 |
| Proposed Development Unit Count | 434 | | kPa under maximum day demand |
| Maximum Day Peaking Factor | 2.5 | | Minimum pressure is 275 kPa (40 |
| Peak Hour Peaking Factor | 3.75 | | psi) under maximum day demand |
| Max Day Flow Rate | 19.779 | L/s | Minimum presssure under max |
| Fire Flow Demand | 79.000 | L/s | day demand plus fire flow is 138 |
| Design Flow (Peak Hour) | 29.668 | L/s | Maximum pressure is 700 kPa (100 psi) |
| Design Flow (Max Day + Fire) | 98.779 | L/s | Pressure below "Normal" |
| Average Day Flow Rate | 7.911 | L/s | Pressure exceeds maximum |
| | | | Pressure below minimum |

Max day plus fire flow design flow is greater than peak hour design flow. Therefore use the max day plus fire to be conservative.

**Phase 1 Plus Phase 2 & 3**

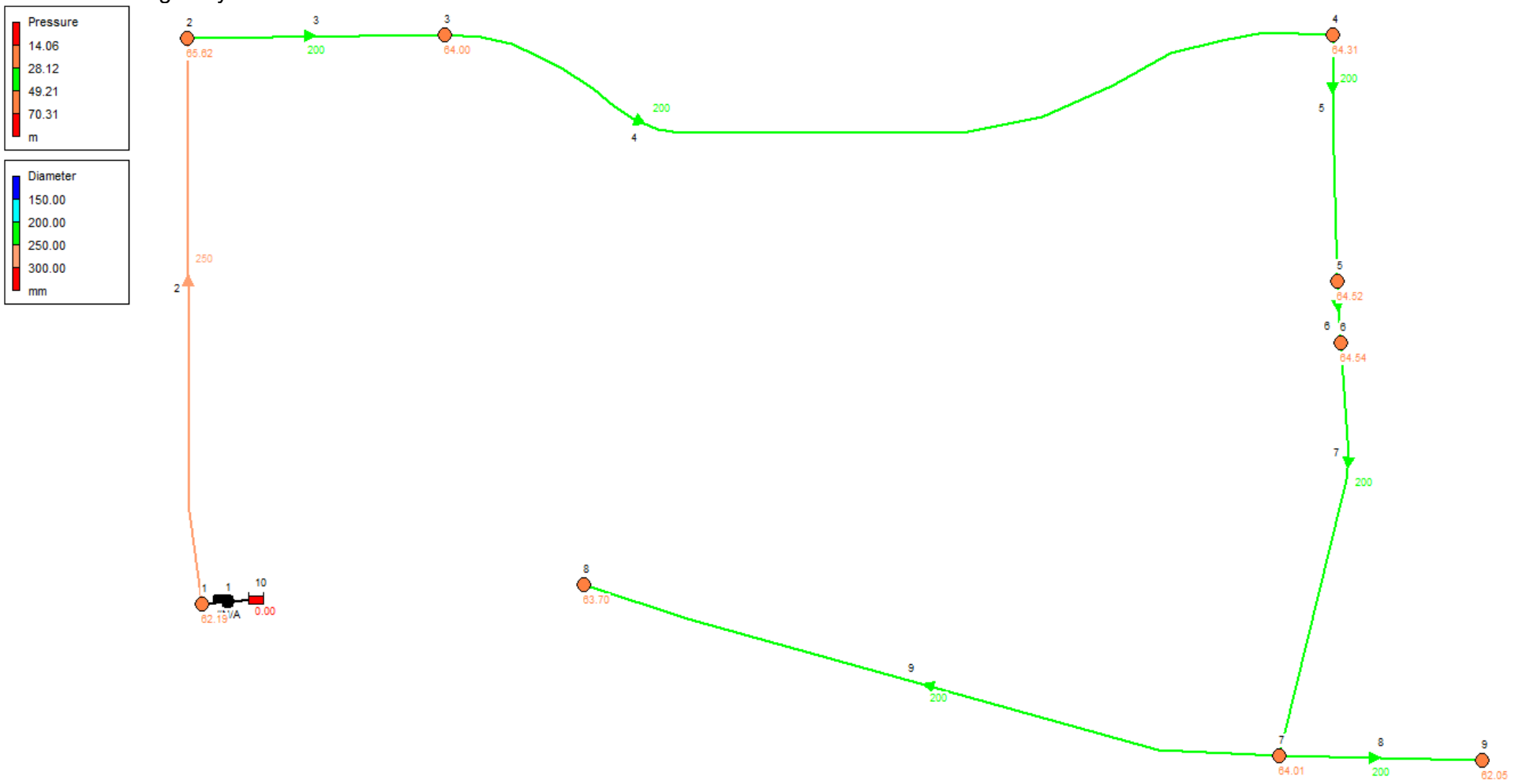
| Node Identifier | Node Elevations (m) | Residential Units (ERU) | Commercial Units (ha) | Average Day Demand (L/s) | Maximum Day Demand (L/s) | Peak Hour Demand (L/s) | Maximum Day Demand Plus Fire Flow at JU8, Worst Case (L/s) |
|---|---|---|---|---|---|---|---|
| JU1 | 182.00 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| JU2 | 178.55 | 3 | 1.07 | 0.397 | 0.993 | 1.489 | 0.993 |
| JU3 | 180.15 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| JU4 | 179.76 | 31 | 0 | 0.565 | 1.413 | 2.119 | 1.413 |
| JU5 | 179.54 | 14 | 0 | 0.255 | 0.638 | 0.957 | 0.638 |
| JU6 | 179.51 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| JU7 | 180.02 | 19 | 0 | 0.346 | 0.866 | 1.299 | 0.866 |
| JU8 | 180.30 | 150 | 0 | 2.734 | 6.836 | 10.254 | 85.836 |
| JU9 | 181.98 | 220 | 0 | 4.010 | 10.026 | 15.039 | 10.026 |

**Note:** 0.32 L/ha/s (28 $m^3$/ha/d) was used for average daily design flow the one (1) commercial property located on Muskoka Road 5 between Node 1 and 2. The resultant design flow was added to the Node 2 demand.

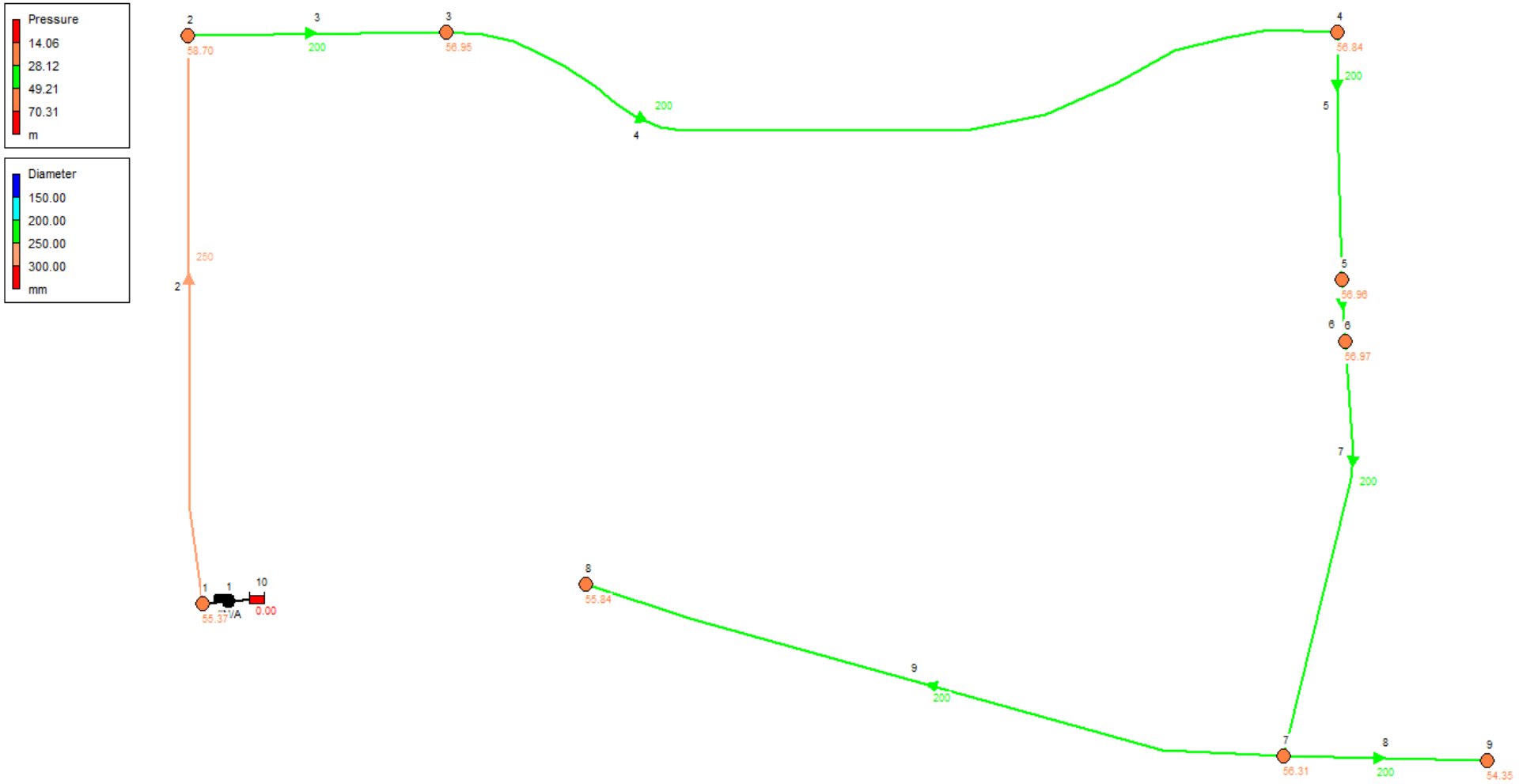
**Note:** Future 211 ERU (Phase 2 & 3) are applied at JU9.

**WM2 - EPA NET 2.0 Schematic Results**

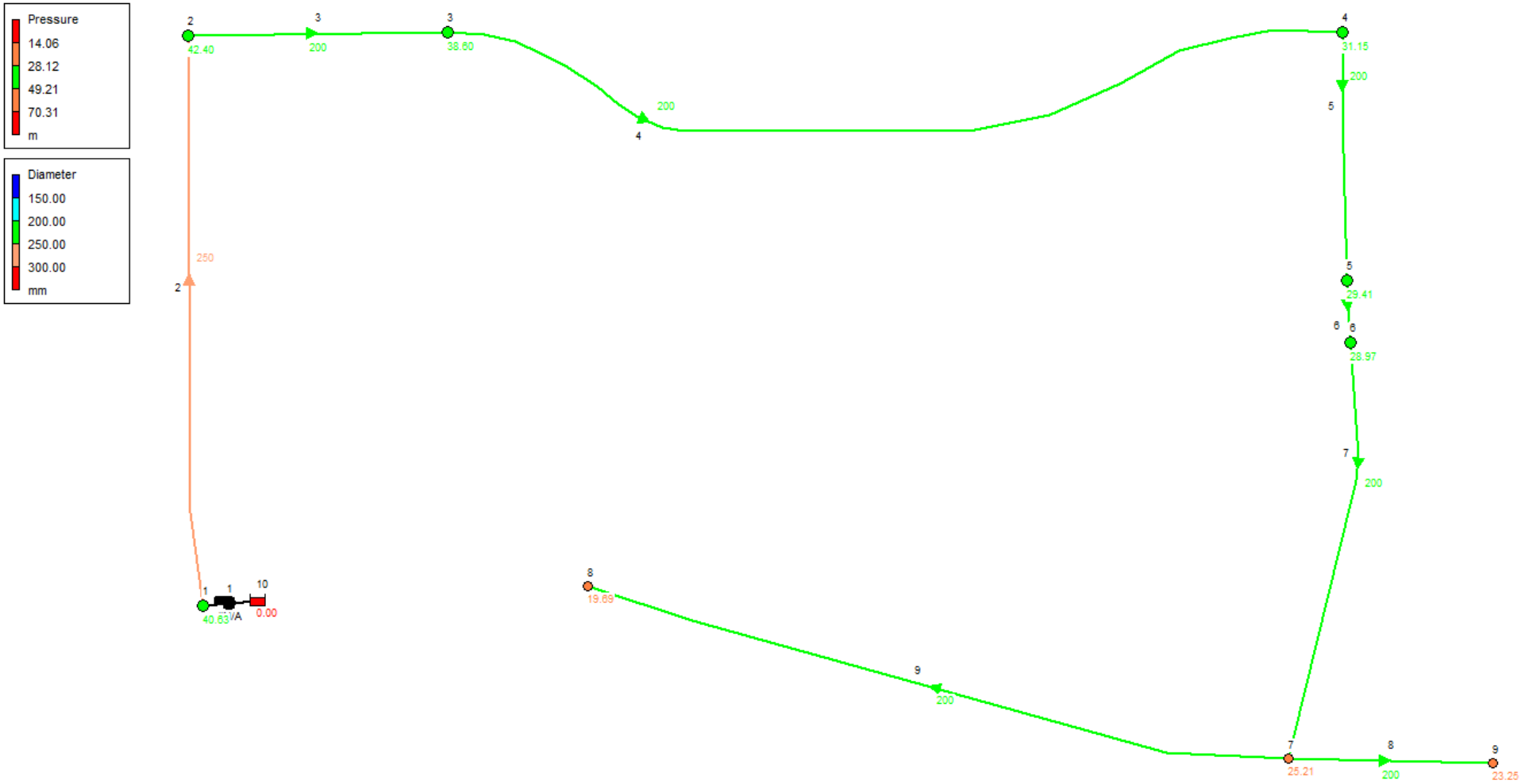
Scenario 1:
Phase 1: Average day demand.



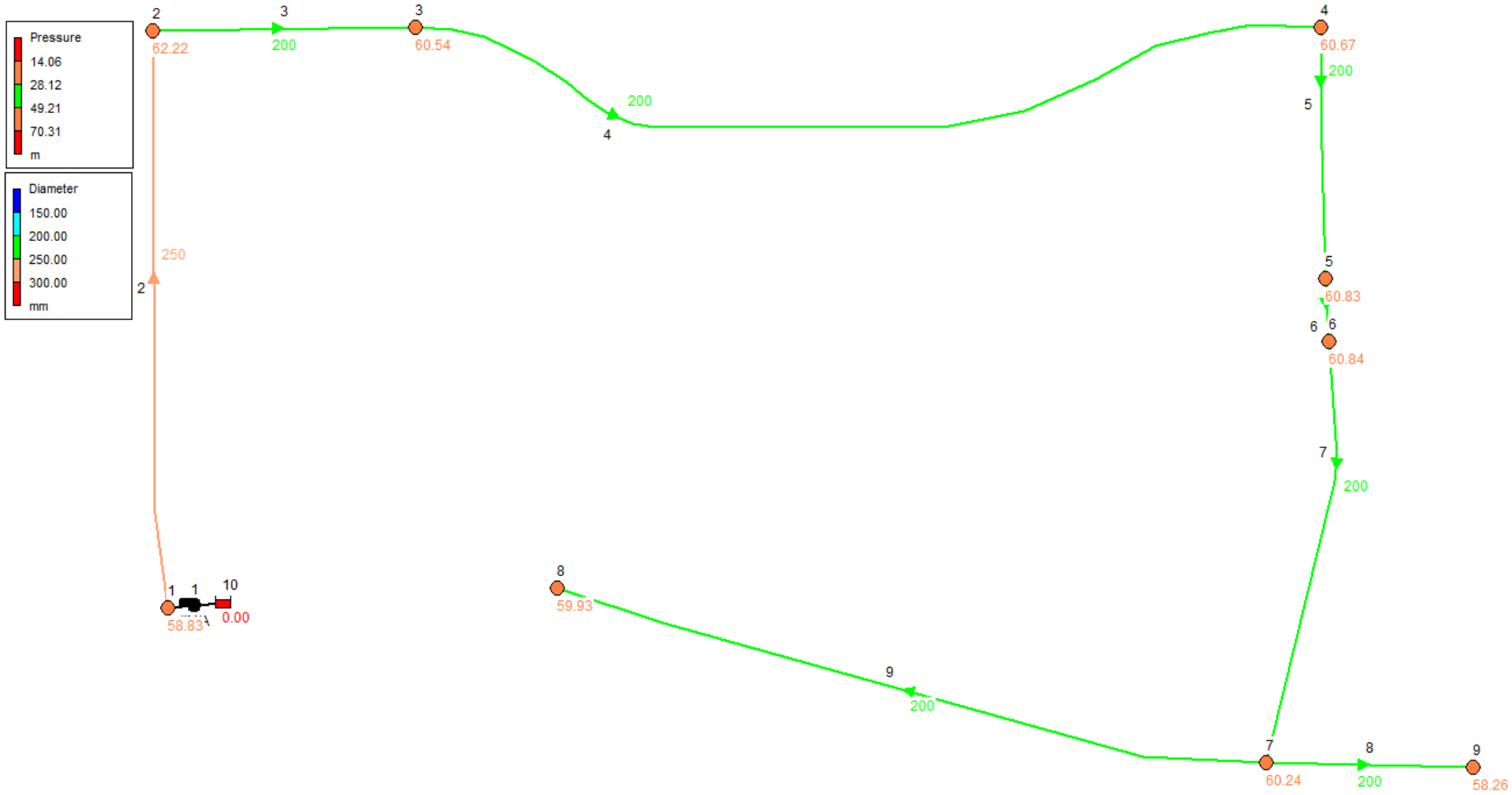
Scenario 2:
Phase 1: Maximum day demand.



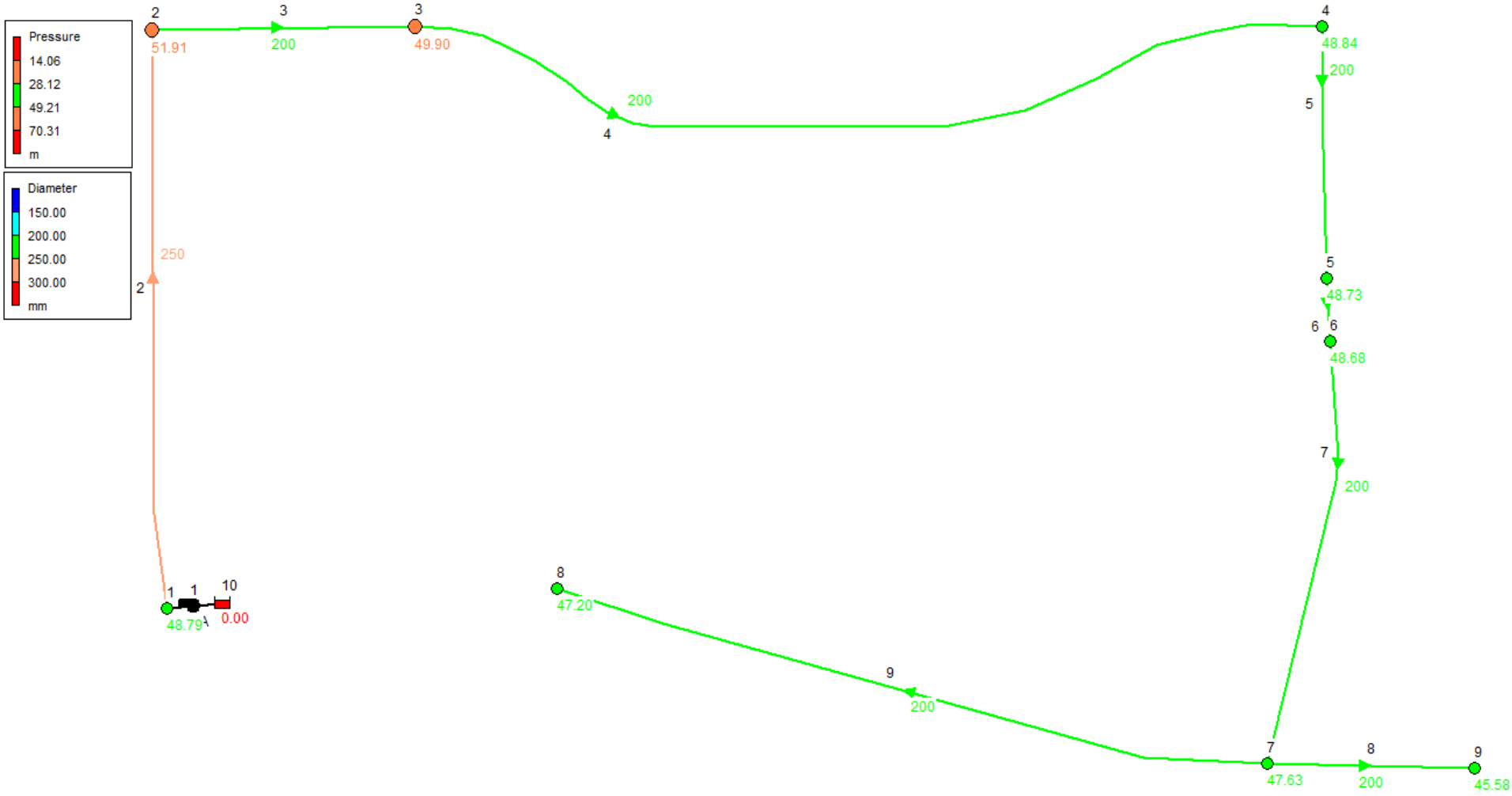
Scenario 3:
Phase 1: Fire Flow, 38 L/s, at JU8 + Maximum day demand.



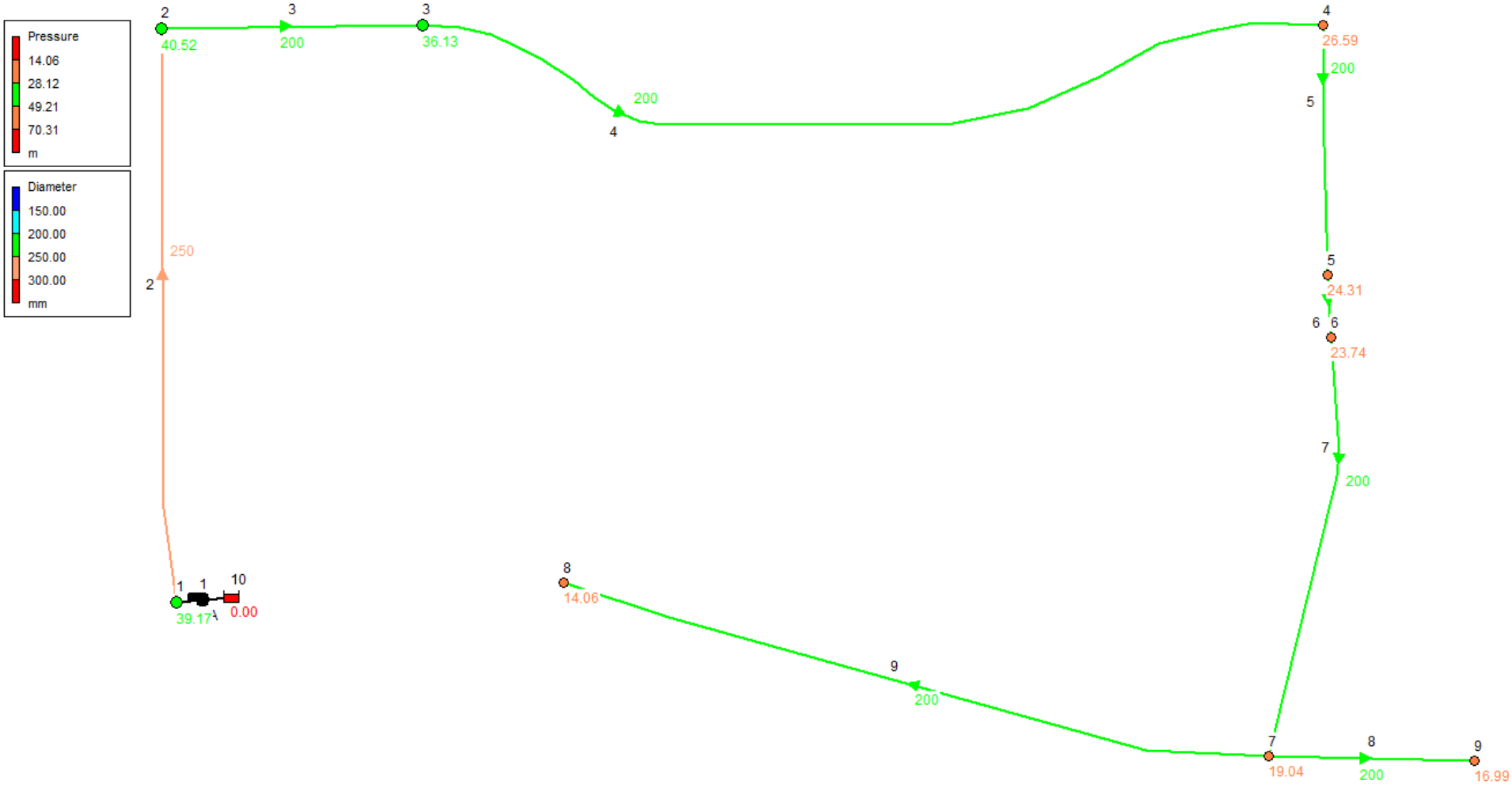
Scenario 4:
Phase 1 Plus Phase 2 & 3: Average Day Demand.



Scenario 5:
Phase 1 Plus Phase 2 & 3: Maximum Day Demand.



Scenario 6:
Phase 1 Plus Phase 2 & 3: Fire Flow,36.06 L/s, @ JU8 + Maximum Day Demand.



**EPA NET 2.0: Tabulated Nodal Results**

Scenario 1:

***Phase 1: Average Day Demand.***

| *Node ID* | Elevation | Demand | Head | Pressure | Converted Pressure |
|---|---|---|---|---|---|
| | m | LPS | m | m | psi |
| *Junc 1* | 182 | 0 | 244.19 | 62.19 | 88.45 |
| *Junc 2* | 178.55 | 0.4 | 244.17 | 65.62 | 93.33 |
| *Junc 3* | 180.15 | 0 | 244.15 | 64 | 91.03 |
| *Junc 4* | 179.76 | 0.56 | 244.07 | 64.31 | 91.47 |
| *Junc 5* | 179.54 | 0.25 | 244.06 | 64.52 | 91.77 |
| *Junc 6* | 179.51 | 0 | 244.05 | 64.54 | 91.80 |
| *Junc 7* | 180.02 | 0.35 | 244.03 | 64.01 | 91.04 |
| *Junc 8* | 180.3 | 2.73 | 244 | 63.7 | 90.60 |
| *Junc 9* | 181.98 | 0.16 | 244.03 | 62.05 | 88.26 |

Scenario 2:

***Phase 1: Maximum Day Demand.***

| *Node ID* | Elevation | Demand | Head | Pressure | Converted Pressure |
|---|---|---|---|---|---|
| | m | LPS | m | m | psi |
| *Junc 1* | 182 | 0 | 237.37 | 55.37 | 78.75 |
| *Junc 2* | 178.55 | 1.09 | 237.25 | 58.7 | 83.49 |
| *Junc 3* | 180.15 | 0 | 237.1 | 56.95 | 81.00 |
| *Junc 4* | 179.76 | 1.55 | 236.6 | 56.84 | 80.85 |
| *Junc 5* | 179.54 | 0.7 | 236.5 | 56.96 | 81.02 |
| *Junc 6* | 179.51 | 0 | 236.48 | 56.97 | 81.03 |
| *Junc 7* | 180.02 | 0.95 | 236.33 | 56.31 | 80.09 |
| *Junc 8* | 180.3 | 7.52 | 236.14 | 55.84 | 79.42 |
| *Junc 9* | 181.98 | 0.45 | 236.33 | 54.35 | 77.30 |

Scenario 3:

***Phase 1: Maximum Day Demand Plus Fire Flow (38 L/s) at JU8.***

| *Node ID* | Elevation | Demand | Head | Pressure | Converted Pressure |
|---|---|---|---|---|---|
| | m | LPS | m | m | psi |
| *Junc 1* | 182 | 0 | 222.63 | 40.63 | 57.79 |
| *Junc 2* | 178.55 | 1.09 | 220.95 | 42.4 | 60.31 |
| *Junc 3* | 180.15 | 0 | 218.75 | 38.6 | 54.90 |
| *Junc 4* | 179.76 | 1.55 | 210.91 | 31.15 | 44.31 |
| *Junc 5* | 179.54 | 0.7 | 208.95 | 29.41 | 41.83 |
| *Junc 6* | 179.51 | 0 | 208.48 | 28.97 | 41.21 |
| *Junc 7* | 180.02 | 0.95 | 205.23 | 25.21 | 35.86 |
| *Junc 8* | 180.3 | 45.52 | 199.99 | 19.69 | 28.01 |
| *Junc 9* | 181.98 | 0.45 | 205.23 | 23.25 | 33.07 |

Scenario 4:

***Phase 1 Plus Phase 2 & 3: Average Day Demand.***

| *Node ID* | Elevation | Demand | Head | Pressure | Converted Pressure |
|---|---|---|---|---|---|
| | m | LPS | m | m | psi |
| *Junc 1* | 182 | 0 | 240.83 | 58.83 | 83.68 |
| *Junc 2* | 178.55 | 0.4 | 240.77 | 62.22 | 88.50 |
| *Junc 3* | 180.15 | 0 | 240.69 | 60.54 | 86.11 |
| *Junc 4* | 179.76 | 0.56 | 240.43 | 60.67 | 86.29 |
| *Junc 5* | 179.54 | 0.25 | 240.37 | 60.83 | 86.52 |
| *Junc 6* | 179.51 | 0 | 240.35 | 60.84 | 86.53 |
| *Junc 7* | 180.02 | 0.35 | 240.26 | 60.24 | 85.68 |
| *Junc 8* | 180.3 | 2.73 | 240.23 | 59.93 | 85.24 |
| *Junc 9* | 181.98 | 4.01 | 240.24 | 58.26 | 82.87 |

Scenario 5:

***Phase 1 Plus Phase 2 & 3: Maximum Day Demand.***

| *Node ID* | Elevation | Demand | Head | Pressure | Converted Pressure |
|---|---|---|---|---|---|
| | m | LPS | m | m | psi |
| *Junc 1* | 182 | 0 | 230.79 | 48.79 | 69.40 |
| *Junc 2* | 178.55 | 0.99 | 230.46 | 51.91 | 73.83 |
| *Junc 3* | 180.15 | 0 | 230.05 | 49.9 | 70.97 |
| *Junc 4* | 179.76 | 1.41 | 228.6 | 48.84 | 69.47 |
| *Junc 5* | 179.54 | 0.64 | 228.27 | 48.73 | 69.31 |
| *Junc 6* | 179.51 | 0 | 228.19 | 48.68 | 69.24 |
| *Junc 7* | 180.02 | 0.87 | 227.65 | 47.63 | 67.75 |
| *Junc 8* | 180.3 | 6.84 | 227.5 | 47.2 | 67.13 |
| *Junc 9* | 181.98 | 10.03 | 227.56 | 45.58 | 64.83 |

Scenario 6:

***Phase 1 Plus Phase 2 & 3: Maximum Day Demand Plus Fire Flow (36.06 L/s) at JU8.***

| *Node ID* | Elevation | Demand | Head | Pressure | Converted Pressure |
|---|---|---|---|---|---|
| | m | LPS | m | m | psi |
| *Junc 1* | 182 | 0 | 221.17 | 39.17 | 55.71 |
| *Junc 2* | 178.55 | 0.99 | 219.07 | 40.52 | 57.63 |
| *Junc 3* | 180.15 | 0 | 216.28 | 36.13 | 51.39 |
| *Junc 4* | 179.76 | 1.41 | 206.35 | 26.59 | 37.82 |
| *Junc 5* | 179.54 | 0.64 | 203.85 | 24.31 | 34.58 |
| *Junc 6* | 179.51 | 0 | 203.25 | 23.74 | 33.77 |
| *Junc 7* | 180.02 | 0.87 | 199.06 | 19.04 | 27.08 |
| *Junc 8* | 180.3 | 42.9 | 194.36 | 14.06 | 20.00 |
| *Junc 9* | 181.98 | 10.03 | 198.97 | 16.99 | 24.17 |

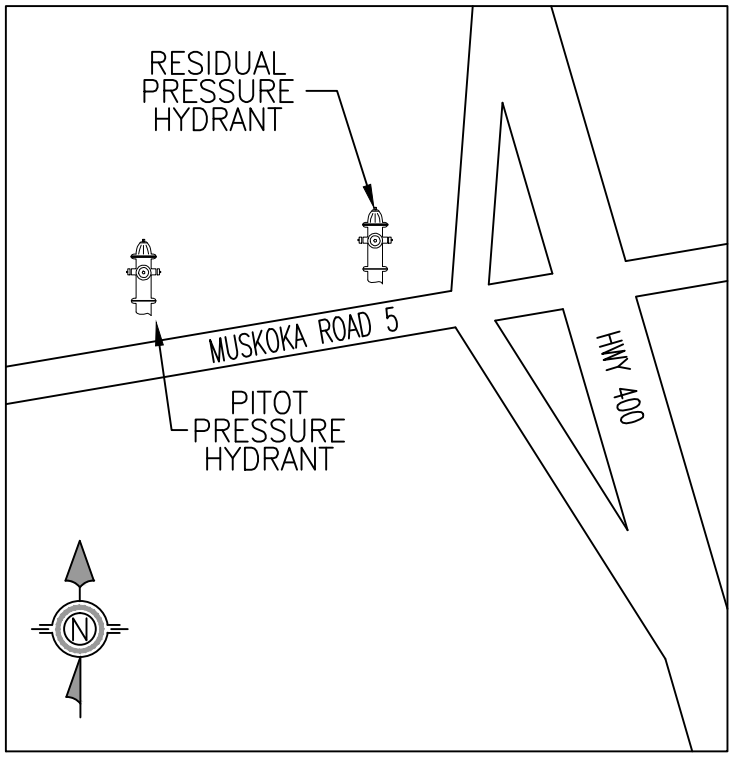
FIRST FOR FIRE, LIFE SAFETY & SECURITY
VIPOND INC
est. 1945

# FLOW TEST RESULTS

DATE : JANUARY 29, 2015 TIME : 1:00 PM

LOCATION : MUSKOKA ROAD 5
PORT SEVERN, ONTARIO

TEST BY : VIPOND FIRE PROTECTION AND LOCAL PUC



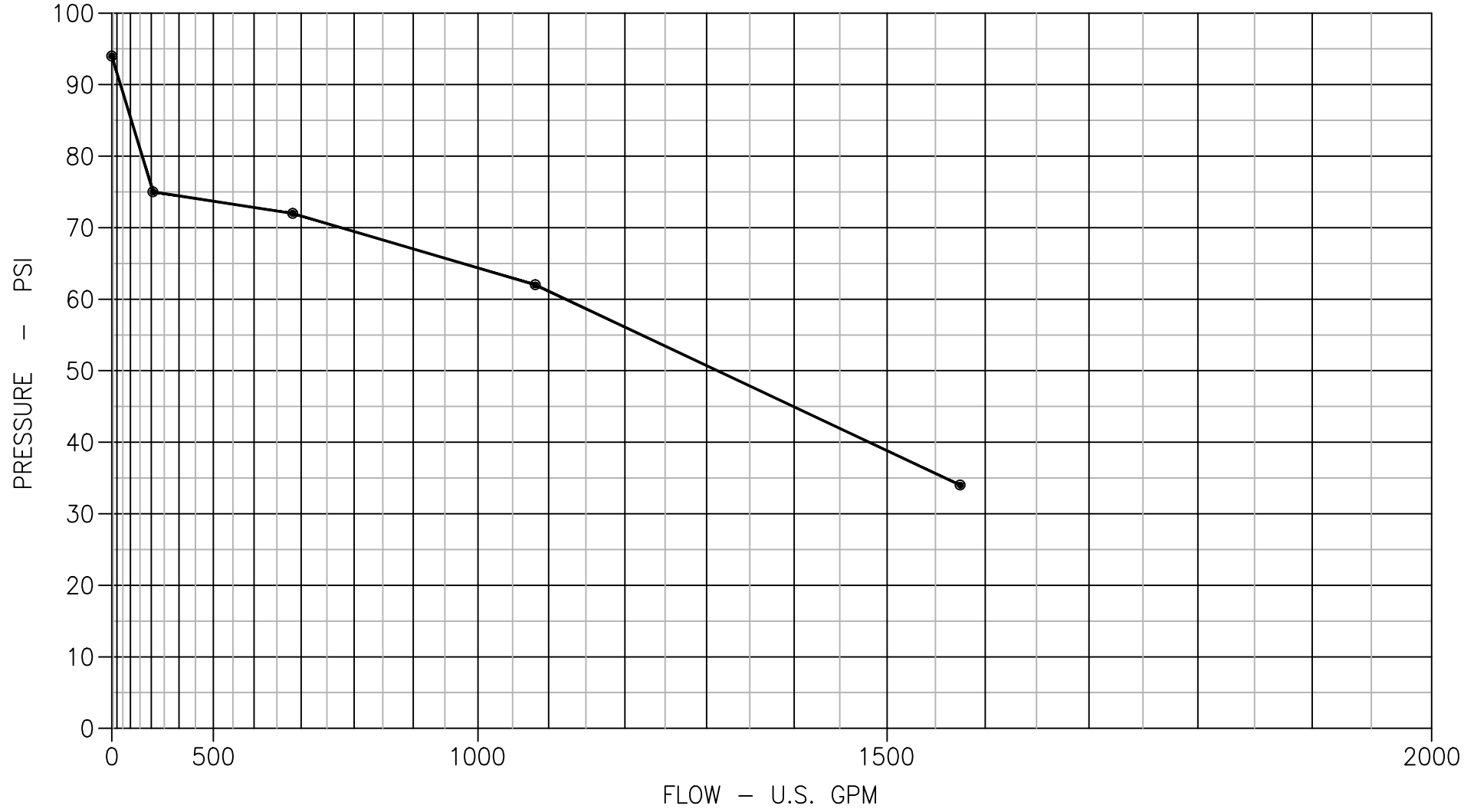

STATIC PRESSURE : 94 PSI

| TEST NO. | NO. OF NOZZLES | NOZZLE DIAMETER (INCHES) | DISCHARGE CO-EFFICIENT | RESIDUAL PRESSURE (PSI) | PITOT PRESSURE (PSI) | DISCHARGE (U.S.GPM) |
|---|---|---|---|---|---|---|
| 1 | 1 | 1-1/8 | 0.97 | 75 | 70 | 306 |
| 2 | 1 | 1-3/4 | 0.97 | 72 | 60 | 686 |
| 3 | 1 | 2-1/2 | 0.9 | 62 | 50 | 1186 |
| 4 | 2 | 2-1/2 | 0.9 | 34 | 22 | 1574 |

FIRST FOR FIRE, LIFE SAFETY & SECURITY
VIPOND INC
est. 1945

| | |
|---|---|
| MUSKOKA ROAD 5 | BY : ZAC SCHELL |
| PORT SEVERN, ONTARIO | OFFICE : BARRIE |
| | TEST BY : VIPOND & PUC |
| | DATE : JANUARY 29, 2015 |

| STATIC: | | RESIDUAL: | | FLOW: |
|---|---|---|---|---|
| 94 PSI | TEST#1 | 75 PSI | @ | 306 GPM |
| | TEST#2 | 72 PSI | @ | 686 GPM |
| | TEST#3 | 62 PSI | @ | 1186 GPM |
| | TEST#4 | 34 PSI | @ | 1574 GPM |



TULLOCH ENGINEERING

TULLOCH ENGINEERING

Port Severn Heights Subdivision Phase 1 - SANITARY SEWER DESIGN (Preliminary)

SANITARY SEWER PIPE SIZING with DESIGN CAPACITIES

DATE: 22-Dec-21 | DESIGN/CHECK: BB/TM | PROJECT NO: 14-4022 | SHEET 1

**Equations and Constants**

| Residential Flow Criteria | Infiltration | Population Density | Peaking Formula - Harmon | Peaking Formula - Babbitt |
|---|---|---|---|---|
| 450 L/cap/d | 0.28 L/ha/s | 3.5 cap/lot | $M = \frac{14}{4+P^{0.5}} + 1$ | $M = \frac{5}{P^{0.2}}$ |
| | | | *where M = peaking factor, P = Design Population, in thousands* | *where M = peaking factor, P = Design Population, in thousands* |

| STREET NAME | Area: DRAINAGE AREA NO. | SANITARY SEWER INVERTS ARE SUBJECT TO FINAL DESIGN | FROM UPSTREAM | TO DOWNSTREAM | POPULATION: DRAINAGE AREA | POPULATION: No. OF CONNECTIONS (ERU) | POPULATION: TOTAL SECTIONAL POPULATION | POPULATION: TOTAL CUMULATIVE POPULATION | PEAK FLOWS: PEAKING FACTOR (HARMON FORMULA) | PEAK FLOWS: PEAKING FACTOR (BABBITT FORMULA) | PEAK FLOWS: AVG. RESIDENTIAL FLOW | PEAK FLOWS: PEAK RESIDENTIAL FLOW (HARMON FORMULA) | PEAK FLOWS: PEAK RESIDENTIAL FLOW (BABBITT FORMULA) | PEAK FLOWS: PEAK EXTRANEOUS FLOW | DESIGN FLOWS: SECTIONAL DESIGN FLOW | DESIGN FLOWS: ACC TOTAL DESIGN FLOW | PIPE: LENGTH | PIPE: PIPE DIA | PIPE: GRADE | PIPE: CAPACITY | FLOW CONDITIONS: OVER/UNDER CAP | FLOW CONDITIONS: FULL FLOW VELOCITY | FLOW CONDITIONS: Q/Q full RATIO | FLOW CONDITIONS: ACTUAL VELOCITY at Q(d) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | | MH # | MH # | ha | | CAP. | CAP. | const. | const. | l/s | l/s | l/s | l/s | l/s | l/s | m | mm | m/m | l/s | l/s | m/s | | m/s |
| **PROPOSED RESIDENTIAL DEVELOPMENT FLOWING SOUTH TO MUSKOKA ROAD 5:** | | | | | | | | | | | | | | | | | | | | | | | | |
| Don Ridge Drive | 200 | | MH S24 | MH S23 | 0.54 | 12 | 42 | 42 | 4.33 | 9.43 | 0.219 | 0.947 | 2.062 | 0.151 | 1.098 | 1.098 | 89.50 | 250 | 0.0028 | 31.44 | 30.3 | 0.640 | 0.035 | 0.26 |
| Multi-Res. Block 67 | 201 | | MH S22 | MH S23 | 0.53 | 32 | 112 | 112 | 4.23 | 7.75 | 0.583 | 2.467 | 4.519 | 0.148 | 2.62 | 2.62 | 12.20 | 200 | 0.0040 | 20.72 | 18.1 | 0.660 | 0.126 | 0.44 |
| Don Ridge Drive | 202 | | MH S23 | MH S19 | 0.43 | 8 | 28 | 182 | 4.16 | 7.03 | 0.146 | 0.607 | 1.025 | 0.120 | 0.73 | 4.44 | 90.50 | 250 | 0.0028 | 31.44 | 27.0 | 0.640 | 0.141 | 0.44 |
| Multi-Res. Block 71 and 73 | 203 | | MH S18 | MH S19 | 1.61 | 80 | 280 | 280 | 4.09 | 6.45 | 1.458 | 5.966 | 9.406 | 0.451 | 6.42 | 6.42 | 10.80 | 200 | 0.0040 | 20.72 | 14.3 | 0.660 | 0.310 | 0.57 |
| Don Ridge Drive | 204 | | MH S19 | MH S14 | 0.48 | 9 | 32 | 494 | 3.98 | 5.76 | 0.164 | 0.652 | 0.945 | 0.134 | 0.79 | 11.65 | 102.60 | 250 | 0.0028 | 31.44 | 19.8 | 0.640 | 0.370 | 0.58 |
| Don Ridge Drive | 205 | | MH S14 | MH S13 | 0.43 | 9 | 32 | 525 | 3.96 | 5.69 | 0.164 | 0.650 | 0.933 | 0.120 | 0.77 | 12.42 | 70.10 | 250 | 0.0028 | 31.44 | 19.0 | 0.640 | 0.395 | 0.59 |
| Don Ridge Drive | 206 | | PHASE 2 | MH S12 | | 0 | 0 | 0 | 4.50 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 | 0.00 | 1.00 | 250 | 0.0028 | 31.44 | 31.4 | 0.640 | 0.000 | 0.00 |
| Don Ridge Drive | 207 | | MH S12 | MH S13 | 0.61 | 9 | 32 | 32 | 4.35 | 9.98 | 0.164 | 0.714 | 1.638 | 0.171 | 0.88 | 0.88 | 100.00 | 250 | 0.0028 | 31.44 | 30.6 | 0.640 | 0.028 | 0.26 |
| Ashton Road | 208 | | MH S13 | MH S11 | 0.64 | 7 | 25 | 581 | 3.94 | 5.57 | 0.128 | 0.503 | 0.711 | 0.179 | 0.68 | 13.98 | 69.40 | 250 | 0.0028 | 31.44 | 17.5 | 0.640 | 0.445 | 0.62 |
| Ashton Road | 209 | | MH S11 | MH S10 | 0.81 | 9 | 32 | 613 | 3.93 | 5.52 | 0.164 | 0.644 | 0.905 | 0.227 | 0.87 | 14.85 | 86.60 | 250 | 0.0028 | 31.44 | 16.6 | 0.640 | 0.472 | 0.63 |
| Ashton Road | 210 | SUBJECT TO FINAL DESIGN | MH S10 | MH S9 | 0.64 | 5 | 18 | 630 | 3.92 | 5.48 | 0.091 | 0.357 | 0.500 | 0.179 | 0.54 | 15.39 | 103.40 | 300 | 0.0022 | 45.32 | 29.9 | 0.641 | 0.340 | 0.57 |
| Ashton Road | 211 | | MH S9 | MH S8 | 0.99 | 12 | 42 | 672 | 3.90 | 5.41 | 0.219 | 0.854 | 1.184 | 0.277 | 1.13 | 16.52 | 103.60 | 300 | 0.0022 | 45.32 | 28.8 | 0.641 | 0.365 | 0.58 |
| Knightsbridge Drive | 212 | | MH S8 | MH S7 | 0.10 | 0 | 0 | 672 | 3.90 | 5.41 | 0.000 | 0.000 | 0.000 | 0.028 | 0.03 | 16.55 | 51.20 | 300 | 0.0022 | 45.32 | 28.8 | 0.641 | 0.365 | 0.58 |
| Knightsbridge Drive | 213 | | MH S7 | MH S6 | 0.17 | 0 | 0 | 672 | 3.90 | 5.41 | 0.000 | 0.000 | 0.000 | 0.048 | 0.05 | 16.60 | 82.30 | 300 | 0.0022 | 45.32 | 28.7 | 0.641 | 0.366 | 0.58 |
| Knightsbridge Drive | 214 | | MH S6 | MH S5 | 0.41 | 5 | 18 | 690 | 3.90 | 5.39 | 0.091 | 0.355 | 0.491 | 0.115 | 0.47 | 17.07 | 55.20 | 300 | 0.0022 | 45.32 | 28.3 | 0.641 | 0.377 | 0.58 |
| Knightsbridge Drive | 215 | | MH S5 | MH S4 | 0.55 | 8 | 28 | 718 | 3.89 | 5.34 | 0.146 | 0.567 | 0.779 | 0.154 | 0.72 | 17.79 | 60.30 | 300 | 0.0022 | 45.32 | 27.5 | 0.641 | 0.393 | 0.59 |

| | Area | SANITARY SEWER INVERTS ARE SUBJECT TO FINAL DESIGN | | | POPULATION | | | | PEAK FLOWS | | | | | | DESIGN FLOWS | | PIPE | | | | FLOW CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STREET NAME | DRAINAGE AREA NO. | | FROM UPSTREAM | TO DOWNSTREAM | DRAINAGE AREA | No. OF CONNECTIONS (ERU) | TOTAL SECTIONAL POPULATION | TOTAL CUMULATIVE POPULATION | PEAKING FACTOR (HARMON FORMULA) | PEAKING FACTOR (BABBITT FORMULA) | AVG. RESIDENTIAL FLOW | PEAK RESIDENTIAL FLOW (HARMON FORMULA) | PEAK RESIDENTIAL FLOW (BABBITT FORMULA) | PEAK EXTRANEOUS FLOW | SECTIONAL DESIGN FLOW | ACC TOTAL DESIGN FLOW | LENGTH | PIPE DIA | GRADE | CAPACITY | OVER/UNDER CAP | FULL FLOW VELOCITY | Q/Q full RATIO | ACTUAL VELOCITY at Q(d) |
| | No. | | MH # | MH # | ha | | CAP. | CAP. | const. | const. | l/s | l/s | l/s | l/s | l/s | l/s | m | mm | m/m | l/s | l/s | m/s | | m/s |
| Knightsbridge Drive | 216 | | **MH S4** | **MH S3** | **0.77** | 11 | 39 | 756 | 3.88 | 5.29 | 0.201 | 0.777 | 1.060 | 0.216 | 0.99 | 18.78 | **88.60** | **300** | 0.0023 | 46.34 | 27.6 | 0.656 | 0.405 | 0.62 |
| Knightsbridge Drive | 217 | | **MH S3** | **MH S2** | **0.60** | 6 | 21 | 777 | 3.87 | 5.26 | 0.109 | 0.423 | 0.575 | 0.168 | 0.59 | 19.37 | **89.50** | **300** | 0.0024 | 47.33 | 28.0 | 0.670 | 0.409 | 0.63 |
| Knightsbridge Drive | 218 | | **MH S2** | **MH S1** | **0.17** | 1 | 4 | 781 | 3.87 | 5.25 | 0.018 | 0.070 | 0.096 | 0.048 | 0.12 | 19.49 | **70.10** | **300** | 0.0024 | 47.33 | 27.8 | 0.670 | 0.412 | 0.63 |
| Knightsbridge Drive | 219 | | **MH S1** | **EXIST. SAN MH5** | **0.09** | 0 | 0 | 781 | 3.87 | 5.25 | 0.000 | 0.000 | 0.000 | 0.025 | 0.03 | 19.52 | **98.50** | **300** | 0.0024 | 47.33 | 27.8 | 0.670 | 0.412 | 0.63 |
| ROW | N/A | | **EXIST. SAN MH-5** | **EXIST. SAN. MH-5A** | **N/A** | 0 | 0 | 781 | 3.87 | 5.25 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 | 19.52 | **73.47** | **300** | 0.0030 | 52.92 | 33.4 | 0.749 | 0.369 | 0.68 |

NOTE: A population density of 3.5 persons/ha was used for all multi residential apartment units.

TULLOCH ENGINEERING

Port Severn Heights Subdivision Phase 1 Plus Phase 2 & 3 - SANITARY SEWER DESIGN (Preliminary)

SANITARY SEWER PIPE SIZING with DESIGN CAPACITIES

DATE: 22-Dec-21 | DESIGN/CHECK: BB/TM | PROJECT NO: 14-4022 | SHEET 1

**Equations and Constants**

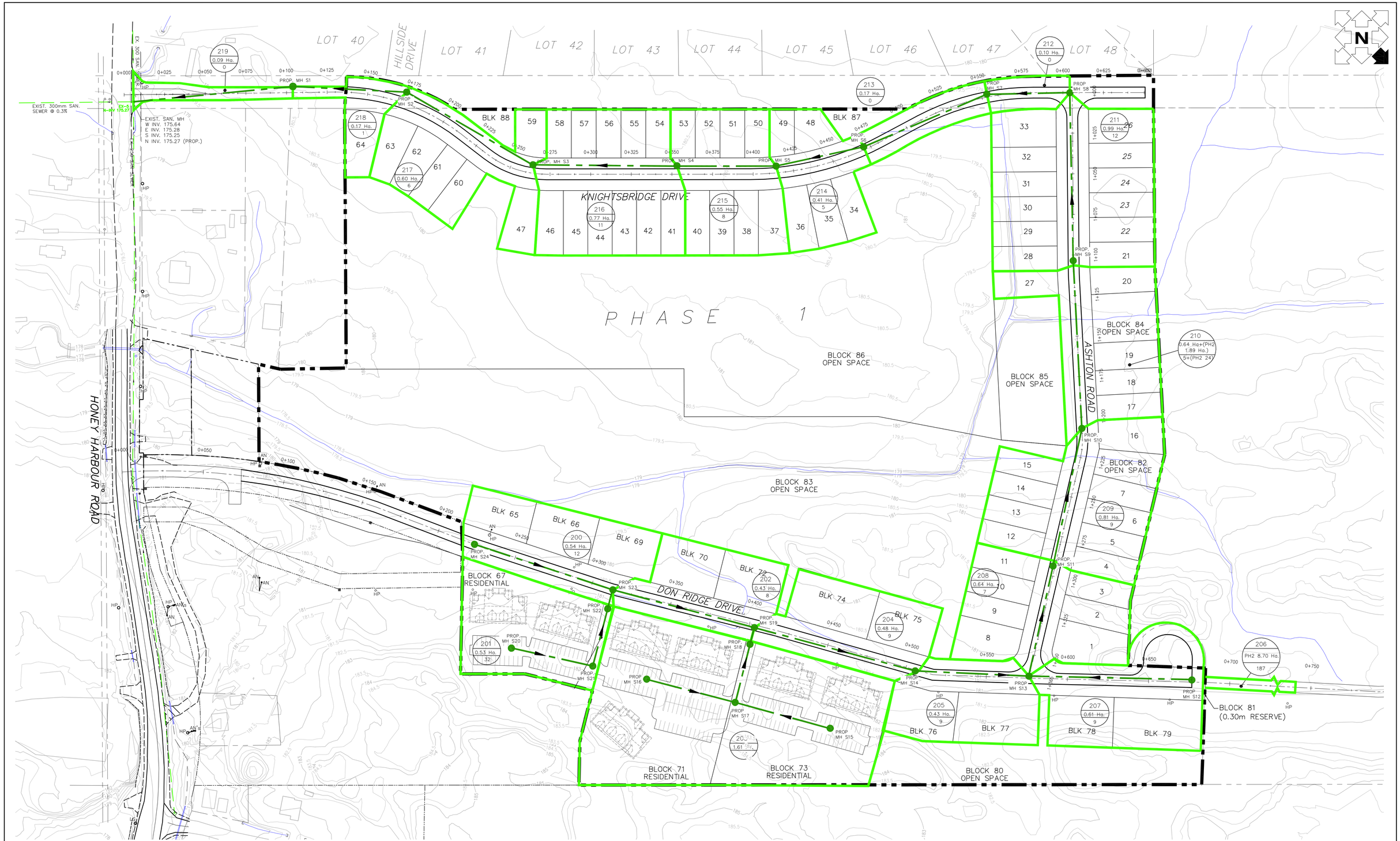
| Residential Flow Criteria | Infiltration | Population Density | Peaking Formula - Harmon | Peaking Formula - Babbitt |
|---|---|---|---|---|
| 450 L/cap/d | 0.28 L/ha/s | 3.5 cap/lot | $M = \frac{14}{4+P^{0.5}} + 1$ | $M = \frac{5}{P^{0.2}}$ |
| | | | *where* M = peaking factor; P = Design Population, in thousands | *where* M = peaking factor; P = Design Population, in thousands |

| STREET NAME | Area DRAINAGE AREA NO. | SANITARY SEWER INVERTS ARE SUBJECT TO FINAL DESIGN | FROM UPSTREAM | TO DOWNSTREAM | POPULATION: DRAINAGE AREA | POPULATION: No. OF CONNECTIONS (ERU) | POPULATION: TOTAL SECTIONAL POPULATION | POPULATION: TOTAL CUMULATIVE POPULATION | PEAK FLOWS: PEAKING FACTOR (HARMON FORMULA) | PEAK FLOWS: PEAKING FACTOR (BABBITT FORMULA) | PEAK FLOWS: AVG. RESIDENTIAL FLOW | PEAK FLOWS: PEAK RESIDENTIAL FLOW (HARMON FORMULA) | PEAK FLOWS: PEAK RESIDENTIAL FLOW (BABBITT FORMULA) | PEAK FLOWS: PEAK EXTRANEOUS FLOW | DESIGN FLOWS: SECTIONAL DESIGN FLOW | DESIGN FLOWS: ACC TOTAL DESIGN FLOW | PIPE: LENGTH | PIPE: PIPE DIA | PIPE: GRADE | PIPE: CAPACITY | FLOW CONDITIONS: OVER/UNDER CAP | FLOW CONDITIONS: FULL FLOW VELOCITY | FLOW CONDITIONS: Q/Q full RATIO | FLOW CONDITIONS: ACTUAL VELOCITY at Q(d) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | | MH # | MH # | ha | | CAP. | CAP. | const. | const. | l/s | l/s | l/s | l/s | l/s | l/s | m | mm | m/m | l/s | l/s | m/s | | m/s |
| **PROPOSED RESIDENTIAL DEVELOPMENT FLOWING SOUTH TO MUSKOKA ROAD 5:** | | | | | | | | | | | | | | | | | | | | | | | | |
| Don Ridge Drive | 200 | | MH S24 | MH S23 | 0.54 | 12 | 42 | 42 | 4.33 | 9.43 | 0.219 | 0.947 | 2.062 | 0.151 | 1.098 | 1.098 | 89.50 | 250 | 0.0028 | 31.44 | 30.3 | 0.640 | 0.035 | 0.26 |
| Multi-Res. Block 67 | 201 | | MH S22 | MH S23 | 0.53 | 32 | 112 | 112 | 4.23 | 7.75 | 0.583 | 2.467 | 4.519 | 0.148 | 2.62 | 2.62 | 12.20 | 200 | 0.0040 | 20.72 | 18.1 | 0.660 | 0.126 | 0.44 |
| Don Ridge Drive | 202 | | MH S23 | MH S19 | 0.43 | 8 | 28 | 182 | 4.16 | 7.03 | 0.146 | 0.607 | 1.025 | 0.120 | 0.73 | 4.44 | 90.50 | 250 | 0.0028 | 31.44 | 27.0 | 0.640 | 0.141 | 0.44 |
| Multi-Res. Block 71 and 73 | 203 | | MH S18 | MH S19 | 1.61 | 80 | 280 | 280 | 4.09 | 6.45 | 1.458 | 5.966 | 9.406 | 0.451 | 6.42 | 6.42 | 10.80 | 200 | 0.0040 | 20.72 | 14.3 | 0.660 | 0.310 | 0.57 |
| Don Ridge Drive | 204 | | MH S19 | MH S14 | 0.48 | 9 | 32 | 494 | 3.98 | 5.76 | 0.164 | 0.652 | 0.945 | 0.134 | 0.79 | 11.65 | 102.60 | 250 | 0.0028 | 31.44 | 19.8 | 0.640 | 0.370 | 0.58 |
| Don Ridge Drive | 205 | | MH S14 | MH S13 | 0.43 | 9 | 32 | 525 | 3.96 | 5.69 | 0.164 | 0.650 | 0.933 | 0.120 | 0.77 | 12.42 | 70.10 | 250 | 0.0028 | 31.44 | 19.0 | 0.640 | 0.395 | 0.59 |
| Don Ridge Drive | 206 | | PHASE 2 | MH S12 | 8.70 | 187 | 655 | 655 | 3.91 | 0.00 | 3.409 | 13.333 | 0.000 | 2.436 | 15.77 | 15.77 | 1.00 | 250 | 0.0028 | 31.44 | 15.7 | 0.640 | 0.502 | 0.64 |
| Don Ridge Drive | 207 | | MH S12 | MH S13 | 0.61 | 9 | 32 | 686 | 3.90 | 5.39 | 0.164 | 0.640 | 0.885 | 0.171 | 0.81 | 16.58 | 100.00 | 250 | 0.0028 | 31.44 | 14.9 | 0.640 | 0.527 | 0.65 |
| Ashton Road | 208 | | MH S13 | MH S11 | 0.64 | 7 | 25 | 1236 | 3.74 | 4.79 | 0.128 | 0.477 | 0.612 | 0.179 | 0.66 | 29.65 | 69.40 | 300 | 0.0022 | 45.32 | 15.7 | 0.641 | 0.654 | 0.69 |
| Ashton Road | 209 | | MH S11 | MH S10 | 0.81 | 9 | 32 | 1267 | 3.73 | 4.77 | 0.164 | 0.612 | 0.782 | 0.227 | 0.84 | 30.49 | 86.60 | 300 | 0.0022 | 45.32 | 14.8 | 0.641 | 0.673 | 0.69 |
| Ashton Road | 210 | SUBJECT TO FINAL DESIGN | MH S10 | MH S9 | 2.53 | 29 | 102 | 1369 | 3.71 | 4.70 | 0.529 | 1.960 | 2.482 | 0.708 | 2.67 | 33.16 | 103.40 | 300 | 0.0022 | 45.32 | 12.2 | 0.641 | 0.732 | 0.71 |
| Ashton Road | 211 | | MH S9 | MH S8 | 0.99 | 12 | 42 | 1411 | 3.70 | 4.67 | 0.219 | 0.809 | 1.021 | 0.277 | 1.09 | 34.25 | 103.60 | 300 | 0.0022 | 45.32 | 11.1 | 0.641 | 0.756 | 0.71 |
| Knightsbridge Drive | 212 | | MH S8 | MH S7 | 0.10 | 0 | 0 | 1411 | 3.70 | 4.67 | 0.000 | 0.000 | 0.000 | 0.028 | 0.03 | 34.27 | 51.20 | 300 | 0.0022 | 45.32 | 11.0 | 0.641 | 0.756 | 0.71 |
| Knightsbridge Drive | 213 | | MH S7 | MH S6 | 0.17 | 0 | 0 | 1411 | 3.70 | 4.67 | 0.000 | 0.000 | 0.000 | 0.048 | 0.05 | 34.32 | 82.30 | 300 | 0.0022 | 45.32 | 11.0 | 0.641 | 0.757 | 0.71 |
| Knightsbridge Drive | 214 | | MH S6 | MH S5 | 0.41 | 5 | 18 | 1428 | 3.69 | 4.66 | 0.091 | 0.337 | 0.424 | 0.115 | 0.45 | 34.77 | 55.20 | 300 | 0.0022 | 45.32 | 10.5 | 0.641 | 0.767 | 0.71 |
| Knightsbridge Drive | 215 | | MH S5 | MH S4 | 0.55 | 8 | 28 | 1456 | 3.69 | 4.64 | 0.146 | 0.538 | 0.676 | 0.154 | 0.69 | 35.46 | 60.30 | 300 | 0.0023 | 46.34 | 10.9 | 0.656 | 0.765 | 0.73 |

| | Area | SANITARY SEWER INVERTS ARE SUBJECT TO FINAL DESIGN | | | POPULATION | | | | PEAK FLOWS | | | | | | DESIGN FLOWS | | PIPE | | | | FLOW CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STREET NAME | DRAINAGE AREA NO. | | FROM UPSTREAM | TO DOWNSTREAM | DRAINAGE AREA | No. OF CONNECTIONS (ERU) | TOTAL SECTIONAL POPULATION | TOTAL CUMULATIVE POPULATION | PEAKING FACTOR (HARMON FORMULA) | PEAKING FACTOR (BABBITT FORMULA) | AVG. RESIDENTIAL FLOW | PEAK RESIDENTIAL FLOW (HARMON FORMULA) | PEAK RESIDENTIAL FLOW (BABBITT FORMULA) | PEAK EXTRANEOUS FLOW | SECTIONAL DESIGN FLOW | ACC TOTAL DESIGN FLOW | LENGTH | PIPE DIA | GRADE | CAPACITY | OVER/UNDER CAP | FULL FLOW VELOCITY | Q/Q full RATIO | ACTUAL VELOCITY at Q(d) |
| | **No.** | | **MH #** | **MH #** | **ha** | | **CAP.** | **CAP.** | **const.** | **const.** | **l/s** | **l/s** | **l/s** | **l/s** | **l/s** | **l/s** | **m** | **mm** | **m/m** | **l/s** | **l/s** | **m/s** | | **m/s** |
| Knightsbridge Drive | 216 | | **MH S4** | **MH S3** | **0.77** | 11 | 39 | 1495 | 3.68 | 4.61 | 0.201 | 0.738 | 0.925 | 0.216 | 0.95 | 36.42 | **88.60** | **300** | 0.0024 | 47.33 | 10.9 | 0.670 | 0.769 | 0.74 |
| Knightsbridge Drive | 217 | | **MH S3** | **MH S2** | **0.60** | 6 | 21 | 1516 | 3.68 | 4.60 | 0.109 | 0.402 | 0.503 | 0.168 | 0.57 | 36.99 | **89.50** | **300** | 0.0025 | 48.31 | 11.3 | 0.683 | 0.766 | 0.76 |
| Knightsbridge Drive | 218 | | **MH S2** | **MH S1** | **0.17** | 1 | 4 | 1519 | 3.68 | 4.60 | 0.018 | 0.067 | 0.084 | 0.048 | 0.11 | 37.10 | **70.10** | **300** | 0.0025 | 48.31 | 11.2 | 0.683 | 0.768 | 0.76 |
| Knightsbridge Drive | 219 | | **MH S1** | **EXIST. SAN MH5** | **0.09** | 0 | 0 | 1519 | 3.68 | 4.60 | 0.000 | 0.000 | 0.000 | 0.025 | 0.03 | 37.13 | **98.50** | **300** | 0.0025 | 48.31 | 11.2 | 0.683 | 0.769 | 0.76 |
| ROW | N/A | | **EXIST. SAN MH-5** | **EXIST. SAN. MH-5A** | **N/A** | 0 | 0 | 1519 | 3.68 | 4.60 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 | 37.13 | **73.47** | **300** | 0.0030 | 52.92 | 15.8 | 0.749 | 0.702 | 0.82 |

NOTE: A population density of 3.5 persons/ERU was used for all multi residential apartment units.

NOTE: Phase 2 ERUs and extraneous flow drainage areas were obtained from Draft Plan S2016-1. Phase 3 ERUs and extraneous flow drainage areas were retrieved from the 2015 Phase 2 & 3 Preliminary FSR Master Plan. Area 206 received an additional future 187 ERU and 8.70 ha of sanitary drainage area from Phase 2 and 3. Area 210 received an additional future 24 ERU and 1.86 ha of sanitary drainage area from Phase 2.




LEGEND

- EXIST. CONTOURS
- EXIST. SANITARY MANHOLE
- EXIST. SANITARY SEWER
- PROP. SANITARY MANHOLE
- PROP. SANITARY SEWER
- EXIST. STORM MH / CB
- EXIST. STORM SEWER
- PROP. STORM MH / CB
- PROP. STORM SEWER
- EXIST. WATERMAIN
- PROP. WATERMAIN
- MODELED WATERMAIN NODE
- PROP. FIRE HYDRANT
- CATCHMENT AREA DESIGNATION
- CATCHMENT AREA IN HECTARES
- UNIT COUNT (ERU)
- SANITARY CATCHMENT AREA BOUNDARY

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| REVISED SUBDIVISION BLOCKS 67, 71 AND 73 | 1 | NOV. 17, 2021 | TM |
| ISSUED FOR UPDATED FSR | 2 | DEC. 22, 2021 | TM |

TULLOCH ENGINEERING

# PORT SEVERN HEIGHTS
# PORT SEVERN, ONTARIO

## PRELIMINARY SANITARY DRAINAGE AREAS

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,000 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | JULY 15, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S2 |

# APPENDIX B

## IDF Curve Look-up – MTO

## OTTHYMO Detailed Output

## Ontario Surficial Geology Map and Legend

## 2013 Phase 1 Stormwater Management Brief

## 2014 Phase 1 Stormwater Management Brief

Ontario IDF CURVE LOOKUP

# Active coordinate

44° 48' 15" N, 79° 44' 45" W (44.804167,-79.745833)

Retrieved: Thu, 16 Dec 2021 20:40:53 GMT


## Location summary

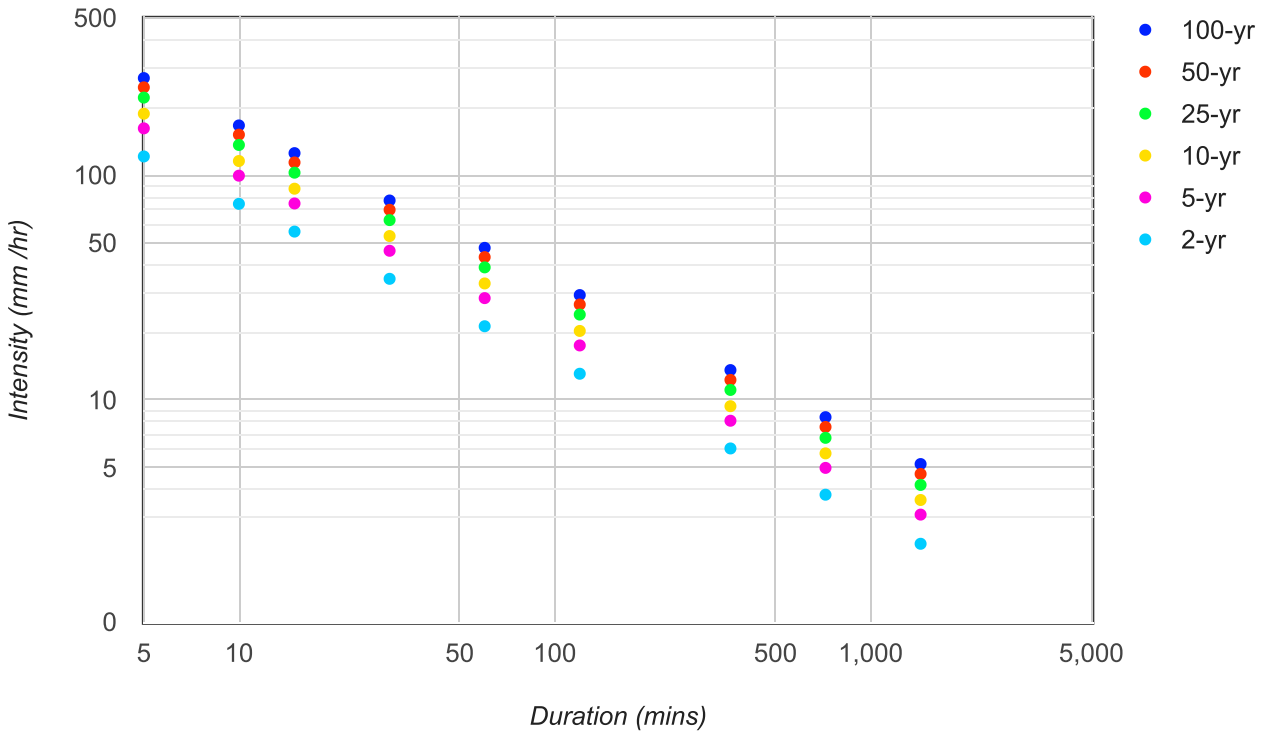
These are the locations in the selection.

**IDF Curve:** 44° 48' 15" N, 79° 44' 45" W (44.804167,-79.745833)

## Results

An IDF curve was found.

**Coordinate: 44.804167, -79.745833**
**IDF curve year: 2010**



## Coefficient summary

**IDF Curve:** 44° 48' 15" N, 79° 44' 45" W (44.804167,-79.745833)

Retrieved: Thu, 16 Dec 2021 20:40:53 GMT

**Data year:** 2010
**IDF curve year:** 2010

| Return period | 2-yr | 5-yr | 10-yr | 25-yr | 50-yr | 100-yr |
|---|---|---|---|---|---|---|
| **A** | 21.3 | 28.4 | 33.0 | 38.9 | 43.2 | 47.5 |
| **B** | -0.699 | -0.699 | -0.699 | -0.699 | -0.699 | -0.699 |

## Statistics

### Rainfall intensity (mm $hr^{-1}$)

| Duration | 5-min | 10-min | 15-min | 30-min | 1-hr | 2-hr | 6-hr | 12-hr | 24-hr |
|---|---|---|---|---|---|---|---|---|---|
| **2-yr** | 121.0 | 74.5 | 56.1 | 34.6 | 21.3 | 13.1 | 6.1 | 3.8 | 2.3 |
| **5-yr** | 161.3 | 99.4 | 74.8 | 46.1 | 28.4 | 17.5 | 8.1 | 5.0 | 3.1 |
| **10-yr** | 187.4 | 115.5 | 87.0 | 53.6 | 33.0 | 20.3 | 9.4 | 5.8 | 3.6 |
| **25-yr** | 221.0 | 136.1 | 102.5 | 63.1 | 38.9 | 24.0 | 11.1 | 6.8 | 4.2 |
| **50-yr** | 245.4 | 151.2 | 113.8 | 70.1 | 43.2 | 26.6 | 12.3 | 7.6 | 4.7 |
| **100-yr** | 269.8 | 166.2 | 125.2 | 77.1 | 47.5 | 29.3 | 13.6 | 8.4 | 5.2 |

### Rainfall depth (mm)

| Duration | 5-min | 10-min | 15-min | 30-min | 1-hr | 2-hr | 6-hr | 12-hr | 24-hr |
|---|---|---|---|---|---|---|---|---|---|
| **2-yr** | 10.1 | 12.4 | 14.0 | 17.3 | 21.3 | 26.2 | 36.5 | 45.0 | 55.4 |
| **5-yr** | 13.4 | 16.6 | 18.7 | 23.1 | 28.4 | 35.0 | 48.7 | 60.0 | 73.9 |
| **10-yr** | 15.6 | 19.2 | 21.7 | 26.8 | 33.0 | 40.7 | 56.6 | 69.7 | 85.9 |
| **25-yr** | 18.4 | 22.7 | 25.6 | 31.6 | 38.9 | 47.9 | 66.7 | 82.2 | 101.2 |
| **50-yr** | 20.4 | 25.2 | 28.5 | 35.1 | 43.2 | 53.2 | 74.1 | 91.3 | 112.4 |
| **100-yr** | 22.5 | 27.7 | 31.3 | 38.6 | 47.5 | 58.5 | 81.5 | 100.4 | 123.6 |

## Terms of Use

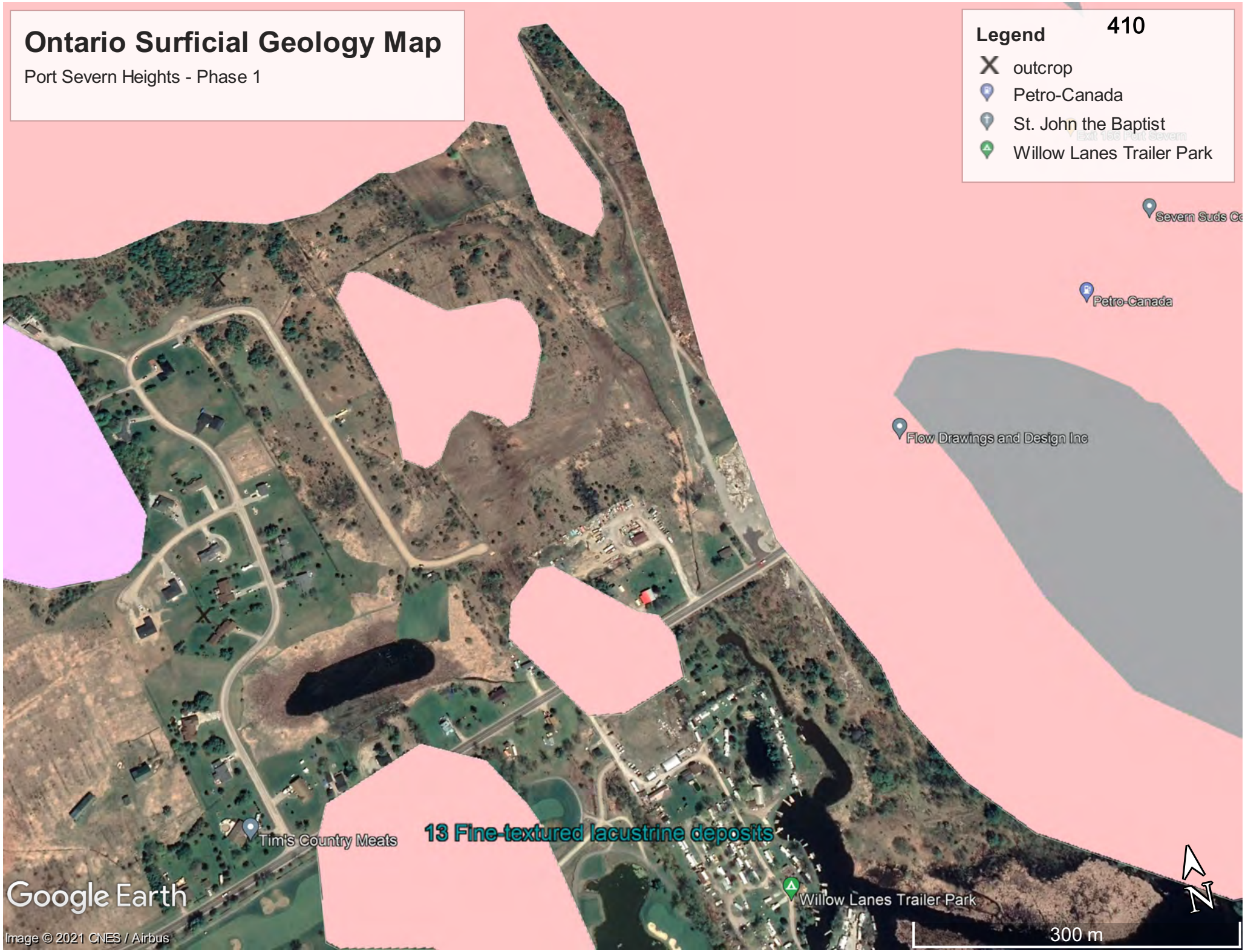
# Ontario Surficial Geology Map

Port Severn Heights - Phase 1

410

**Legend**

- outcrop
- Petro-Canada
- St. John the Baptist
- Willow Lanes Trailer Park



Ontario

Ontario Geological Survey

SURFICIAL GEOLOGY OF
# SOUTHERN ONTARIO

This map is published with the permission of the Senior Manager, Sedimentary Geoscience Section, Ontario Geological Survey.


Location Map

## SOURCES OF INFORMATION

Base map: Natural Resources and Values Information System (NRVIS)

Projection: NAD 83

## CREDITS

Author: The Ontario Geological Survey

Acknowledgements: John Dodge (OGS), Andy Bajc (OGS), George Gao (OGS), Steve van Haaften (OGS), Shannon Evers (OGS), Steve Leney (MNR), John Ernsting (MNR), Scott Christilaw (MNR), Andrew Moore (GSC)



Issued 2003.

Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form:

The Ontario Geological Survey. 2003. Surficial Geology of Southern Ontario.

## LEGEND

- **Fill**
- **Organic Deposits:** peat, muck and marl
- **Silt**
- **Clay**
- **Sand**
- **Gravel**
- **Till (Diamicton)**
- **Sedimentary (Paleozoic) bedrock**
- **Precambrian bedrock**

## Correlation Matrix:

| Material | Current map units |
|---|---|
| Fill | 21 |
| Organic Materials | 20 |
| Silt & Clay | 8, 10, 12, 13, 15, 18, 19 |
| Sand & Gravel | 6, 7, 9, 11, 12, 14, 16, 18, 19 |
| Sand | 6, 7, 9, 11, 12, 14, 16, 17, 18, 19 |
| Till (Diamicton) | 5, 5a, 5b, 5c, 5d, 5e |
| Sedimentary bedrock | 3, 4 |
| Precambrian bedrock | 1, 2 |

## LEGEND

### PHANEROZOIC

#### CENOZOIC

##### QUATERNARY

###### RECENT

21 **Man-made deposits:** fill, sewage lagoon, landfill, urban development

20 **Organic Deposits:** peat, muck, marl

19 **Modern alluvial deposits:** clay, silt, sand, gravel, may contain organic remains

18 **Colluvial deposits:** boulders, scree, talus, undifferentiated landslide materials

17 **Eolian deposits:** fine to very fine sand and silt

16 **Coarse-textured marine deposits:** sand, gravel, minor silt and clay
16a Deltaic deposits
16b Littoral deposits
16c Foreshore and basinal deposits

15 **Fine-textured marine deposits:** silt and clay, minor sand and gravel

14 **Coarse-textured lacustrine deposits:** sand, gravel, minor silt and clay
14a Deltaic deposit
14b Littoral deposits
14c Foreshore and basinal deposits

13 **Fine-textured lacustrine deposits:** silt and clay, minor sand and gravel

###### PLEISTOCENE

12 **Older alluvial deposits:** clay, silt, sand, gravel, may contain organic remains

11 **Coarse-textured glaciomarine deposits:** sand, gravel, minor silt and clay
11a Deltaic deposits
11b Littoral deposits
11c Foreshore and basinal deposits

10 **Fine-textured glaciomarine deposits:** silt and clay, minor sand and gravel
10a Massive to well laminated
10b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits

9 **Coarse-textured glaciolacustrine deposits:** sand, gravel, minor silt and clay
9a Deltaic deposits
9b Littoral deposits
9c Foreshore and basinal deposits

8 **Fine-textured glaciolacustrine deposits:** silt and clay, minor sand and gravel
8a Massive to well laminated
8b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits

7 **Glaciofluvial deposits:** river deposits and delta topset facies
7a Sandy deposits
7b Gravelly deposits

6 **Ice-contact stratified deposits:** sand and gravel, minor silt, clay and till
6a In moraines, eskers, kames and crevasse fills
6b In subaquatic fans

5a **Till:** Silty sand to sand-textured till on Precambrian terrain
5a Silty sand to sand-textured till on Precambrian terrain

5b 5b Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain

5c 5c Stony, sandy silt to silty sand-textured till on Paleozoic terrain

5d 5d Clay to silt-textured till (derived from glaciolacustrine deposits or shale)

5e 5e Undifferentiated older tills, may include stratified deposits

### PALEOZOIC

4 **Bedrock-drift complex in Paleozoic terrain:**
4a Primarily till cover
4b Primarily stratified drift cover

3 **Paleozoic bedrock**

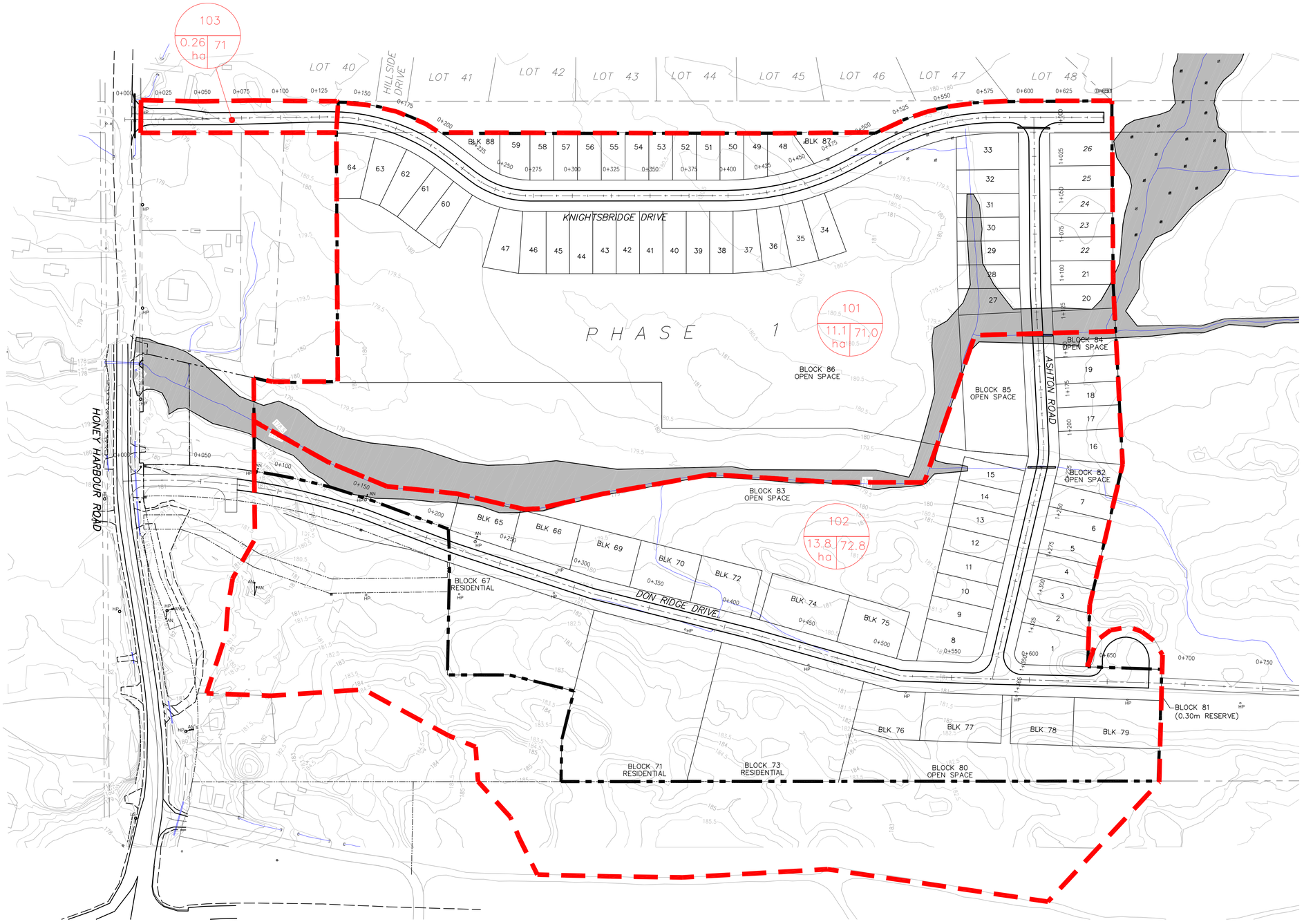
### PRECAMBRIAN

2 **Bedrock-drift complex in Precambrian terrain:**
2a Primarily till cover
2b Primarily stratified drift cover

1 **Precambrian bedrock**

## SYMBOLS

- Clay pit (active or inactive)
- Peat and muck pit
- Location of quarry
- Sand or gravel pit;
- Tailings
- Stoss and lee feature; crag and tail
- Delta, glaciolacustrine
- Drumlin or drumlinoid ridges
- Dune
- Glacial fluting
- Fossil locality
- Geotechnical or stratigraphic borehole not reaching bedrock
- Kame
- Solution weathering feature
- Kettle
- Outcrop
- Observed pebble orientation in till
- Reservoir
- Roches moutonee
- Sample site
- Small landslide scar
- Glacial striae; direction of ice movement known
- Glacial striae; direction of ice movement unknown
- Talus
- Area of sand dune
- Area of former lake bed
- Area of ribbed moraine or till ridges transverse to ice flow
- Area of scabland
- Beach ridges and near shore bars
- Shore bluff or scarp
- Crevasse filling
- Crests of large sand dune (eolian)
- Trend of moraine crest
- Bedrock scarp or escarpment
- Esker; direction of flow known
- Esker; direction of flow unknown
- Meltwater channel; inferred direction of flow
- Meltwater channel; direction of flow unknown
- Iceberg keel mark
- Ice-contact slope
- Clint and gryke topography
- Linear feature observed on aerial photograph
- Crest of megaripple
- Meltwater flow; inferred direction of flow
- Meltwater flow; direction of flow unknown
- Minor moraine
- Mapable edge of quarry or pit
- Bedrock pressure release ridge
- Ribbed or rogen moraine
- Edge of a mapable landslide scar
- Slump block, margin
- Abandoned meltwater channel or river channel; terrace escarpment
- Area of landslide scar
- Area of hummocky topography
- Area of moraine with no hummocky topography




LEGEND

- EXIST. CONTOURS
- EXIST. SANITARY MANHOLE
- EXIST. SANITARY SEWER
- PROP. SANITARY MANHOLE
- PROP. SANITARY SEWER
- EXIST. STORM MH / CB
- EXIST. STORM SEWER
- PROP. STORM MH / CB
- PROP. STORM SEWER
- PROP. CB
- PROP. CBMH
- PROP. STORM SEWER
- PROP. OIL GRIT SEPARATOR (PROP. OGS)
- PROP. DITCH
- PROP. CULVERT
- 103 / 0.26 ha / 71 — CATCHMENT AREA DESIGNATION / CATCHMENT CURVE NUMBER / CATCHMENT AREA (Ha.)
- CATCHMENT BOUNDARY

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| ISSUED FOR UPDATED FSR | 1 | DEC. 22, 2021 | TM |

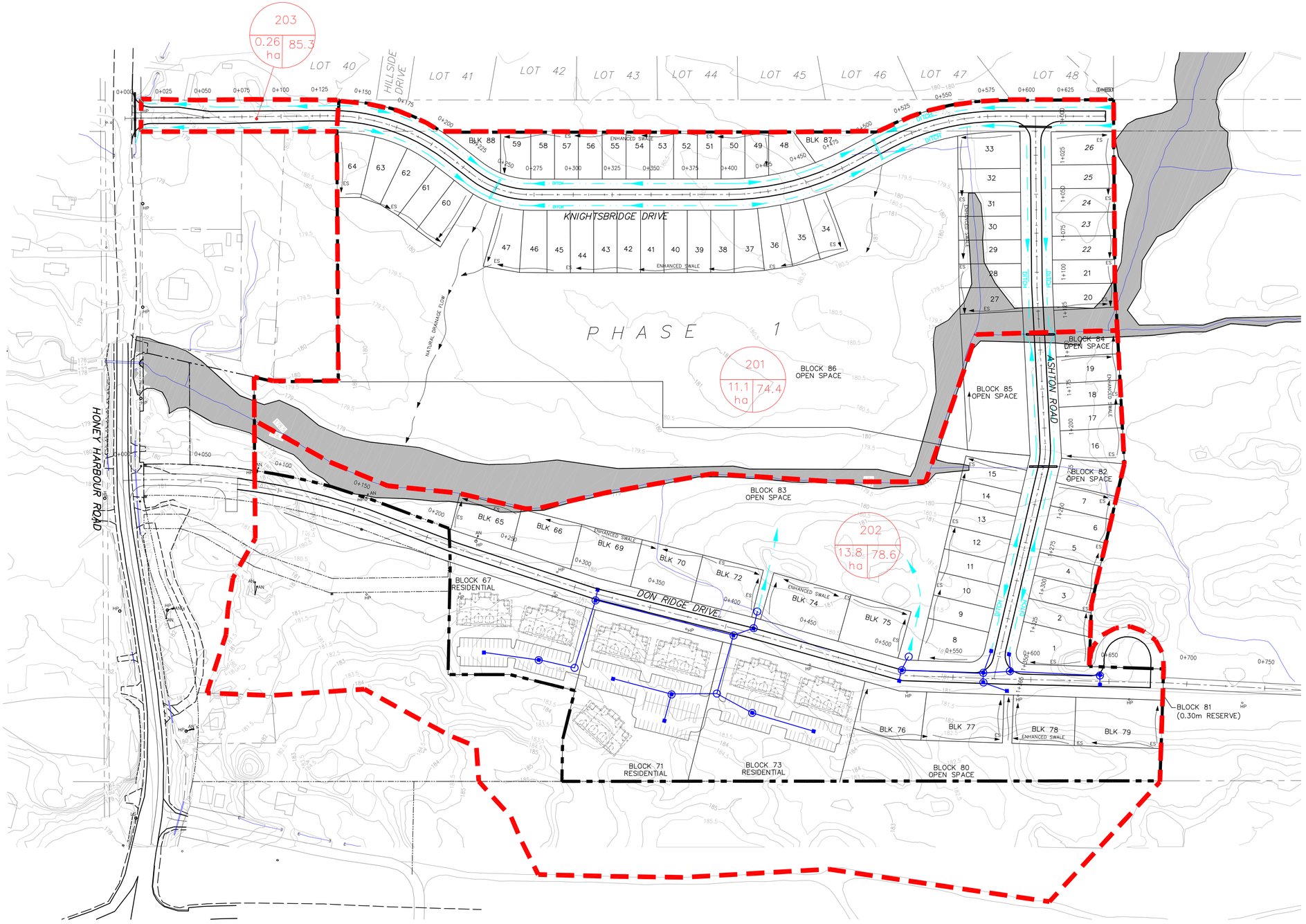
TULLOCH ENGINEERING

PORT SEVERN HEIGHTS
PORT SEVERN, ONTARIO

PRELIMINARY DRAINAGE PLAN
PRE-DEVELOPMENT DRAINAGE AREAS

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,250 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | DEC. 17, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S5 |




LEGEND

- EXIST. CONTOURS
- EXIST. SANITARY MANHOLE
- EXIST. SANITARY SEWER
- PROP. SANITARY MANHOLE
- PROP. SANITARY SEWER
- EXIST. STORM MH / CB
- EXIST. STORM SEWER
- PROP. STORM MH / CB
- PROP. STORM SEWER
- PROP. CB
- PROP. CBMH
- PROP. STORM SEWER
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- 103 / 0.26 ha / 71 — CATCHMENT AREA DESIGNATION; CATCHMENT CURVE NUMBER; CATCHMENT AREA (Ha.)
- CATCHMENT BOUNDARY

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| ISSUED FOR UPDATED FSR | 1 | DEC. 22, 2021 | TM |

TULLOCH ENGINEERING

# PORT SEVERN HEIGHTS
# PORT SEVERN, ONTARIO

## PRELIMINARY DRAINAGE PLAN
## POST DEVELOPMENT DRAINAGE AREAS

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,250 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | DEC. 17, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S6 |

PINESTONE ENGINEERING LTD.

Pinestone Engineering Ltd.
110 Kimberley Ave, Unit#1
Bracebridge, ON P1L 1Z8

T: **(705) 645-8853**
F: **(705) 645-7262**
**www.pel.ca – pinestone@pel.ca**

May 9, 2013 P.N. 09-10858.1

**Planning Department**
District Municipality of Muskoka
70 Pine Street
Bracebridge, Ontario
P1L 1N3

**Attention: Melissa Halford, MCIP, RPP**

Dear Melissa:

**Reference: Port Severn Heights in the Township of Georgian Bay**
**District Municipality of Muskoka**
**Red lined Draft Plan Approval - Response to Peer Review Comments**

Further to review comments received from SLR Consulting Ltd. dated March 20, 2013 and as discussed in our meeting held at the District offices on March 26, 2013 for the above noted red lined draft plan; we offer the following response relating to the general framework of storm water management to be accomplished within the townhouse and multi-residential blocks proposed on the east and west sides of Deer Run Drive (Bell Tower Rd.) within Phase 1.

Peer review comments made relating to soils, servicing, grading and storm water management have been duly noted and can appropriately to be satisfied with a final servicing design for this phase of the development. A servicing strategy recognizing and managing all environmentally sensitive zones and significant wildlife habitat identified within this portion of the development can be addressed at that time.

## PROPOSED DEVELOPMENT

Townhouse blocks 43 through 47 and 52 through 57 and multi-residential blocks 48, 50 and 51 are proposed to replace previously draft approved single residential lots along the east and west sides of Deer Run Trail (Street A) within Phase 1. The blocks, open space and road allowance within this portion of the Phase 1 make up an approximate area of 6.03 hectares. The expected block unit count includes 47 townhouses and 112 multi-residential units. Development within the multi-residential blocks will consist of multiple unit townhouse or apartment style building arrangements including access ways, parking and landscaped buffers. Access ways and parking areas will be constructed with asphalt surfaces. Townhouse units within those blocks fronting on Street A will include individual paved

driveways and lawn/landscape areas for each unit.

Based on the proposed land use, the maximum surface imperviousness affecting rainfall runoff is expected to be 65%.

**Site Soils**

Soil conditions within the multi-residential block area on the east side of Deer Run Dive (Bell tower Road) vary from east to west. With a predominant rock ridge or backbone of exposed bedrock along the easterly half of the block changing to shallow soil depths on the west half of the block.

Based on a site soils investigation as completed by Jacques Whitford in November of 2006, boreholes advanced along the Bell Tower Road within the multi residential block area show soils depths ranging between 1.4m and 2.4m. Three boreholes, BH1, BH2 & BH3, with locations indicated on the attached Dwg No. 1 by JW, show fine to coarse sand with some silt soils without encountering the water table. All three boreholes where advanced to refusal on bedrock.

**Pre-Development**

Under pre-development conditions, surface drainage generated within the blocks drain overland in the form of sheet flow in a westerly direction and is intercepted to the west within the main watercourse that bisects the development lands north to south. There is a portion of higher external lands to the east of the development boundary that currently drains west through the subject blocks primarily as surface sheet flow. The existing Bell Tower Road impedes surface flow somewhat causing minor storm events to collect in low areas along the east side of the roadway. There is the remnant of a farm ditch crossing blocks 46, 47, 52 and 54 in a south-westerly direction that serves to collect runoff conveying it to the main watercourse. See attached drainage area sketch SK-1.

The main watercourse which traverses the central portion of the development has previously been established as a sensitive “enhanced” level receiver under the Ministry of Environment’s criteria.

A regional storm flood line analysis was previously completed for the development’s main watercourse in 2007, as it relates to watercourse restriction at the existing culvert under Muskoka Road No. 5 (Honey Harbour Rd. The results of the previous study established a flood line limit at the 179.0m contour that should be taken into consideration with final design. However, a further review of the affects that the multi-residential block may have on the flood line analysis has not been completed at this time and it was considered unwarranted with expected negligible differences in post-development imperviousness for the revised block usage.

**Post-Development**

It is proposed that post-development surface drainage from the site be collected, attenuated, treated and conveyed to roadside ditches and sewers to be located along Street A. The original development plan for the east side of Phase 1 was to collect storm water conveyed by roadside ditches within a central storm water treatment facility adjacent to the main watercourse. However, attenuation and

treatment of storm water within the multi-residential block and townhouse blocks will provide a treatment train approach, eliminating the need for a central storm water facility (pond) to service this portion of Phase 1. See attached Sketch SK2 for reference.

External drainage from lands to the east of the development will be permitted to drain through the subject blocks, similar to pre-development conditions. Storm sewers will need to be properly sized for conveyance of external storm water flows through the development area.

**Criteria**

In accordance with both the Ministry of Environment SWM Planning and Design Manual and the District of Muskoka Inter Agency Working Committee Design Manual; design criteria for the proposed residential development is as follows:

- Peak Flow attenuation to pre-development levels for all regional storm events 5-year up to the regional 100-year event.
- Conveyance of post development 100 year peak flows safely from the site.
- Water quality enhancement to an 'enhanced' level of protection through the use of accepted control techniques such as detention storage, permanent pool storage, enhanced grass swales, level spreaders, infiltration facilities, and oil / grit removers.
- Preparation of a detailed erosion and sediment control and construction mitigation plan to be implemented as part of the construction program.

**Quantity Control**

Storm water attenuation for the block controlling post-development runoff rates to pre-development levels can be accomplished in one of several ways. Examples would be roof top storage, enhanced rear yard swales or depressed parking lot including underground super pipe storage within the parking areas.

A preliminary analysis of the surface runoff flow rates was completed for a combined block development area of 6.03ha. using the rational method and Muskoka rainfall IDF values. Based on the results, an increase in peak storm water run-off rates and run-off volumes from the site can be expected during all major events. The following table summarizes the results and calculations are attached.

## Rational Method Results

The results from the 5 and 100 year peak storm events are listed in Table 1.

**Table 1**
**Rational Method – Peak Flows and Hydrograph Attenuation**

| | 5Yr (m3/sec) | 100Yr (m3/sec) | Hydrograph Attenuation Volume (m3) |
|---|---|---|---|
| PRE-DEVELOPMENT<br>Blocks 43 - 58 | 0.28 | 0.48 | 330 |
| POST-DEVELOPMENT (m3/sec)<br>Blocks 43 - 58 | 0.62 | 1.05 | 551 |

Post development peak flows will increase over pre-development levels, thereby requiring attenuation.

It will be necessary to attenuate approximately 330m3 of runoff during the minor 5yr storm event and 551m3 during the major 100 year storm event. Controlling these events to pre-development discharge rates will be necessary within each of the blocks, prior to releasing storm water to the main watercourse.

As previously mentioned and indicated on the attached sketch SK2, attenuation of surface runoff flow increases can be accomplished at final design using one of several methods. However, it is most likely that depressed parking lot storage and enhanced rear yard swales will be the most appropriate methods to be used in combination with storm sewers for conveyance. Table 2 indicates the approximate attenuation storage to be achieved by each of the proposed mechanisms/methods.

**Table 2**
**Proposed Methods and Attenuation Volumes**

| | Sizing (m2) | Preliminary Volume (m3) | Comment |
|---|---|---|---|
| **Enhanced Rear Yard Swale** | | | 3:1 side slopes with 1.0m wide flat bottom |
| Blocks 43 - 47 | 190mx0.5m2 | 95 | |
| Blocks 52 - 53 | 200mx0.5m2 | 100 | |
| Blocks 54 - 57 | 95mx0.5m2 | 47 | |
| **Depressed Parking Lot Storage** | | | Average depth of 62mm |
| Blocks 48 - 51 | 5040m2x0.62m | 312 | |
| Total Attenuation Volume **Available** | | **554** | |
| Total Attenuation Volume ***Required*** | | ***551*** | |

**Quality Control**

In order to provide water quality enhancement to an "enhanced" level of protection (80% TSS removal) for this development, it is best to incorporate a "treatment train" approach consisting of the following elements:

- Use of enhanced vegetated perimeter swales and ditches to collect runoff from the site where possible.
- Discharging roof leaders to grade to promote infiltration, reduce point source loading, and attenuate flow rates.
- Provision of "soft" landscaping where feasible.
- Construction of a graded rip rap splash pad at roof downspout disconnections and swale outlet to control discharge rate of water.
- Yard grading using minimal surface slopes and gravel surface where possible to promote infiltration.
- Use of oil/grit separator manholes for control of sediment and suspended solids removal. To be located at collection points within the parking lot storm sewer system.
- Suitable construction mitigation measures to be utilized during the site development.

Possible locations for four oil/grit separator manholes have been indicated on attached sketch SK2. Due to shallow soil conditions over bedrock it is recommend to use shallow wide vortech model type quality control units made by Armtec. Final details and unit selection / sizing would be part of a final storm water management design.

**May 9, 2013**

**Reference: Port Severn Heights in the Township of Georgian Bay**
**District Municipality of Muskoka**
**Red lined Draft Plan Approval - Response to Peer Review Comments**

---

It is expected that additional sedimentation and erosion control measures will be required during construction and until such time that site development has been completed and the internal site works are stabilized. Appropriate measures should be detailed with the final storm water management design.

**CONCLUSION:**

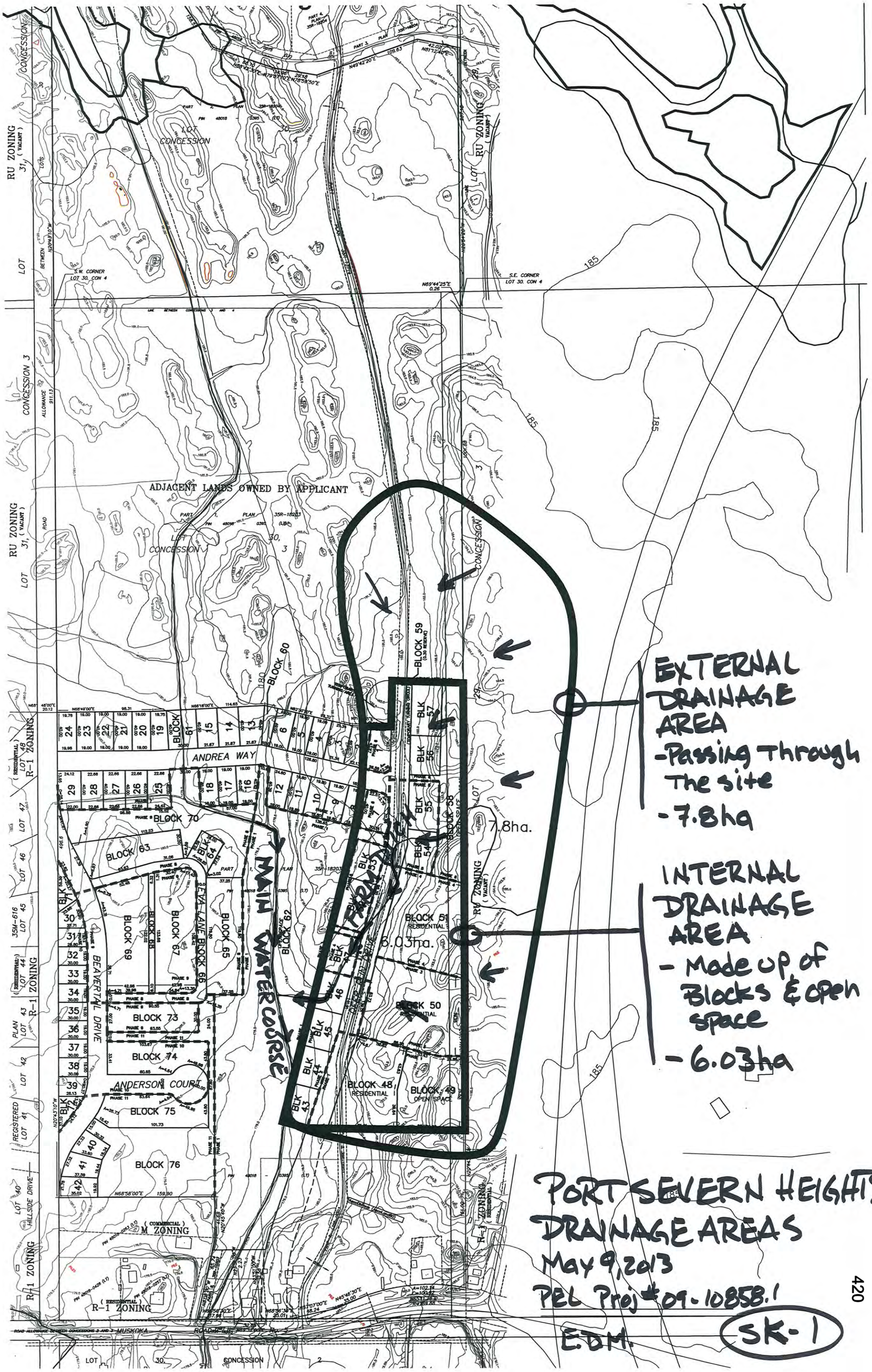
We trust the foregoing outline of storm water management measures relating to the proposed multi residential block is acceptable at this time.

It is the opinion of Pinestone Engineering Ltd. that acceptable storm water management measures can be implemented for the proposed development to meet the approval of both the Municipality of Muskoka and Ministry of Environment requirements.

Sincerely,
**PINESTONE ENGINEERING LTD.**

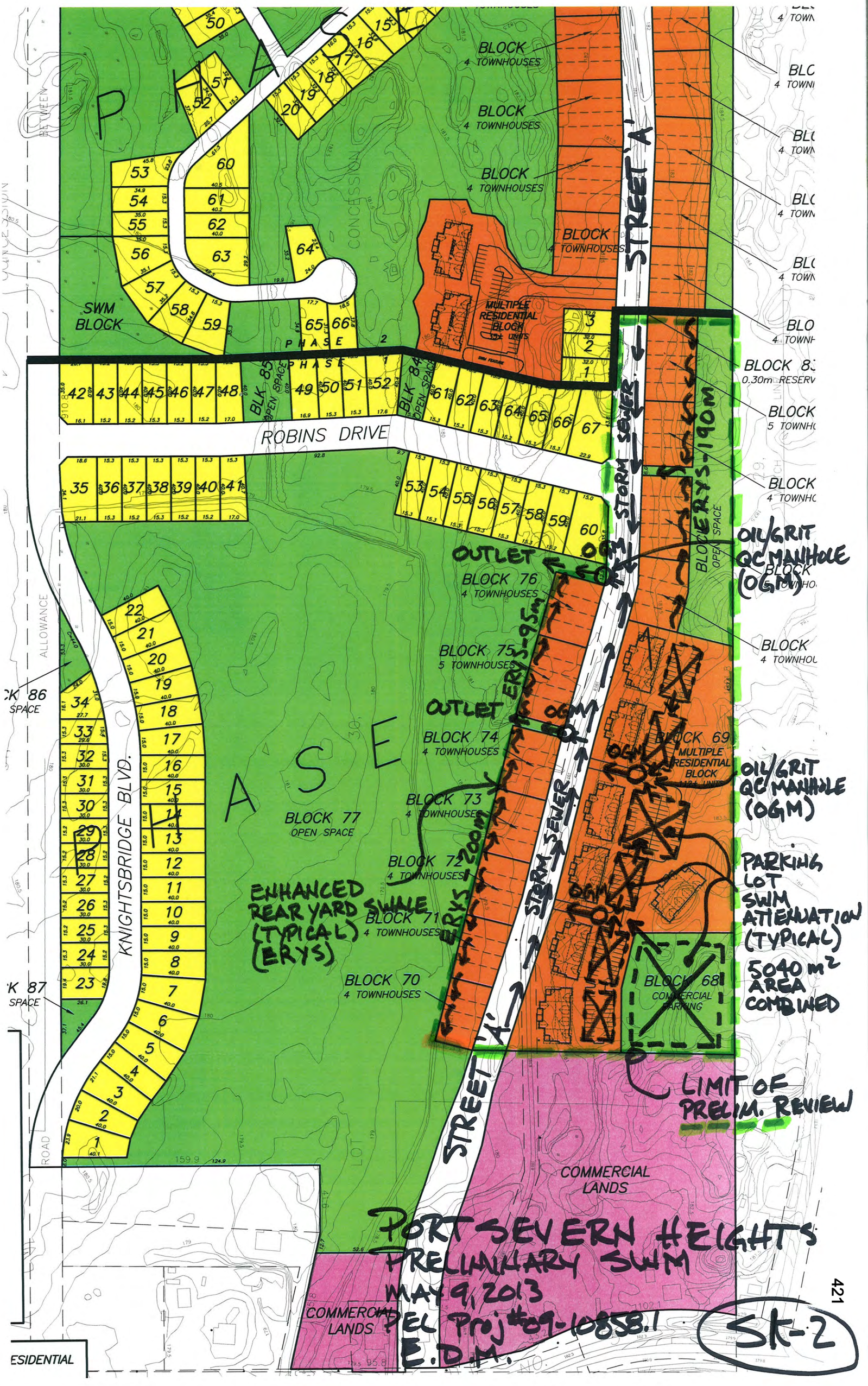
Ted Maurer, C.E.T.

Attachments: (SK1,SK-2, RM Calculations, Soils)




PORT SEVERN HEIGHTS
DRAINAGE AREAS
May 9, 2013
PEL Proj #09-10858.1
EDM.

SK-1


PHASE
BLOCK 4 TOWNHOUSES
BLOCK 4 TOWNHOUSES
BLOCK 4 TOWNHOUSES
BLOCK 4 TOWNHOUSES
MULTIPLE RESIDENTIAL BLOCK 15± UNITS
STREET 'A'
STORM SEWER
SWM BLOCK
ROBINS DRIVE
BLK 85 OPEN SPACE
BLK 84 OPEN SPACE
BLOCK 83 0.30m RESERV
BLOCK 5 TOWNHO
BLOCK 4 TOWNHO
OPEN SPACE
OUTLET
OGM
OIL/GRIT QC MANHOLE (OGM)
BLOCK 76 4 TOWNHOUSES
BLOCK 75 5 TOWNHOUSES
BLOCK 74 4 TOWNHOUSES
BLOCK 73 4 TOWNHOUSES
BLOCK 72 4 TOWNHOUSES
BLOCK 71 4 TOWNHOUSES
BLOCK 70 4 TOWNHOUSES
BLOCK 69 MULTIPLE RESIDENTIAL BLOCK 124 UNITS
BLOCK 68 COMMERCIAL PARKING
BLOCK 77 OPEN SPACE
ENHANCED REAR YARD SWALE (TYPICAL) (ERYS)
ERYS-120m
ERYS-195m
ERYS-190m
PARKING LOT SWM ATTENUATION (TYPICAL) 5040 m² AREA COMBINED
LIMIT OF PRELIM. REVIEW
KNIGHTSBRIDGE BLVD.
ALLOWANCE
ROAD
LOT
COMMERCIAL LANDS
COMMERCIAL LANDS
PORT SEVERN HEIGHTS
PRELIMINARY SWM
MAY 9, 2013
PEL Proj #09-10858.1
E.D.M.
SK-2
421

RATIONAL METHOD 422 2

Port Severn Heights
PEL No. 09-10858.1
Prelim. SWM
May 9, 2013

# RATIONAL METHOD

## 5 Year Storm Event

### PRE - Entire Site

$t_C$=3.26((1.1-C)*(L^.5/S^.33))

| | | |
|---|---|---|
| C | 0.40 | |
| Length | 480.00 | m |
| High Elevation | 185.00 | m |
| Low Elevation | 179.00 | m |
| Slope | 1.25 | |
| Area | 6.030 | ha |
| tc | 46.45 | min |

From Graph → i = **41.9** mm/hr

Q = 0.0028 CiA **0.2830** $m^3/s$

### POST - Entire Site

$t_C$=3.26((1.1-C)*(L^.5/S^.33))

| | | |
|---|---|---|
| C | 0.65 | |
| Length | 480.00 | m |
| High Elevation | 185.00 | m |
| Low Elevation | 179.00 | m |
| Slope | 1.25 | |
| Area | 6.030 | ha |
| tc | 29.86 | min |

From Graph → i = **56.6** mm/hr

Q = 0.0028 CiA **0.6210** $m^3/s$

## 100 Year Storm Event

### PRE - Entire Site

$t_C$=3.26((1.1-C)*(L^.5/S^.33))

| | | |
|---|---|---|
| C | 0.40 | |
| Length | 480.00 | m |
| High Elevation | 185.00 | m |
| Low Elevation | 179.00 | m |
| Slope | 1.25 | |
| Area | 6.030 | ha |
| tc | 46.45 | min |

From Graph → i = **71.4** mm/hr

Q = 0.0028 CiA **0.4821** $m^3/s$

### POST - Entire Site

$t_C$=3.26((1.1-C)*(L^.5/S^.33))

| | | |
|---|---|---|
| C | 0.65 | |
| Length | 480.00 | m |
| High Elevation | 185.00 | m |
| Low Elevation | 179.00 | m |
| Slope | 1.25 | |
| Area | 6.030 | ha |
| tc | 29.86 | min |

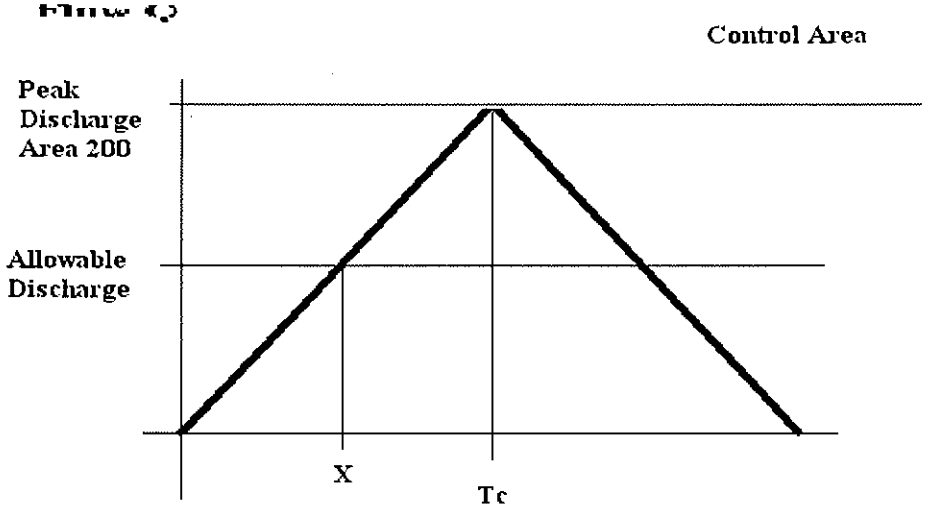
From Graph → i = **95.7** mm/hr

Q = 0.0028 CiA **1.0506** $m^3/s$ **Paved Parking & Yard**

RATIONAL METHOD 2-2



# RATIONAL METHOD HYDROGRAPH




**Storage Requirements to insure Post Development Flow = Pre-Development Flow**

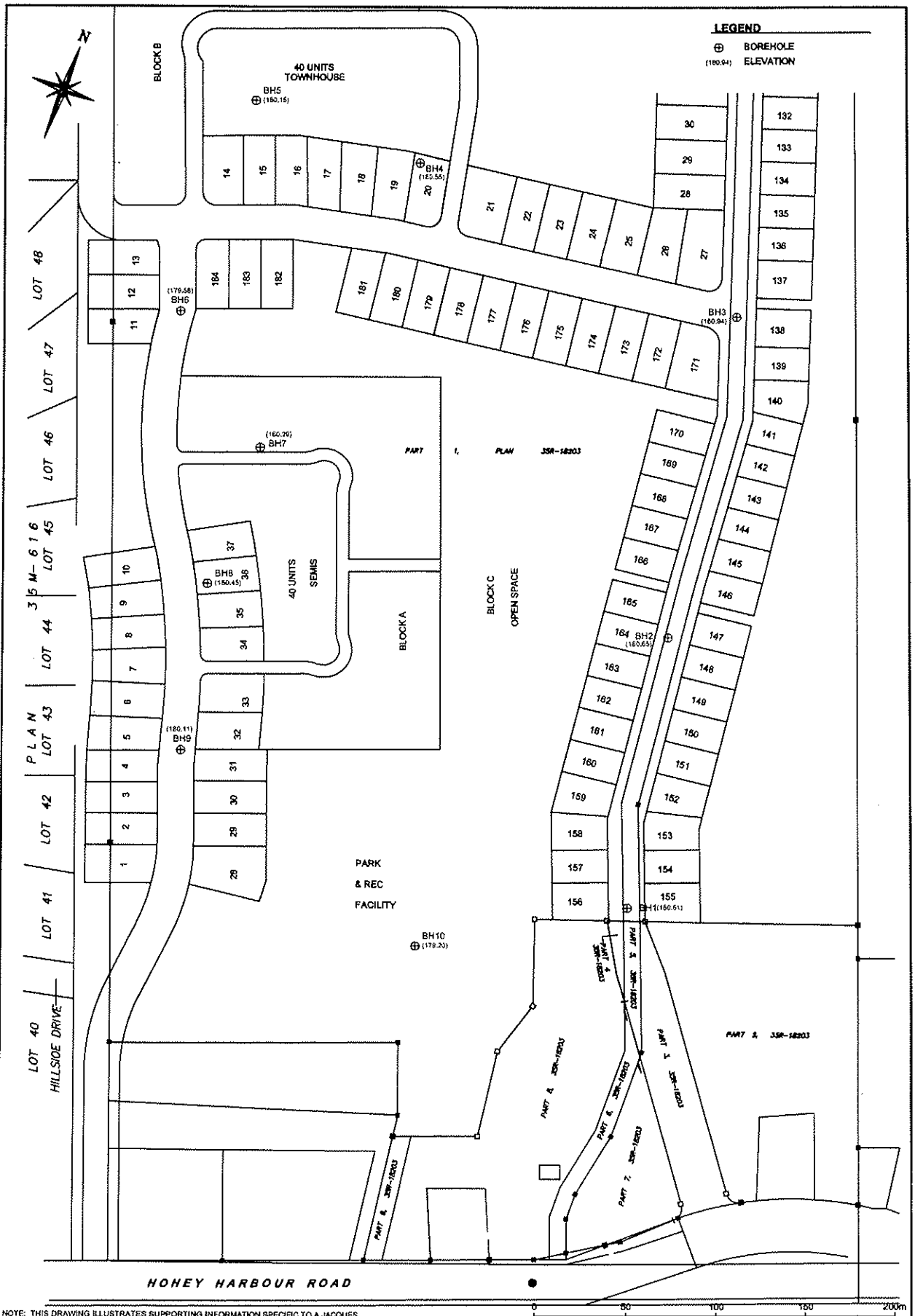
Storage Requirements equals area under the hydrograph
between the peak discharge and the allowable discharge
The length of time is calculated between the point on the rising leg where the allowable discharge is reached until the point on the falling leg where the allowable discharge is reached.

Design flow for post-conditions

Tc = 30 min 1792 s

| Storm Event Year | Peak Discharge $m^3/s$ | Allowable Discharge $m^3/s$ | Time to Allowable Discharge (s) | Volume Storage $m^3$ |
|---|---|---|---|---|
| 5 | 0.6210 | 0.2830 | 816 | 329.57 |
| 100 | 1.0506 | 0.4821 | 822 | 551.20 |

Sol 4 & 5 1-4




NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A JACQUES WHITFORD LIMITED PROJECT AND MUST NOT BE USED FOR OTHER PURPOSES.

SITE PLAN SHOWING SITE FEATURES AND BOREHOLE LOCATIONS

HONEY HARBOUR ROAD, PORT SEVERN, ONTARIO

Client: PORT SEVERN SUBDIVISION

| | |
|---|---|
| Job No.: | 1020300 |
| Scale: | 1 : 2000 |
| Date: | 07/01/22 |
| Dwn. By: | JW HZ |
| App'd By: | PH |

Dwg. No.: 1

Jacques Whitford

T:\CMIC JOBS\1020\00X\1020300\1020300PH2-01.dwg PRINTED: Jan 22, 2007

Soils 2-4

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

1

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) / TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.60 | | | | 0 | | | | | |
| | 180.4 | 150mm TOPSOIL | | | | | | | | |
| | | Brown, loose, Silty SAND, some clay and gravel, moist | | | 1 | SS | 1 | 250/610 | 4 | |
| | 179.8 | | | | 2 | | | | | |
| 1 | | Grey, stiff, Silty CLAY, moist | | | 3 | SS | 2 | 510/610 | 12 | |
| | 179.1 | | | | 4 | | | | | 0 61 14 25 |
| | | Brown, compact, fine to coarse SAND, some silt, wet | | | 5 | | | | | |
| 2 | | | | | 6 | SS | 3 | 510/610 | 24 | |
| | | | | | 7 | | | | | 16 61 19 4 |
| | 178.2 | | | | 8 | SS | 4 | | 50/0.0 | |
| | | END OF BOREHOLE at approximately 2.4 m | | | | | | | | |
| | | Refusal to augering on inferred bedrock | | | 9 | | | | | |
| 3 | | Borehole caved to a depth of 1.4 m | | | 10 | | | | | |
| | | Borehole dry upon completion of drilling | | | 11 | | | | | |
| | | | | | 12 | | | | | |
| 4 | | | | | 13 | | | | | |
| | | | | | 14 | | | | | |
| | | | | | 15 | | | | | |
| 5 | | | | | 16 | | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

( ) Field Vane Test (kPa)

□ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

Soils 3-4

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

2

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.70 | | | | 0 | | | | |
| | 180.6 | 100 mm TOPSOIL | | | | | | | |
| | | Brown, compact, fone to coarse SAND, moist | | | 1 | SS | 1 | 300/610 | 16 |
| | 179.9 | | | | 2 | | | | |
| 1 | | Brown, very stiff, Silty CLAY, some sand, moist | | | 3 | SS | 2 | 560/610 | 15 |
| | | | | | 4 | | | | |
| | | - hard | | | 5 | SS | 3 | 360/460 | 50/4.3 |
| | 178.7 | | | | 6 | | | | |
| 2 | | END OF BOREHOLE at approximately 2.0 m | | | 7 | | | | |
| | | Refusal to augering on inferred bedrock | | | 8 | | | | |
| | | Borehole dry upon completion of drilling | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)
50 100 150 200
$W_P$ W $W_L$
WATER CONTENT & ATTERBERG LIMITS
DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼
STANDARD PENETRATION TEST, BLOWS/0.3m ●
10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

□ Field Vane Test (kPa)
■ Remoulded Vane Test (kPa)
△ Pocket Penetrometer Test (kPa)

SOILS 27 4-6

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

3

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.90 | | | | 0 | | | | |
| | 180.7 | 150 mm TOPSOIL | | | | | | | |
| | | Brown, compact fine to coarse SAND with some silt, moist | | | 1 | SS | 1 | 300/610 | 12 |
| | 180.1 | | | | 2 | | | | |
| 1 | | Brown, hard, Silty CLAY, trace sand, moist | | | 3 | SS | 2 | 300/610 | 50/13 |
| | 179.5 | | | | 4 | SS | 3 | 0/0 | |
| | | END OF BOREHOLE at approximately 1.4 m<br><br>Refusal to augering on inferred bedrock<br><br>Borehole dry upon completion of drilling | | | 5 | | | | |
| 2 | | | | | 6 | | | | |
| | | | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| | | | | | 13 | | | | |
| 4 | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| | | | | | 16 | | | | |
| 5 | | | | | | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

$W_P$ W $W_L$

WATER CONTENT & ATTERBERG LIMITS

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

Field Vane Test (kPa)

□ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

TULLOCH ENGINEERING

80 Main Street W.
Huntsville, ON
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August 22, 2014
14-4022

**Planning Department**
District Municipality of Muskoka
70 Pine Street
Bracebridge, Ontario
P1L 1N3

**Attention: Melissa Halford, MCIP, RPP**

Dear Melissa:

**Reference: Port Severn Heights in the Township of Georgian Bay**
**District Municipality of Muskoka**
**Phase 1 Draft Plan changes**

Port Severn Heights Inc. has retained Tulloch Engineering to prepare a preliminary stormwater management plan update for proposed changes to the Port Severn Heights Phase 1 Draft Plan. The draft plan application package is being completed for submission by Wayne Simpson and Associates.

As such, this stormwater report update should be read in conjunction with the most current servicing report prepared by Pinestone Engineering dated February 9, 2012 submitted as part of the draft of subdivision application completed in 2012, and the updated stormwater management plan for Phase 1A prepared by Pinestone Engineering dated May 9, 2013. The URS stormwater management report prepared in 2007 was also used as a background reference in the revision of stormwater management for this update.

The property is located as part of Lot 30, Concession 3, Baxter Ward, Township of Georgian Bay; District of Muskoka. The property is bordered on the south by Muskoka Road 5 and located west of Violet Drive. The lands to the east and the west are currently developed as residential.

Phase 1B (west side) of the residential development covers an area of approximately 9.9 hectares and is comprised of 48 units. The changes since the 2012 draft plan servicing reports involve eliminating a road and turnaround with residential lots, and a crescent containing multi-residential blocks branching from Knightsbridge Blvd (Street C). These blocks have been changed to open space.

***Storm Water Management***

A stormwater management plan has been developed for the current updated draft plan dated March 20, 2014 of the Port Severn Heights development. This report reviews all changes since the report update issued by Pinestone Engineering February 9, 2013.

## Design Criteria

Both quantity and quality control of the post development run-off is required. In accordance with the Ministry of Environment SWM Planning and Design Manual, the level of quality control to be applied to a development site is dictated by the sensitivity of the receiving watercourse. The main watercourse which traverses the central portion of the site eventually discharges to Georgian Bay. As a result, the receiving main watercourse should be considered sensitive and an "Enhanced Level" of protection will be required.

The Municipality requires development proponents to identify the mitigation measures that will be put in place during construction to address erosion and sediment control.

Noting the above, the design criteria for the proposed development is as follows:

- Peak flow attenuation to pre-development levels for all storm sewer events up to the 100-year event.
- Conveyance of post development 100 year peak flows safely from the site.
- Water quality treatment to an "enhanced" level of protection through the use of accepted control techniques such as detention storage, enhanced grass swales, infiltration facilities, and oil/grit maintenance hole separators.
- Preparation of a detailed erosion and sediment control construction mitigation plan to be implemented during the construction work.

## Site Soils

Based on a site soils investigation as completed by Jacques Whitford in November of 2006, boreholes advanced along the proposed road (KnightsBridge Blvd / Street C.) within the residential block area show soils depths ranging between 0.6m and 1.8m. Four boreholes, BH6, BH7, BH8 & BH9, with locations indicated on the attached Dwg No. 1 by JW, silty sand with some clay soils. The water table is also recorded to vary in the overburden soils with depths between 0.8m and 1.8m. All four boreholes where advanced to refusal on bedrock.

## Hydrology

The hydrologic model prepared by URS in 2007 provided quantitative estimates of runoff rates under both existing and proposed development conditions. The following is a summary and review of the 2007 and 2012 report findings and a discussion of the changes as a result of the recent updates.

## Drainage Catchments

In the February 9, 2012 Phase 1 update report prepared by Pinestone Engineering, two stormwater management facilities were proposed. This is no longer an option due to conflicts with protected environmental zones, so a different approach to stormwater management is necessary.

Changes to catchment areas from the 2012 report from Pinestone Engineering are required. Catchments 205 and 206 have been combined after the removal of the stormwater pond in catchment 206. The townhouse block originally in catchment 205 has also been removed and the catchment has been revised to follow the back of the property lines on Knightsbridge Blvd. Catchment 202 changes involve an elimination of multi-residential units and removal of a road reducing the level of imperviousness and the catchment size. Catchment 201 and 209 have also been combined into open space, as a result of the removal of the storm water management facility originally in catchment 209. Catchment areas 204, 207, 203, and 208 will not change.

## Storm Water Management Plan

Runoff from catchment 202 will drain through enhanced rear yard drainage swales behind houses 34 – 60. A cross culvert between lot 47 and 60 will convey flows across Knightsbridge Blvd. into open channel natural swale through open space catchment 205 to the existing drainage course. Catchment 201 drainage runoff is directed to the existing drainage course similar to pre-development conditions. Drainage from the east side of the property and catchment 207 is addressed in the Pinestone Engineering Report dated May 9, 2013 and is not part of this review.

## Quantity Control

A hydrological analysis of the site has been conducted using information provided in the 2007 URS report. The rational method was used to determine the peak flow under the pre-development conditions and the proposed conditions for the site. Table 1 shows the results of this analysis.

*Table 1 - Rational Method Flow Comparison*

| Catchment Area | Storm Event (Year) | Peak Flows ($m^3/s$) | | Flow Increase ($m^3/s$) |
|---|---|---|---|---|
| | | Existing Conditions | Proposed Conditions | |
| 201 (Revised Residental Lots) | 5 | 0.06 | 0.10 | 0.04 |
| | 10 | 0.07 | 0.12 | 0.04 |
| | 25 | 0.10 | 0.15 | 0.06 |
| | 50 | 0.12 | 0.19 | 0.07 |
| | 100 | 0.13 | 0.21 | 0.08 |
| 202 (Revised Residential Lots) | 5 | 0.07 | 0.15 | 0.08 |
| | 10 | 0.08 | 0.17 | 0.09 |
| | 25 | 0.10 | 0.22 | 0.12 |
| | 50 | 0.12 | 0.27 | 0.15 |
| | 100 | 0.14 | 0.31 | 0.17 |
| 205 (Open Space) | 5 | 0.25 | 0.25 | 0.00 |
| | 10 | 0.30 | 0.30 | 0.00 |
| | 25 | 0.35 | 0.35 | 0.00 |
| | 50 | 0.39 | 0.39 | 0.00 |
| | 100 | 0.43 | 0.43 | 0.00 |

In order to control the post development flows to the pre-development conditions, enhanced rear yard swales will be utilized in catchments 201 and 202. Table 2 shows that it will be necessary to attenuate approximately 335$m^3$ of runoff during the 100 year storm event in catchment 202, and 151 $m^3$ of runoff during the 100 year storm event for catchment 201.

*Table 2 - Hydrograph Attenuation*

| Catchment Area | Storm Event (years) | Flow Difference ($m^3/s$) | Hydrograph Attenuation ($m^3$) |
|---|---|---|---|
| 201 | 5 | 0.04 | 71 |
| | 10 | 0.04 | 82 |
| | 25 | 0.06 | 106 |
| | 50 | 0.07 | 132 |
| | 100 | 0.08 | 151 |
| 202 | 5 | 0.08 | 158 |
| | 10 | 0.09 | 184 |
| | 25 | 0.12 | 240 |
| | 50 | 0.15 | 291 |
| | 100 | 0.17 | 335 |

As mentioned in the above section Tulloch concludes that the most appropriate method for flow attenuation is the enhanced rear yard swales. Table 3 shows the swale sizing and the attenuated volume can be achieved within the swale. In catchment 202, this will occur behind lots 20 to 26 and 34 to 64, with a swale length 621m and an approximate depth of 0.4m, a volume of 547m$^3$ can be attenuated, which exceeds the 335m$^3$ required during the 100 year storm event. For catchment 201, the 184m ditch length behind lots 16 to 19 and 27 to 33 would be capable of attenuating approximately 162m$^3$ at a depth of 0.4m, which exceed the 151m$^3$ resulting from a 100 year storm event.

*Table 3 – Enhanced Swale Sizing and Attenuation Volume*

| Catchment | Ditch Sizing | Ditch Depth (m) | Preliminary Volume (m3) | Comment |
|---|---|---|---|---|
| 201 | 184m x 0.57m2 | 0.4 | 162 > 151 | 3:1 Silde Slopes and 1 m flat bottom width |
| 202 | 621m x 0.57m2 | 0.4 | 547 > 335 | 3:1 Silde Slopes and 1 m flat bottom width |

## Quality Control

In order to provide water quality enhancement to an "enhanced" level of protection (80% TSS removal) for this development, it is best to incorporate a "treatment train" approach consisting of the following elements:

- Use of enhanced vegetated perimeter swales and ditches to collect runoff from the site where possible.
- Discharging roof leaders to grade to promote infiltration, reduce point source loading, and attenuate flow rates.
- Provision of "soft" landscaping where feasible.
- Construction of a graded rip rap splash pad at roof downspout disconnections and swale outlet to control discharge rate of water.
- Yard grading using minimal surface slopes and gravel surface where possible to promote infiltration.
- Use of infiltration based trench in the base of the enhanced swales for control of sediment and suspended solids removal.
- Suitable construction mitigation measures to be utilized during the site development.

It was noted in the above sections that an enhanced level of protection is required for the development due to the sensitivity of the receiving water course. Quality control can be achieved through the enhanced rear yard swales. A clear stone infiltration trench is proposed to be installed in the base of the rear yard enhanced swale to provide infiltration based quality control. The site soils indicate that there is enough depth of overburden soil over bedrock to achieve a shallow stone infiltration trench in the order of 0.5m depth.
The infiltration based trench will need to be sized at the final design stage to store the required quantity

based upon Table 3.2 of the Stormwater Management Planning and Design Manual. According to Table 3.2, for an impervious level of 35% the trench would be required to store 25$m^3$/ha of catchment area. The detail provided on attached Drawing D1 demonstrates the enhanced swale and stone infiltration trench. Table 4 shows the infiltration trench volume that would be required for each catchment area.

*Table 4 - Infiltration Trench Volume*

| Catchment | Storage Volume ($m^3$/ha) for 35% Impervious | Area (ha) | Volume Required ($m^3$) |
|---|---|---|---|
| 201 | 25 | 4 | 100 |
| 202 | 25 | 3.89 | 97.25 |

It is anticipated that additional erosion and sediment control measures will be required during construction, until all grading operations have been completed and adequate cover has been established. Appropriate measures are to be detailed utilizing the criteria set out in this review with the final storm water management design.

***Conclusions***

It is concluded that the revised Phase 1B Draft Plan is viable subject to the stormwater management criteria and measures proposed. Full consideration of the parameters presented will be required with final design.

Sincerely,

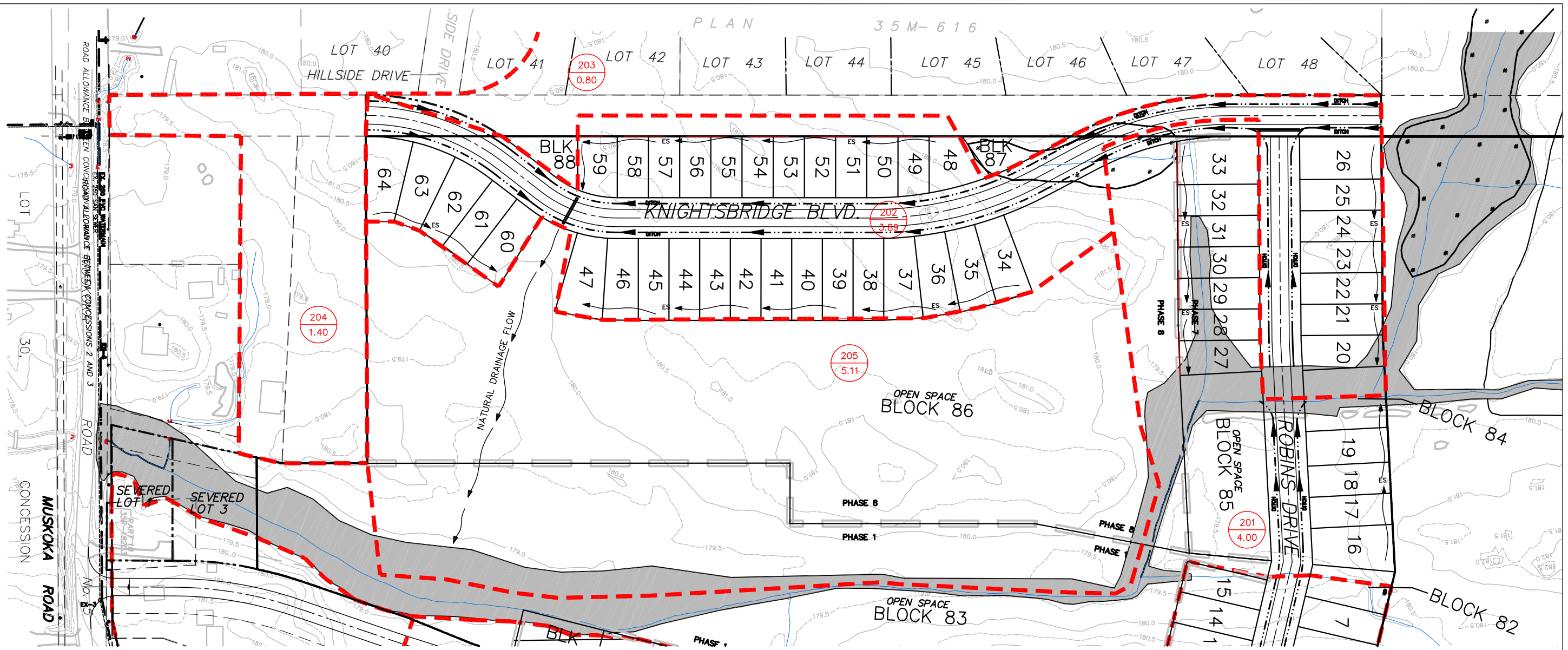
Tulloch Engineering Inc.

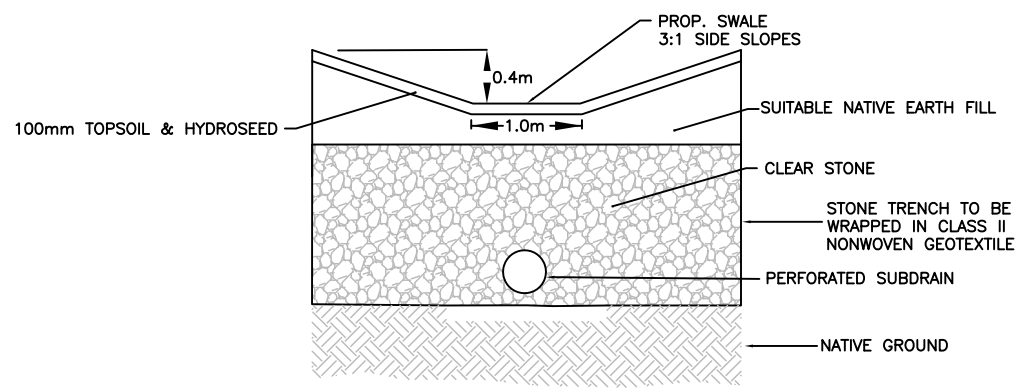
Ted Maurer, C.E.T.

Mark Walker, E.I.T.

Attached

- Drawing D1 – Port Severn Heights Phase 1B
- Rational Method calculation spread sheet
- Soil Information




## ENHANCED SWALE DETAIL
**N.T.S.**

LEGEND

- DITCH
- CATCHMENT BOUNDARY
- ES — ENHANCED SWALE
- 205 / 2.20 — CATCHMENT NUMBER / CATCHMENT AREA(ha.)

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| | | | |

NOTE:
ORIGINAL DRAWING PREPARED BY TSH (NOW AECOM LTD.).

TULLOCH ENGINEERING

PORT SEVERN HEIGHTS
PHASE 1B

PRELIMINARY DRAINAGE PLAN
PHASE 1B KNIGHTSBRIDGE BLVD.
& ROBINS DR.

| | |
|---|---|
| SCALE | 1:2,000 |
| DRAWN | DR |
| CHECKED | TM |
| DATE | AUG 22, 2014 |
| PROJECT No. | 14-4022 |
| SHEET | D1 |

Existing Conditions

| Catchment Area | Area (ha) | Flow Length (m) | High Elevation | Low Elevation | Slope (%) | Tc | C Value |
|---|---|---|---|---|---|---|---|
| 201 | 4 | 872 | 184 | 179 | 0.57 | 95.99846 | 0.27 |
| 202 | 3.89 | 514 | 181 | 179 | 0.39 | 83.76357 | 0.27 |
| 205 | 5.11 | 395.1 | 281.5 | 179 | 25.94 | 18.36638 | 0.27 |

C value from URS 2007 Report

Catchment 201

| Storm Event | i (mm/h) | Q ($m^3/s$) |
|---|---|---|
| 5 | 20.86 | 0.063 |
| 10 | 24.34 | 0.074 |
| 25 | 28.82 | 0.096 |
| 50 | 32.06 | 0.116 |
| 100 | 35.34 | 0.134 |

Catchment 202

| Storm Event | i (mm/h) | Q ($m^3/s$) |
|---|---|---|
| 5 | 22.94 | 0.067 |
| 10 | 26.76 | 0.079 |
| 25 | 31.68 | 0.102 |
| 50 | 35.24 | 0.124 |
| 100 | 38.86 | 0.143 |

Catchment 205

| Storm Event | i (mm/h) | Q ($m^3/s$) |
|---|---|---|
| 5 | 65.66 | 0.254 |
| 10 | 76.56 | 0.296 |
| 25 | 90.68 | 0.350 |
| 50 | 100.84 | 0.390 |
| 100 | 111.28 | 0.430 |

Proposed Conditions

| Catchment Area | Area (ha) | Flow Length (m) | High Elevation | Low Elevation | Slope (%) | Tc | C Value |
|---|---|---|---|---|---|---|---|
| 201 | 4 | 872 | 184 | 179 | 0.57 | 82.11917 | 0.39 |
| 202 | 3.89 | 514 | 181 | 179 | 0.39 | 60.55198 | 0.5 |
| 205 | 5.11 | 395.1 | 281.5 | 179 | 25.94 | 18.36638 | 0.27 |

Catchment 201

| Storm Event | i (mm/h) | Q ($m^3$/s) |
|---|---|---|
| 5 | 23.16 | 0.101 |
| 10 | 27.00 | 0.118 |
| 25 | 31.93 | 0.153 |
| 50 | 35.71 | 0.187 |
| 100 | 39.32 | 0.215 |

Catchment 202

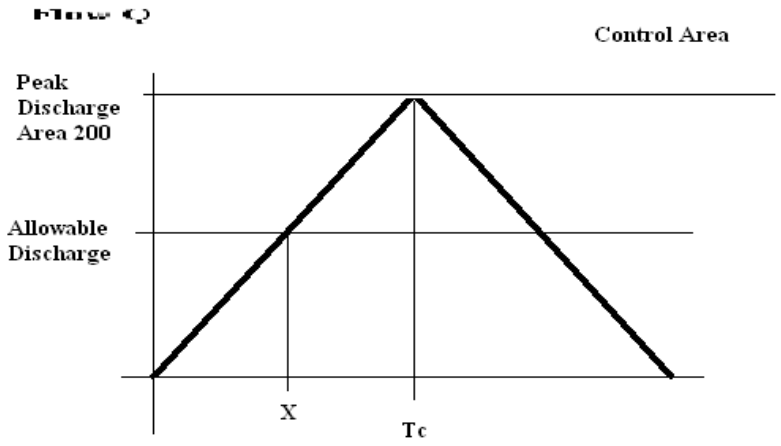
| Storm Event | i (mm/h) | Q ($m^3$/s) |
|---|---|---|
| 5 | 27.10 | 0.148 |
| 10 | 31.60 | 0.172 |
| 25 | 37.40 | 0.224 |
| 50 | 41.60 | 0.272 |
| 100 | 45.90 | 0.312 |

Catchment 205

| Storm Event | i (mm/h) | Q ($m^3$/s) |
|---|---|---|
| 5 | 65.66 | 0.254 |
| 10 | 76.56 | 0.296 |
| 25 | 90.68 | 0.350 |
| 50 | 100.84 | 0.390 |
| 100 | 111.28 | 0.430 |

## RATIONAL METHOD HYDROGRAPH

Storage for Catchment 201




**Storage Requirements to insure Post Development Flow = Pre-Development Flow**

Storage Requirements equals area under the hydrograph
between the peak discharge and the allowable discharge
The length of time is calculated between the point on the rising leg where the allowable discharge is reached until the point on the falling leg where the allowable discharge is reached.

Design flow for post-conditions

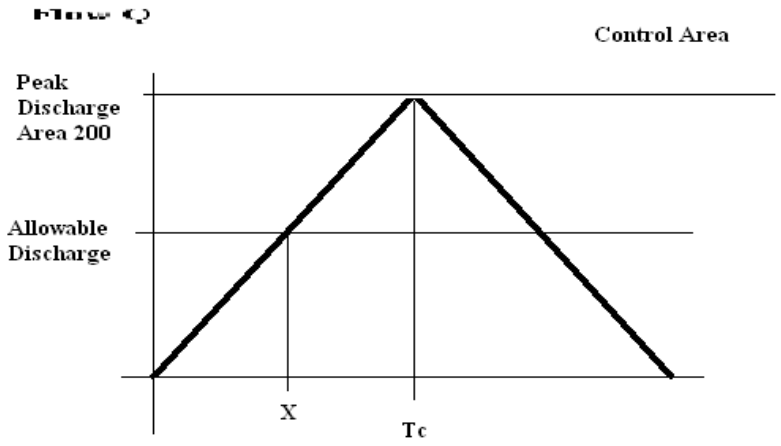
Tc = 82 min 4927 s

| Storm Event Year | Peak Discharge $m^3/s$ | Allowable Discharge $m^3/s$ | Time to Allowable Discharge ( | Volume Storage $m^3$ |
|---|---|---|---|---|
| 5 | 0.1012 | 0.0631 | 3072 | 70.63 |
| 10 | 0.1179 | 0.0736 | 3075 | 82.11 |
| 25 | 0.1534 | 0.0959 | 3079 | 106.37 |
| 50 | 0.1872 | 0.1163 | 3062 | 132.09 |
| 100 | 0.2147 | 0.1336 | 3066 | 150.96 |

| Ditch Dimmensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length | | | 184 | | | | lots | length |
| Water Depth | | | 0.4 | | | | 16-19 | 71 |
| Ditch Bottom W | | | 1 | | | | 27-33 | 113 |
| Side Slopes | | | 3 | to1 | | | | |
| Cross-sectional Area | | | 0.88 | | | | | |
| | | | | | | | | |
| Volume | | | 161.92 | | | | | |

## RATIONAL METHOD HYDROGRAPH

Storage for Catchment 202




**Storage Requirements to insure Post Development Flow = Pre-Development Flow**

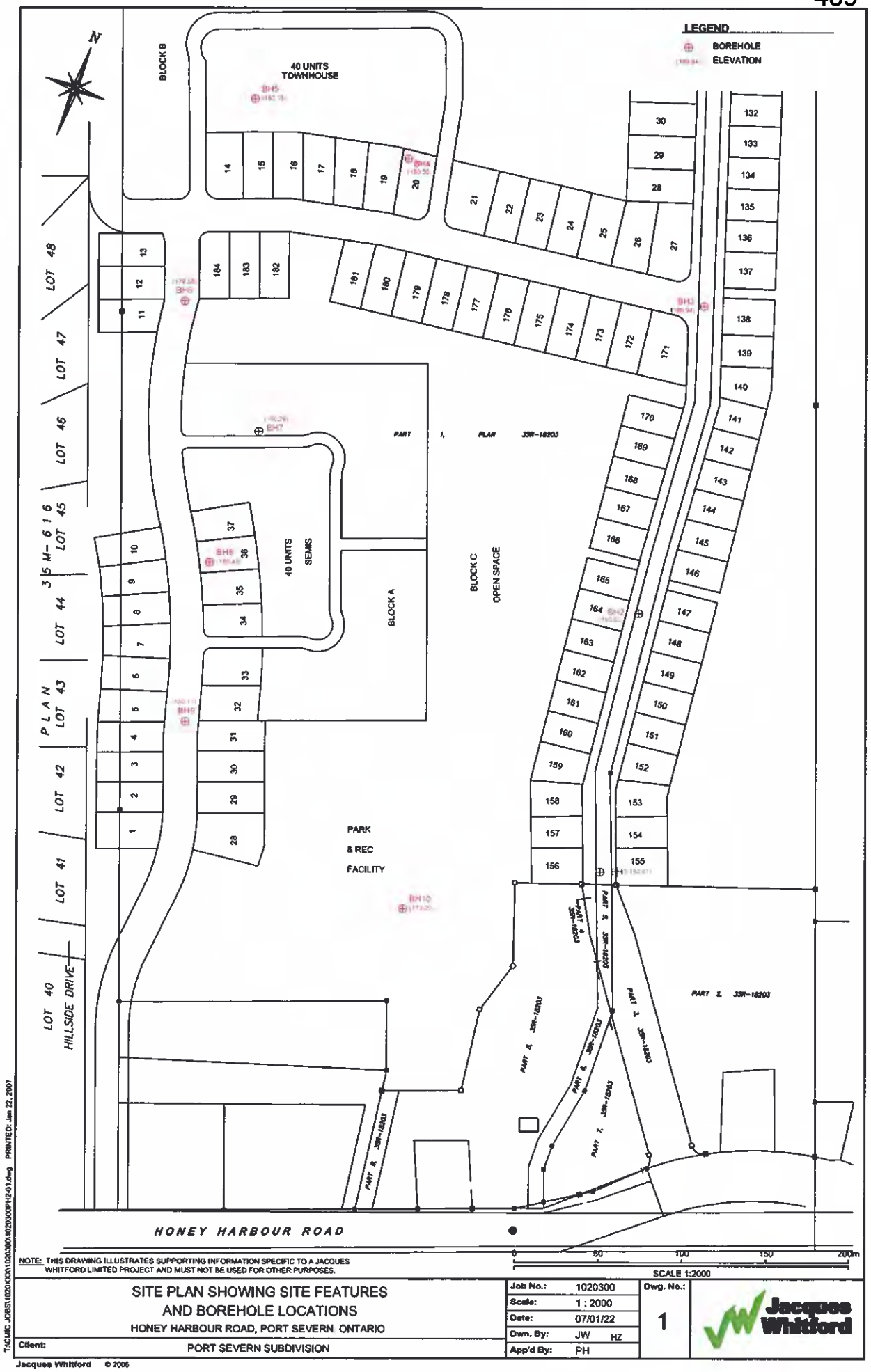
Storage Requirements equals area under the hydrograph
between the peak discharge and the allowable discharge
The length of time is calculated between the point on the rising leg where the allowable discharge is reached until the point on the falling leg where the allowable discharge is reached.

Design flow for post-conditions

Tc = 61 min 3633 s

| Storm Event Year | Peak Discharge $m^3/s$ | Allowable Discharge $m^3/s$ | Time to Allowable Discharge ( | Volume Storage $m^3$ |
|---|---|---|---|---|
| 5 | 0.1476 | 0.0675 | 1661 | 158.04 |
| 10 | 0.1721 | 0.0787 | 1661 | 184.15 |
| 25 | 0.2240 | 0.1025 | 1662 | 239.64 |
| 50 | 0.2719 | 0.1244 | 1662 | 290.75 |
| 100 | 0.3125 | 0.1429 | 1661 | 334.50 |

| Ditch Dimmensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length | | 621 | | | | lots | length |
| Water Depth | | 0.4 | | | | 34-47 | 235 |
| Ditch Bottom W | | 1 | | | | 48-59 | 186 |
| Side Slopes | | 3 | to1 | | | 60-64 | 74 |
| Cross-sectional Area | | 0.88 | | | | 20-26 | 126 |
| | | | | | | | |
| Volume | | 546.48 | | | | | |




NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A JACQUES WHITFORD LIMITED PROJECT AND MUST NOT BE USED FOR OTHER PURPOSES.

# SITE PLAN SHOWING SITE FEATURES AND BOREHOLE LOCATIONS

HONEY HARBOUR ROAD, PORT SEVERN ONTARIO

Client: PORT SEVERN SUBDIVISION

| | |
|---|---|
| Job No.: | 1020300 |
| Scale: | 1 : 2000 |
| Date: | 07/01/22 |
| Dwn. By: | JW HZ |
| App'd By: | PH |

Dwg. No.: 1

Jacques Whitford

T:\CMIC JOBS\1020\XX\1020300\1020300PH2-01.dwg PRINTED: Jan 22, 2007

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

6

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL Jan 3, 2007 — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 179.60 | | | | 0 | | | | |
| | | 50 mm TOPSOIL | | | | | | | |
| | | Brownish grey, soft, silty CLAY, some sand, moist | | | 1 | SS | 1 | 360/610 | 3 |
| | | | | | 2 | | | | |
| 1 | | - very stiff | | ▼ | 3 | SS | 2 | 560/610 | 20 |
| | | | | | 4 | | | | |
| | 178.1 | | | | | | | | |
| | 177.9 | Brownish grey, dense, fine to coarse SAND, some silt, wet | | | 5 | SS | 3 | 180/180 | 50/2.0 |
| | | END OF BOREHOLE at approximately 1.7 m | | | 6 | | | | |
| 2 | | Refusal to augering on inferred bedrock | | | 7 | | | | |
| | | Borehole wet upon completion of drilling | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

1 25 24 50

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD 7

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL Jan 3, 2007 — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.30 | | | | 0 | | | | |
| | 180.2 | 100 mm TOPSOIL | | | | | | | |
| | | Grey, soft, Silty CLAY, some sand, moist | | | 1 | SS | 1 | 410/610 | 6 |
| | | | | | 2 | | | | |
| | | - hard | | | 3 | SS | 2 | 0.0/610 | 50/13 |
| 1 | | | | ▼ | 4 | | | | |
| | 178.9 | END OF BOREHOLE at approximately 1.4 m | | | 5 | | | | |
| | | Refusal to augering on inferred bedrock | | | 6 | | | | |
| 2 | | Borehole wet upon completion of drilling | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Field Vane Test (kPa)

Remoulded Vane Test (kPa)

Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

8

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL Jan 3, 2007 — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.50 | | | | 0 | | | | |
| | 180.3 | 150 mm TOPSOIL | | | | | | | |
| | | Brown, stiff, Silty CLAY, some sand, moist | | ▼ | 1 | SS | 1 | 460/610 | 6 |
| | 179.7 | | | | 2 | | | | |
| | | END OF BOREHOLE at approximately 0.8 m<br><br>Refusal to augering on inferred bedrock<br><br>Borehole wet upon completion of drilling | | | 3 | SS | 2 | 0 0/52 | 50/2.0 |
| 1 | | | | | 4 | | | | |
| | | | | | 5 | | | | |
| 2 | | | | | 6 | | | | |
| | | | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| | | | | | 16 | | | | |
| 5 | | | | | | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Field Vane Test (kPa)

□ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD 9

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) | UNDRAINED SHEAR STRENGTH (kPa) 50 100 150 200 / WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$ / DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼ / STANDARD PENETRATION TEST, BLOWS/0.3m ● | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.10 | | | | 0 | | | | | 10 20 30 40 50 60 70 80 90 100 | |
| | | 50 mm TOPSOIL | | | | | | | | | |
| | | Grey, stiff, Silt CLAY, some sand, moist | | | 1 | SS | 1 | 510/610 | 5 | ● | |
| | 179.5 | | | | 2 | | | | | | |
| | | END OF BOREHOLE at approximately 0.6 m | | | | | | | | | |
| 1 | | Refusal to augering on inferred bedrock | | | 3 | | | | | | |
| | | Borehole dry upon completion of drilling | | | 4 | | | | | | |
| | | | | | 5 | | | | | | |
| 2 | | | | | 6 | | | | | | |
| | | | | | 7 | | | | | | |
| | | | | | 8 | | | | | | |
| | | | | | 9 | | | | | | |
| 3 | | | | | 10 | | | | | | |
| | | | | | 11 | | | | | | |
| | | | | | 12 | | | | | | |
| 4 | | | | | 13 | | | | | | |
| | | | | | 14 | | | | | | |
| | | | | | 15 | | | | | | |
| | | | | | 16 | | | | | | |
| 5 | | | | | | | | | | | |

□ Field Vane Test (kPa)
■ Remoulded Vane Test (kPa)
△ Pocket Penetrometer Test (kPa)

# APPENDIX C

## Geotechnical Investigation

Jacques Whitford

# REPORT

Geotechnical Investigation
Proposed Residential Subdivision
Muskoka Road 5
Port Severn, Ontario

TOTTEN SIMS HUBICKI ASSOCIATES

**PROJECT NO. 1020300**

# REPORT NO. 1020300

REPORT TO **Totten Sims Hubicki Associates**
**49-1 Manitoba Street**
**Bracebridge, ON**
**P1L 2A9**

FOR **Geotechnical Investigation**
**Proposed Residential Subdivision**

ON **Muskoka Road 5**
**Port Severn, Ontario**

**January 25, 2007**

Jacques Whitford
74 Cedar Point Drive Unit 1001
Barrie, Ontario,
L4N 5R7

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Fax: 705-719-1814

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Jacques Whitford

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## 1.0 INTRODUCTION

This report provides the results of the geotechnical investigation completed for the construction of the proposed residential development. The project consists of the construction of single unit and medium density residential housing, municipal servicing and a storm water management facility.

Written authorization to carry out the work was provided by Mr. Dan Manson of Port Severn Heights Estates, on November 14, 2006.

This report presents the factual results of the geotechnical investigation and provides geotechnical comments and recommendations for consideration in the design and construction of the proposed development.

## 2.0 PROPOSED DEVELOPMENT

The proposed development will consist of the construction of a residential lot fabric consisting of single and multiple residential units and a storm water management facility. The development is to be provided with full municipal servicing.

All construction is intended to conform to the local municipal standards.

## 3.0 SITE DESCRIPTION

The property is located on the north side of Honey Harbour Road (also known as Muskoka Road 5) west of Violet Drive in the Town of Port Severn. The site consists of open fields with occasional exposed bedrock outcrops and is bordered by forested lands to the north.

The site is relatively flat with a slight grade from north to south with a difference in elevation of approximately 2.0 m. The north portion of the site is relatively flat with a total relief of less than 3.0 m over a horizontal distance of ±300 m.

## 4.0 SCOPE OF WORK

The scope of work for the Geotechnical Investigation was as follows:

- 9 boreholes within the proposed road alignments to depths of 5.0 m;
- 1 borehole within the proposed storm water management facility to a depth of 6.6 m.
- Supplement the field information with a Laboratory Testing Program to provide geotechnical characterization of the soils encountered; and,
- Summarize the field and laboratory results in a report that includes recommendations for geotechnical issues associated with the development of the site, such as:

- Site preparation and grading;
- Dewatering recommendations for earth works construction and site servicing;
- Recommendations for the construction of the storm water management facility;
- Foundation types and allowable bearing capacity for the proposed buildings;
- Recommendation for slab-on-grade construction;
- General excavation and backfill; and;
- Pavement designs for road construction.

# 5.0 METHOD OF INVESTIGATION

## 5.1 Field Investigation

Prior to commencing the field investigation, the borehole locations were laid out in the field by Jacques Whitford Limited (Jacques Whitford) personnel.

The fieldwork for this investigation was carried out on January 3, 2007 and consisted of 10 boreholes. The boreholes (BH1 to BH10) were advanced at the location shown on Drawing No. 1 in Appendix A, and were drilled within the proposed site development footprint.

The boreholes were advanced using a track mounted CME-D50 drill rig using a 100 mm outside diameter (O.D.) continuous flight solid stem augers. The soils were sampled at regular intervals using a 50 mm O.D. split-spoon sampler by conducting Standard Penetration Tests (SPTs) in accordance with the procedures outlined in the ASTM Specification D1586-99. The results are plotted on the borehole logs attached in Appendix B.

All soil samples recovered from the field investigation were placed in moisture proof bags and transported to our laboratory for detailed visual and tactile examination and testing as required.

## 5.2 Survey

The locations and elevations of the boreholes were surveyed by Totten Sims Hubicki Associates (TSH) and provided to us on The Draft Plan of Subdivision Prepared by Galbraith, Epleet, Worobec Surveyors, forwarded on January 22, 2007. The locations of the boreholes are provided on Drawing No. 1 in Appendix A.

The ground surface elevations at the borehole pit locations are provided on the Borehole Records attached included in Appendix B.

## 5.3 Laboratory Testing

All samples were subjected to detailed visual and tactile examination. A total of three grain size distribution tests were conducted on selected samples.

Unless requested in advance, all samples will be stored for a period of two months from the investigation date.

# 6.0 RESULTS OF INVESTIGATION

## 6.1 Regional Geology and Subsurface Conditions

The site is situated of the Georgian Bay-Ottawa Valley Moraine where drift has been partly eroded by glacial Lake Algonquin and filled with lacustrine sands, silts and clays.

The subsurface conditions encountered in the boreholes are provided on the Borehole Record sheet in Appendix B. An explanation of the symbols and terms used in the Borehole Records is attached.

The boreholes revealed subsurface conditions consistent with geology known to occur in the area. In general the site consisted of a layer of topsoil overlying strata of silty clay and fine to coarse sand. Precambrian bedrock surface was inferred from refusal to augering at the termination of all boreholes.

Groundwater was encountered at depths ranging from 0.6 m to 1.2 m below the existing ground surface. A total of 6 boreholes were found to be dry.

The following paragraphs provide additional information on the soil strata encountered in the boreholes.

### 6.1.1 Topsoil

A layer of topsoil was encountered at the ground surface in all of the boreholes. The thickness of the topsoil was measured to range from 50 mm to 150 mm.

### 6.1.2 Silty Sand

A stratum of silty sand was encountered beneath the topsoil in borehole BH1 and BH5 and extended onto the silty clay deposits at a depth of 0.8 m. The silty sand consisted of varying amounts of sand and silt with trace amounts to some clay and gravel.

The silty sand was in a loose condition, based on the N-values obtained from the SPTs.

Laboratory tests carried out on representative samples of the silty sand revealed moisture contents in the range of 20% to 28%. One grain size analysis test was carried out on Sample 1 from borehole BH1 at a depth of 0.4 m of the silty sand and yielded a grain size distribution as follows:

- 0 % gravel;
- 61 % sand;
- 22 % silt and;
- 17% clay sized particles.

### 6.1.3 Silty Clay

Silty clay was encountered below the topsoil, fine to coarse sand and silty sand in all boreholes and extended to depths ranging from 0.6 to 3.1 m below existing grade. The silty clay was typically brown in colour and was generally wet.

Based on the N-values obtained from the SPTs, the silty clay was assessed to be stiff to hard.

Laboratory Testing performed on selected samples consisted of moisture content tests, an Atterberg Limits Test and a gradation analysis. The test results were as follows:

| | |
|---|---|
| Moisture content: | 27% to 38% |
| Plastic limit: | 26% |
| Liquid limit: | 54% |
| Plasticity Index: | 28% |
| Gradation: | 1% gravel;<br>26% sand;<br>37% silt; and,<br>36% clay size (<2μm) particles. |

The results of the moisture content tests are shown on the Borehole Records in **Appendix B.**

Based on the results of the Atterberg Limits testing, the material may be classified as a CH, clay of high plasticity, according to the Canadian Foundation Engineering Manual. The results of the Atterberg Limits Testing for the clayey silt fill are presented on Figure 2 in **Appendix C**.

The results of the grain size analysis for the silty clay are presented on Figure 3, in **Appendix C**.

### 6.1.4 Fine to Coarse Sand

A stratum of fine to coarse sand was encountered above and/or beneath silty clay in boreholes BH1, BH3 and BH4. The sand extended to depths ranging 0.8 m to 2.6 m below the ground surface elevation. The sand contained trace to some amounts of clay, silt and gravel.

The sand was loose to compact, based on the N-values obtained from the SPTs.

The sand was generally described to vary from moist to wet, based on visual and textural examination. Laboratory tests carried out on representative samples of the sand revealed moisture contents in the range of 14% to 20%. One grain size analysis test was carried out on Sample 4 from borehole BH2 at a depth of 1.5 m in the sand and yielded a grain size distribution as follows:

- 16 % gravel;
- 61 % sand; and,
- 23 % silt and clay sized particles.

The results are illustrated graphically on Figure 3 in **Appendix C**

### 6.1.5 Bedrock

Auger refusal was encountered in all boreholes at depths ranging from 0.6 to 3.1 m below existing grade, respectively. It was presumed that this was the contact with the underlying bedrock.

Exposed bedrock was observed on site and was visually classified as hard granite-gneiss.

## 6.2 Groundwater

The groundwater levels were measured in the boreholes upon completion of drilling. The measured groundwater levels are listed below:

**Table 6-1 Recorded Groundwater Levels**

| Borehole No. | Groundwater Depth (m) on Completion | Groundwater Elevation (m) on completion |
|---|---|---|
| BH 1 | Dry | Dry |
| BH 2 | Dry | Dry |
| BH 3 | Dry | Dry |
| BH 4 | Dry | Dry |
| BH 5 | 1.2 | 179.0 |
| BH 6 | 0.9 | 178.7 |
| BH 7 | 1.0 | 179.2 |
| BH 8 | 0.6 | 179.9 |
| BH 9 | Dry | Dry |
| BH 10 | Dry | Dry |

The findings reported above show that groundwater was encountered in 4 of the 10 boreholes upon completion of drilling. The depth of the groundwater level ranged between 0.6 and 1.2 m below the existing ground surface upon completion of drilling. The groundwater was found within the silty clay and fine to coarse sand deposits.

# 7.0 DISCUSSION AND RECOMMENDATIONS

## 7.1 Site Development Constraints

Based on the conditions encountered in the boreholes and our understanding of the proposed project, the following considerations and constraints are set forth for the site:

- Topsoil 50 to 150 mm in thickness was encountered in the boreholes. The variation in topsoil thickness will require careful monitoring of the stripping operations to ensure that the appropriate topsoil thickness is removed. It should also be noted that topsoil thicker than that encountered in the boreholes is likely, particularly in the open fields observed on the property. It is therefore recommended that a test pit program be completed to accurately determine the topsoil thickness prior to the stripping operation.

- Groundwater was generally encountered at shallow depths throughout the site within the silty clay and fine to coarse sand deposits. Excavations extending to below the permanent ground water level will require temporary dewatering measures which will depend upon the type of deposits and the extent of the drawdown required.
- Foundations for the proposed buildings may consist of conventional spread and strip footings, subject that these are founded on compact fine to coarse sand, very stiff silty clay, Precambrian bedrock and/or compacted structural fill.

## 7.2 Site Preparation

Site preparation should consist of removal of all ground surface cover which extended to depths ranging from 50 mm to 150 mm.

The topsoil must be removed within all road alignments, building envelopes and any other structures sensitive to total and differential settlements and replaced with structural fill, comprised of native material obtained from the site, OPSS Select Subgrade material or other approved granular fill. Where loose silty sand is encountered it must be removed and replaced with structural fill. The structural fill supporting foundations should be compacted in 200 mm thick loose lifts to a minimum of 98% of the materials Standard Proctor Maximum Dry Density (SPMDD). The structural fill supporting the floor slab should be compacted to a minimum of 98% of SPMDD.

Prior to placement of structural fill and subsequent to completion of the stripping and removals, the exposed ground surface should be inspected and where applicable proof-rolled. This will provide a uniform surface for the placement of the new engineered/structural fill material. The exposed surface of the native soils should be compacted to a minimum of 98% of the materials SPMDD. Soft/loose, wet, organic or otherwise unsuitable soils encountered during the proof-rolling operation should be sub-excavated and backfilled with structural fill in accordance with the requirements stated in this report.

Should grading requirements extend into the bedrock it is anticipated that hydraulic rock breaking equipment (as a minimum) will be required to remove/excavate the weathered bedrock. Should removal of the sound bedrock be required a drilling and blasting program would likely provide a more practical and efficient solution. An expert in blasting must be consulted to determine the appropriate blasting program.

In order to maintain the basement dry, it is recommended that the basement floor slabs of the houses and commercial buildings be constructed a minimum of 0.5 m above the highest groundwater level. The water ground levels reported in this report may not represent their highest position, as perched condition due to seasonally high precipitation may prevail in places. It is recommended therefore that the water ground levels be further monitored.

## 7.3 Foundations and Floors

Conventional strip and spread footings and slab-on-grade construction can be used on this site, subject to the constraints and recommendations provided in this report.

### 7.3.1 Foundations

As noted above it is recommended that the building foundations and floor slabs and any other structures be founded on native compact to dense fine to coarse sand, very stiff silty clay, Precambrian bedrock or on engineered fill placed on the competent soils listed above.

Conventional strip and spread footings can be founded on the structural fill as noted above. An allowable bearing pressure of 150 kPa may be available for the design of the foundations placed on the engineered fill with a minimum thickness of 0.5m. An allowable soil pressure of 150 kPa can be used for the design of foundations placed on the compact to dense fine to coarse sand and very stiff clayey silt soils. The Precambrian bedrock is also suitable for supporting foundations. Foundations placed on the Precambrian bedrock can be designed using a maximum allowable rock pressure of 3000 kPa.

Placement of foundations on a combination of the bedrock and soil is not recommended, in consideration of the potential for differential settlements at the bedrock soil interface which exceed the tolerable limits for the structure. Total settlements for foundations placed on the native soils or structural fill could reach 25 mm whereas total settlement of foundations placed on bedrock would be negligible. This could result in significant differential settlement at the bedrock soil interface.

The preferred approach would be to place the foundations on a combination of native soils and structural fill or entirely on bedrock. Should it be necessary to place the foundations on a combination of soil and/structural fill and bedrock, consideration could be given to reducing the allowable bearing capacity and thereby the resulting settlements. Alternatively excavation of the rock and placement of structural fill to generate transition zones at the bedrock soil interface could be considered. On confirmation of the FFE additional guidance in this respect can be provided.

The total and differential settlement of footings designed in accordance with the recommendations provided above should be in the order of 25 mm and 19 mm respectively.

All footings should be protected with a minimum of 1.5 m of soil cover, or equivalent insulation for adequate frost protection. If construction is undertaken during winter conditions, the footing subgrade must be protected from freezing.

### 7.3.2 Floor Slabs

As noted above the floor slab can be constructed on grade and placed at a minimum elevation of 0.5 m above the groundwater levels.

A modulus of subgrade reaction, $k_s$, of 10 MN/m$^3$ can be used for the design of the floor slabs if the construction is in accordance with the recommendations provided herein.

It is recommended that a perimeter subdrain drainage system be designed and constructed around the building structures.

## 7.4 Excavations and Backfill

Temporary excavations for the construction of engineered fill and footings or installation of underground services must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA).

The loose sandy silt can be classified as Type 3 soils. The minimum excavation side slope for Type '3' soils is 1:1 (Horizontal: Vertical) in accordance with the OHSA.

The compact to dense fine to coarse sand and very stiff to hard clayey silt can be classified as Type 2 soils. The minimum excavation side slope for Type 2 soils is 1:1 (Horizontal: Vertical) with a 1.2 m vertical excavation from the base of the excavation in accordance with the OHSA.

The water bearing fine to coarse sand soils at this site can be classified as Type 4 soils. The minimum excavation side slope for Type 4 soils is 3:1 (Horizontal: Vertical) or flatter in accordance with the OHSA.

Should excavations extend into the bedrock it is anticipated that hydraulic rock breaking equipment will be required as a minimum to remove/excavate the weathered bedrock. Additional information is provided in the Site Preparation section.

If localized instability is noted during excavation or if wet conditions are encountered, the side slopes should be flattened to a stable configuration.

If space is restricted such that the side slope cannot be safely cut back in accordance with the OHSA regulation, temporary shoring must be provided.

Free groundwater was encountered at depths ranging from 0.6 to 1.2 m below the existing ground surface in four of the open boreholes. It is therefore anticipated that excavations for the structural fill operation and services may extend to below the groundwater level. As a result a dewatering program will be required for the operations. Groundwater seepage from the silty clay soils should be handled by pumping from sumps using conventional submersible pumps provided the excavations remain open for a short period of time, less than 48 hours. Seepage from the sand soils will require more comprehensive dewatering efforts. A dewatering contractor should be consulted to determine an appropriate dewatering plan for construction.

Pipe bedding and backfill material specifications and compaction criteria for water and sewer services should be in accordance with the pipe design recommendations and/or local municipal requirements.

In settlement sensitive areas, service trench backfill can consist of suitable portions of the existing earth materials, OPSS Select Subgrade Material or approved equal. As noted the moisture content of the onsite soils is generally suitable for structural compaction however, some of the silty clay is too wet and will require prior aeration or mixing with dryer soils for structural compaction.

The backfill should be placed in 200 mm thick loose lifts, and compacted to a minimum of 98% of the materials SPMDD. Within 0.5 m of the sub-grade level, the backfill should be compacted to a minimum of 100% SPMDD.

Backfill for service trenches in non-settlement sensitive landscaped areas may consist of the materials described above placed in 300 mm lifts and compacted to a minimum of 95% SPMDD.

Water and sewer lines installed outside of heated areas should be provided with a minimum 1.5 m soil cover or equivalent, for frost protection.

In excavations seepage through the silty clay deposit is expected to be minimal and groundwater flow will be slow to moderate; however the groundwater yield through the sands will be appreciable and persistent.

## 7.5 Earthquake Considerations

The proposed building must be designed to resist a minimum earthquake force. The Ontario Building Code (OBC) [1997] specifies that the structure should be designed to withstand a minimum lateral seismic force, *V*. This parameter is a function of the equivalent lateral seismic force representing elastic response, $V_e$, calculated in accordance with the following expression:

$$V_e = v*S*I*F*W$$

The terms relevant to the geotechnical conditions at the site are the Zonal Velocity Ratio, *v*, and the Foundation Factor, *F*.

The Foundation Factor to be applied at this site is 1.0, as obtained from Table 4.1.9.1.C of the OBC. The Zonal Velocity Ratio to be applied for this site is 0.05, in accordance with Table 2.5.1.1 of the OBC.

These parameters are to be reviewed and verified by the structural engineer.

## 7.6 Pavement Design

The comments and recommendations provided herein, with respect to the design and construction of the paved roadways, presume that the procedures and requirements provided in the previous sections of this report will be adopted. The pavement structures provided in proceeding Table 7-2 can be considered for use at the site, providing the pavement is constructed on the native silty clay, sands or structural fill.

**Table 7-1 Asphalt Pavement Structure Design**

| Material | Recommended Pavement Structure (mm) | Compaction Requirements |
|---|---|---|
| HL3 (top course asphaltic concrete) | 40 mm | 97% MBD |
| HL8 (base course asphaltic concrete) | 50 mm | 97% MBD |
| OPSS Granular A Base | 150 mm | 100% SPMDD |
| OPSS Granular B Sub-base | 450 mm | 100% SPMDD |

The exposed subgrade should be compacted to a minimum of 100% prior to the placement of the pavement structure (granular materials and asphalt).

The Granular ‘B’ sub-base and Granular ‘A’ base materials should be compacted to 100% SPMDD as shown in the above table. The asphaltic concrete should be compacted to a minimum of 97% Maximum Bulk Density (MBD) as indicated in the above table.

The pavement surface and the subgrade should be graded to direct runoff water away from the roadway and associated infrastructure.

The use of sub-drains under the pavement is considered a prudent measure. This will mitigate potential adverse affects associated with periods of intense rainfall.

## 7.7 Storm Water Management Facility (BH 10)

It is our understanding that the storm water management facility (SWMF), is proposed in the southern portion of the site.

The soil conditions encountered in borehole BH10 advanced at the location of the proposed SWMF consisted of a layer of topsoil 150 mm thick overlying and stratum of silty clay extending to the termination depth of the borehole on inferred bedrock at a depth of 0.8 m below the existing ground surface.

It is our understanding that the SWMF design has not been finalized and that the pond elevations have not been set. Accordingly, should the base of the pond be designed below an elevation of 178.4 m, the Precambrian bedrock will have to be removed for the construction of the pond. Should rock removal be required it should be completed in accordance to the procedures listed in section 7.2.

Alternatively, if the site grades permit, the pond can be constructed above elevation 178.4 m utilizing the native soils to construct earth berms to develop the side slopes of the pond.

If the pond is to be designed with a permanent pool elevation it must be lined with an impermeable membrane. The silty clay is relatively impermeable with an estimated permeability of $10^{-7}$ cm/sec. Therefore if the pond is to be designed to maintain a permanent pool elevation the native materials will be suitable for use as an impermeable membrane. The liner, or impermeable membrane, must be implemented below the permanent pool elevation. The liner can consist of an approved synthetic liner or alternatively a 0.6 m thick native silty clay liner.

All organics must be removed from within the pond footprint and particularly where earth fill is to be placed such as berms and or adjacent to control structures. The side slopes of the pond must be sloped at 3 horizontal:1 vertical above the high water level and at 4 horizontal:1 vertical below the high water level. The sections above the high water level should be sodded immediately to protect against rain-wash erosion. The pond slopes at the normal water level should be protected with rip rap or similar for protection against wave action.

All footings for the control structures must be placed on the sound very stiff silty clay, structural fill or onto the sound Precambrian bedrock. A maximum Allowable soil pressure of 150 kPa, can be used for the design of the foundations constructed on soils in accordance to the above recommendations. A maximum allowable rock pressure of 3000 kPa can be used for the design of footings constructed on sound bedrock. The footings must be placed below the frost depth or scour depth whichever is deeper with a minimum earth cover of 1.5 m.

# 8.0 CLOSURE

The recommendations presented in this report are in accordance with our present understanding of the project.

A soil investigation is a limited sampling of a site. The conclusions given herein are based on information gathered at a specific borehole location and can only be extrapolated to an undefined limited area around the location. The extent of the limited area depends on the soil and ground water conditions, as well as the history of the site reflecting natural conditions, construction activities, and site use.

Should any site conditions be encountered which differ from those at the borehole locations, or the locations of the proposed buildings changed, we request that we be notified immediately in order to assess the additional information and its effects on the above conclusions.

We trust the above information meets with your present requirements. Should you have any questions or require further information, please do not hesitate to contact us at your convenience.

Yours very truly,

**JACQUES WHITFORD**

*Original signed by:*

Peter Healy, C.E.T.
Senior Project Manager

*Original signed by:*

Ron Howieson, P.Eng.
Group Leader, Geotechnical Engineering

PH/RH/to

Enclosure

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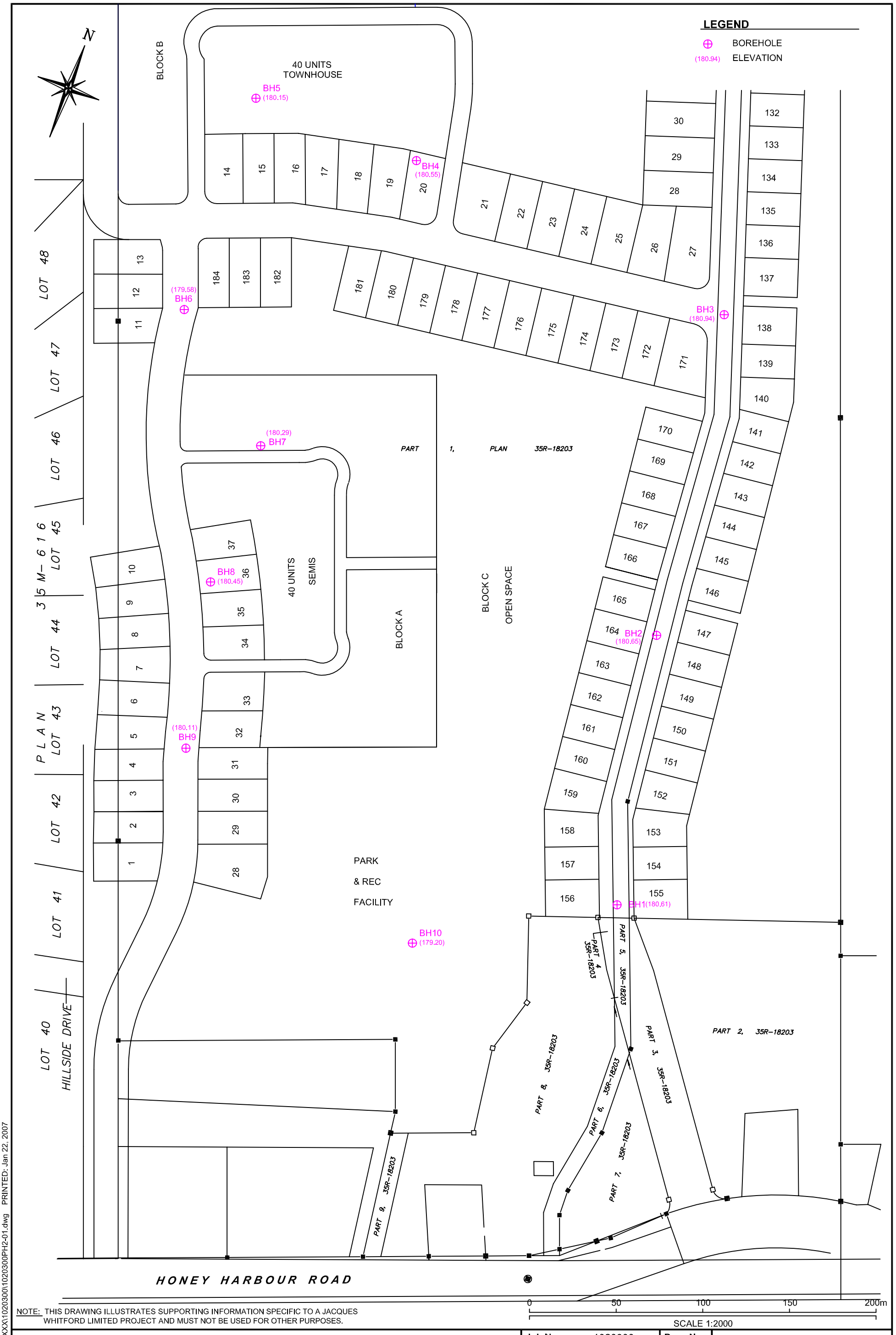
# APPENDIX A

Drawings




NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A JACQUES WHITFORD LIMITED PROJECT AND MUST NOT BE USED FOR OTHER PURPOSES.

# SITE PLAN SHOWING SITE FEATURES AND BOREHOLE LOCATIONS

HONEY HARBOUR ROAD, PORT SEVERN, ONTARIO

**Client:** PORT SEVERN SUBDIVISION

| | |
|---|---|
| Job No.: | 1020300 |
| Scale: | 1 : 2000 |
| Date: | 07/01/22 |
| Dwn. By: | JW HZ |
| App'd By: | PH |

Dwg. No.: 1

Jacques Whitford

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# APPENDIX B

## Symbols & Terms Used on the Borehole Records

Borehole Records

# SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

## SOIL DESCRIPTION

**Terminology describing common soil genesis:**

| | | |
|---|---|---|
| *Topsoil* | - | mixture of soil and humus capable of supporting vegetative growth |
| *Peat* | - | mixture of visible and invisible fragments of decayed organic matter |
| *Till* | - | unstratified glacial deposit which may range from clay to boulders |
| *Fill* | - | material below the surface identified as placed by humans (excluding buried services) |

**Terminology describing soil structure:**

| | | |
|---|---|---|
| *Desiccated* | - | having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc. |
| *Fissured* | - | having cracks, and hence a blocky structure |
| *Varved* | - | composed of regular alternating layers of silt and clay |
| *Stratified* | - | composed of alternating successions of different soil types, e.g. silt and sand |
| *Layer* | - | > 75 mm in thickness |
| *Seam* | - | 2 mm to 75 mm in thickness |
| *Parting* | - | < 2 mm in thickness |

**Terminology describing soil types:**
The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488). The classification excludes particles larger than 76 mm (3 inches). The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

**Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):**
Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present:

| | |
|---|---|
| *Trace, or occasional* | Less than 10% |
| *Some* | 10-20% |
| *Frequent* | > 20% |

**Terminology describing compactness of cohesionless soils:**
The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test N-Value (also known as N-Index). A relationship between compactness condition and N-Value is shown in the following table.

| Compactness Condition | SPT N-Value |
|---|---|
| *Very Loose* | <4 |
| *Loose* | 4-10 |
| *Compact* | 10-30 |
| *Dense* | 30-50 |
| *Very Dense* | >50 |

**Terminology describing consistency of cohesive soils:**
The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests.

| Consistency | Undrained Shear Strength | |
|---|---|---|
| | kips/sq.ft. | kPa |
| *Very Soft* | <0.25 | <12.5 |
| *Soft* | 0.25 - 0.5 | 12.5 - 25 |
| *Firm* | 0.5 - 1.0 | 25 - 50 |
| *Stiff* | 1.0 - 2.0 | 50 – 100 |
| *Very Stiff* | 2.0 - 4.0 | 100 - 200 |
| *Hard* | >4.0 | >200 |

## ROCK DESCRIPTION

**Terminology describing rock quality:**

| RQD | Rock Mass Quality |
|---|---|
| 0-25 | *Very Poor* |
| 25-50 | *Poor* |
| 50-75 | *Fair* |
| 75-90 | *Good* |
| 90-100 | *Excellent* |

Rock quality classification is based on a modified core recovery percentage (RQD) in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be done on NW core; however, it can be used on different core sizes if the bulk of the fractures caused by drilling stresses are easily distinguishable from *in situ* fractures. The terminology describing rock mass quality based on RQD is subjective and is underlain by the presumption that sound strong rock is of higher engineering value than fractured weak rock.

**Terminology describing rock mass:**

| Spacing (mm) | Joint Classification | Bedding, Laminations, Bands |
|---|---|---|
| > 6000 | *Extremely Wide* | - |
| 2000-6000 | *Very Wide* | *Very Thick* |
| 600-2000 | *Wide* | *Thick* |
| 200-600 | *Moderate* | *Medium* |
| 60-200 | *Close* | *Thin* |
| 20-60 | *Very Close* | *Very Thin* |
| <20 | *Extremely Close* | *Laminated* |
| <6 | - | *Thinly Laminated* |

**Terminology describing rock strength:**

| Strength Classification | Unconfined Compressive Strength (MPa) |
|---|---|
| *Extremely Weak* | < 1 |
| *Very Weak* | 1 – 5 |
| *Weak* | 5 – 25 |
| *Medium Strong* | 25 – 50 |
| *Strong* | 50 – 100 |
| *Very Strong* | 100 – 250 |
| *Extremely Strong* | > 250 |

**Terminology describing rock weathering:**

| Term | Description |
|---|---|
| *Fresh* | No visible signs of rock weathering. Slight discolouration along major discontinuities |
| *Slightly Weathered* | Discolouration indicates weathering of rock on discontinuity surfaces. All the rock material may be discoloured. |
| *Moderately Weathered* | Less than half the rock is decomposed and/or disintegrated into soil. |
| *Highly Weathered* | More than half the rock is decomposed and/or disintegrated into soil. |
| *Completely Weathered* | All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact. |

## STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.

Boulders Cobbles Gravel | Sand | Silt | Clay | Organics | Asphalt | Concrete | Fill | Igneous Bedrock | Meta-morphic Bedrock | Sedi-mentary Bedrock

## SAMPLE TYPE

| | |
|---|---|
| *SS* | Split spoon sample (obtained by performing the Standard Penetration Test) |
| *ST* | Shelby tube or thin wall tube |
| *PS* | Piston sample |
| *BS* | Bulk sample |
| *WS* | Wash sample |
| *HQ, NQ, BQ, etc.* | Rock core samples obtained with the use of standard size diamond coring bits. |

## WATER LEVEL MEASUREMENT

measured in standpipe, piezometer, or well

inferred

## RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

## N-VALUE / RQD

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration was achieved and N-values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N value corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log. RQD is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery.

## DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to A size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (305 mm) into the soil. The DCPT is used as a probe to assess soil variability. Soil type may be inferred from adjacent boreholes and test pits.

## OTHER TESTS

| | |
|---|---|
| *S* | Sieve analysis |
| *H* | Hydrometer analysis |
| *k* | Laboratory permeability |
| $\gamma$ | Unit weight |
| $G_s$ | Specific gravity of soil particles |
| *CD* | Consolidated drained triaxial |
| *CU* | Consolidated undrained triaxial with pore pressure measurements |
| *UU* | Unconsolidated undrained triaxial |
| *DS* | Direct Shear |
| *C* | Consolidation |
| $Q_u$ | Unconfined compression |
| $I_p$ | Point Load Index ($I_p$ on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm) |

| | |
|---|---|
|  | Single packer permeability test; test interval from depth shown to bottom of borehole |
|  | Double packer permeability test; test interval as indicated |
|  | Falling head permeability test using casing |
|  | Falling head permeability test using well point or piezometer |

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

1

CLIENT TSH

PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5

DATUM local

DATES: BORING Jan 3, 2007

WATER LEVEL

TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | **180.60** | | | | 0 | | | | |
| | 180.4 | 150mm TOPSOIL | | | | | | | |
| | | Brown, loose, Silty SAND, some clay and gravel, moist | | | 1 | SS | 1 | 250/610 | 4 |
| | 179.8 | | | | 2 | | | | |
| 1 | | Grey, stiff, Silty CLAY, moist | | | 3 | SS | 2 | 510/610 | 12 |
| | 179.1 | | | | 4 | | | | |
| | | Brown, compact, fine to coarse SAND, some silt, wet | | | 5 | SS | 3 | 510/610 | 24 |
| 2 | | | | | 6 | | | | |
| | | | | | 7 | | | | |
| | 178.2 | | | | 8 | SS | 4 | | 50/0.0 |
| | | END OF BOREHOLE at approximately 2.4 m<br><br>Refusal to augering on inferred bedrock<br><br>Borehole caved to a depth of 1.4 m<br><br>Borehole dry upon completion of drilling | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)
50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

0 61 14 25

16 61 19 4

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD 2

CLIENT TSH PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 DATUM local

DATES: BORING Jan 3, 2007 WATER LEVEL TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.70 | | | | 0 | | | | |
| | 180.6 | 100 mm TOPSOIL | | | | | | | |
| | | Brown, compact, fone to coarse SAND, moist | | | 1 | SS | 1 | 300/610 | 16 |
| | 179.9 | | | | 2 | | | | |
| 1 | | Brown, very stiff, Silty CLAY, some sand, moist | | | 3 | SS | 2 | 560/610 | 15 |
| | | | | | 4 | | | | |
| | | - hard | | | 5 | SS | 3 | 360/460 | 50/4.3 |
| | 178.7 | | | | 6 | | | | |
| 2 | | END OF BOREHOLE at approximately 2.0 m | | | 7 | | | | |
| | | Refusal to augering on inferred bedrock | | | 8 | | | | |
| | | Borehole dry upon completion of drilling | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

$W_P$ W $W_L$

WATER CONTENT & ATTERBERG LIMITS

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

3

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.90 | | | | 0 | | | | |
| | 180.7 | 150 mm TOPSOIL | | | | | | | |
| | | Brown, compact fine to coarse SAND with some silt, moist | | | 1 | SS | 1 | 300/610 | 12 |
| | 180.1 | | | | 2 | | | | |
| 1 | | Brown, hard, Silty CLAY, trace sand, moist | | | 3 | SS | 2 | 300/610 | 50/13 |
| | 179.5 | | | | 4 | SS | 3 | 0.0/76 | |
| | | END OF BOREHOLE at approximately 1.4 m<br><br>Refusal to augering on inferred bedrock<br><br>Borehole dry upon completion of drilling | | | 5 | | | | |
| 2 | | | | | 6 | | | | |
| | | | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

4

CLIENT TSH

PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5

DATUM local

DATES: BORING Jan 3, 2007

WATER LEVEL

TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.60 | | | | 0 | | | | |
| | 180.5 | 100 mm TOPSOIL | | | | | | | |
| | | Brown, soft, Silty CLAY, some sand, moist | | | 1 | SS | 1 | 510/610 | 3 |
| | | | | | 2 | | | | |
| | | - very stiff | | | 3 | SS | 2 | 360/610 | 21 |
| 1 | | | | | 4 | | | | |
| | | - stiff | | | 5 | | | | |
| | | | | | 6 | SS | 3 | 560/610 | 12 |
| 2 | | | | | 7 | | | | |
| | | - hard | | | 8 | SS | 4 | 250/300 | 50/8.4 |
| | 178.1 | | | | | | | | |
| | | - 50 mm fine to coarse SAND | | | | | | | |
| | | END OF BOREHOLE at approximately 2.6 m | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | Refusal to augering on inferred bedrock | | | 11 | | | | |
| | | | | | 12 | | | | |
| | | Borehole dry upon completion of drilling | | | 13 | | | | |
| 4 | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| | | | | | 16 | | | | |
| 5 | | | | | | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

5

CLIENT TSH

PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5

DATUM local

DATES: BORING Jan 3, 2007

WATER LEVEL Jan 3, 2007

TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.20 | | | | 0 | | | | |
| | 180.1 | 100 mm TOPSOIL | | | | | | | |
| | | Brown, loose, silty SAND, some clay and gravel, moist | | | 1 | SS | 1 | 300/610 | 4 |
| | 179.4 | | | | 2 | | | | |
| 1 | | Greyish brown, stiff, Silty CLAY, some sand, moist | | ▼ | 3 | SS | 2 | 560/610 | 11 |
| | | | | | 4 | | | | |
| | | - Grey, very stiff | | | 5 | | | | |
| | | | | | 6 | SS | 3 | 580/610 | 16 |
| 2 | | | | | 7 | | | | |
| | | - stiff | | | 8 | | | | |
| | | | | | 9 | SS | 4 | 360/610 | 10 |
| 3 | 177.1 | | | | 10 | SS | 5 | 0.0/52 | |
| | | END OF BOREHOLE at approximately 3.1 m | | | 11 | | | | |
| | | Refusal to augering on inferred bedrock | | | 12 | | | | |
| | | Borehole wet upon completion of drilling | | | 13 | | | | |
| 4 | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)
50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

19 32 15 35

□ Field Vane Test (kPa)
■ Remoulded Vane Test (kPa)
△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

6

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL Jan 3, 2007 — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 179.60 | | | | 0 | | | | |
| | | 50 mm TOPSOIL | | | | | | | |
| | | Brownish grey, soft, silty CLAY, some sand, moist | | | 1 | SS | 1 | 360/610 | 3 |
| | | | | | 2 | | | | |
| | | - very stiff | | ▼ | 3 | SS | 2 | 560/610 | 20 |
| 1 | | | | | 4 | | | | |
| | 178.1 | | | | 5 | SS | 3 | 180/180 | 50/2.0 |
| | 177.9 | Brownish grey, dense, fine to coarse SAND, some silt, wet | | | | | | | |
| | | END OF BOREHOLE at approximately 1.7 m | | | 6 | | | | |
| 2 | | Refusal to augering on inferred bedrock | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | Borehole wet upon completion of drilling | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

1 25 24 50

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

7

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL Jan 3, 2007 — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | **180.30** | | | | 0 | | | | |
| | 180.2 | 100 mm TOPSOIL | | | | | | | |
| | | Grey, soft, Silty CLAY, some sand, moist | | | 1 | SS | 1 | 410/610 | 6 |
| | | | | | 2 | | | | |
| 1 | | - hard | | ▼ | 3 | SS | 2 | 0.0/610 | 50/13 |
| | 178.9 | | | | 4 | | | | |
| | | END OF BOREHOLE at approximately 1.4 m<br><br>Refusal to augering on inferred bedrock<br><br>Borehole wet upon completion of drilling | | | 5 | | | | |
| 2 | | | | | 6 | | | | |
| | | | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

8

CLIENT TSH — PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 — DATUM local

DATES: BORING Jan 3, 2007 — WATER LEVEL Jan 3, 2007 — TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) | UNDRAINED SHEAR STRENGTH (kPa) 50 100 150 200 / WATER CONTENT & ATTERBERG LIMITS Wp W WL / DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m / STANDARD PENETRATION TEST, BLOWS/0.3m | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.50 | | | | 0 | | | | | | |
| | 180.3 | 150 mm TOPSOIL | | | | | | | | | |
| | | Brown, stiff, Silty CLAY, some sand, moist | | ▼ | 1 | SS | 1 | 460/610 | 6 | ● | |
| | 179.7 | | | | 2 | | | | | | |
| | | END OF BOREHOLE at approximately 0.8 m | | | | SS | 2 | 0.0/52 | 50/2.0 | >>● | |
| 1 | | Refusal to augering on inferred bedrock | | | 3 | | | | | | |
| | | Borehole wet upon completion of drilling | | | 4 | | | | | | |
| | | | | | 5 | | | | | | |
| 2 | | | | | 6 | | | | | | |
| | | | | | 7 | | | | | | |
| | | | | | 8 | | | | | | |
| | | | | | 9 | | | | | | |
| 3 | | | | | 10 | | | | | | |
| | | | | | 11 | | | | | | |
| | | | | | 12 | | | | | | |
| 4 | | | | | 13 | | | | | | |
| | | | | | 14 | | | | | | |
| | | | | | 15 | | | | | | |
| 5 | | | | | 16 | | | | | | |

□ Field Vane Test (kPa)
■ Remoulded Vane Test (kPa)
△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD 9

CLIENT TSH PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 DATUM local

DATES: BORING Jan 3, 2007 WATER LEVEL TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) | UNDRAINED SHEAR STRENGTH (kPa) 50 100 150 200 / WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$ / DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼ / STANDARD PENETRATION TEST, BLOWS/0.3m ● | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 180.10 | | | | 0 | | | | | 10 20 30 40 50 60 70 80 90 100 | |
| | | 50 mm TOPSOIL | | | | | | | | | |
| | | Grey, stiff, Silt CLAY, some sand, moist | | | 1 | SS | 1 | 510/610 | 5 | ● | |
| | 179.5 | | | | 2 | | | | | | |
| | | END OF BOREHOLE at approximately 0.6 m | | | 3 | | | | | | |
| 1 | | Refusal to augering on inferred bedrock | | | 4 | | | | | | |
| | | Borehole dry upon completion of drilling | | | 5 | | | | | | |
| | | | | | 6 | | | | | | |
| 2 | | | | | 7 | | | | | | |
| | | | | | 8 | | | | | | |
| | | | | | 9 | | | | | | |
| 3 | | | | | 10 | | | | | | |
| | | | | | 11 | | | | | | |
| | | | | | 12 | | | | | | |
| 4 | | | | | 13 | | | | | | |
| | | | | | 14 | | | | | | |
| | | | | | 15 | | | | | | |
| 5 | | | | | 16 | | | | | | |

□ Field Vane Test (kPa)
■ Remoulded Vane Test (kPa)
△ Pocket Penetrometer Test (kPa)

JACQUES, WHITFORD AND ASSOCIATES LIMITED

# BOREHOLE RECORD

10

CLIENT TSH PROJECT No. 1020300

LOCATION Port Severn Muskoka Road 5 DATUM local

DATES: BORING Jan 3, 2007 WATER LEVEL TPC ELEV.

| DEPTH (m) | ELEVATION (m) | STRATA DESCRIPTION | STRATA PLOT | WATER LEVEL | DEPTH (ft) | SAMPLES TYPE | SAMPLES NUMBER | SAMPLES RECOVERY (mm) TCR(%) / SCR(%) | SAMPLES N-VALUE OR RQD(%) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 179.20 | | | | 0 | | | | |
| | 179.0 | 150 mm TOPSOIL | | | | | | | |
| | | Brown, stiff, Silty CLAY, some sand, moist | | | 1 | SS | 1 | 560/610 | 6 |
| | 178.4 | | | | 2 | | | | |
| | | END OF BOREHOLE at approximately 0.8 m | | | | SS | 2 | 0.0/52 | 50/2.0 |
| 1 | | Refusal to augering on inferred bedrock | | | 3 | | | | |
| | | Borehole dry upon completion of drilling | | | 4 | | | | |
| | | | | | 5 | | | | |
| 2 | | | | | 6 | | | | |
| | | | | | 7 | | | | |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| 3 | | | | | 10 | | | | |
| | | | | | 11 | | | | |
| | | | | | 12 | | | | |
| 4 | | | | | 13 | | | | |
| | | | | | 14 | | | | |
| | | | | | 15 | | | | |
| 5 | | | | | 16 | | | | |

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS $W_P$ W $W_L$

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

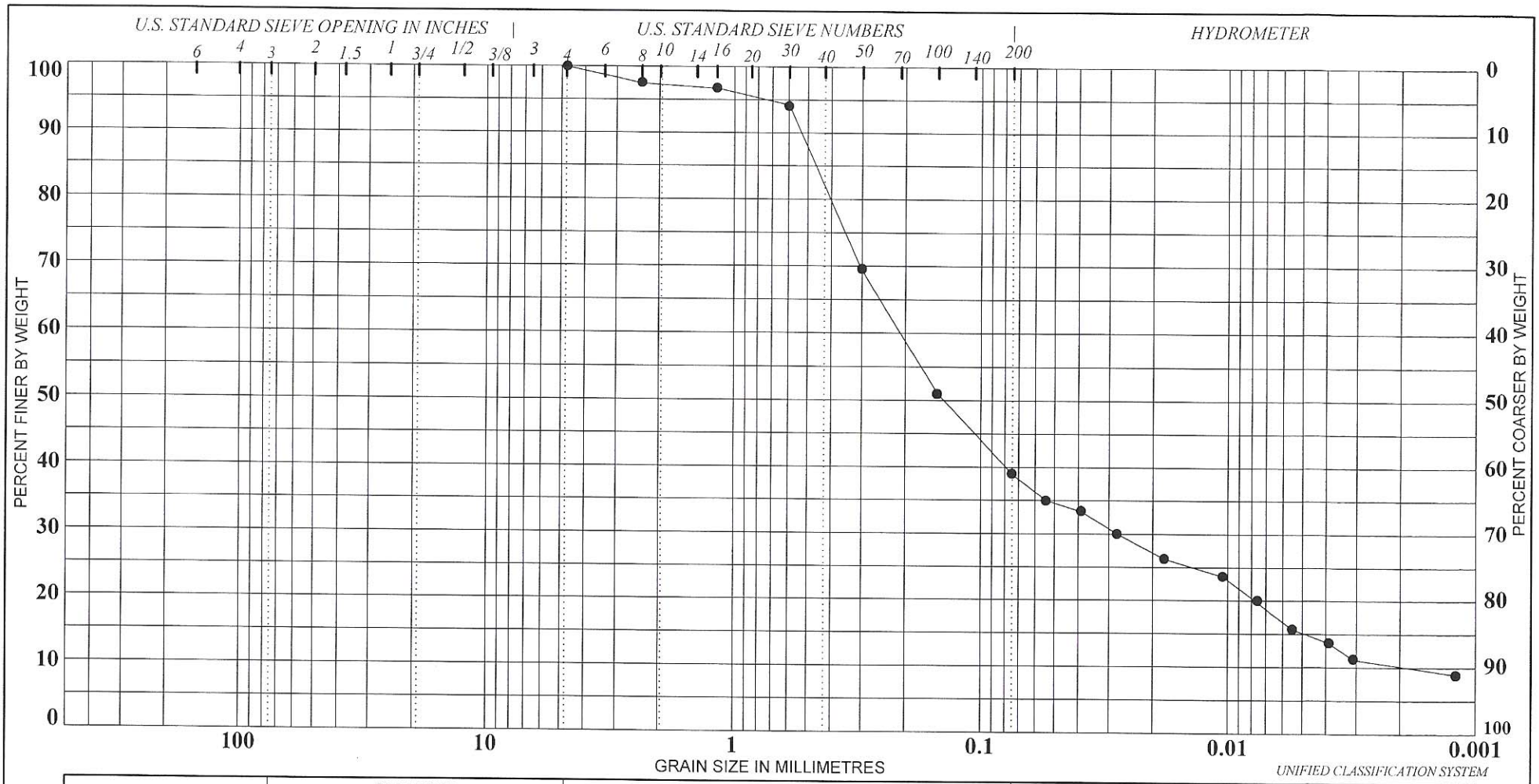
□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)

# APPENDIX C

Laboratory Tests

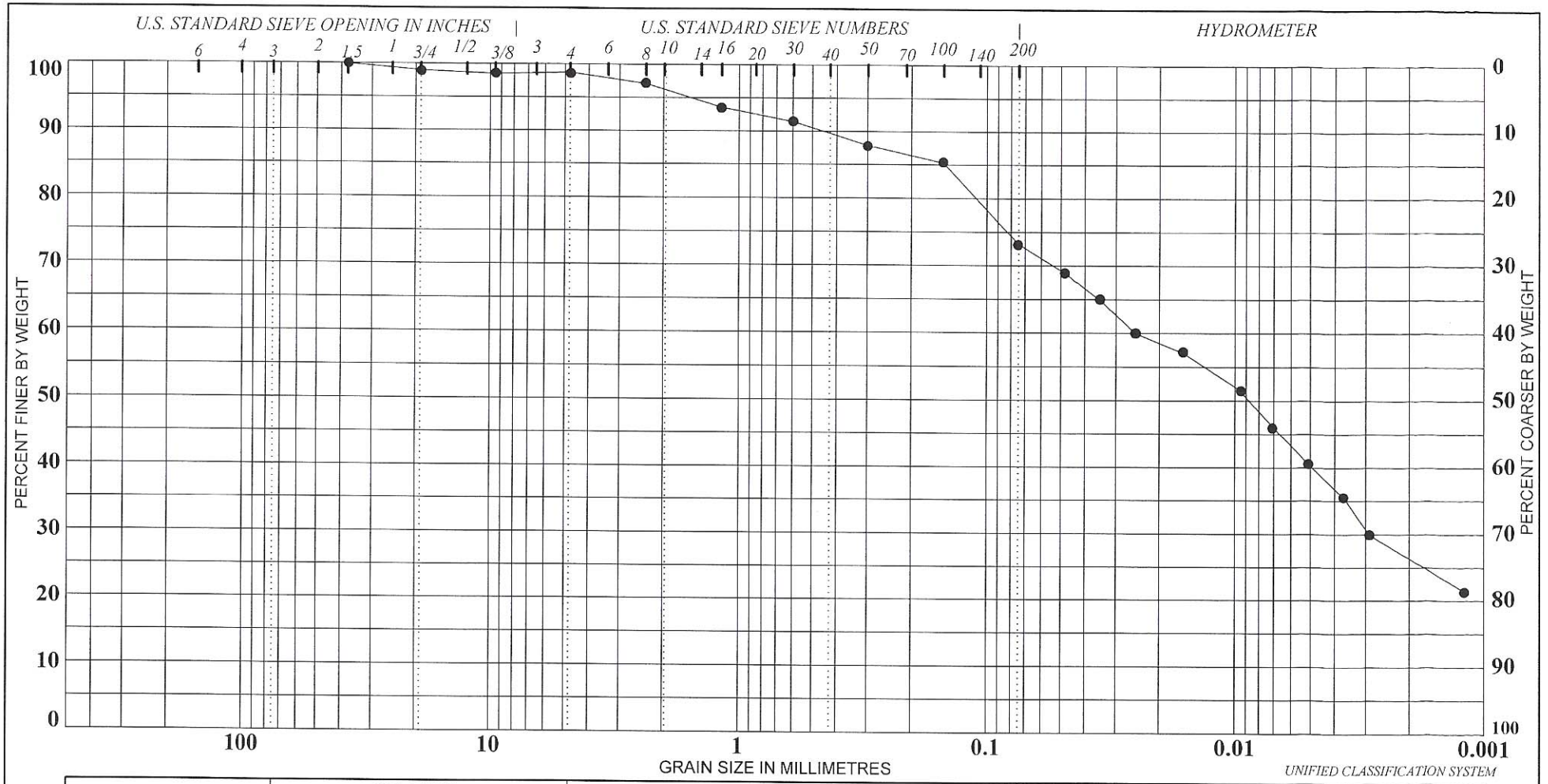



| COBBLES | GRAVEL | | SAND | | | SILT and CLAY | |
|---|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | SILT | CLAY |

| Specimen | Depth (m) | Description | W% | $W_L$ | $W_P$ | $I_P$ | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● 1 | ..4 | Silty SAND with some clay and gravel | 33 | | | | 0 | 61 | 22 | 17 |

**Project:** Port Severn
**Location:** Port Severn Muskoka Road 5
**Project No.:** 1020300

**GRADATION CURVE** (ASTM D422-63(1998))
**Figure:** 1
**Remarks:**




| COBBLES | GRAVEL | | SAND | | | SILT and CLAY | |
|---|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | SILT | CLAY |

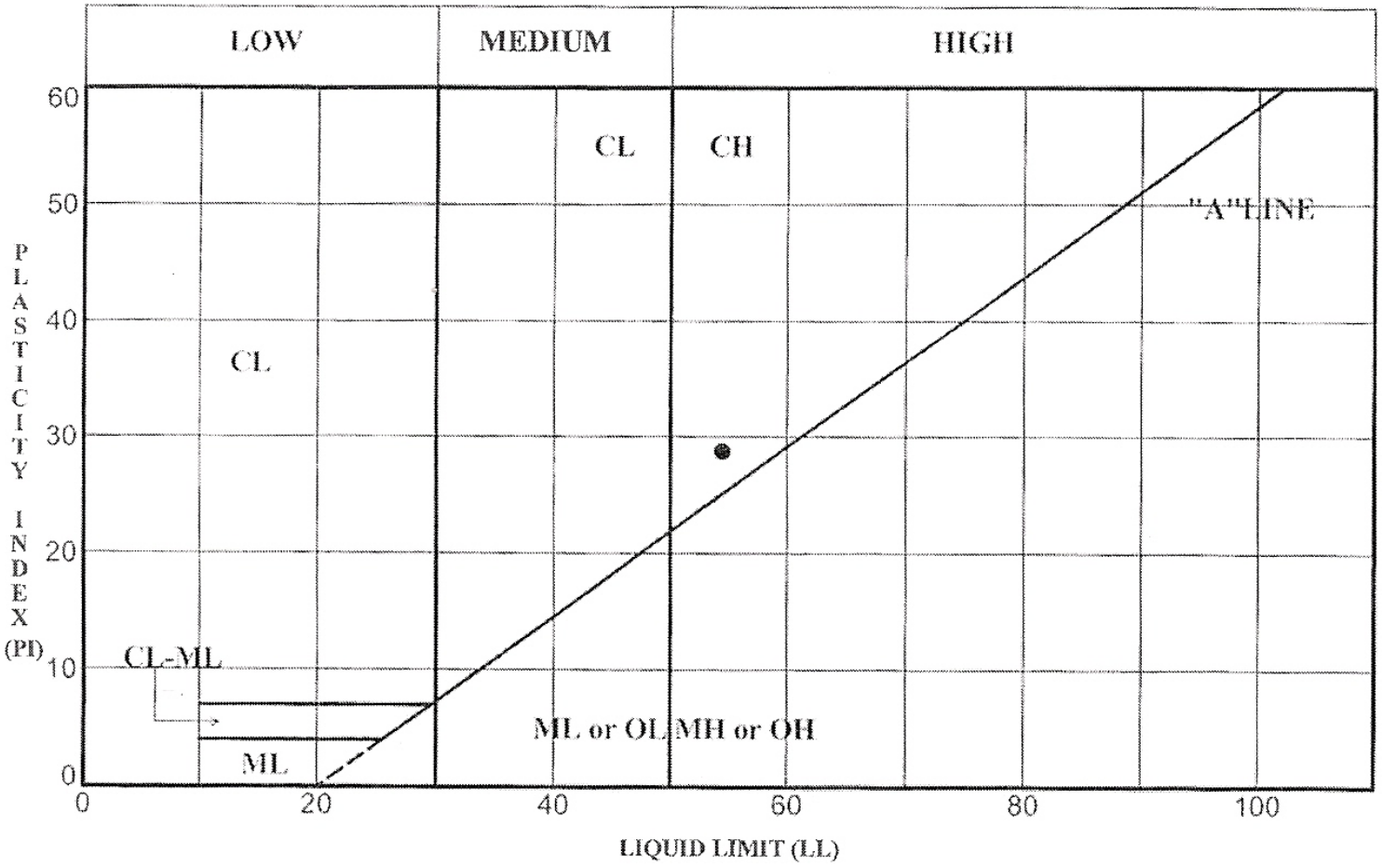
| Specimen | Depth (m) | Description | W% | $W_L$ | $W_P$ | $I_P$ | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● 6 | 1.4 | Silty CLAY with some sand | 27 | | | | 1 | 26 | 37 | 36 |

**Project:** Port Severn
**Location:** Port Severn Muskoka Road 5
**Project No.:** 1020300

**GRADATION CURVE** (ASTM D422-63(1998))
**Figure:** 2
**Remarks:**

# PLASTICITY CHART






| | Specimen | Depth (m) | LL | PL | PI | Fines | W% | Classification |
|---|---|---|---|---|---|---|---|---|
| ● | 5 | 2.3 | 54 | 26 | 28 | 50 | 32 | CLAYEY SAND with GRAVEL(SC) |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

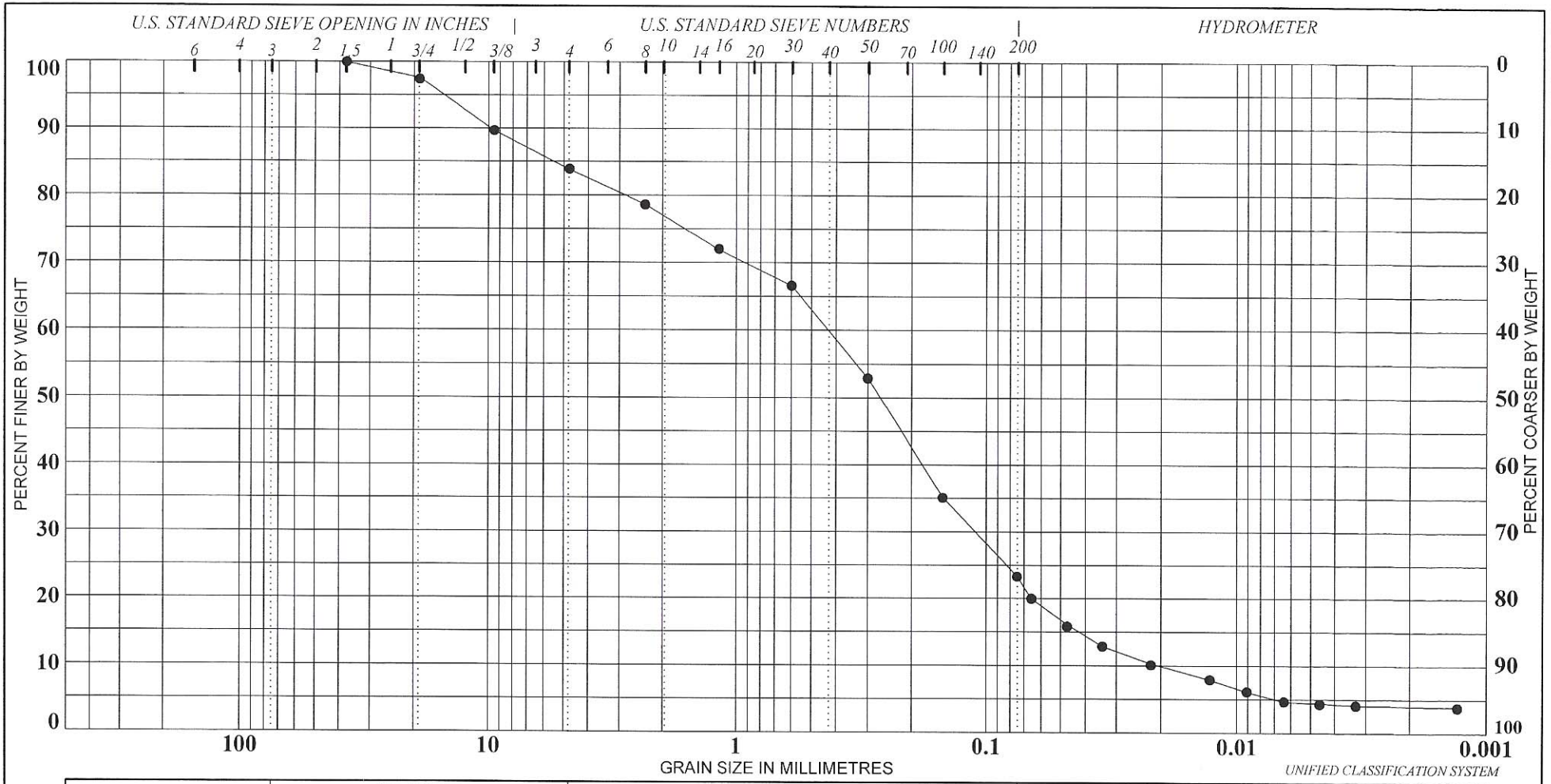
Jacques

**Project:** Port Severn

**Location:** Port Severn Muskoka Road 5

## ATTERBERG LIMITS (ASTM D4318-95)

**Figure:** 1




| COBBLES | GRAVEL | | SAND | | | SILT and CLAY | |
|---|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | SILT | CLAY |

| Specimen | Depth (m) | Description | W% | $W_L$ | $W_P$ | $I_P$ | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● 1 | 2.1 | fine to coarse SAND with some silt | 15 | | | | 16 | 61 | 19 | 4 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**Project:** Port Severn
**Location:** Port Severn Muskoka Road 5
**Project No.:** 1020300

**GRADATION CURVE** (ASTM D422-63(1998))
**Figure:** 3
**Remarks:**

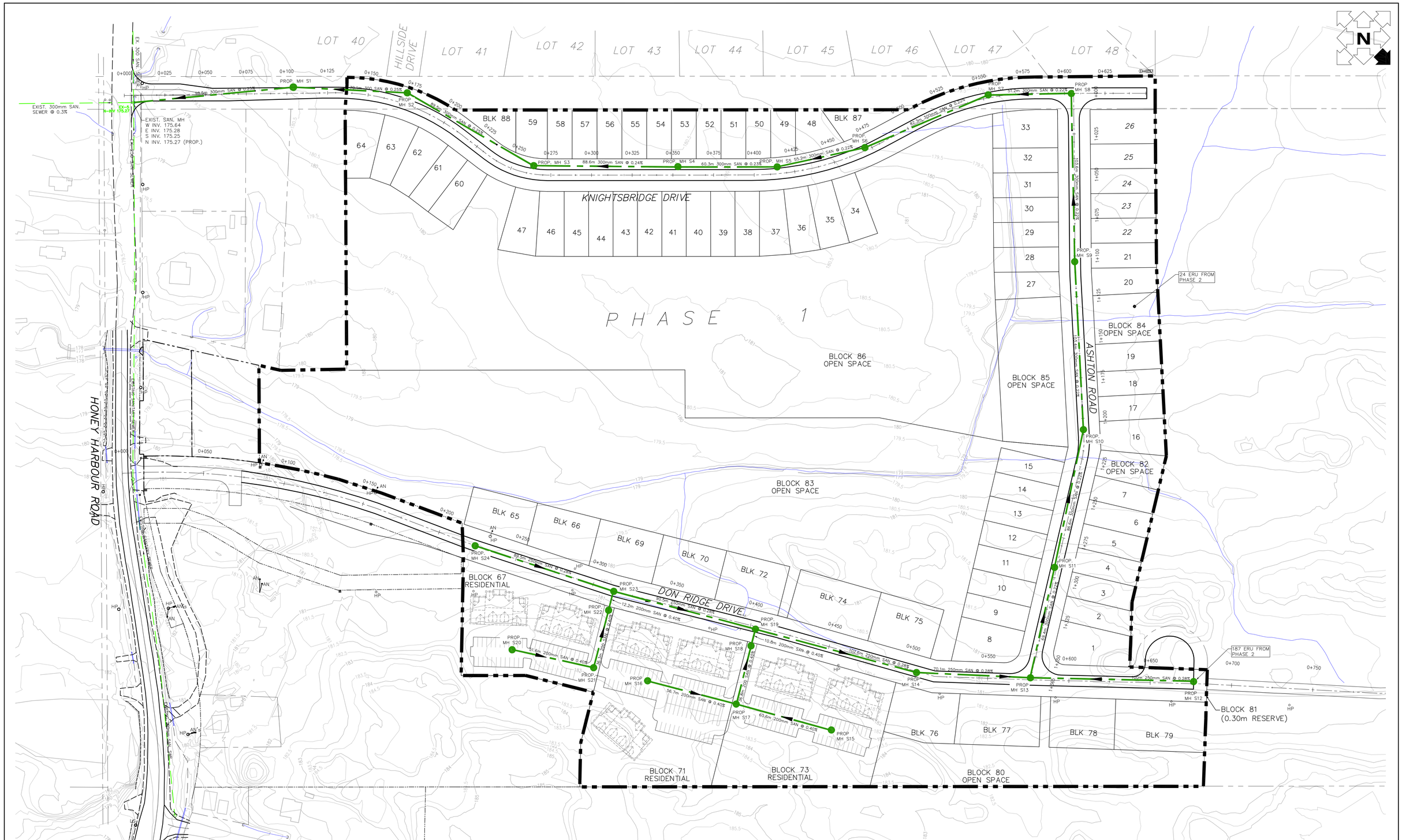
# APPENDIX D

## Preliminary Servicing Drawings

## Preliminary Roadway Cross Section Details

## Draft Plan S2007-4 Red lined

## Master Plan




LEGEND

- EXIST. CONTOURS
- EXIST. SANITARY MANHOLE
- EXIST. SANITARY SEWER
- PROP. SANITARY MANHOLE
- PROP. SANITARY SEWER
- EXIST. STORM MH / CB
- EXIST. STORM SEWER
- PROP. STORM MH / CB
- PROP. STORM SEWER
- EXIST. WATERMAIN
- PROP. WATERMAIN
- MODELED WATERMAIN NODE
- PROP. FIRE HYDRANT

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| REVISED SUBDIVISION BLOCKS 67, 71 AND 73 | 1 | NOV. 17, 2021 | TM |
| ISSUED FOR UPDATED FSR | 2 | DEC. 22, 2021 | TM |

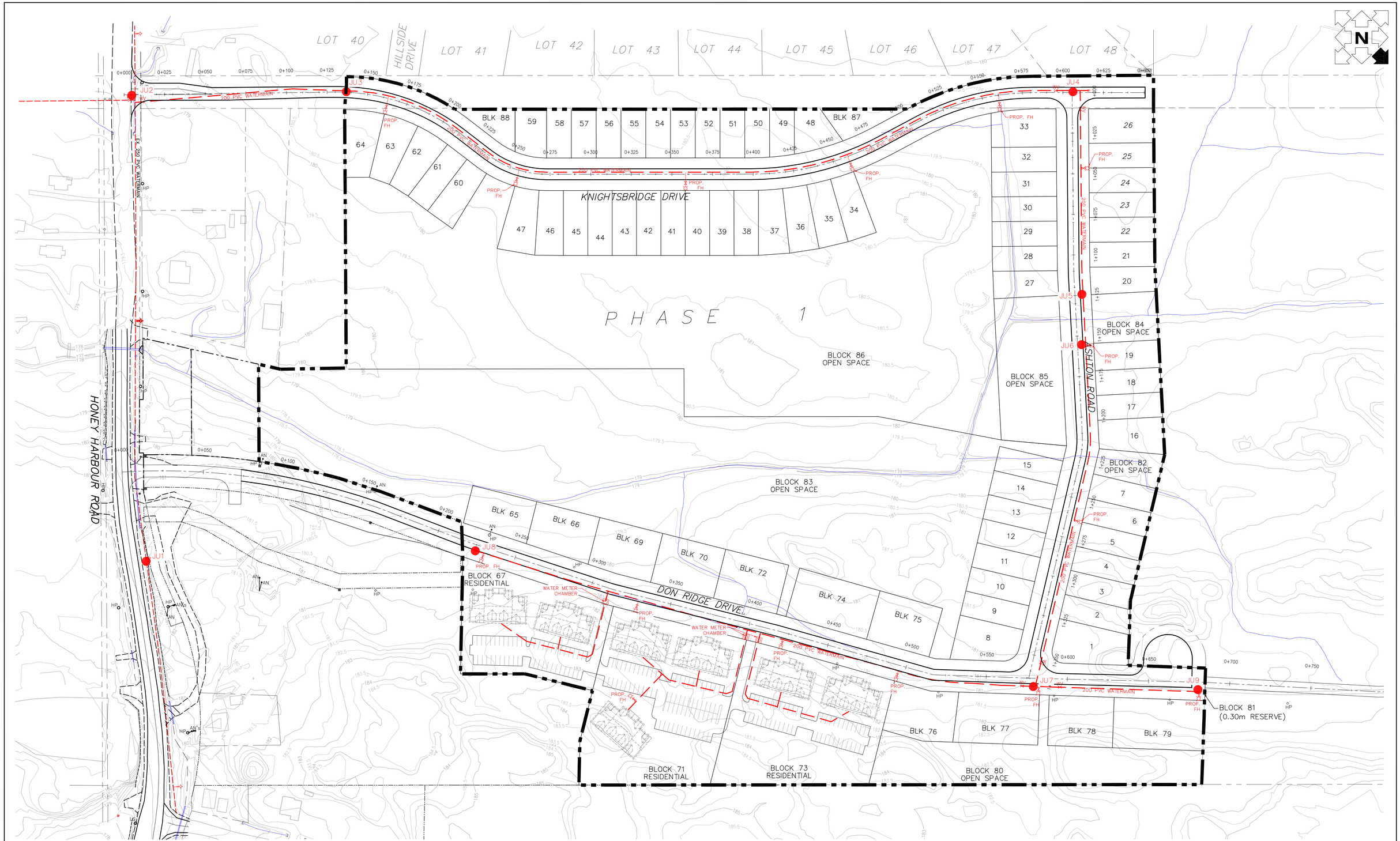
TULLOCH ENGINEERING

# PORT SEVERN HEIGHTS
# PORT SEVERN, ONTARIO

## PRELIMINARY SANITARY SERVICING

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,000 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | JULY 15, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S1 |




LEGEND

- EXIST. CONTOURS
- EXIST. SANITARY MANHOLE
- EXIST. SANITARY SEWER
- PROP. SANITARY MANHOLE
- PROP. SANITARY SEWER
- EXIST. STORM MH / CB
- EXIST. STORM SEWER
- PROP. STORM MH / CB
- PROP. STORM SEWER
- EXIST. WATERMAIN
- PROP. WATERMAIN
- MODELED WATERMAIN NODE
- PROP. FIRE HYDRANT

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| REVISED SUBDIVISION BLOCKS 67, 71 AND 73 | 1 | NOV. 17, 2021 | TM |
| ISSUED FOR UPDATED FSR | 2 | DEC. 22, 2021 | TM |

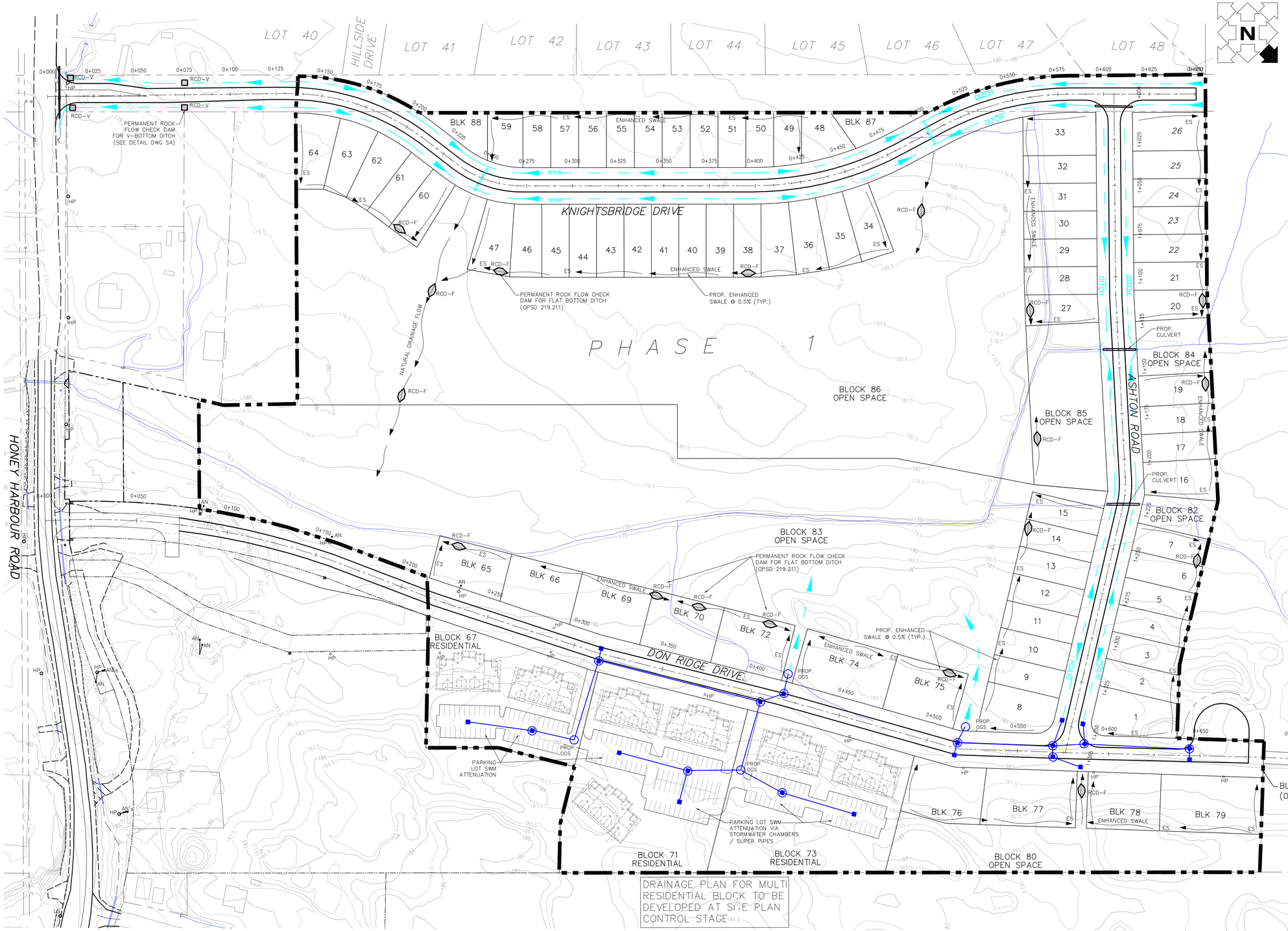
TULLOCH ENGINEERING

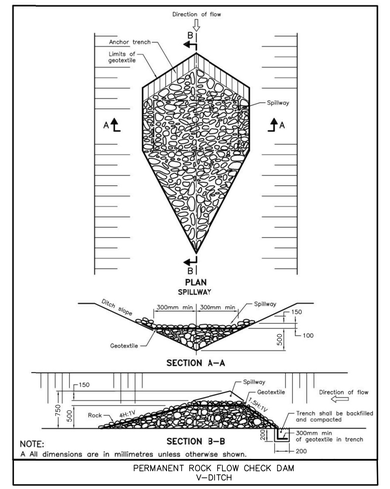
# PORT SEVERN HEIGHTS
# PORT SEVERN, ONTARIO

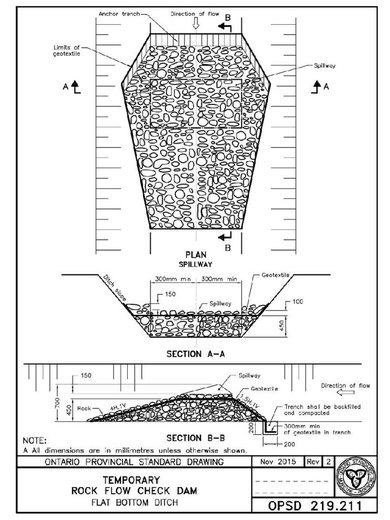
## PRELIMINARY WATER SERVICING

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,000 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | JULY 15, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S3 |




LEGEND

EXIST. CONTOURS
EXIST. SANITARY MANHOLE
EXIST. SANITARY SEWER
PROP. SANITARY MANHOLE
PROP. SANITARY SEWER
EXIST. MH / CB
EXIST. STORM SEWER
PROP. STORM MH / CB
PROP. STORM SEWER
EXIST. WATERMAIN
PROP. WATERMAIN
MODELED WATERMAIN NODE
PROP. FIRE HYDRANT
PROP. DITCH
PROP. CULVERT
PROP. CB
PROP. CBMH
PROP. STORM SEWER
PROP. OGS
PROP. OIL GRIT SEPARATOR

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| REVISED SUBDIVISION BLOCKS 67, 71 AND 73 | 1 | NOV. 17, 2021 | TM |
| ISSUED FOR UPDATED FSR | 2 | DEC. 22, 2021 | TM |

TULLOCH ENGINEERING

PORT SEVERN HEIGHTS
PORT SEVERN, ONTARIO

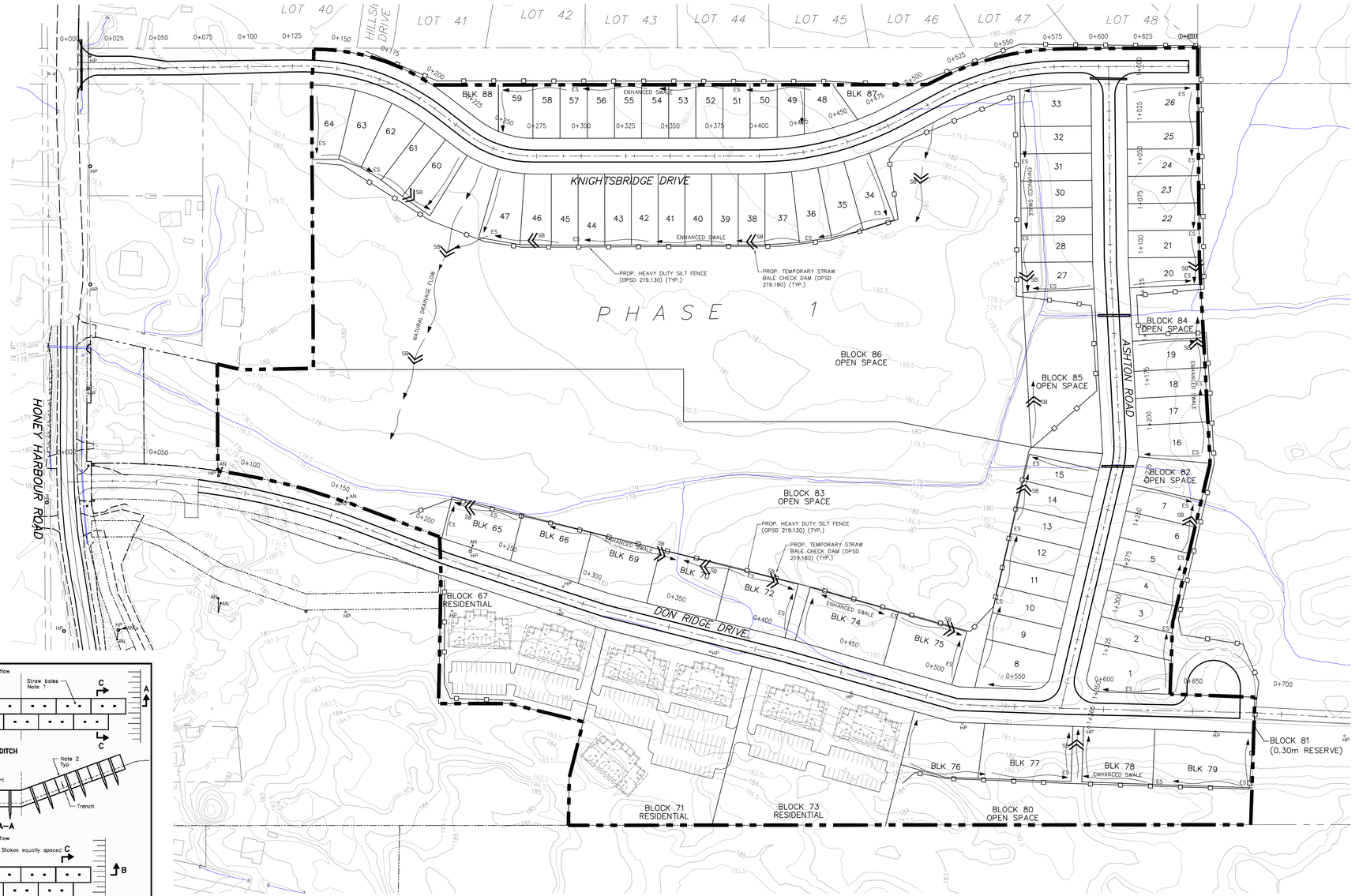
PRELIMINARY STORMWATER DRAINAGE

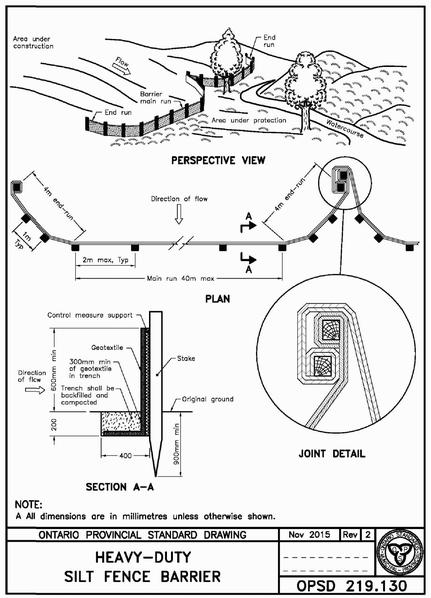
ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,000 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | JULY 15, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S4 |

## CONSTRUCTION MITIGATION:

1. ALL SEDIMENT CONTROL FENCING IS TO BE INSTALLED PRIOR TO ANY GRADING OR EXCAVATION.
2. EROSION CONTROL FENCING TO BE INSTALLED AROUND THE BASE OF ALL STOCKPILES.
3. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED AS SITE DEVELOPMENT PROGRESSES. CONTRACTOR TO PROVIDE ALL ADDITIONAL EROSION CONTROL STRUCTURES, AS NEEDED.
4. ENGINEER IS TO MONITOR EROSION CONTROL STRUCTURES TO ENSURE FENCING IS INSTALLED AND MAINTAINED TO TOWN REQUIREMENTS.
5. EROSION CONTROL STRUCTURES ARE TO BE MONITORED REGULARLY AND ANY DAMAGE REPAIRED IMMEDIATELY. SEDIMENT IS TO BE REMOVED WHEN ACCUMULATIONS BUILD UP INSIDE THE CONTROL FENCE.
6. ALL EROSION CONTROL STRUCTURES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND HAS BEEN RESTABLIZED EITHER BY GRAVEL OR RESTORATION OF VEGETATIVE GROUND COVER.
7. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE ENGINEER AND THE DEPARTMENT OF PUBLIC WORKS.
8. THE CONTRACTOR IS RESPONSIBLE FOR MUNICIPAL ROADWAY TO ENSURE ROADS ARE CLEARED OF ALL SEDIMENT TRACKED BY VEHICLES AT THE END OF EACH DAY.
9. THE CONTRACTOR IS RESPONSIBLE TO REMOVE ANY SEDIMENT THAT HAS TRACKED OFF SITE ONTO ADJACENT PROPERTY OWNED BY OTHERS. RESTORATION AND/OR MAINTENANCE TO ADJACENT PROPERTY MUST BE COMPLETED TO EQUAL OR BETTER CONDITION.

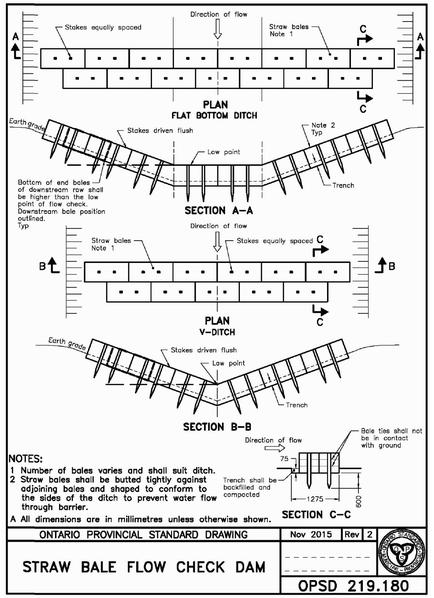



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

**HEAVY–DUTY SILT FENCE BARRIER**

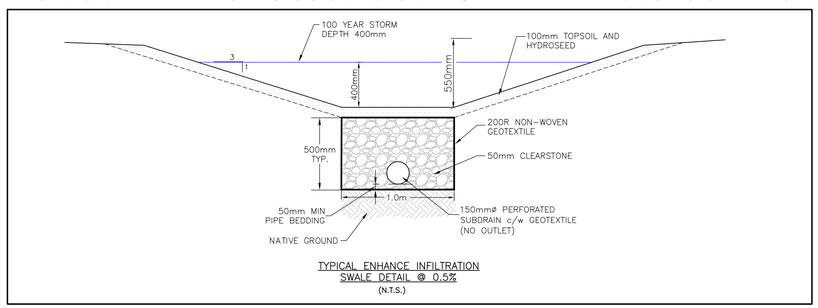
OPSD 219.130




ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

**STRAW BALE FLOW CHECK DAM**

OPSD 219.180




TYPICAL ENHANCE INFILTRATION SWALE DETAIL @ 0.5%
(N.T.S.)

LEGEND

EXIST. CONTOURS
EXIST. SANITARY MANHOLE
EXIST. SANITARY SEWER
PROP. SANITARY MANHOLE
PROP. SANITARY SEWER
EXIST. STORM MH / CB
EXIST. STORM SEWER
PROP. STORM MH / CB
PROP. STORM SEWER
PROP. CB
PROP. CBMH
PROP. STORM SEWER
PROP. OGS
PROP. OIL GRIT SEPARATOR
PROP. DITCH
PROP. CULVERT
HEAVY DUTY SILT FENCE (OPSD 219.130)
STRAW BALE CHECK DAM (OPSD 219.180)

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| ISSUED FOR UPDATED FSR | 1 | DEC. 22, 2021 | TM |

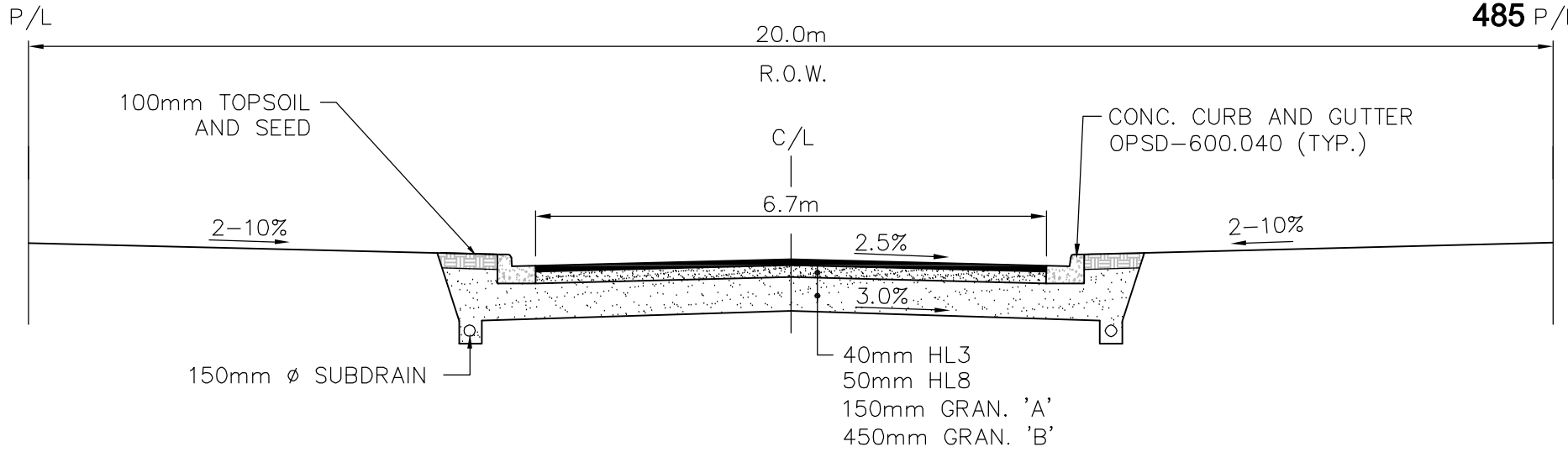
TULLOCH ENGINEERING

# PORT SEVERN HEIGHTS
# PORT SEVERN, ONTARIO

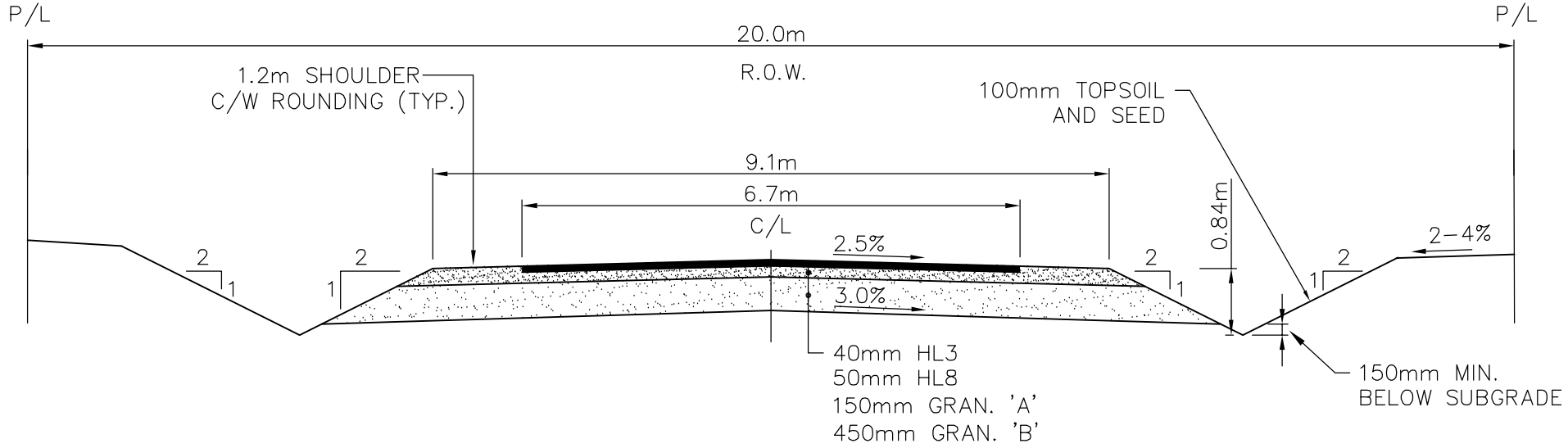
## SEDIMENT, EROSION CONTROL AND CONSTRUCTION MITIGATION PLAN

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:1,250 |
| DRAWN | D.W.R. |
| CHECKED | T.M. |
| DATE | DEC. 17, 2021 |
| PROJECT No. | 14-4022 |
| SHEET | S7 |

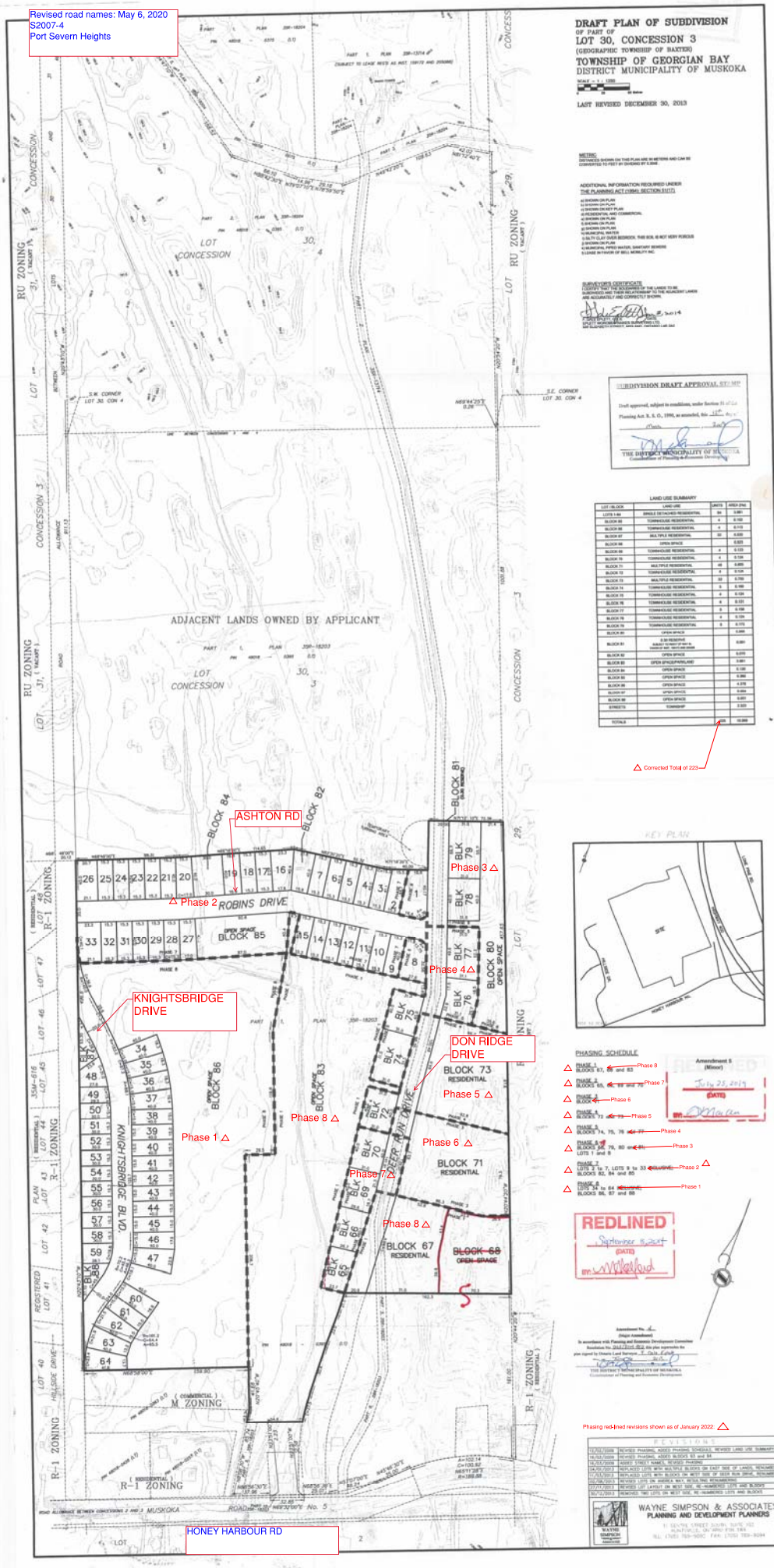



PORT SEVERN HEIGHTS ESTATES
PRELIMINARY TYPICAL URBAN SECTION
NTS




PORT SEVERN HEIGHTS ESTATES
PRELIMINARY TYPICAL SEMI-URBAN SECTION
NTS

Revised road names: May 6, 2020
S2007-4
Port Severn Heights

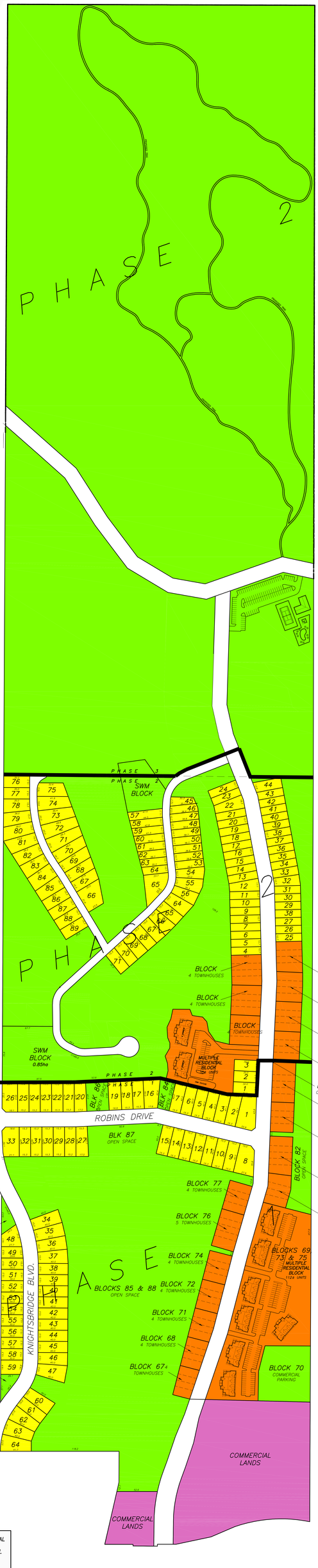


# PORT SEVERN HEIGHTS

CONCEPTUAL MASTER PLAN

AUGUST 9, 2016

SCALE 1:4000




## UNIT BREAKDOWN

PHASE 1:

| | |
|---|---|
| SINGLE DETACHED LOTS | = 64 |
| TOWNHOUSE DWELLINGS | = 47 |
| MULTI-RES UNITS | = 112 |
| TOTAL PHASE | = 223 |

PHASE 2:

| | |
|---|---|
| SINGLE DETACHED LOTS | = 89 |
| TOWNHOUSE DWELLINGS | = 28 |
| MULTI-RES UNITS | = 35 |
| TOTAL PHASE | = 152 |
| TOTAL DEVELOPMENT | = 375 |

- SINGLE DETACHED RESIDENTIAL
- MULTIPLE FAMILY RESIDENTIAL
- COMMERCIAL
- OPEN SPACE
- INSTITUTIONAL

This is Exhibit “E” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

*Commissioner for Taking Affidavits (or as may be)*

**ROBERT B. COHEN**

## SCHEDULE "A" CONSOLIDATION

Amd. by Auth. July 25/19

## PLAN OF SUBDIVISION FILE ~~NO.~~ S2007-4 "Port Severn Heights"

*Consolidated to include Minor Amendments on July 25, 2019 and March 16, 2020. Please be advised that this is an office consolidation and is to be used for information purposes only.*

### Part A – Approval

Amd. by Auth. July 25/19

Plan of Subdivision File ~~No.~~ S2007-4 (Port Severn Heights) is approved subject to Parts B, C, and D herein.

### Part B – Conditions

### General Conditions

Amd. by Auth. Sep 24/10

~~1. This approval applies to the "Port Severn Heights" Plan of Subdivision, File No. S2007-4, prepared by Galbraith, Eplett, Worobec Surveyors, dated February 19, 2009, showing a total of eighty (80) lots and twenty-four (24) blocks on Part of Lot 30, Concessions 3 and 4, Baxter Ward, in the Township of Georgian Bay, The District Municipality of Muskoka.~~

~~1. This approval applies to the "Port Severn Heights" Plan of Subdivision, File No. S2007-4, prepared by Galbraith, Eplett, Worobec Surveyors, dated February 19, 2009, and redlined on March 12, 2009, April 7, 2009 and September 23, 2010, showing a total of 80 lots and 19 blocks on Part of Lot 30, Concessions 3 and 4, Baxter Ward, in the Township of Georgian Bay, The District Municipality of Muskoka.~~

Amd. By Res. D/2013-PED Jul 15/13

1. ~~This approval applies to the "Port Severn Heights" Plan of Subdivision, File No. S2007-4, prepared by Galbraith, Eplett, Worobec Surveyors, dated March 11, 2013, and redlined on June 18, 2013, showing a total of 42 lots and 34 blocks on Part of Lot 30, Concession 4, Baxter Ward, in the Township of Georgian Bay, The District Municipality of Muskoka.~~

Amd. By Res. D62/2014-PED Sep 18/14

Amd. by Auth. July 25/19

1. This approval applies to the "Port Severn Heights" Plan of Subdivision, File ~~No.~~ S2007-4, prepared by Galbraith, Eplett, Worobec Surveyors, dated January 8, 2014, and redlined on September 8, 2014, showing a total of 64 lots and ~~24~~ 23 blocks on Part of Lot 30, Concession 3, Baxter Ward, in the Township of Georgian Bay, The District Municipality of Muskoka.

Amd. by Auth. July 25/19

Amd. by Auth. Mar 16/20

2. Prior to final approval being granted, The District Municipality of Muskoka shall be provided with a satisfactory copy of the final plan in digital format, including road centrelines, in accordance with The District ~~Municipality~~ of Muskoka Draft ~~Digital~~ and Final Plan of Subdivision Digital Submission Requirements.

3. Prior to final approval being granted and prior to the submission of the proposed internal road names to the Township of Georgian Bay for approval purposes, the Owner shall submit names to The District Municipality of Muskoka for 911 verification.

Amd. by Auth. Mar 16/20

4. Prior to final approval being granted and to the execution or the Area Municipal Council's endorsement thereof, The District Municipality of Muskoka shall be circulated a draft of the Area Municipal Subdivision Agreement for review, comment and potential revisions, if required related to District interests ~~and comment~~ and shall be in receipt of a registered copy thereof.

### Phasing

Amd. by Auth. Sep 24/10

5. The plan of subdivision shall be finalized in the ~~seven (7)~~ ~~eleven (11)~~ eight (8) phases as set out on the draft approved plan and detailed below, with each proceeding phase being registered and

Amd. By Res. D/2013-PED Jul 15/13

~~substantially complete~~ building permits have been issued for a minimum of 80% of the units in that phase prior to the final approval of the subsequent phase and subject to the confirmation of available water and sewer capacity. Prior to the final approval of any phase, The District of Muskoka and the Township of Georgian Bay shall be satisfied that the previously registered phases have been serviced by municipal water and sewer services and that any required infrastructure has been installed.

~~Phase 1: Lots 38-57 and Blocks 71, 75 and 87-91~~
~~Phase 2: Lots 23, 32-37, 58-70 and Blocks 72 and 92~~
~~Phase 3: Lots 4-22, 24-31 and Blocks 73, 74 and 103~~
~~Phase 4: Blocks 78-80~~
~~Phase 5: Blocks 76-77 and 81~~
~~Phase 6: Lots 93-102 and Blocks 82 and 85-86~~
~~Phase 7: Lots 1-3 and Blocks 83-84 and 104~~

Amd. By Res. D/2013-PED on Jul 15/13

~~Phase 1: Blocks 48, 49 and 62~~
~~Phase 2: Blocks 43-46~~
~~Phase 3: Block 50~~
~~Phase 4: Blocks 47 and 51~~
~~Phase 5: Blocks 52-55~~
~~Phase 6: Blocks 56, 57, 58 and 59 and Lots 1 and 7~~
~~Phase 7: Lots 2-6, Lots 8-29 and Blocks 60 and 61~~
~~Phase 8: Blocks 63 – 66 and 70~~
~~Phase 9: Blocks 67 – 69 and 73~~
~~Phase 10: Lots 30 – 39 and Blocks 71, 72 and 74~~
~~Phase 11: Lots 40 – 42 and Blocks 75 and 76~~

Amd. by Auth. July 25/19

Amd. By Res. D62/2014-PED Sep 18/14

Phase 1: Blocks 67~~, 68~~ and 83
Phase 2: Blocks 65, 66, 69 and 70
Phase 3: Block 71
Phase 4: Blocks 72 and 73
Phase 5: Blocks 74-77
Phase 6: Blocks 78- 81 and Lots 1 and 8
Phase 7: Lots 2 – 7, Lots 9 – 33 and Blocks 82, 84 and 85
Phase 8: Lots 34 – 64 and Blocks 86-88

**Access**

6. The road allowances included in this plan of subdivision shall be dedicated as public highways, and the roads shall be designed, constructed and named to the satisfaction of the Township of Georgian Bay.

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7. Prior to final approval of ~~Phase 5~~ Phase 8 being granted, the owner shall design and construct a road access for Township assumption over a portion of the road allowance between Lots 30 and 31, Concession 3, Baxter Ward as a second public road access leading to the subject lands to the satisfaction of the Township of Georgian Bay.

Amd. By Res. D/2013-PED Jul 15/13

8. Prior to final approval of ~~Phase 5~~ Phase 8 being granted, the owner shall design, construct, and dedicate as a public highway ~~Street 'C'~~ ~~Beavertail Drive~~ Knightsbridge Boulevard as part of a

Amd. By Res. D62/2014-PED Sep 18/14

second public road access leading to the subject lands to the satisfaction of the Township of Georgian Bay.

**Conveyances**

Amd. by Auth. Mar 16/20

9. Easements as may be required for access, pedestrian walkways, utilities, drainage, or other purposes shall be granted to The District Municipality of Muskoka, the Township of Georgian Bay and any other authority or party ~~as may be required~~.

Amd. by Auth. Sep 24/10

~~10. Prior to final approval of any phase, the owner shall convey Block 89 to The District Municipality of Muskoka for road widening purposes on Muskoka Road No. 5. This land shall be dedicated as a public highway on the final plan.~~

Amd. by Auth. Sep 24/10

~~11. Prior to final approval of Phase 1, the lands known as Parts 2 and 3 of Plan 35R-14786 in the ownership of the Ministry of Transportation shall be conveyed to The District Municipality of Muskoka for road widening purposes on Muskoka Road No. 5.~~

Amd. by Auth. Sep 24/10

~~12. Upon registration of Phase 1, the owner shall convey Blocks 88 and 91 to The District Municipality of Muskoka along the frontage of Muskoka Road No. 5. This 0.3 metre reserve shall be shown on the final plan.~~

Amd. By Res. D62/2014-PED Sep 18/14

10. Upon registration of ~~Phase 2~~ Phase 6, the owner shall convey ~~Block 72~~ Block 81 to the Township of Georgian Bay along the northern end of ~~Street 'A'~~ Deer Run Trail. This 0.3 metre reserve shall be shown on the final plan.

**Parkland**

Amd. by Auth. Mar 16/20

11. Prior to final approval of any phase, land shall be dedicated fro park or other recreation purposes or the payment in lieu requirements of the Township of Georgian Bay pursuant to the Planning Act, R.S.O. 1990, as amended shall be satisfied.

~~The owner shall convey lands in an amount equal to five (5) percent of the land included in the plan to the Township of Georgian Bay for park or other recreational purposes pursuant to Section 51.1(1) of the Planning Act, R.S.O. 1990, as amended. Alternatively, the Township of Georgian Bay may require cash-in-lieu of all or a portion of the parkland dedication in accordance with Section 51.1(3) of the Planning Act, R.S.O. 1990, as amended.~~

**Zoning**

Amd. By Res. D/2013-PED Jul 15/13

11a. Prior to final approval of Phase 1 being granted, the property included in this plan of subdivision shall be zoned for its intended residential and open space uses.

**~~Environmental~~ Infrastructure**

Amd. by Auth. Mar 16/20

~~12. Prior to final approval being granted or any site alteration on the subject lands, the owner shall provide The District Municipality of Muskoka with four copies of a detailed supplemental stormwater management and construction mitigation plan prepared by a certified professional engineer in consultation with a qualified biologist. The engineer shall verify in writing to The District Municipality of Muskoka that the proposed stormwater management measures incorporate the recommendations contained in the Geotechnical Investigation prepared by Jacques Whitford and dated January 25, 2007. The biologist shall verify in writing to The District Municipality of Muskoka that the proposed stormwater management measures incorporate the recommendations contained in the Environmental Impact Report prepared by Michalski Nielsen Associates Limited and dated October 2007 as amended and associated peer review undertaken by Gartner Lee Limited/AECOM dated June 3, 2008 as amended. The plans shall be circulated by The District Municipality of Muskoka to the Township of Georgian Bay for their review and approval. If required, a Certificate~~

~~of Approval for the plan shall be obtained from the Ministry of the Environment prior to construction of the works.~~

Amd. By Res. D/2013-PED Jul 15/13

12. Prior to final approval being granted or any site alteration on the subject lands, the owner shall provide The District Municipality of Muskoka with four copies of a detailed supplemental stormwater management, construction mitigation and site servicing (including blasting/filling requirements) plan prepared by a certified professional engineer in consultation with a qualified biologist. The engineer shall verify in writing to The District Municipality of Muskoka that the proposed stormwater management measures incorporate the recommendations contained in the Geotechnical Investigation prepared by Jacques Whitford and dated January 25, 2007. The biologist shall verify in writing to The District Municipality of Muskoka that the proposed stormwater management, construction mitigation and site servicing measures incorporate the recommendations contained in the following reports:

- The Environmental Impact Report prepared by Michalski Nielsen Associates Limited and dated October 2007 as amended and associated peer review undertaken by Gartner Lee Limited/AECOM dated June 3, 2008 as amended;
- The Letter Report by Michalski Nielsen Associates Limited dated March 9, 2012 and associated peer reviews undertaken by SLR Consulting (Canada) Limited dated March 20, 2013 and June 14, 2013;
- The Letter Report by FRi Ecological Services dated April 25, 2013 in response to the above noted peer review;
- The Response to Peer Review Comments Letter by Pinestone Engineering Limited dated May 9, 2013; ~~and~~
- Comments Related to Stormwater Management for Redlined Draft Plan – Phase 1 dated June 4, 2013 and Updated Comments Related to Stormwater Management for Redlined Draft Plan – Phase 1 dated June 17, 2013 by Jones Consulting Group Limited on behalf of the Township of Georgian Bay;
- Phase 1 Draft Plan changes letter by Tulloch Engineering Inc. dated August 22, 2014; and
- Comments Related to Stormwater Management for Draft Plan Amendment – Phase 1B dated September 10, 2014 by Jones Consulting Group Limited on behalf of the Township of Georgian Bay.

Amd. By Res. D62/2014-PED Sep 18/14

The plans shall be circulated by The District Municipality of Muskoka to the Township of Georgian Bay for their review and approval. If required, an Environmental Compliance Approval for the plan shall be obtained from the Ministry of the Environment prior to construction of the works.

Amd. by Auth. Mar 16/20

12a. Prior to final approval of any phase, hydraulic modelling of both water and sewer services shall be completed and any required improvements or modifications to either the subdivision design or the municipal water and sewer services shall be implemented to the satisfaction of The District Municipality of Muskoka.

13. Prior to final approval being granted, any lands required for stormwater management purposes shall be conveyed to the Township of Georgian Bay.

Amd. By Res. D/2013-PED Jul 15/13

13a. Prior to final approval of, or any site alteration occurring on the lands included in ~~Phases 7-11~~ Phases 7-8, the owner shall obtain an Overall Benefit Permit from the Province of Ontario. A copy of the permit shall be provided to The District of Muskoka and the Township of Georgian Bay.

Amd. By Res. D62/2014-PED Sep 18/14

**ea Municipal Agreement**

Amd. By Res. D/2013-PED Jul 15/13

14. Prior to final approval of Phase 1, the owner shall enter into a ~~master~~ subdivision agreement authorized by Section 51(26) of The Planning Act, R.S.O. 1990, as amended, with the Township of Georgian Bay. The agreement shall be registered on title and shall provide that the owner agrees

to satisfy all the requirements, financial and otherwise, of the Township of Georgian Bay including but not limited to the following:

i. the implementation of the requirements of Conditions 12 and 13 ~~14 and 15~~; and

ii. matters respecting the design and construction of roadways, parkland facilities, and dark sky lighting.

15. The ~~master~~ subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which will implement the recommendations of the Environmental Impact Report prepared by Michalski Nielsen and Associates Limited and dated October 2007 as amended and associated peer review undertaken by Gartner Lee Limited/AECOM dated June 3, 2008 as amended as well as the Letter Report by Michalski Nielson and Associates dated March 9, 2012 as amended by FRi Ecological Services dated April 25, 2013 and associated peer reviews by SLR Consulting (Canada) Limited dated March 20, 2013 and June 14, 2013 as well as the Natural Heritage Features Phase 1b Memorandum by FRi Ecological Services dated January 14, 2014, which include, but are not limited to the following:

Amd. By Res. D/2013-PED Jul 15/13

Amd. By Res. D62/2014-PED Sep 18/14

i. movement of rock fragments from areas of high disturbance to areas of lesser disturbance for potential wildlife habitat;

ii. development and distribution of a natural heritage information package to all homeowners;

iii. implementation of low level maintenance practices in areas with retained habitats;

iv. completion of a restoration planting plan for the stormwater management facilities;

v. installation and maintenance of sediment control and erosion works within the 10 metre buffer adjacent to the defined fish habitat during construction and until re-vegetation occurs;

vi. design and implementation of a landscape buffer located adjacent to the 10 metre buffer area to a depth of no less than 5 metres;

vii. prior to any site alteration, completion of fieldwork to identify any butternut specimens and if found, transplantation to a protected area (i.e. open space zone);

~~viii. design, construction and maintenance of a permanent reptile barrier fence along the northern limit of the subdivision lands; and~~

ix. use of site plan control for all areas proposed to be developed addressing, among other matters, retention of natural features (i.e. large trees, shrubs, and fractured rock) and landscaping with native vegetation.

16. The ~~master~~ subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which will implement the recommendations of the Traffic Noise Impact Study prepared by R. Bouwmeester & Associates and dated November 27, 2007, and related Traffic Noise Impact Study Update prepared by R. Bouwmeester & Associates dated September 7, 2012, which include, but are not limited to the following:

Amd. By Res. D/2013-PED Jul 15/13

Amd. By Res. D62/2014-PED Sep 18/14

Amd. By Res. D62/2014-PED Sep 18/14

i. requirement of forced air heating systems with the capacity to accommodate central air conditioning for dwellings on ~~Lots 1-19, 25, 26 and Blocks 43-48, 50-57, and part~~

~~of Blocks 63-65, 67, 69 and 73-75 8, 14-70 and part of Blocks 76-77, and 79-84~~ Lots 1-20 and Blocks 65-67 and 69-79;

~~ii. requirement for the submission of a noise study for the commercial blocks with the submission of an application for site plan approval; and~~

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ii. inclusion of the following warning clause to be registered on title and included in agreements of purchase and sale for ~~Lots 1-19, 25, 26 and Blocks 43-48, 50-57, and part of Blocks 63-65, 67, 69 and 73-75~~ 8, 14-70 and part of Blocks 76-77, and 79-84 Lots 1-20 and Blocks 65-67 and 69-79:

*"This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.*

*Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment's noise criteria."*

17. The ~~master~~ subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which will implement the recommendations of the Geotechnical Investigation, prepared by Jacques Whitford and dated January 25, 2007 including but not limited to site preparation, construction of foundation and floors, excavation and backfill, earthquake considerations, and design of pavement and detailed stormwater management facilities.

Amd. By Res. D/2013-PED Jul 15/13

~~17a. The subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which requires that prior to final approval of Phase 1, written confirmation shall be provided to the Township of Georgian Bay from a qualified biologist stating that the Avoidance Strategy as referenced in the Ministry of Natural Resources' Letter of Advice dated April 3, 2013 has been complied with. This includes, but is not limited to the following:~~

Amd. By Res. D/2013-PED Jul 15/13

~~i. a requirement to deliver the basic level training program to all contractors and/or consultants working on the site during the development of the property;~~

~~ii. a requirement to develop and deliver a stewardship information package to all future property owners;~~

~~iii. a requirement for the installation and maintenance of permanent and/or temporary functional reptile exclusion fencing along the eastern boundary of Block 62;~~

~~iv. a requirement to establish a Stewardship Committee of the residents and the provision of a presentation on the variety of volunteer monitoring programs currently available;~~

~~v. a requirement to install and maintain 2 temporary remote cameras along the exclusion fencing; and~~

~~vi. a requirement for the installation of educational interpretive signage on site in consultation with the Ministry of Natural Resources to provide information about Species At Risk in general.~~

Amd. By Res. D/2013-PED Jul 15/13

~~17b. The subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which requires that prior to final approval of Phase 1, the issuance of a building permit or any site alteration occurring on any lots or blocks within Phases 1 – 6 that:~~

~~i. the developer enter into an Agreement with the Township of Georgian Bay respecting the developer's responsibility for long-term maintenance of the reptile exclusion fencing to be constructed on Block 62 for as long as the fencing is required by the Ministry of Natural Resources as well as, the developer's responsibility for long-term maintenance of stormwater management swales along the western most lot line of Blocks 43-47 and 52-53. This agreement shall also require the establishment of a maintenance reserve fund for these matters. The agreement shall also require that if there is a transfer of any of the lands to private ownership, the obligation of the developer shall be transferred to the new owners.~~

Amd. By Res. D62/2014-PED Sep 18/14

17a. The subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which requires that prior to the final approval of Phase 1 the requirements of the Avoidance Strategy, as referenced in the Ministry of Natural Resources and Forestry's Letter of Advice dated April 3, 2013, as well as any other approvals issued by the Province prior to any site alteration occurring, such as an Overall Benefit Permit issued under Clause 17(2) of the Endangered Species Act, 2007 will be implemented. This includes, but is not limited to the following:

i. a requirement for a qualified professional to develop and deliver an education and awareness training program, to the satisfaction of the Ministry of Natural Resources and Forestry, for all contractors and/consultants entering the site to undertake species relocation, installation of reptile fencing, vegetation removal or maintenance, excavation, grading or exterior construction activities;

ii. a requirement for a qualified professional to develop and deliver specialized training in snake handling to any person inspecting and/or maintaining reptile fencing or relocating and/or transporting snakes, and that this training shall be provided in addition to the training required in Condition 17a. i.;

iii. a requirement for a qualified professional to develop a Stewardship Committee structure and variety of volunteer monitoring programs for use by the future residents;

iv. a requirement for a qualified professional to develop a Ministry of Natural Resources and Forestry approved stewardship information package for use by the Stewardship Committee and distribution to all future property owners to the satisfaction of the Ministry of Natural Resources and Forestry;

v. a requirement for the installation and maintenance of permanent and/or temporary functional reptile exclusion fencing on the Eastern Foxsnake Overall Benefit Area along the eastern boundary of Block 83;

viii. a requirement to install and maintain two (2) temporary remote cameras along the exclusion fencing located along the eastern boundary of Block 83; and

xi. a requirement for the installation of three (3) educational signage to the satisfaction of the Ministry of Natural Resources and Forestry to provide information about Species At Risk in general.

17b. The subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which requires that prior to the final approval of Phase 7 the requirements of the Avoidance Strategy, as referenced in the Ministry of Natural Resources and Forestry's Letter of Advice dated April 3, 2013, as well as any other approvals issued by the Province prior to any site alteration occurring, such as an Overall Benefit Permit issued under Clause 17(2) of the Endangered Species Act, 2007. This includes, but is not limited to the following:

i. a requirement for a qualified professional to develop and deliver an education and awareness training program, to the satisfaction of the Ministry of Natural Resources and Forestry, for all contractors and/consultants entering the site to undertake species relocation, installation of reptile fencing, vegetation removal or maintenance, excavation, grading or exterior construction activities;

ii. a requirement for a qualified professional to develop and deliver specialized training in snake handling to any person inspecting and/or maintaining reptile fencing or relocating and/or transporting snakes, and that this training shall be provided in addition to the training required in Condition 17b. i.;

iii. a requirement for the installation and maintenance of temporary reptile fencing on the Eastern Foxsnake Overall Benefit Area along the exterior boundary of Lots 64, 48-59, 33, 20-26, 16-19, 2-7 and 9, the exterior boundary of Blocks 82, 84, 87 and 88, the southern and eastern boundaries of Block 83, the southern boundary of Block 86, the portions of the Robins Drive and Knightsbridge Boulevard that abut the road allowance between Lots 30 and 31, Concession 3, Baxter Ward and across the portion of Robins Drive between Lots 2 and 9 prior to any vegetation removal, vegetation maintenance, excavation, grading or exterior construction activities;

iv. a requirement for the installation and maintenance of permanent reptile fencing on the Eastern Foxsnake Overall Benefit Area along the eastern boundary of Lot 27, along the southern boundary of Lots 27-33, the eastern boundary of Block 87, the northern and eastern boundary of Lot 34, a portion of Knightsbridge Boulevard north of Lot 34, the eastern boundary of Lots 45-47, the southern boundary of Lot 47, the northern boundary of Lot 60 and the eastern boundary of Lots 60-64, the exterior boundary of the portion of Block 83 located between Block 85 and Lot 15, as well as along the southern boundary of Lot 15;

v. a requirement to install and maintain permanent gateless residential-grade chain-link fencing along the boundaries of the Eastern Foxsnake Overall Benefit Area (Blocks 83, 85 and 86);

vi. a requirement to design and incorporate three (3) naturalized corridors on Blocks 84, 85, 86, 87 and 88 to facilitate Eastern Foxsnake movement through the area;

vii. a requirement for the installation of three (3) educational signs to be located on the exterior boundary of Blocks 83, 85 and 86, identifying the Eastern Foxsnake Overall Benefit Area (Blocks 83, 85 and 86); as Protected Species' Habitat, to the satisfaction of the Ministry of Natural Resources;

viii. a requirement for the enhancement of the 9.8 hectares of habitat contained within the Eastern Foxsnake Overall Benefit Area (Blocks 83, 85 and 86) by preparation of an Enhancement Plan to the satisfaction of the Ministry of Natural Resources and Forestry;

ix. a requirement to conduct a monitoring program for the Eastern Foxsnake Overall Benefit Area for a period of ten (10) consecutive years following the commencement of any enhancement activities described in Condition 17b. viii. to the satisfaction of the Ministry of Natural Resources and Forestry;

x. a requirement for the development and completion of a research project which shall occur over three (3) consecutive years to the satisfaction of the Ministry of Natural Resources and Forestry; and

xi. a requirement for the submission of copies of any annual monitoring reports that may be required by the Ministry of Natural Resources and Forestry to the Township of Georgian Bay for their reference.

17c. The subdivision agreement shall contain a provision or provisions in wording acceptable to the Township of Georgian Bay and The District Municipality of Muskoka which requires that prior to final approval of any phase, the issuance of a building permit or any site alteration that the developer enter into an Agreement with the Township of Georgian Bay respecting the following:

i. the developer's responsibility for long-term maintenance of the reptile exclusion fencing to be constructed on the eastern boundary of Block 83, for as long as the fencing is required by the Ministry of Natural Resources and Forestry;

ii. the developer's responsibility for long-term maintenance of the permanent reptile fencing to be constructed along the eastern boundary of Lot 27, along the southern boundary of Lots 27-33, the eastern boundary of Block 87, the northern and eastern boundary of Lot 34, a portion of Knightsbridge Boulevard north of Lot 34, the eastern boundary of Lots 45-47, the southern boundary of Lot 47, the northern boundary of Lot 60 and the eastern boundary of Lots 60-64 , the exterior boundary of the portion of Block 83 located between Block 85 and Lot 15, as well as along the southern boundary of Lot 15;

iii. the developer's responsibility for the monitoring program referred to in Condition 17b. ix. and long-term maintenance of the Eastern Foxsnake Overall Benefit Area (Blocks 83, 85 and 86) including the three (3) naturalized corridors located on Blocks 84, 85, 86, 87 and 88, all associated fencing and required signage;

iv. the developer's responsibility for long-term maintenance of stormwater management swales along the western most lot line of Blocks 65-72 and 74 and 75;

v. the establishment of a long term maintenance reserve fund for these matters; and

vi. the requirement that should there be a transfer of any of the lands to private ownership, the obligation of the developer shall be transferred to the new owners.

18. Prior to final approval being granted for any subsequent phase, the owner shall enter into and register on title, ~~supplemental~~ amending subdivision agreements with the Township of Georgian Bay. The agreements shall be registered on title and shall provide that the owner agrees to satisfy all the requirements, financial and otherwise, of the Township of Georgian Bay including but not limited to provision of roads, installation of services, site grading and drainage works, parking, and lighting, amongst other matters for that phase.

Amd. By Res. D/2013-PED Jul 15/13

**District Municipal Agreement**

19. Prior to final approval of Phase 1 being granted, the owner shall enter into a master subdivision agreement authorized by Section 51(26) of the Planning Act, R.S.O. 1990, as amended, with The District Municipality of Muskoka. The agreement shall be registered on title and shall provide that the owner agrees to satisfy all the requirements, financial and otherwise, of The District Municipality of Muskoka, including but not limited the following:

    i. installation of municipal water and sewer services and provision for municipal assumption and operation of same;

Amd. By Res. D62/2014-PED Sep 18/14

    ii. any improvements necessary respecting Muskoka Road No. 5 including but not limited to turning lanes, tapers, entrance design signalization, road widening, and culvert installation or enlargement or any updates to technical studies in support thereof, as required;

    iii. the availability of sufficient Equivalent Residential Units (ERUs) to service each phase and the acquisition by the owner of such ERUs if required;

Amd. By Auth Nov 1/16

    iv. the disposal of solid waste; and

Amd. by Auth. Mar 16/20

    v. the implementation of Conditions 12 and 12.a., including provision of securities, as required.

20. Prior to final approval being granted for any subsequent phase and subject to confirmation of available water and sanitary sewage capacity, the owner shall enter into and register on title, supplemental subdivision agreements with The District Municipality of Muskoka for each of those phases and the agreements shall include, but not be limited to the following:

    i. the owner agrees to satisfy all the requirements, financial and otherwise, of The District Municipality of Muskoka concerning the provision of municipal water and sewer services, amongst other matters related to each phase;

Amd. By Auth Nov 1/16

    ii. the owner agrees to provide for the installation of municipal water and sewer services appurtenant to each phase to the satisfaction of The District Municipality of Muskoka and shall provide for municipal assumption of same; ~~and~~

    iii. the disposal of solid waste; and

Amd. by Auth. Mar 16/20

    iv. the implementation of Conditions 12 and 12.a., including the provision of securities.

**Clearance Letters**

21. Prior to final approval being granted, the Township of Georgian Bay shall advise The District Municipality of Muskoka in writing that Conditions ~~5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 20, and 21~~ ~~5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18~~ 1, 3, 5, 6, 7, 8, 9, 10, 11, 11a, 12, 13, 13a, 14, 15, 16, 17, 17a,17b, 17c and 18 have been complied with to their satisfaction with a brief and concise statement detailing how each condition has been satisfied.

Amd. by Auth. Sep 24/10

Amd. By Res. D/2013-PED Jul 15/13

22. Prior to final approval being granted, The District Municipality of Muskoka shall be satisfied that conditions ~~1, 2, 3, 4, 5, 9, 10, 11, 12, 15, 18, 19, 20, 22, and 23~~ ~~1, 2, 3, 4, 5, 9, 12, 15, 16, 17, 19, and 20~~ 1, 2, 3, 4, 5, 9, 12, 13a, 15, 16, 17, 17a, 17b, 17c, 19 and 20 have been complied with to their satisfaction.

Amd. By Res. D62/2014-PED Sep 18/14

22a. ~~Prior to final approval being granted for Phases 7 – 11, The Province of Ontario shall advise The District Municipality of Muskoka in writing that Conditions 13a and 17c have been complied with to their satisfaction with a brief and concise statement detailing how each condition has been satisfied~~.

**~~District Development Charges~~**

Amd. By Res. D/2013-PED Jul 15/13

23. ~~District Development charges are required to be paid in accordance with By-law 2008-58, as amended from time to time.~~

**Final Plan**

24. The final plan must be in registerable form together with all necessary instruments or plans describing an interest in the land.

Amd. by Auth. July 25/19

25. Prior to final approval being granted, the Commissioner of ~~Planning and Economic Development or her~~ Community & Planning Services or their designate shall be satisfied that the conditions of approval have been satisfied and the final plan is in conformity with the draft plan.

**Part C – Lapsing Provision**

Amd. By Res. D62/2014-PED Sep 18/14

~~In the event that the owner fails to fulfill the conditions of draft approval on or before March 12, 2014 September 18, 2016, the approval herein granted shall be deemed to have lapsed pursuant to the Planning Act, R.S.O 1990, as amended.~~

~~In the event that the owner fails to fulfill the conditions of approval for the subsequent phases within twenty-four (24) months from the date of registration of the preceding phase, the approval herein granted may be withdrawn pursuant to the Planning Act, R.S.O. 1990.~~

Amd. By Auth. Nov 1/16

In the event that the owner fails to fulfill the conditions of draft approval on or before March 16, 2022 ~~November 1, 2019~~, the approval herein granted shall be deemed to have lapsed pursuant to the Planning Act, R.S.O. 1990, as amended.

Amd. by Auth. Mar 16/20

Extensions to draft approval may be considered provided that existing technical reports are still applicable or updates are provided and the provisions of By-law 2008-22, as amended, are met.

It is the responsibility of the applicant and/or their agent to apply for any required extensions of draft approval for at least three (3) months prior to the lapsing date noted above. The District Municipality of Muskoka will forward one courtesy notice prior to the lapsing date. This notification is a best efforts courtesy only and The District Municipality of Muskoka does not assume any responsibility for notification of lapsing of approval. No further notices will be forwarded and in the event that the appropriate application and related fee are not received, the approval herein granted shall be deemed to have lapsed.

**Part D – Timing of Work**

The owner is advised that any site alteration or the installation of any works or matters that may be the subject of any agreements required by this schedule shall not be permitted prior to the execution of such agreements. Where any such works, alterations or matters are undertaken in violation of this clause, approval of this plan may be withdrawn as authorized under Section 51(44) of the Planning Act, R.S.O. 1990.

This is Exhibit “F” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

*Commissioner for Taking Affidavits (or as may be)*

**ROBERT B. COHEN**

## SCHEDULE "A"

## A U T H O R I Z A T I O N

Pursuant to By-law 2008-22, being a by-law to delegate certain approval authorities under the Planning Act, that Schedule "A" to PED Resolution D72/16, being the condition of approval for Plan of Subdivision File S2016-1 (Port Severn Heights Phase 2), be further amended as follows:

1. That Condition 2 be amended to delete the last occurrence of the word "Digital" and to insert the word "Digital" before the word "Submission".

2. That heading "Stormwater Management" be deleted and replaced with the heading "Infrastructure".

3. That Condition 12 be deleted and replaced with the following:

   "Prior to final approval of any phase being granted, four copies of a detailed report(s), prepared by a professional engineer in consultation with a qualified biologist, addressing stormwater management, construction mitigation, and municipal water and sewer services shall be submitted to The District Municipality of Muskoka. The report(s) shall be circulated by The District Municipality of Muskoka to the Township of Georgian Bay for their review and comment. The biologist shall verify in writing to The District of Municipality of Muskoka, that the proposed stormwater management plan incorporate the recommendations contained in the Environmental Impact Study prepared by Michalski Nielsen and Associates Limited dated January 2010 as updated by FRi Ecological Services dated August 2015 and October 2016 and peer reviewed by Beacon Environmental dated April 5, 2016 and the Overall Benefit Permit from the Province of Ontario, if applicable.

   In addition, one (1) of the following documents shall also be provided to the satisfaction of The District Municipality of Muskoka for any applicable infrastructure works, including but not limited to municipal services and stormwater management:

   (i) An Environmental Compliance Approval (ECA) for the project(s) shall be obtained from the Provincial Ministry with jurisdiction, or

   (ii) Written confirmation from the Provincial Ministry with jurisdiction exempting the project(s) from the requirement to obtain an ECA; or

   (iii) A written opinion, stamped and signed by a Professional Engineer, that confirms that the project(s) meet the specific exemptions outlined in the applicable legislation/regulations."

4. That Condition 13a be inserted immediately following Condition 13, and the following wording be inserted:

"13a. Prior to final approval of any phase, hydraulic modelling of both water and sewer services shall be completed and any required improvements or modifications to either the subdivision design or the municipal water and sewer services shall be implemented to the satisfaction of The District Municipality of Muskoka."

5. That Condition 25 be amended to insert the word "13a" immediately following the word "12".

6. That Condition 28 be amended to delete the words "Planning and Economic Development" and be replaced with the following "Community and Planning Services".

7. That "Part C – Lapsing Provision" be deleted and replaced with the following:

   "In the event that these conditions of draft approval fail to be fulfilled on or before January 25, 2024, the approval herein granted shall be deemed to have lapsed pursuant to the Planning Act, R.S.O 1990, as amended.

   Extensions to draft approval may be considered provided that existing technical reports are still applicable or updates are provided and the provisions of By-law 2008-22, as amended, including the performance and planning based criteria, are met.

   It is the responsibility of the applicant and/or their agent to apply for any required extensions of draft approval at least three (3) months prior to the lapsing date noted above. The District Municipality of Muskoka will forward one courtesy notice prior to the lapsing date. This notification is a best efforts courtesy only and The District Municipality of Muskoka does not assume any responsibility for notification of lapsing of approval. No further notices will be forwarded and in the event that the appropriate application and related fee are not received, the approval herein granted shall be deemed to have lapsed."

January 25, 2022
Date

Commissioner of Community and Planning Services or their designate

| REVISIONS | |
|---|---|
| DD/MM/YY | REVISION |
| 03/09/15 | GENERAL REVISIONS (P.M.) |
| 19/10/15 | DIMENSIONS ADDED (P.M.) |
| 08/09/16 | BLOCKS REVISED (P.M.) |
| | |
| | |
| | |
| | |

## OTHER INFORMATION

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

A. LAND BOUNDARIES ARE AS SHOWN ON DRAFT PLAN
B. ROADWAYS ARE AS SHOWN ON DRAFT PLAN AND KEY PLAN
C. KEY PLAN IS AS SHOWN ON DRAFT PLAN
D. PROPOSED LOTS ARE FOR RESIDENTIAL USE, AS SHOWN
E. ADJACENT USES: VACANT LANDS
F. LOT DIMENSIONS ARE APPROXIMATE ONLY
G. TOPOGRAPHICAL FEATURES ARE AS SHOWN, BASED UPON GALBRAITH, EPLETT WOROBEC SURVEYORS DIGITAL TOPOGRAPHICAL PLAN
H. WATER SUPPLY IS TO BE PROVIDED FROM MUNICIPAL WATER SUPPLY
I. SOIL IS NATIVE SILTY SAND OVER BEDROCK
J. 1m CONTOURS ARE AS SHOWN ON DRAFT PLAN
K. MUNICIPAL SANITARY SEWER TO BE AVAILABLE
L. SUBJECT TO EASEMENT FOR ACCESS TO BELL RADIO TOWER OVER PART 2 ON PLAN 35R-13714

# PORT SEVERN HEIGHTS
## PHASE 2
## DRAFT PLAN OF SUBDIVISION

PART OF LOT 30, CONCESSION 3 and 4,
GEOGRAPHIC TOWNSHIP OF BAXTER
TOWNSHIP OF GEORGIAN BAY
DISTRICT MUNICIPALITY OF MUSKOKA

OCTOBER 6, 2014

SCALE 1:1000

## SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED (SHOWN IN HEAVY DASHED OUTLINE) AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY SHOWN ON THIS PLAN.

F. DALE EPLETT, O.L.S. — DATE: Nov 3, 2015
EPLETT, WOROBEC & RAIKES SURVEYING LIMITED
529 ELIZABETH STREET
MIDLAND, ONTARIO L4R 2A2

## SUBDIVISION DRAFT APPROVAL STAMP

Draft approved, subject to conditions, under Section 51 of the Planning Act, R. S. O., 1990, as amended, this 24th day of November, 2016

THE DISTRICT MUNICIPALITY OF MUSKOKA
Commissioner of Planning & Economic Development

LANDS OWNED BY APPLICANT NOT PART OF PLAN

BLOCK 56 0.32ha. SWM BLOCK
BLOCK 55 0.79ha.
BLOCK 59 1.51ha.
BLOCK 57 3.70ha.
BLOCK 57 3.70ha.
BLOCK 60 3.26ha.
BLOCK 58 2.48ha.
BLOCK 62 0.74ha.
BLOCK 61 0.82ha.
BLOCK 47 0.82ha.
BLK 54 0.14ha.
BLK 53 0.16ha.
BLK 52 0.14ha.
BLK 51 0.16ha.
BLK 50 0.14ha.
BLK 49 0.16ha.
BLK 48 0.14ha.

PROPOSED EXTENSION OF PUBLIC ROAD

PREVIOUSLY DRAFT APPROVED LANDS

| LOT/BLOCK | LAND USE | UNITS |
|---|---|---|
| LOTS 1-44 | SINGLE-DETACHED RESIDENTIAL | 44 |
| BLOCK 47 | MULTIPLE RESIDENTIAL | 35 |
| BLOCK 48 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 49 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 50 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 51 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 52 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 53 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 54 | TOWNHOUSE RESIDENTIAL | 4 |
| BLOCK 55 | OPEN SPACE | |
| BLOCK 56 | SWM BLOCK | |
| BLOCK 57 | SINGLE-DETACHED RESIDENTIAL | 45 |
| BLOCK 58 | OPEN SPACE | |
| BLOCK 59 | OPEN SPACE | |
| BLOCK 60 | OPEN SPACE | |
| BLOCK 61 | SWM BLOCK | |
| BLOCK 62 | SWM BLOCK | |
| | SUBTOTAL SINGLES | 89 |
| | SUBTOTAL TOWNS | 28 |
| | SUBTOTAL MULTI | 35 |
| | TOTAL UNITS | 152 |

REDLINED
September 29/16
(DATE)
BY: MMacLeod

## PHASING

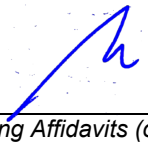
PHASE 1: LOTS 1, 2 & 3, BLOCK 47
PHASE 2: BLOCKS 48-54 INCLUSIVE
PHASE 3: LOTS 4-14, 25-34 INCLUSIVE + BLOCK 55
PHASE 4: LOTS 15-24, 35-44 INCLUSIVE
PHASE 5: BLOCKS 56-59 & 62 ~~INCLUSIVE~~
~~PHASE 6~~: BLOCKS 60 & 61 INCLUSIVE

PLAN PREPARED BY:
WAYNE SIMPSON & ASSOCIATES
Planning and Development Consultants
11 Centre Street South, Suite 102
Huntsville, Ontario P1H 1W4
Tel: (705) 789-9092 Fax: (705) 789-9094

KEY MAP

3812 - Port Severn Heights - Phase 2 - Draft Plan - Aug. 9-16.dwg

This is Exhibit “G” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.



*Commissioner for Taking Affidavits (or as may be)*

**ROBERT B. COHEN**

**The Corporation of the**
**Township of Georgian Bay**
**Planning Department**

**99 Lone Pine Road, Port Severn, Ontario, L0K 1S0**
**Phone: 1-800-567-0187 Facsimile: (705) 538-1850**
**web: www.gbtownship.ca**

# NOTICE OF DECISION
# CONCERNING PROPOSED CONSENT APPLICATION
# IN THE TOWNSHIP OF GEORGIAN BAY

Consent Application No. B22-12
Port Severn Heights
in the Township of Georgian Bay
Municipally known as 74 Honey Harbour Road
Roll No. 446503001205700

**DATE OF DECISION: September 16, 2022**

Upon application to the Committee of Adjustment for consent pursuant to Section 53(1) of the Planning Act, R.S.O. 1990, Chapter P.13, the decision of the Township of Georgian Bay Committee of Adjustment is as follows:

**THAT** the severance will be granted provided that:

a) Municipal Taxes shall be paid in full up to the date of request of issuance of the consent certificate.
b) A reference plan of the consent shall be prepared and duly registered by an Ontario Land Surveyor and one copy filed with the Secretary/Treasurer of the Committee. A draft copy of the reference plan shall be provided to the Secretary-Treasurer for review and approval prior to registration on title, if applicable.
c) That all fees and disbursements (legal, engineering, planning), if any, incurred by the Township with respect to this application shall be paid for by the owner.
d) The Conditions set out herein shall be completed within two years of the date of the decision of the Committee.

**REASONS:** The application will conform to the requirements of the Township of Georgian Bay Zoning By-law and the Township of Georgian Bay Official Plan and will meet the requirements of all commenting agencies.

Prior to making a decision, Committee took into account 3 written submissions and 0 oral submissions.

Pursuant to Subsection 41 of Section 53 of the Planning Act, R.S.O. 1990, Chapter P.13, as amended, all conditions imposed must be fulfilled within two years from the date of the sending of the Notice of Decision or the application is deemed to be refused.

It is a requirement that all conditions imposed be fulfilled prior to the granting of this consent and the giving by the Secretary-Treasurer of the certificate provided for in Subsection 42 of Section 53 of the Planning Act, R.S.O. 1990, Chapter P.13, as amended.

**NOTICE OF LAST DATE FOR APPEAL – October 6, 2022**

The applicant, the Minister or any other person who has an interest in the matter may, within twenty (20) days of the giving of Notice, appeal to the Ontario Land Tribunal against the decision of the Committee by filing with the Secretary-Treasurer of the Committee a notice of appeal setting out the objection to the decision and the reasons in support of the objection. You must enclose the appeal fee of $400.00, paid by cheque, made payable to the Ontario Minister of Finance, and forwarded to the Secretary-Treasurer, as prescribed by the Tribunal under the **Ontario Land Tribunal** as payable on an appeal from a Committee of Adjustment to the Board. A copy of an appeal form (Appellant Form A-1, Bill 51) is available from the OLT website at www.elto.gov.on.ca.

Send To: Mercia Barron, Secretary-Treasurer
Township of Georgian Bay Committee of Adjustment
99 Lone Pine Road
Port Severn, ON L0K 1S0

NOTE: Only individuals, corporations, and public bodies may appeal decisions in respect of applications for consent to the Tribunal. A notice of appeal may not be filed by an unincorporated association or group. However, a notice of appeal may be filed in the name of an individual who is a member of the association or group on its behalf.

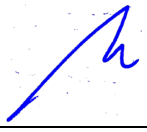
I, **MERCIA BARRON**, Secretary-Treasurer of the Township of Georgian Bay Committee of Adjustment, hereby certify that the above is a true copy of the decision of the Committee with respect to the application therein.

Dated this 16 day of September 2022

Mercia Barron

Secretary-Treasurer of Committee of Adjustment
Township of Georgian Bay

This is Exhibit “H” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.



*Commissioner for Taking Affidavits (or as may be)*

**ROBERT B. COHEN**

LRO # 35 **Charge/Mortgage** **Registered as MT264645** on 2022 05 05 at 12:55

*The applicant(s) hereby applies to the Land Registrar.* yyyy mm dd 

## Properties

*PIN* 48018 - 0807 LT *Interest/Estate* Fee Simple

*Description* PT LT 30 CON 4 BAXTER PT 2 35R18204; PT LT 30 CON 3 BAXTER PT 1-10 35R18203 EXCEPT PT 1, 2 & 3 ON 35R23914 AND EXCEPT PART 3 35R-25939; GEORGIAN BAY; THE DISTRICT MUNICIPALITY OF MUSKOKA; SUBJECT TO AN EASEMENT OVER PART 4 ON 35R23914 IN FAVOUR OF PT LT 30 CON 3 BAXTER PT 1 ON 35R23914 AS IN MT149718; SUBJECT TO AN EASEMENT OVER PART 4 ON 35R23914 IN FAVOUR OF PT LT 30 CON 3 BAXTER PT 2 ON 35R23914 AS IN MT149719; SUBJECT TO AN EASEMENT OVER PART 4 ON 35R23914 IN FAVOUR OF PT LT 30 CON 3 BAXTER PT 3 ON 35R23914 AS IN MT149720; SUBJECT TO AN EASEMENT OVER PART LOT 30 CONCESSION 3 BAXTER, PART 1 AND 2, 35R25939 AS IN MT256750

*Address* PORT SEVERN

## Chargor(s)

The chargor(s) hereby charges the land to the chargee(s). The chargor(s) acknowledges the receipt of the charge and the standard charge terms, if any.

*Name* 1000171168 ONTARIO INC.

*Address for Service* 150 Sanford Avenue North, Attn: Office,
Hamilton, Ontario, Canada, L8L 5Z6

A person or persons with authority to bind the corporation has/have consented to the registration of this document.

This document is not authorized under Power of Attorney by this party.

## Chargee(s) *Capacity* *Share*

*Name* PORT SEVERN HEIGHTS INC.

*Address for Service* 1858 Avenue Road, Suite 300
Toronto, ON M5M 3Z5

## Provisions

| | | | |
|---|---|---|---|
| *Principal* | $6,000,000.00 | *Currency* | CDN |
| *Calculation Period* | | | |
| *Balance Due Date* | 2025/04/14 | | |
| *Interest Rate* | 4% per annum | | |
| *Payments* | | | |
| *Interest Adjustment Date* | | | |
| *Payment Date* | See Additional Provisions | | |
| *First Payment Date* | | | |
| *Last Payment Date* | | | |
| *Standard Charge Terms* | 200033 | | |
| *Insurance Amount* | Full insurable value | | |
| *Guarantor* | | | |

## Additional Provisions

1) The Chargor shall be entitled to make payments of principal from time to time without notice, bonus or penalty.

2) There will be no interest charged against the indebtedness outstanding until October 14, 2022. From and after October 14, 2022:

(a) the indebtedness secured by this Charge will bear interest at a rate of 4% per annum; and
(b) the Chargor will make interest only payments to the Chargee on a quarterly basis.

3. In the event the plan of subdivision for the portion of this property comprising the Phase 1 lands (being Plan of Subdivision File S2007-4) is not registered on or before November 4, 2023, there will be a default within the meaning of this Charge.

## Signed By

Lawrence Zimmerman 3338 Dufferin St.
Toronto
M6A 3A4

acting for Chargor(s) Signed 2022 05 05

Tel 416-489-8422

Fax 416-489-6222

I have the authority to sign and register the document on behalf of the Chargor(s).

## *Submitted By*

LAWRENCE ZIMMERMAN LAW OFFICE
3338 Dufferin St.
Toronto
M6A 3A4
2022 05 05

Tel 416-489-8422
Fax 416-489-6222

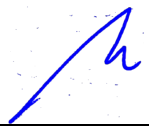
## *Fees/Taxes/Payment*

| | |
|---|---|
| *Statutory Registration Fee* | $66.30 |
| *Total Paid* | $66.30 |

## *File Number*

*Chargor Client File Number :* 131968

This is Exhibit “I” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.



*Commissioner for Taking Affidavits (or as may be)*

**ROBERT B. COHEN**

PROPERTY DESCRIPTION: PART LOT 30 CONCESSION 4 BAXTER PART 2 35R18204, EXCEPT PART 1 35R27136; PART LOT 30 CONCESSION 3 BAXTER PARTS 1-10 35R18203, EXCEPT PARTS 1, 2 & 3 35R23914 & EXCEPT PART 3 35R25939; SUBJECT TO AN EASEMENT OVER PART 4 35R23914 IN FAVOUR OF PART LOT 30 CONCESSION 3 BAXTER PART 1 35R23914 AS IN MT149718; SUBJECT TO AN EASEMENT OVER PART 4 35R23914 IN FAVOUR OF PART LOT 30 CONCESSION 3 BAXTER PART 2 35R23914 AS IN MT149719; SUBJECT TO AN EASEMENT OVER PART 4 35R23914 IN FAVOUR OF PART LOT 30 CONCESSION 3 BAXTER PART 3 35R23914 AS IN MT149720; SUBJECT TO AN EASEMENT OVER PART LOT 30 CONCESSION 3 BAXTER, PART 1 & 2 35R25939 AS IN MT256750; TOWNSHIP OF GEORGIAN BAY

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
ABSOLUTE

RECENTLY:
DIVISION FROM 48018-0807

PIN CREATION DATE:
2023/08/02

OWNERS' NAMES
1000171168 ONTARIO INC.

CAPACITY SHARE
ROWN

| REG. NUM. | DATE | INSTRUMENT TYPE | AMOUNT | PARTIES FROM | PARTIES TO | CERT/ CHKD |
|---|---|---|---|---|---|---|
| *** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 2023/08/02 *** | | | | | | |
| 35R13714 | 1990/09/10 | PLAN REFERENCE | | | | C |
| LT159172 | 1990/10/19 | NOTICE OF LEASE | | | BELL CELLULAR INC. | C |
| LT205088 | 1998/11/04 | NOTICE OF LEASE | | | BELL MOBILITY CELLULAR INC. | C |
| 35R18203 | 2000/02/24 | PLAN REFERENCE | | | | C |
| 35R18204 | 2000/02/24 | PLAN REFERENCE | | | | C |
| MT4273 | 2005/07/18 | APL CH NAME INST | | BELL MOBILITY CELLULAR INC. | BELL MOBILITY INC. | C |
| | *REMARKS: LT205088* | | | | | |
| MT4274 | 2005/07/18 | NO CHNG ADDR INST | | BELL MOBILITY INC. | | C |
| | *REMARKS: LT205088* | | | | | |
| 35R23914 | 2012/07/20 | PLAN REFERENCE | | | | C |
| 35R25939 | 2019/04/15 | PLAN REFERENCE | | | | C |
| MT256750 | 2021/11/19 | TRANSFER EASEMENT | $2 | PORT SEVERN HEIGHTS INC. | BELL MOBILITY INC. | C |
| MT264643 | 2022/05/05 | TRANSFER | $8,000,000 | PORT SEVERN HEIGHTS INC. | 1000171168 ONTARIO INC. | C |
| | *REMARKS: PLANNING ACT STATEMENTS.* | | | | | |
| MT264644 | 2022/05/05 | CAU AGR PUR & SALE | | *** DELETED AGAINST THIS PROPERTY *** 1000171168 ONTARIO INC. | PORT SEVERN HEIGHTS INC. | |
| | *REMARKS: EXPIRES 60 DAYS FROM 2027/05/04* | | | | | |

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

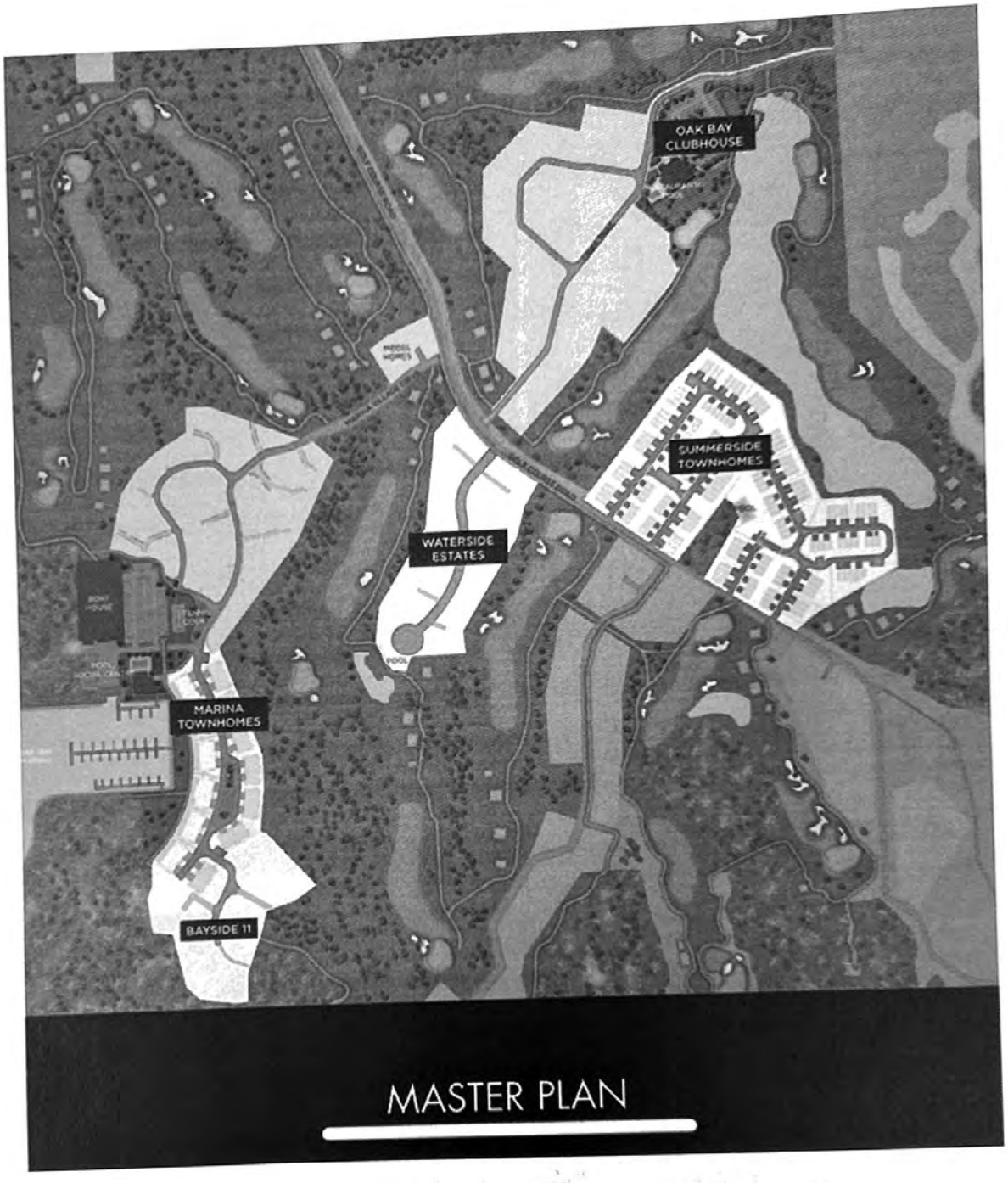
| REG. NUM. | DATE | INSTRUMENT TYPE | AMOUNT | PARTIES FROM | PARTIES TO | CERT/ CHKD |
|---|---|---|---|---|---|---|
| MT264645 | 2022/05/05 | CHARGE | $6,000,000 | 1000171168 ONTARIO INC. | PORT SEVERN HEIGHTS INC. | C |
| MT264646 | 2022/05/05 | CHARGE | $4,000,000 | 1000171168 ONTARIO INC. | 1000080373 ONTARIO INC. | C |
| MT281288 | 2023/06/20 | WITHDRAWAL CAUTION | | *** DELETED AGAINST THIS PROPERTY ***<br>PORT SEVERN HEIGHTS INC. | | |
| *REMARKS: MT264644.* | | | | | | |

This is Exhibit “J” referred to in the Affidavit of Edward Maurer sworn by Edward Maurer of the Town of Huntsville, in the Province of Ontario, before me at the City of Toronto, in the Province of Ontario, on July 2, 2024 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

*Commissioner for Taking Affidavits (or as may be)*

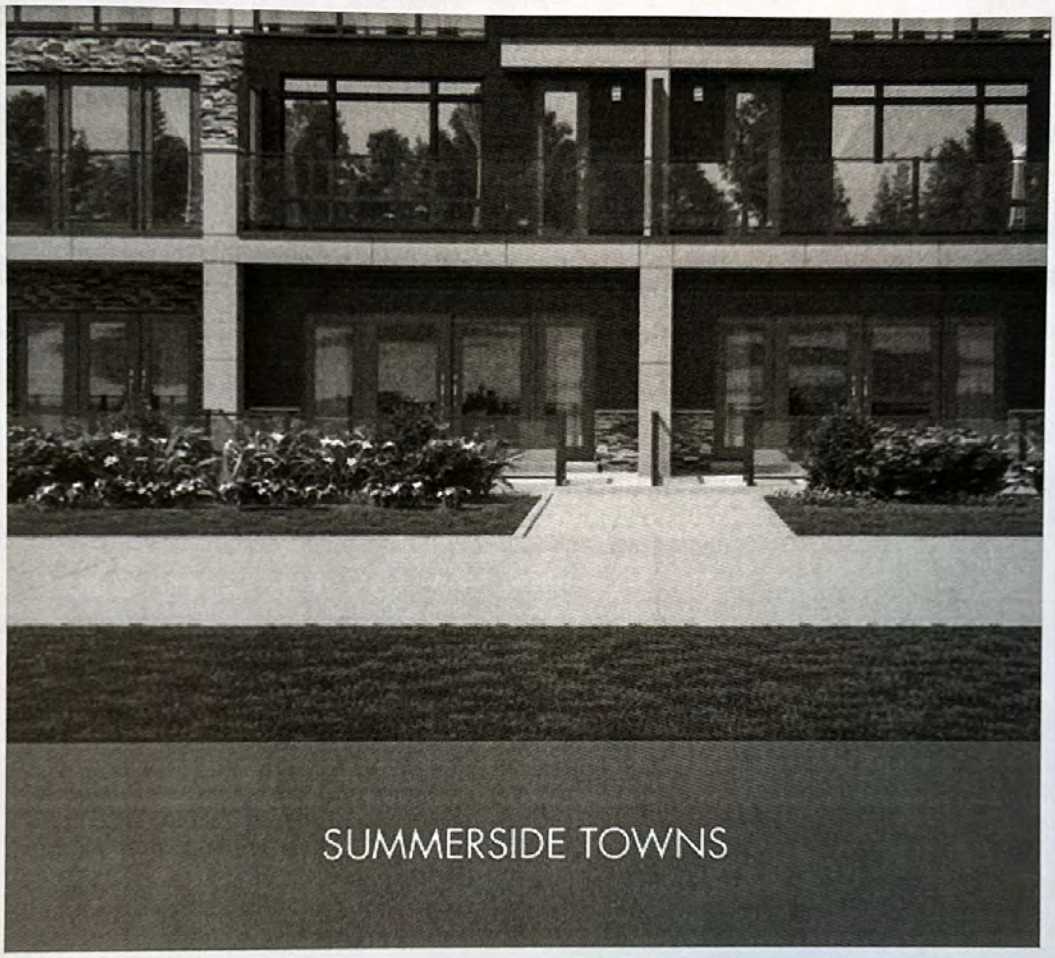
**ROBERT B. COHEN**


myoakbay.ca/homes/
OAK BAY
MARINA
HOMES
GOLF
DINING
RECREATION
AREA
TEAM
OAK BAY GOLF & MARINA COMMUNITY


OAK BAY
CLUBHOUSE
SUMMERSIDE
TOWNHOMES
WATERSIDE
ESTATES
MARINA
TOWNHOMES
BAYSIDE 11
MASTER PLAN

5:33

OAK BAY

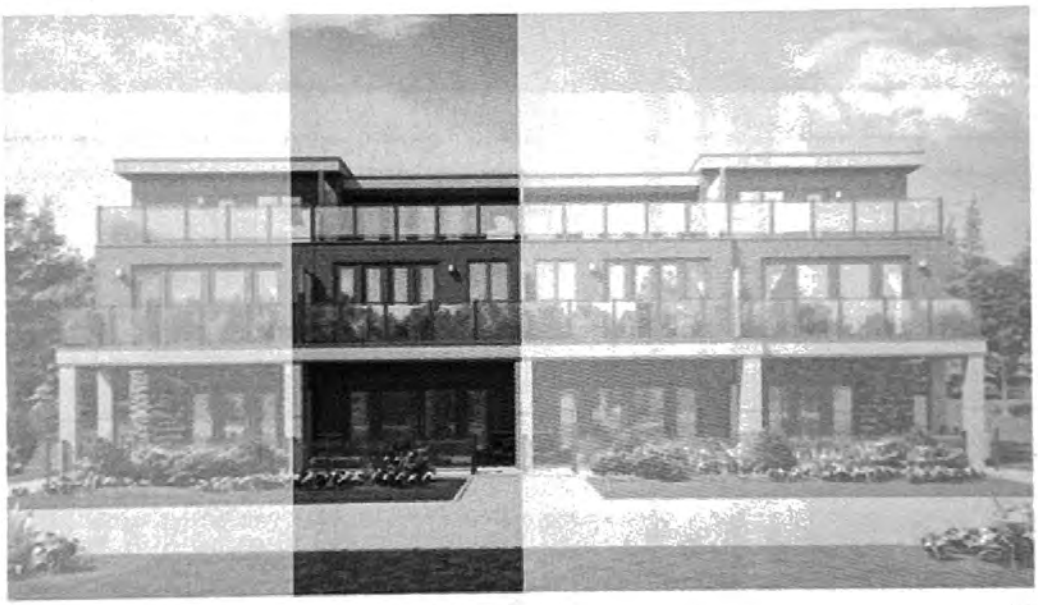


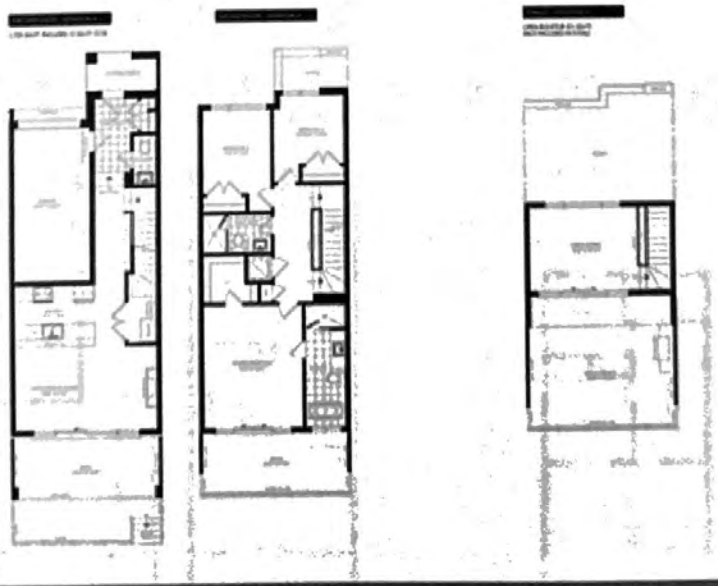
SUMMERSIDE TOWNS

5:35

OAK BAY

# THE BREEZE





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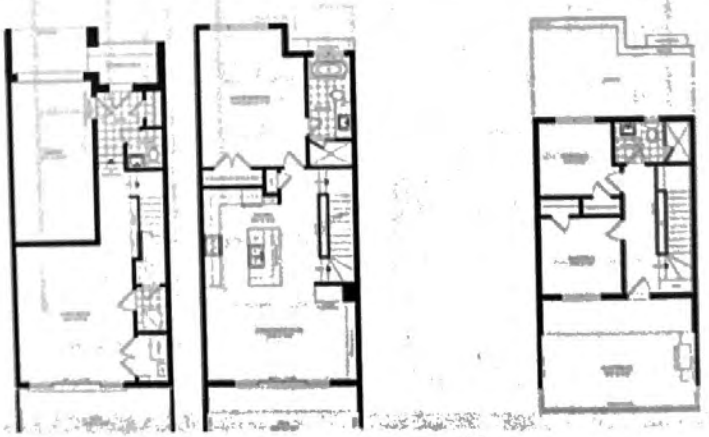
OAK BAY

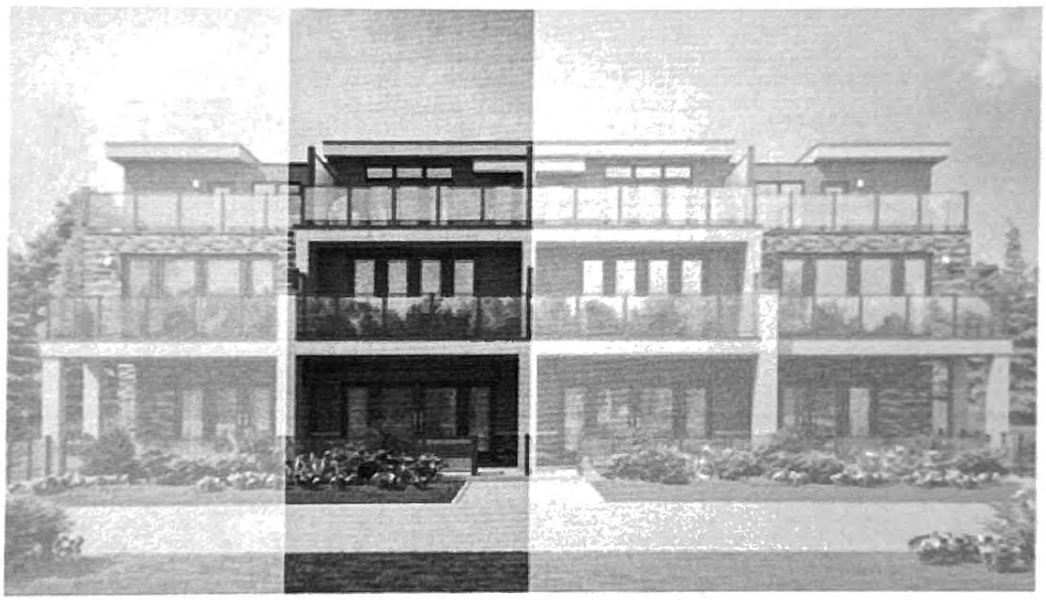
## THE SHINE



5:36

OAK BAY

# THE SKY



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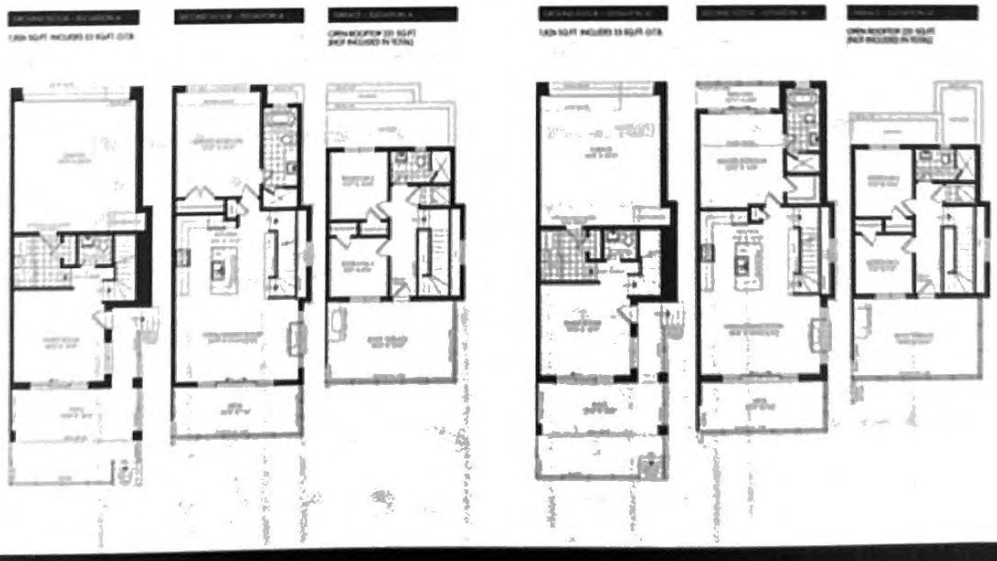
OAK BAY

# THE SOL



5:36

OAK BAY

# THE SUMMER

5:36

OAK BAY

# THE GARDEN

5:36

OAK BAY

# THE MEADOW

## THE OASIS UPG

5:37

OAK BAY

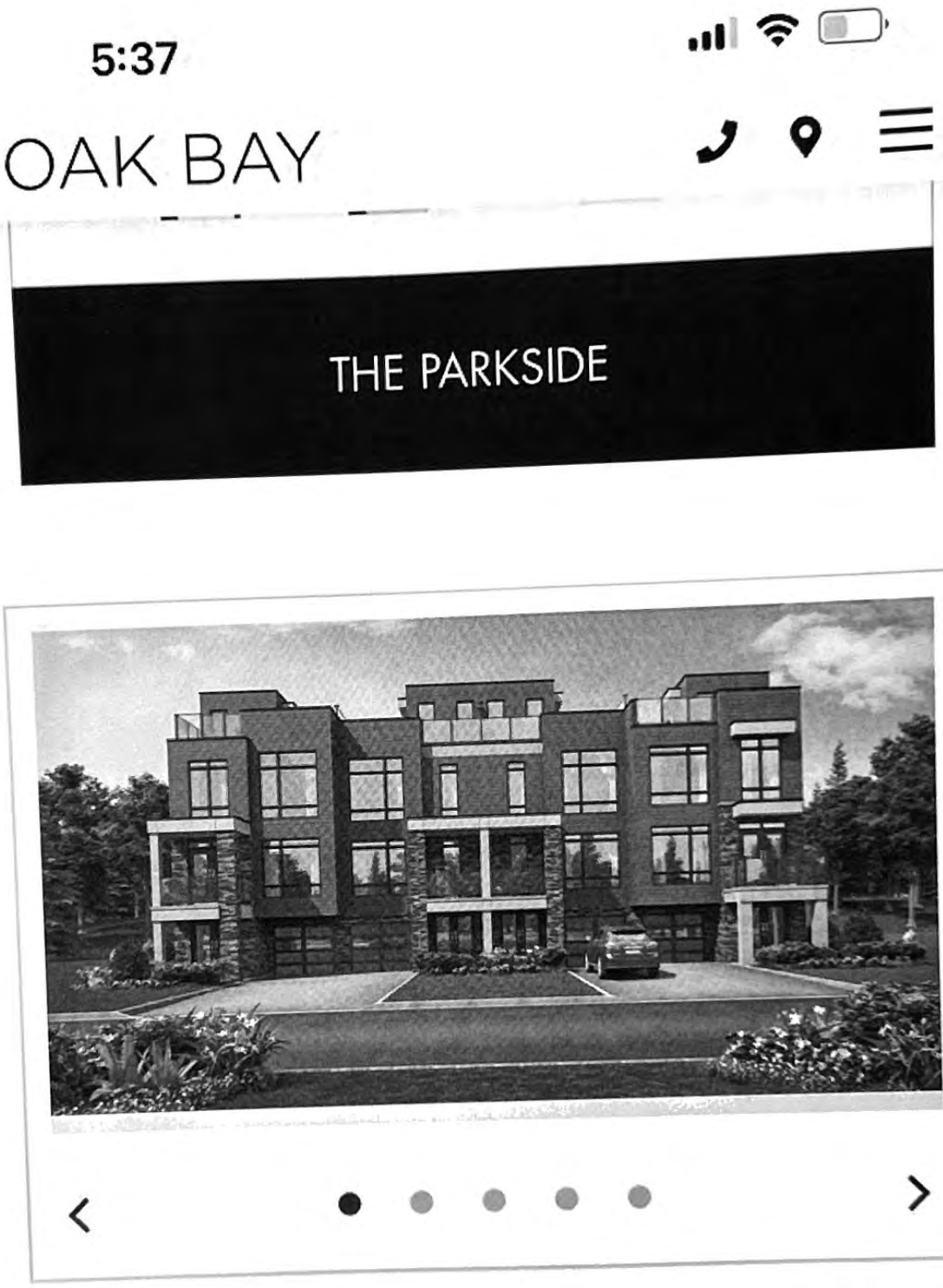
# THE OASIS UPG

5:37

OAK BAY

## THE OASIS

## THE PARKSIDE


5:37
OAK BAY
THE PARKSIDE

5:37

OAK BAY

THE PARKSIDE

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OAK BAY

THE PARKSIDE

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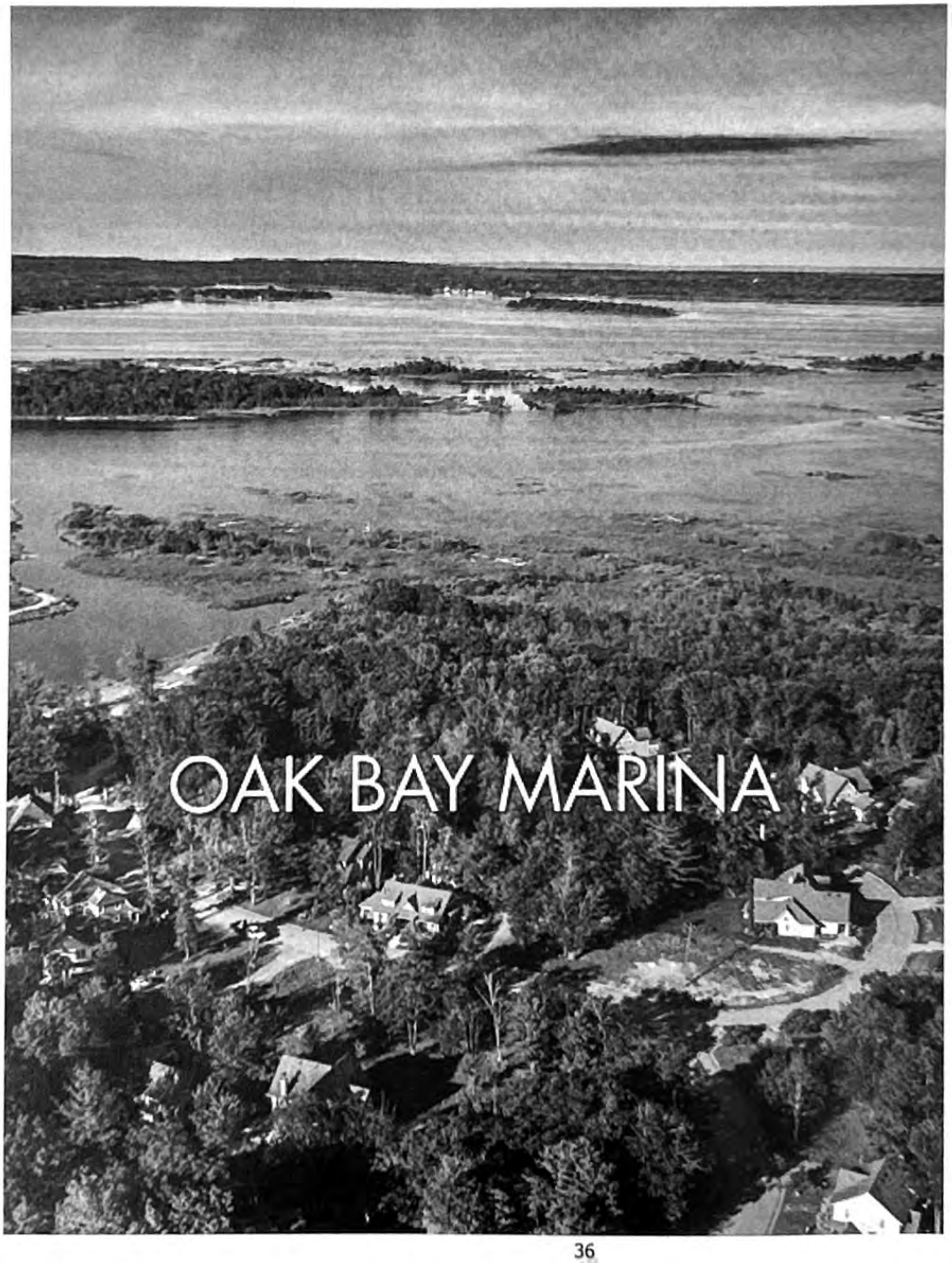
OAK BAY

THE PARKSIDE

5:38

www.myoakbay.ca

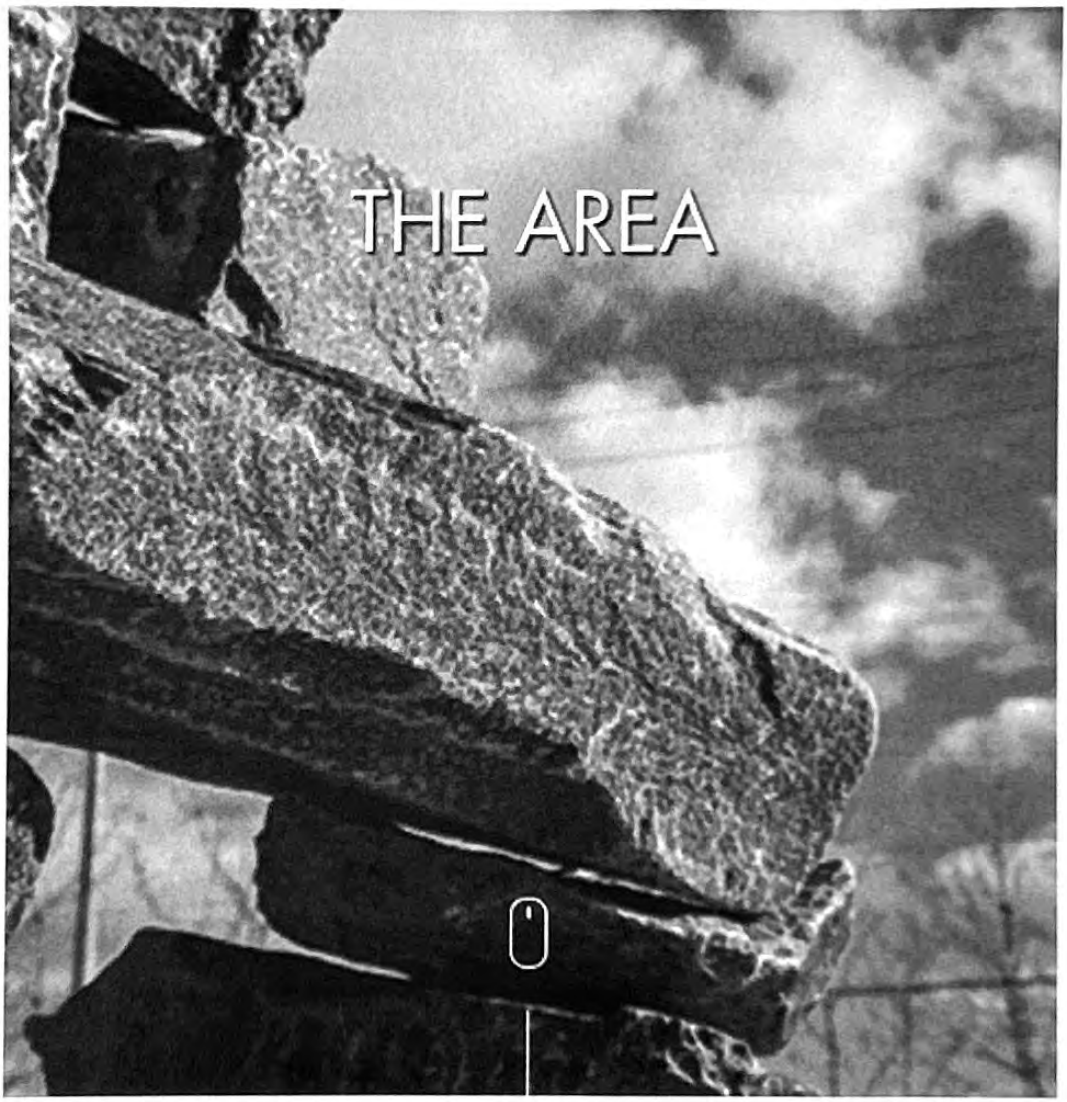
OAK BAY



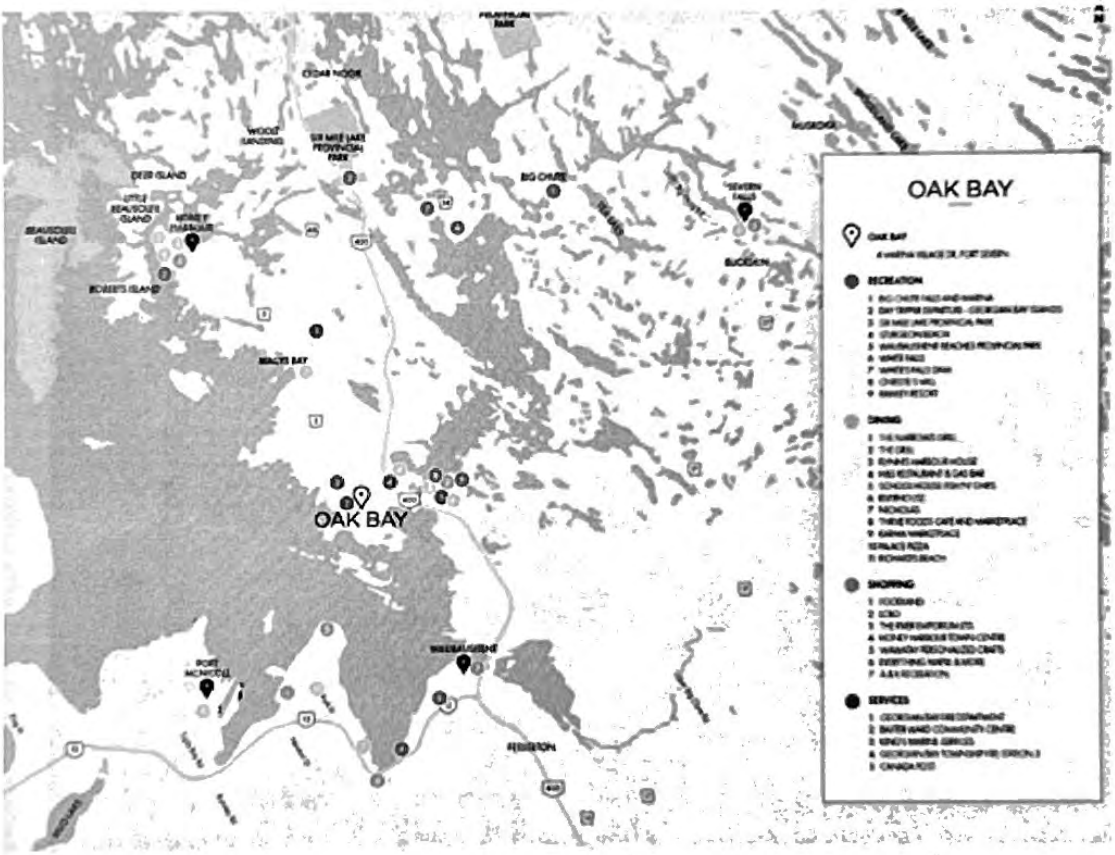
5:38

www.myoakbay.ca

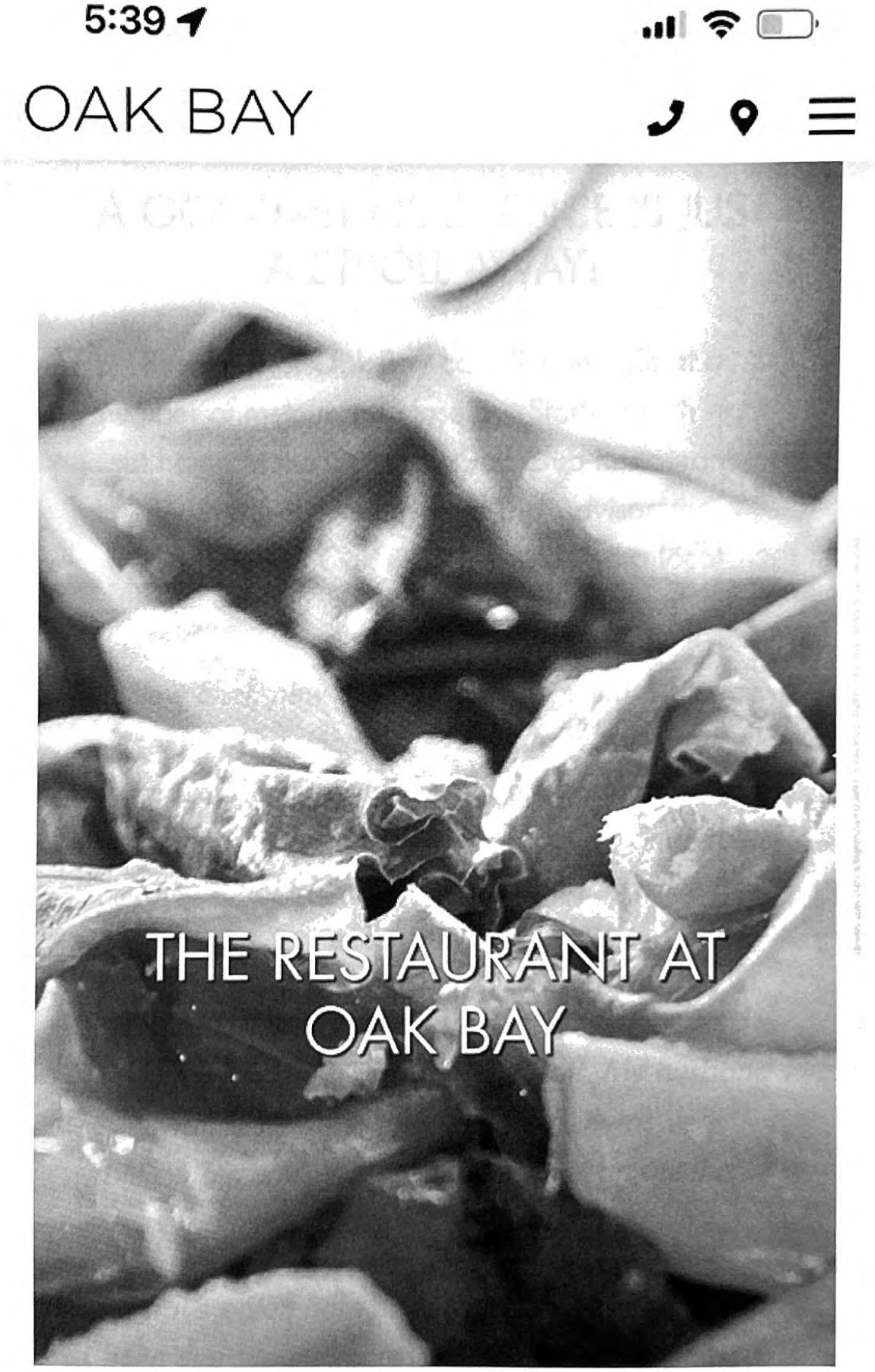
OAK BAY




LOCATED AT THE CENTRE OF
ONTARIO'S PLAYGROUND




DOWNLOAD MAP


5:39
OAK BAY
THE RESTAURANT AT
OAK BAY

OAK BAY

# A GOURMET EXPERIENCE IS JUST A STROLL AWAY!

Residents of Oak Bay can dine in style at a number of restaurants close by. Starting with right at home at the Oak Bay Golf Club Restaurant. With a 5-star rating from Trip Advisor, the restaurant at Oak Bay is considered a local favourite.

*"New chef, new menu, some renovations. Italian theme menu, incredible pizza from wood fired oven. Excellent specials, great pasta, salads. Lunch and dinner menu. Great view of course and water. Professional friendly staff. Reasonably price for excellent food!"*

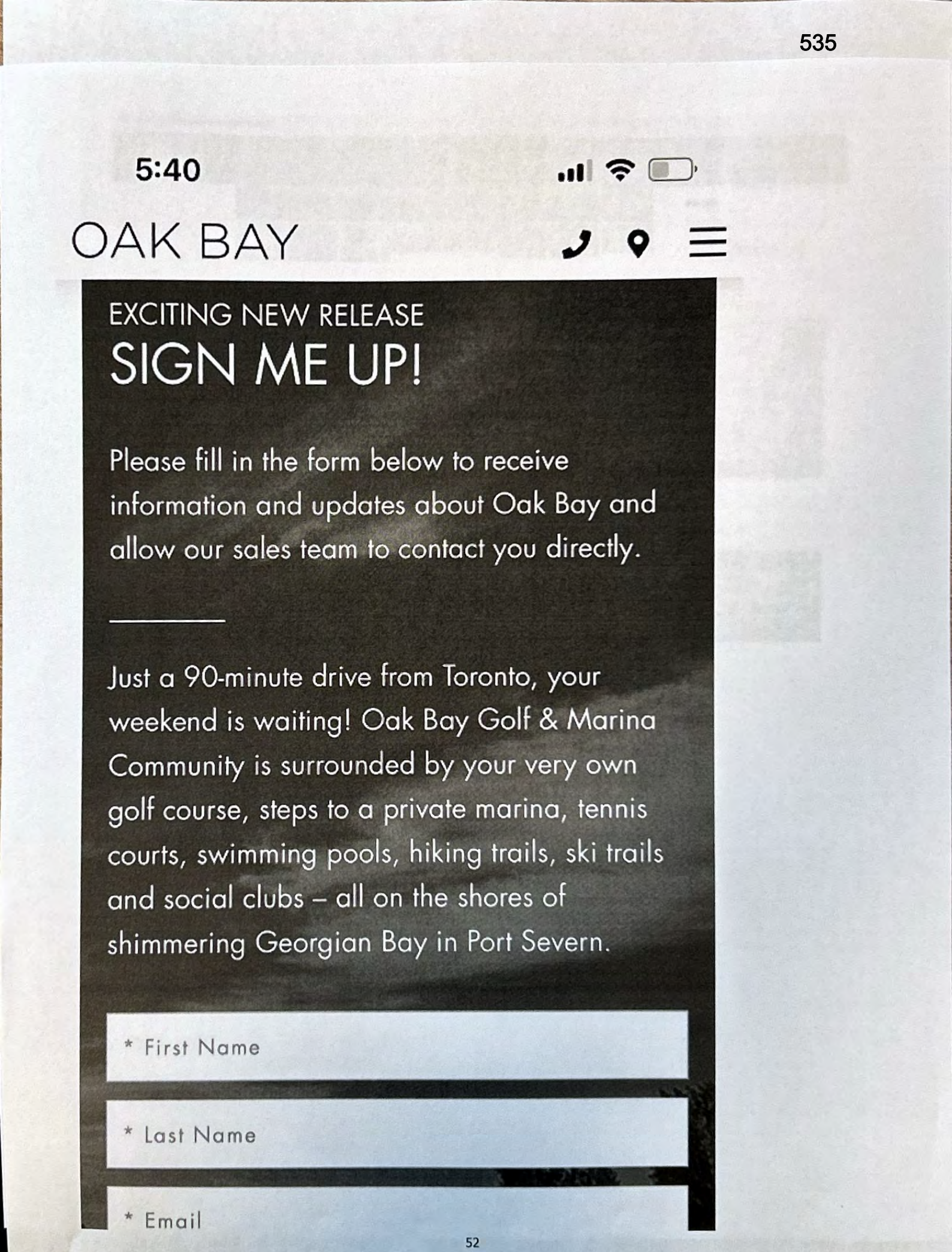
*"New restaurant, had to try it. Great food and attention to detail, very friendly staff. My husband and I were very happy indeed, it was very pleasing menu. We are passing this on out there, go try it you won't be disappointed."*

*"I have eaten here three times so far and I have been thoroughly impressed by the quality of food.*

5:39

OAK BAY

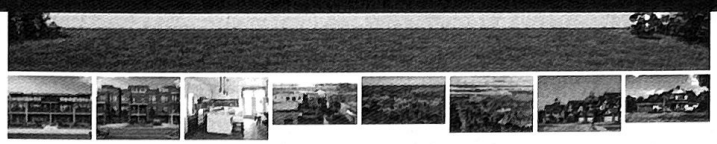
With the convenience of getting together with friends at the on-site Clubhouse or the numerous restaurants and cafes that are all nearby, there is sure to be something for everyone to enjoy.


5:40
OAK BAY
EXCITING NEW RELEASE
SIGN ME UP!
Please fill in the form below to receive information and updates about Oak Bay and allow our sales team to contact you directly.
Just a 90-minute drive from Toronto, your weekend is waiting! Oak Bay Golf & Marina Community is surrounded by your very own golf course, steps to a private marina, tennis courts, swimming pools, hiking trails, ski trails and social clubs – all on the shores of shimmering Georgian Bay in Port Severn.
* First Name
* Last Name
* Email

condoinvestments.ca/property/oak-bay/

Sotheby's | Canada

HOME SEARCH OPTIONS BUY SELL ABOUT US



Message

Register Now

## Description

# OAK BAY

Oak Bay is a condo, townhouse, semi and detached home community development by Eden Oak at Golf Course Road, Georgian Bay.

The community offers a total of 181 units with sizes ranging from 1,093 Sqft to 2,845 sqft.

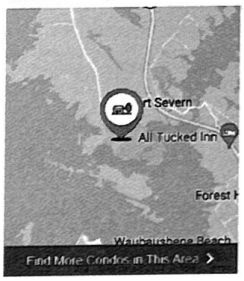
Introducing Oak Bay's Crown Jewel, Bayside 11. These bungalows and 2-storey ultra-modern and exclusive collection of homes offer the closet proximity to Georgian Bay. The Bayside 11 collection provides up to 2,845 sq. ft. of luxury and privacy, making them your perfect retreat.

Oak Bay's Waterside Estates is a collection of fully-detached bungalow and 2-storey designs on a private enclave surrounded by the lush Oak Bay Golf Club and just a 5-minute walk to Georgian Bay.

The newest phase is Marina Towns, gorgeous two and three storey townhomes at the foot of the Marina that offer both waterfront and golf course views. These contemporary designed homes include 1,700 to 2,200 sq. ft. of glamorous living space, topped with terraces.

With the convenience and cache of a beautiful 18-hole golf course mere steps from your home, Oak Bay is the ideal choice for golfers who take their fun seriously.

4 Marina Village Drive




## Featured

| | | |
|---|---|---|
| 1000171168 ONTARIO INC.<br>Plaintiff | and | PORT SEVERN HEIGHTS INC.<br>Defendant |

Court File No. CV-24-00713711-0000

***ONTARIO***
**SUPERIOR COURT OF JUSTICE**

PROCEEDING COMMENCED AT
TORONTO

**AFFIDAVIT OF EDWARD MAURER**

**Cassels Brock & Blackwell LLP**
Suite 3200, Bay Adelaide Centre - North Tower
40 Temperance Street
Toronto, ON M5H 0B4

Robert B. Cohen LSO #: 32187D
Tel: 416.869.5425
rcohen@cassels.com

Lawyers for the Defendant, Plaintiff by Counterclaim

Email for party served:
Elliot Birnboim: ebirnboim@cpllp.com
Michael Crampton: mcrampton@cpllp.com

# Tab 4

**Court File No. CV-24-00713711-0000**

***ONTARIO***
**SUPERIOR COURT OF JUSTICE**

**B E T W E E N:**

**1000171168 ONTARIO INC.**

**Plaintiff (Defendant by Counterclaim)**

**- and -**

**PORT SEVERN HEIGHTS INC.**

**Defendant (Plaintiff by Counterclaim)**

**CONSENT TO ACT AS RECEIVER**

**TDB Restructuring Limited** hereby consents to act as Court-appointed Receiver, without security, in this proceeding should such an Order be granted by the Court appointing TDB Restructuring Limited as Receiver over the lands legally described as Pt Lt 30 Con 4 Baxter Pt 2 35R18204; Pt Lt 30 Con 3 Baxter Pt 1-10 35R18203 Except Pt 1, 2 & 3 On 35R23914, Except Part 3 35R-25939 and Except Part 1 3R-27136; Georgian Bay; The District Municipality of Muskoka; Subject to an Easement over Part 4 on 35R23914 in favour of Pt Lt 30 Con 3 Baxter Pt 1 on 35R23914 as in MT149718; Subject to an Easement over Part 4 on 35R23914 in favour of Pt Lt 30 Con 3 Baxter Pt 2 on 35R23914 as in MT149719; Subject to an Easement over Part 4 on 35R23914 in favour of Pt Lt 30 Con 3 Baxter Pt 3 on 35R23914 As In MT149720; Subject to an Easement over Part Lot 30 Concession 3 Baxter, Part 1 And 2, 35R25939 as in MT256750 (the "Property") owned by 1000171168 Ontario Inc. (the "Debtor"), in accordance with an order sought and included in the Application Record of Port Severn Heights Inc.,

DATED AT TORONTO, ONTARIO, this 7th day of June 2024.

Per: Bryan A. Tannenbaum, FCPA, FCA, FCIRP, LIT
Title: Managing Director

1000171168 ONTARIO INC.
Plaintiff

and

PORT SEVERN HEIGHTS INC.
Defendant

Court File No. CV-24-00713711-0000

***ONTARIO***
**SUPERIOR COURT OF JUSTICE**

PROCEEDING COMMENCED AT
TORONTO

**CONSENT TO ACT AS COURT-APPOINTED INTERIM RECEIVER**

**Cassels Brock & Blackwell LLP**
Suite 3200, Bay Adelaide Centre - North Tower
40 Temperance Street
Toronto, ON M5H 0B4

Robert B. Cohen LSO #: 32187D
Tel: 416.869.5425
rcohen@cassels.com

Lawyers for the Defendant

Email for party served:
Elliot Birnboim: ebirnboim@cpllp.com
Michael Crampton: mcrampton@cpllp.com

1000171168 ONTARIO INC.
Plaintiff

and

PORT SEVERN HEIGHTS INC.
Defendant

Court File No. CV-24-00713711-0000

***ONTARIO***
**SUPERIOR COURT OF JUSTICE**

PROCEEDING COMMENCED AT
TORONTO

**MOTION RECORD OF THE MOVING PARTY,**
**PORT SEVERN HEIGHTS INC.**
(**re Receivership Motion returnable**
**September 20, 2024**)

**Volume 2 of 2**

**Cassels Brock & Blackwell LLP**
Suite 3200, Bay Adelaide Centre - North Tower
40 Temperance Street
Toronto, ON M5H 0B4

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Lawyers for the Defendant (Plaintiff by Counterclaim)

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Michael Crampton: mcrampton@cpllp.com
Ben Blay: bblay@scottpetrie.com