



**TO:** Brenda Guy/Matthew Linton, Town of Gananoque  
**FROM:** Eric Ming, EIT.  
**DATE:** February 1<sup>st</sup>, 2021  
**PROJECT:** Starbucks Gananoque– 787 King St. East, Gananoque  
Pre and Post-Development Runoff Calculations

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This technical memorandum was prepared by EVB Engineering on behalf of 995423 Ontario Inc. to provide a summary of the stormwater management requirements for the proposed development to be constructed at 787 King St. East in Gananoque, Ontario.

### Background

EVB has reviewed the existing site and the proposed development conditions to determine if any stormwater attenuation would be required to satisfy the Town's requirements.

### General Project Description

The existing property at 787 King St. East is currently zoned Commercial and is home to Putt N' Play Golf mini golf course. The property has 47.6m of frontage and is 78.1m deep for a total area of 0.37ha. The Putt N' Play Golf site is currently covered with a combination of rooftop (building area) space, asphalt, hard landscaping (mini golf course), and soft landscaping. Refer to Fig.1 attached for a summary of the existing site conditions and areas associated with each surface type.

The owner is proposing a renovation which consists of demolishing the existing Putt N' Play Golf building and mini golf course and constructing a 195m<sup>2</sup> Starbucks Restaurant and Drive-Thru. It is proposed that the new building and Drive-Thru be constructed in place of the demolished mini golf course with minor alterations to the existing asphalt laneways and parking areas as required. The proposed site will incorporate both new hard and soft landscaping features to finish the site.

### Site Overview and Drainage Patterns

The existing site drains to the south and east into an existing ditch. The ditch flows south between two existing private laneways and outlets to a natural attenuation area. It is proposed that the new development will maintain the existing site drainage characteristics.

### Weighted Runoff Coefficients

A weighted Runoff Coefficient for the pre-development and post-development sites was determined using the provided runoff coefficients outlined in the MOE Stormwater Management Planning and Design Manual (2003) and the area of each surface type associated with the existing and proposed developments.

Figure 1 in Appendix A shows the areas used to determine the pre-development weighted Runoff Coefficient. Drawing SP01 – "SITE PLAN" dated 2021/01/22 by Alexander Wilson Architecture Inc. also included in Appendix A provides a summary of the land use areas for the proposed development.

The Weighted "C" Factor Calculations included in Appendix B show that there negligible changes to the pre-development and post-development site weighted Runoff Coefficients as they are both  $C=0.6$ .

### Conclusions

Based on the MOE coefficients and the surface areas calculated in Figure 1 and Drawing SP01 – "SITE PLAN", it can be demonstrated that the weighted Runoff Coefficient for the existing site will remain unchanged by the proposed development. Therefore, it is expected that the proposed development at 787 King St. East will not increase the existing stormwater runoff calculations for the site.



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Eric Ming, EIT



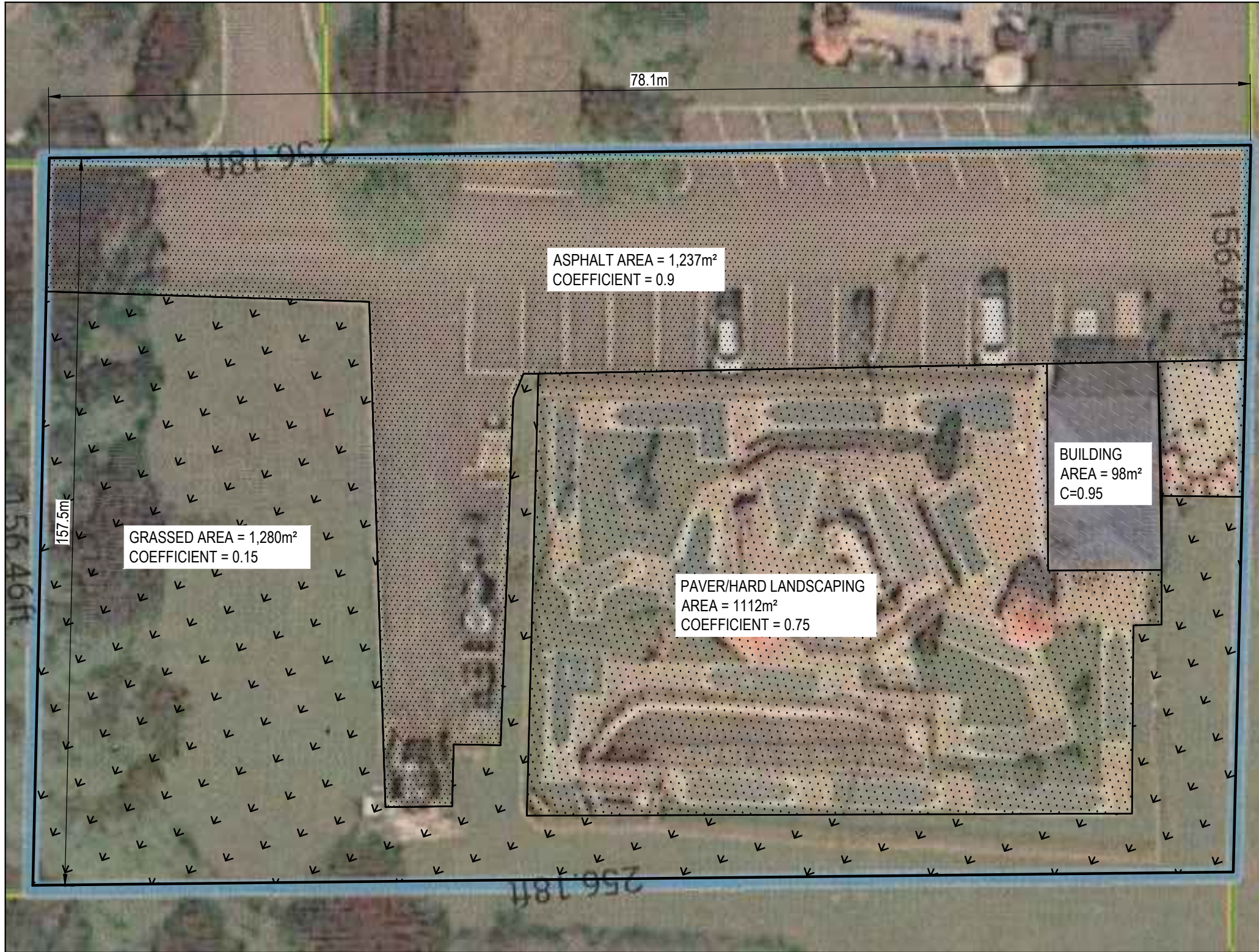
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Kevin McCulloch, P. Eng



# APPENDIX A

## Figures



KING ST. EAST



800 SECOND STREET WEST  
CORNWALL, ONTARIO CANADA, K6J 1H6  
TEL: 613-935-3775 | FAX: 613-935-6450  
WEBSITE: EVBengineering.com

CLIENT:

995423 ONTARIO INC.

PROJECT:

KING ST. EAST STARBUCKS

TITLE:

PRE-DEVELOPMENT  
SURFACE AREAS

SCALE: 1:300	JOB NO: 19018
DESIGNED BY: E.M.	DATE: 2021/02/01
DRAWN BY: E.M.	DRAWING NO.
CHECKED BY: K.M.	FIG.1



**GENERAL**

- A) All trenching and blasting in accordance with the Occupational Health and Safety Act and Ontario Building Code Div B, Part 7.
- B) All services, utilities, to be supported as per Ontario Building Code.
- C) Laser alignment control to be used.
- D) For dimensions and details not shown, refer to Ontario Building Code.
- E) Contractor shall reinstatement all private and municipal properties disturbed during construction, to existing conditions or better. (O.P.S.S. 504).
- F) All services shall be constructed in accordance with Municipal design criteria and standards or Ontario Provincial Standards.
- G) All Electrical work must have prior approval of the Municipality and must conform with Municipal standards/Ontario Hydro Codes/ESA and current C.S.A. Standards.
- H) All work shall have Municipal approval before commencement of construction and will be subject to inspection and approval by the Municipality.
- I) All work shall be completed in accordance with the "Occupational Health and Safety Act". The General Contractor shall be deemed to be the Contractor as defined by the Act.
- J) The Contractor shall incorporate preventive measures for erosion control of the construction site as required by the Municipality.
- K) The location and elevation of all existing services and utilities are to be verified in the field by the Contractor at their expense. The Contractor shall be responsible for the restoration and/or repair of existing utilities disturbed during construction.
- L) Roof leaders shall discharge to the front of the property to ground surface splash pads to permit runoff to the street. Weeping tile or foundation drain systems shall not be connected to the sewer. Provision shall be made to discharge ground water to the surface grades.
- M) All services on private property are to be constructed in accordance with the Ontario Building Code.
- N) All offsite works to be constructed and restored to the satisfaction of the Municipality.
- O) These drawings may include information provided by others. Anley Group believes this information to be reliable but has not verified its accuracy and/or completeness and, accordingly, shall not be responsible for any errors or omissions which may result from its incorporation herein.
- P) Any wells found on site are to be decommissioned by a licensed well technician in accordance with O.Reg. 372/07, S.20

**SITE WORK (O.P.S.S. 201/206)**

- A) Contractor shall strip and stockpile suitable topsoil from the site at locations as directed.
- B) Contractor shall remove all surplus excavated material from the site as directed in accordance with O.P.S.S. 180.
- C) The Contractor shall be responsible for maintaining traffic flow at all times during construction. Two 3.25m (each) lanes of traffic are to be provided. When one lane is required as approved by the Engineer, the lane width shall be 4.0m and flagmen shall be used.
- D) All construction signing must conform to the M.T.C. manual of "Uniform Traffic Control Devices".
- E) All work shall be completed in accordance with the "Occupational Health and Safety Act". The General Contractor shall be deemed to be the contractor as defined by the Act.
- F) The Contractor shall maintain the adjacent streets being used for access to the subject property for the purpose of construction of services and buildings. The Contractor shall maintain these roads to the Quinte West's satisfaction which shall include the placing of dust palliatives, the removal of mud and other materials carried out onto paved streets adjoining the subject property, and the repair to the satisfaction of the Director of Engineering of any damages caused to the streets.
- G) All stripped topsoil used to build up exterior slope to final building elevation with excess to be deposited into the rear berm.
- H) All excavated native sub-soils to be deposited into building envelopes to build up base for proposed finished floor elevation (FFE). Strip all topsoil on envelope prior and deposit into rear berm.

**SIGNAGE**

- A) All new signage to be placed in accordance with the U.M.T.C.D. Book 7 (unless otherwise specified). Signage to include street signs, stop signs, barricades, etc.

**WATERMANS (O.P.S.S. 701)**

- A) Pipe (Din as shown). Shall be PVC Class 150 DR18 (or approved equal). #6 AWG Copper Tracer Wire.
- B) Fittings. Fittings shall be gray or ductile iron conforming to AWWA C110/A21.10, ductile iron conforming to AWWA C153/A21.53, or injection molded polyvinyl chloride (PVC) conforming to CSA B137.2. Mechanical restrainers are to be utilized two joints back from each bend or fitting.
- C) Gate Valves. Gate valves shall be in accordance with AWWA Standard C509-94 for gate valves with iron body, bronze mounted non-rising stem, open left, resilient seat with a working pressure of 1035 kPa.
- D) Valve Boxes. Valve Boxes shall be cast iron three piece slide type (S.S.) complete with round base, lower section, upper section and cover. The size shall be determined by the size of valve and depth of Waterman.
- E) Fire Hydrants - Quinte West Standards. Fire Hydrants shall be breakaway, McAvity M 67 or Mueller Centurion to AWWA Std. C502-80, with two 60 mm outlets with 5 threads per 25 mm nominal 1.80 m bury, open left with mechanical joint to base. The actual bury of the hydrant shall be determined by the actual depth of the main and the finished grade at the hydrant, 1.8 m minimum. All hydrants to have two 60 mm and one 100 mm outlet. Fire Hydrants shall be installed with a clear and unobstructed area of 3.0m around the hydrant. Fire Hydrants shall meet the Ontario Standard 336, two 63mm CSA standard threads with a pump connection of 145mm O.D. with 4.5 threads per 25mm. All hydrants to be installed utilizing anchor tees and valves.
- F) Thrust Blocks. As per O.P.S.D. 1103.01, 1103.02.
- G) Service Connections. Spatial separation of the sanitary and water service connections, shall be in accordance with section 7.3.5.6 of the Ontario Building Code and subsection 1.4 of the Ontario Plumbing Code. Subject to conditions set out below, service pipe material to be poly. Services are not to be installed in proposed driveways. Cross Linked High Density Polyethylene, blue in color 904, complete with stainless inserts meeting NSF 14 & 61, AWWA C304, CSA B137.5, and ASTM 7876 & 7877. Sizing must conform to standard copper tube size (CTS) O.D. and be compatible with standard copper tube compression fittings, with a minimum working pressure rating of 1100kPa (160 psi) at 23°C. Adjustable sliding-type service box bases (Type #8) are to be used on all services over a bronze stop and drain curb stop. These are to be located on the property line.
- H) Bedding. As per O.P.S.D. 802.010 and 802.013 for both mainline and service connections. Bedding and cover material shall be granular 'A' or 13mm crusher run limestone. Backfill to be approved native material to 100% S.P.M.I.D.
- I) Service Markers. Shall be installed to indicate valve box or curb stop locations at property lines. (50mm x 100mm - Painted Blue).
- J) Watermain Testing. As per Quinte West "Watermain sampling and testing policy and procedure".

**MEASUREMENTS**

- A) All measurements in metres, pipe size in millimeters, unless otherwise specified.

**EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION**

Control of erosion on construction sites and the removal of sediments from construction site run-off is very important if downstream areas are to be protected during all construction. Erosion and sedimentation should be controlled by the following techniques:

- A) Limiting the extent of exposed soils at any given time.
- B) Revegetation of exposed areas as soon as possible.
- C) Minimization of area to be cleared and grubbed.
- D) Protection of exposed slopes with plastic or synthetic mulches.
- E) Silt fence (O.P.S.D. 219.110) to be installed around the perimeter of stockpiles of any topsoil to be used or removed from site. (location to be determined).
- F) A visual inspection to be done daily on sediment control measures and cleaned of any accumulated silt as required. The deposits will be disposed of as per the requirement of the contract.
- G) In some cases some filter barriers may be removed temporarily to accommodate the construction operations. The affected barriers will be reinstated at night when construction is completed. No removal will occur if there is a run off or predicted rain fall unless a new device has been installed to ensure the existing storm and sanitary sewer systems will not be contaminated.
- H) No refueling or cleaning of equipment near any existing waterways.

**ROAD DESIGN (O.P.S.S. 206/310/313/314/501/502/507)**

- A) **INTERNAL ROADS** **PARKING SPACES** **Material Specification**  
 HL3 40mm HL3 50mm O.P.S.S. 1003/1101/1150  
 HL8 50mm O.P.S.S. 1003/1101/1150  
 Granular 'A' 150mm Granular 'A' 200mm O.P.S.S. 1010  
 Granular 'B' 300mm Granular 'B' 300mm O.P.S.S. 1010
- B) **COMPACTION TO SPEC.** O.P.S.S. 501.08.02  
 Boulevards shall be constructed as per typical road section within construction limits.
- C) Concrete mountable curb (with narrow gutter) O.P.S.D. 600.100, dropped with a continuous height throughout
- D) Concrete outlet, for concrete curb and gutter O.P.S.D. 604.010 & 605.010. (Max. slope size 100mm)
- E) Method of termination for concrete curb and gutter O.P.S.D. 608.010.

**PARKING REQUIREMENTS**

ZONING CC PERMITTED USE - COMMERCIAL BUILDING

**REQUIRED PARKING**

- 1 SPACE PER 33m OF GROSS FLOOR AREA
- TOTAL SPACES REQUIRED= 20

**PROVIDED PARKING**

- TOTAL SPACES PROVIDED = 18 (INCLUDING 2 BARRIER FREE SPACES)

**\*CAUTION\***

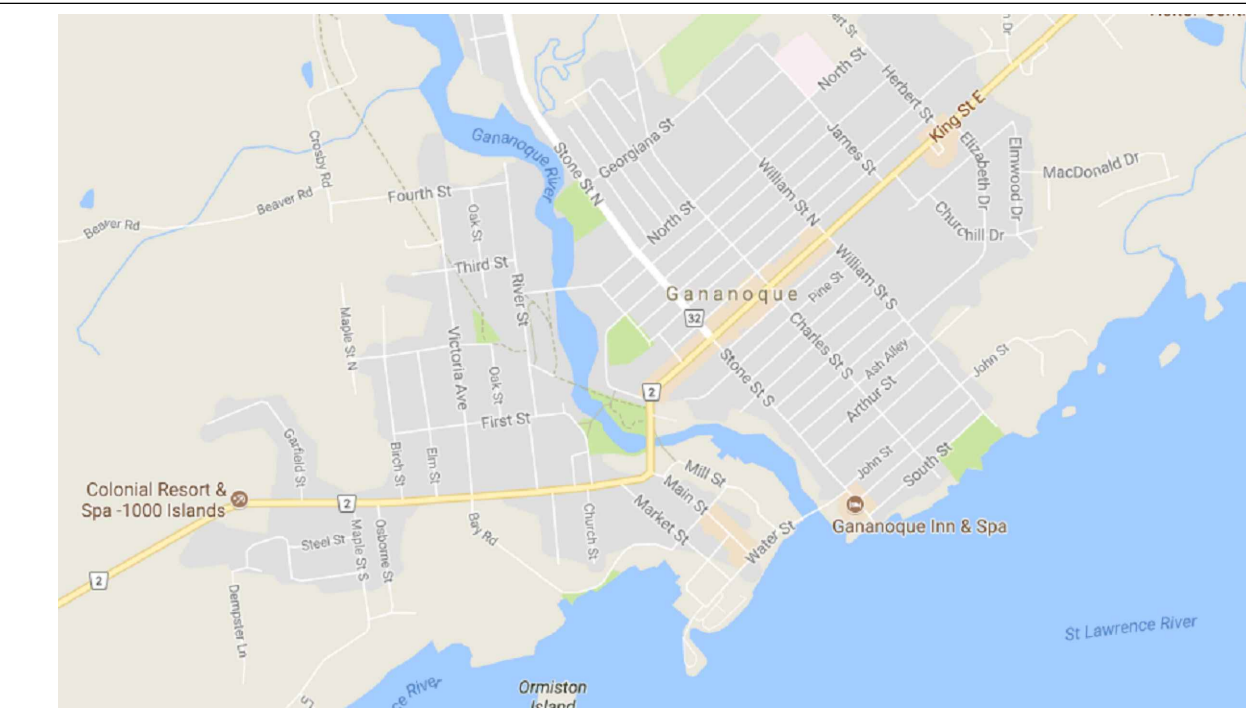
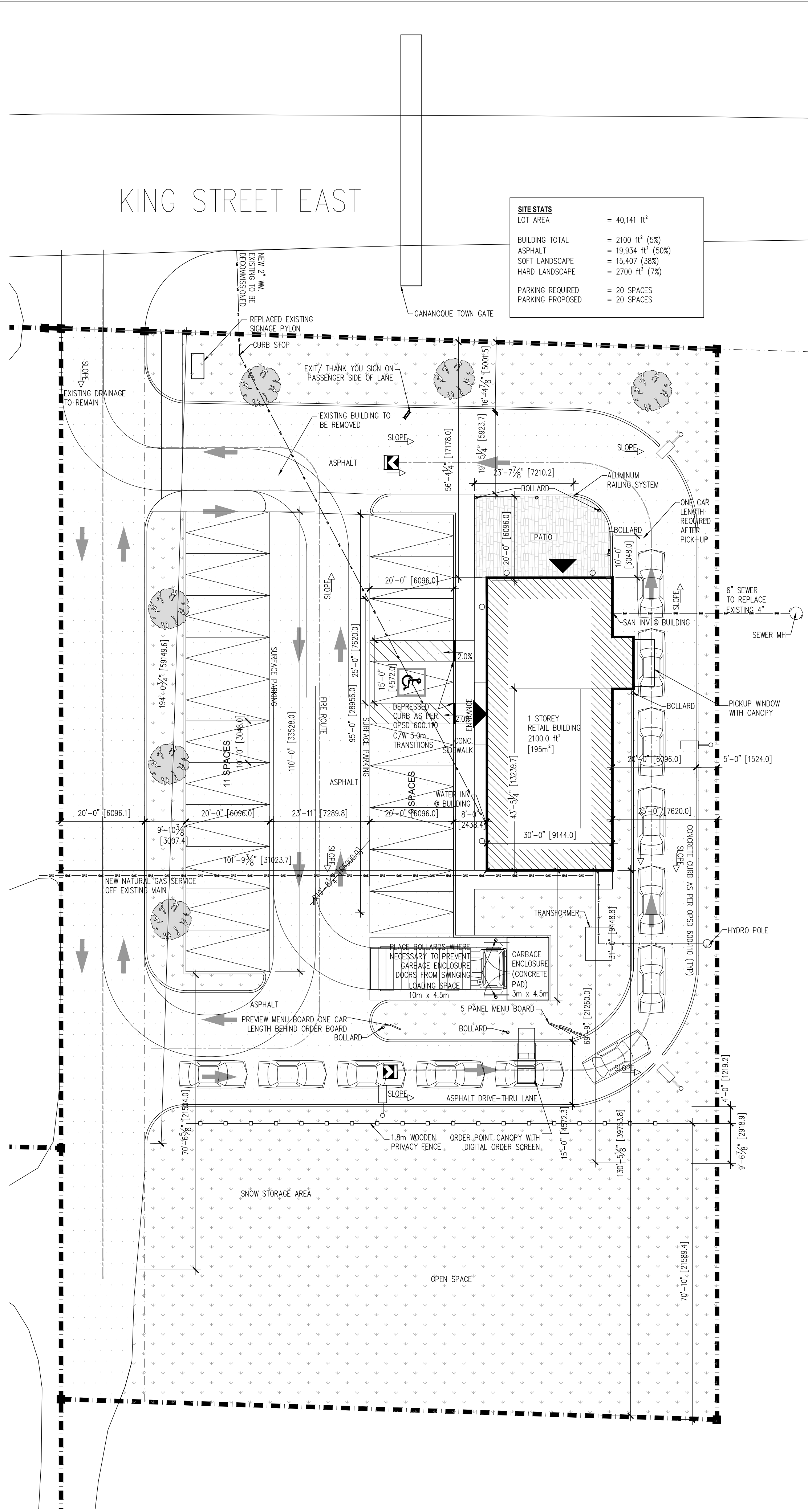
THE LOCATION OF ALL EXISTING SERVICES AND UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPALITY AND UTILITY PROVIDERS. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE LOCATION AND STATUS OF THESE SERVICES AND UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION.

**LANDSCAPING NOTES**

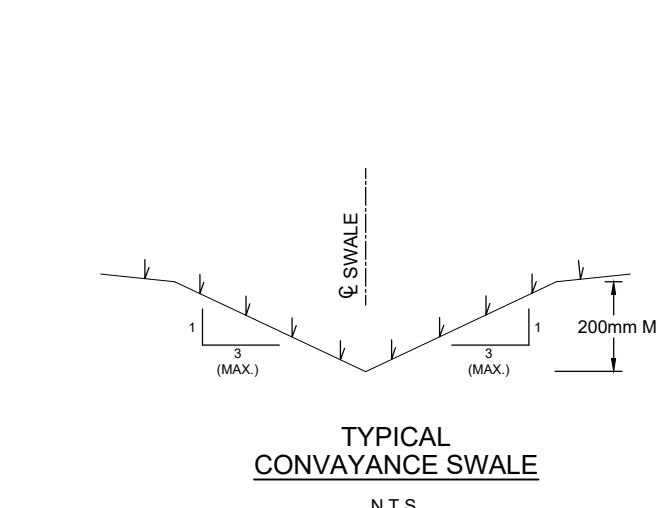
1. ALL LANDSCAPED PORTIONS OF THE SITE TO BE FINISHED WITH 100mm TOPSOIL & SEED
2. ALL SWALES TO BE COMPLETED WITH 100mm TOPSOIL AND 2 ROWS OF SOD IN THE BOTTOM
3. ALL DISTURBED PORTIONS OF THE BOULEVARD TO BE RESTORED TO PROPERTY LIMITS WITH 100mm TOPSOIL AND SOD.

**NOTE:**

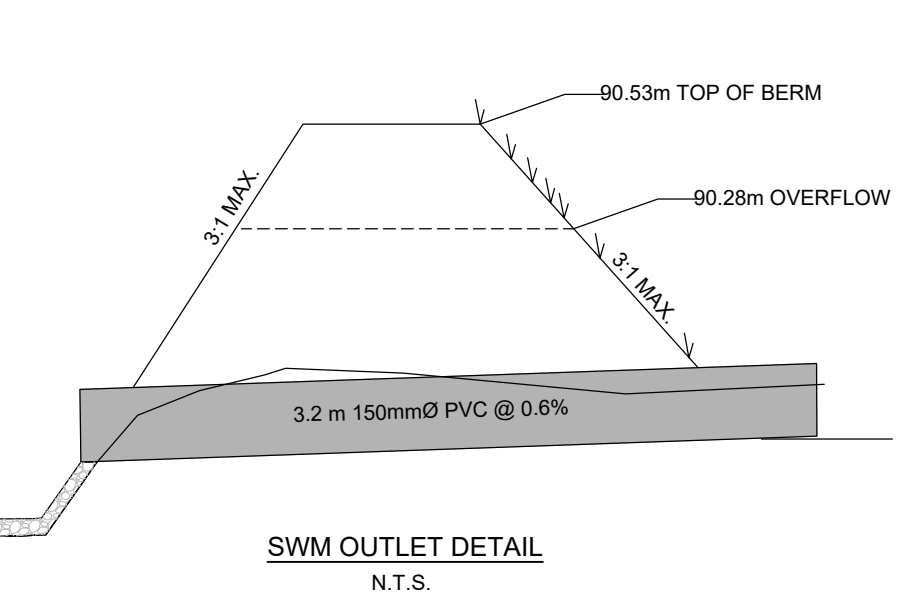
SITE GRADING TO BE COMPLETED TO ENSURE POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS. SURPLUS MATERIAL TO BE REMOVED FROM SITE. ALL DISTURBED AREAS ARE TO BE REINSTATED.



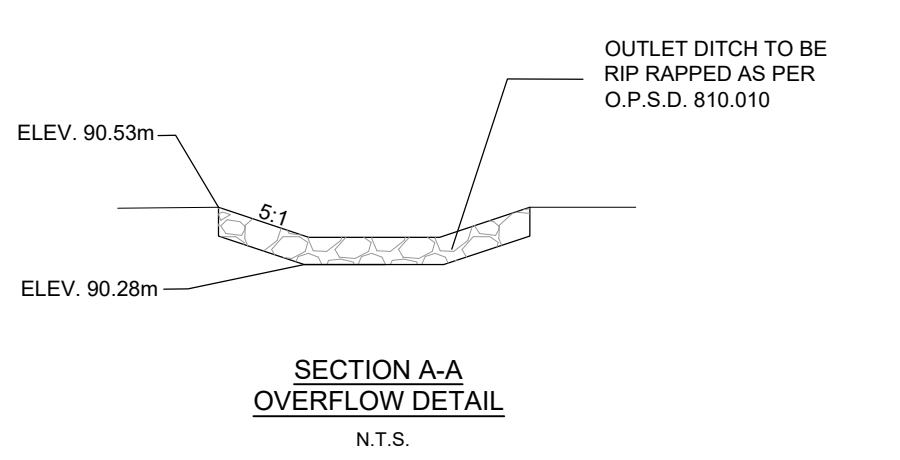
**1 KEY PLAN**  
SP01 SCALE: 1/32" = 1'-0"



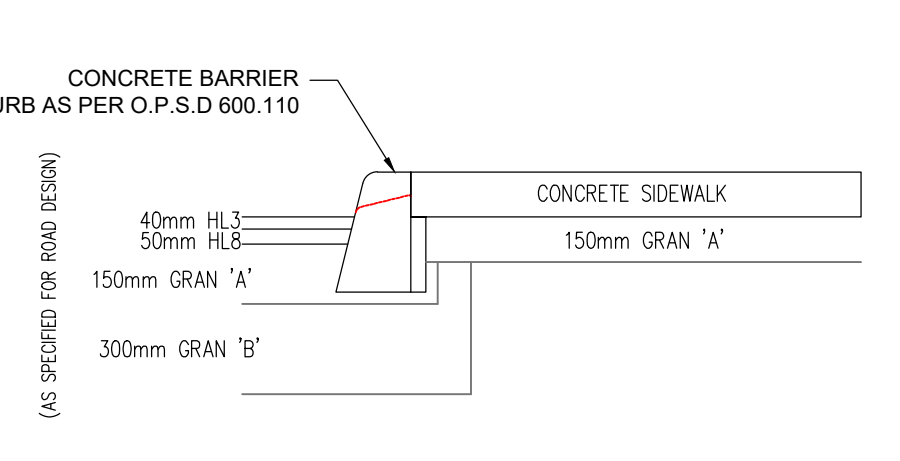
**TYPICAL CONVEYANCE SWALE**  
N.T.S.



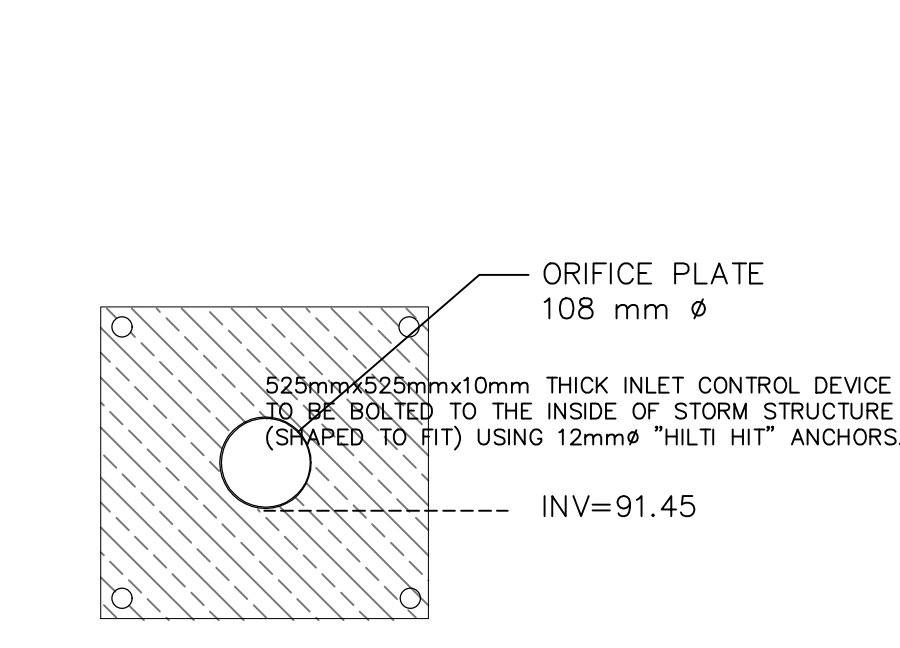
**SWM OUTLET DETAIL**  
N.T.S.



**SECTION A-A OVERFLOW DETAIL**  
N.T.S.



**TYPICAL PAVEMENT STRUCTURE AND CURB DETAILS**  
N.T.S.



**INLET CONTROL DEVICE**  
N.T.S.

**DO NOT SCALE DRAWINGS**

CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. DRAWINGS NOT TO BE USED FOR CONSTRUCTION UNLESS STAMPED AND SIGNED BY THE CONSULTANT. THESE DRAWINGS HAVE BEEN DESIGNED IN CONFORMANCE WITH THE ONTARIO BUILDING CODE.

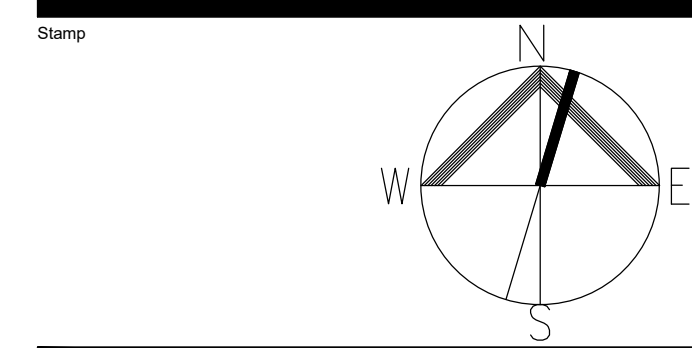
**Revisions and Issues**

REV.	DATE	DESCRIPTION
1	2021/01/07	ISSUED FOR REVIEW
2	2021/01/22	REVISIONS
3		

**LEGEND**

- ▲ EXIT/ENTRANCE
- TRAFFIC FLOW
- LIGHT STANDARD
- GRASS SEED
- ASPHALT
- LOT BOUNDARY
- FIRE ROUTE
- 1.8m WOODEN PRIVACY FENCE
- GAS
- WATER MAIN
- HYDRO
- SANITARY SEWER

**Alexander Wilson Architect Inc**  
 Admiralty Place  
 103-20 Gore Street  
 Kingston, ON K7L 2L1  
 T: 613-545-3744  
 F: 613-545-1411



**NEW STARBUCKS GANANOQUE**

787 King Street  
 Gananoque, Ontario

**SITE PLAN**

Drawn By	CR	Checked By	JMJ
Scale	AS NOTED	Date	JAN 2021
Project No.	2011	Revision	1
Drawing No.	SP01		





# APPENDIX B

## Calculations

## Weighted C Factor Calculations

**Project Name:** Starbucks Gananoque  
**Project No:**  
**Client:** 995423 Ontario Inc.

**Designed By:** E.M.  
**Reviewed By:** K.M.  
**Date:** Jan 28, 2021

### A1 - Predevelopment Conditions

Surface/Development Type	Coefficient	Area (m <sup>2</sup> )
Asphalt/Concrete	0.9	1237
Roof	0.95	98
Gravel	0.5	0
Precast Paving	0.75	1112
Grassed & Undeveloped	0.15	1280
<b>Σ Areas</b>		3727
<b>Weighted 'C' Factor</b>		0.599

### A2 - Post Development Conditions

Surface/Development Type	Coefficient	Area (m <sup>2</sup> )
Asphalt/Concrete	0.9	1851
Roof	0.95	195
Gravel	0.5	0
Precast Paving	0.75	250
Grassed & Undeveloped	0.15	1431
<b>Σ Areas</b>		3727
<b>Weighted 'C' Factor</b>		0.605