
MEMORANDUM

TO: Jeff Brown, 995423 Ontario Inc.	DATE: January 15, 2021
FROM: Darcie Dillon, P.Eng.	PROJECT #: 20-034
PROJECT: Proposed Development at 787 King Street East, Gananoque	
SUBJECT: Noise Assessment	

1. Introduction

The purpose of this technical memorandum is to review the noise impacts from vehicular sources from the proposed coffee shop to be located at 787 King Street East, Gananoque, Ontario. The site location is shown on Figure 1. A site plan is included in **Appendix A**.



Figure 1: Site Location

The proposed development will be built on the south side of King Street East in Gananoque, Ontario. The site will generate traffic on King Street East and attract customers already travelling along King Street East. The

hotel properties located adjacent to the site to the west and north are considered noise sensitive land uses and an acoustic assessment is required to determine the effects of the proposed development.

2. Methodology

The assessment was conducted within the Study Area to determine the impact to noise sensitive areas (NSA's) and what mitigation measures, if any, should be incorporated into the site plan design.

The assessment was completed in accordance with the Ministry of the Environment, Conservation and Parks (MECP's) Noise Assessment Criteria guidelines, which are used for the planning of noise sensitive lands uses. These guidelines define the equivalent sound level criteria for indoor and outdoor amenity areas.

STAMSON 2.5 was used to calculate the sound levels for one representative receiver site (Travelodge by Wyndham Gananoque). It is the closest receiver site to the development and would experience the highest level of impact. The receiver site was defined as an outdoor residential space during the day and as inside a bedroom at night.

Outdoor Sound Level Criteria

The significance of a noise impact on day-time sound levels is assessed by using the objective of 55 dBA (7 a.m. to 11 p.m.) for road sources. These levels are established as acceptable sound levels for outdoor recreation areas of developments adjacent to transportation noise (roads, transit, light rail, and rail).

Plane of Window (Sleeping Quarters)

Outdoor night-time (8 hr) roadway sound levels at the plane of a bedroom (3rd storey) window must not exceed 60 dBA, otherwise air conditioning is required.

3. Traffic Input Data

King Street East traffic volumes for the existing year 2021 were based on 2017 traffic counts provided by the Town of Gananoque and a growth rate of 1%. The Thousand Islands Parkway ramp volumes for the existing year 2021 were based on 2017 traffic counts provided by the Ministry of Transportation Ontario and a growth rate of 1%. Highway 401 is not considered in the analysis because it is greater than 500 m from the receiver site (STAMSON does not consider sources beyond 500 m). The traffic volume for the proposed coffee shop is based on a trip generation volume. It is anticipated that the proposed development will be completed in 2021, therefore the year 2031 (10 years from date of construction) was used to determine the future effects of the development. The AADT volumes provided included truck volumes on King Street East, as illustrated in **Table 1**. A 90/10 daytime/nighttime split for traffic volumes was used.

Table 1: Traffic Input Data

	2021 AADT (Cars)	2021 AADT (Medium Trucks)	2021 AADT (Heavy Trucks)
King Street East	14,476	770	154
Thousand Islands Parkway Eastbound Ramp	1,749	328	109
Thousand Islands Parkway Westbound Ramp	2,030	381	127
Proposed Coffee Shop Trip Generation	1,000	0	0

Additional input to the STAMSON model included:

- The intermediate ground surface (hard surface reflects sound, soft surface absorbs sound);
- Distance, in metres, from the source to the receiver, using the centreline of the road as the source;
- The angle at which the receiver (hotel) intercepts the source (roadway and/or railway), measured relative to the perpendicular line between the source and the receiver;
- Receiver height (standard is 1.5 m above ground level during the daytime and 4.5 m above ground level during the nighttime);
- Road height (Thousand Islands Parkway ramps are elevated with respect to the receiver site);
- Posted speed limit – the posted speed limit for King Street East is 50 km/h and the Thousand Islands Parkway is 80 km/h within the study limits;
- Depth of woods (0-30 m, 30-60 m, 60 m or more);
- Roadway grade (slope) and elevation;
- Topography (hills, flatlands); and
- Existing attenuation due to shielding from barriers (natural or man-made).

King Street East is an arterial roadway which travels through the downtown of the Town of Gananoque. It is a 3-lane roadway, including a two-way left-turn lane, in front of the development. The posted speed limit at the project site is 50 km/h.

The Thousand Islands Parkway is a scenic parkway that starts at Highway 401 (to the north of the Study Area) and travels east to Brockville, Ontario. The parkway is elevated at the site location, and is a 2-lane undivided roadway with a posted speed limit of 80 km/h.

4. Analysis of Sound Levels

Year 2021 16-hour equivalent daytime sound levels and 8-hour nighttime sound levels for the receiver site, calculated using the STAMSON noise software program, are shown in **Table 2**.

Table 2: Existing Sound Levels

Receiver Site	Year 2021 Daytime (16 h) Sound Level, Leq (dBA)	Year 2021 Nighttime (8 h) Sound Level, Leq (dBA)
R1	58.9	54.6

Three assumptions for the proposed coffee shop were made:

- 1) Half the users of the development will use the drive-thru and the other half will park;
- 2) The coffee shop is not a 24/7 service drive-thru (i.e. no nighttime sound levels); and
- 3) The operating speed of the drive-thru is 20 km/h.

The future sound levels from the proposed development only are forecast to be 42.88 dBA in 2031, including sound from drive-thru/idling cars; the effects of stop and go vehicles in the queue; and the drive-thru speaker volume.

The future 2031 calculated site development sound levels are illustrated in **Table 3** (without the project) and **Table 4** (with the project). Note that the future daytime sound levels with the project at the receiver site include a 2 dBA increase for the drive-thru.

Table 3: 2031 Site Development (Without Project) Sound Levels

Receiver Site	Year 2031 Daytime (16 h) Sound Level, Leq (dBA)	Year 2031 Nighttime (8 h) Sound Level, Leq (dBA)
R1	59.2	55.0

Table 4: 2031 Site Development (With Project) Sound Levels

Receiver Site	Year 2031 Daytime (16 h) Sound Level, Leq (dBA)	Year 2031 Nighttime (8 h) Sound Level, Leq (dBA)
R1 – traffic only	59.4	55.2
R1 – including proposed development	59.5	55.2

5. Conclusions

Based on the calculated sound levels during both day-time and night-time, no perceptible (greater than 3 dBA) increases in sound level are forecast to occur. Although sound levels are greater than 55 dBA, it would not be technically or economically feasible to construct a noise barrier. In addition, a noise barrier is not recommended where less than a 5 dBA reduction in sound level can be obtained. Therefore, no mitigation is required for the three hotels/noise sensitive areas.

It is also noted that the Town of Gananoque has recently installed a generator at the pumping station to the southeast of the property. This unit runs intermittently with significant noise transmission (65 dBA) at the existing garbage enclosure on the development site. The noise from the generator is not considered in the ambient sound level of the proposed coffee shop development and is therefore excluded from this analysis.

Acoustical shielding will be required for all air conditioning units on the site to protect the adjacent noise sensitive areas from stationary noise.

Prepared by: Darcie Dillon, P.Eng., Partner, BTE



Attachments

Attachment 1: Site Plan

Attachment 2: STAMSON Outputs

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 reinstate 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 from 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** (In 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 (S2). complete with round base, lower section, upper section and cover. The size shall be determined by the size of valve and depth of watermain.
- E) **Fire Hydrants** - Quinte West Standards. Fire Hydrants shall be breakaway, McAlister M 67 or Mueller Centurion to AWWA Std. C502-80, with two 60 mm outlets with 5 hydrants 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 19mm 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.S. 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**

INTERNAL ROADS	PARKING SPACES	Material Specification
HL3	40mm HL3	50mm O.P.S.S. 1003/1101/1150
HLB	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

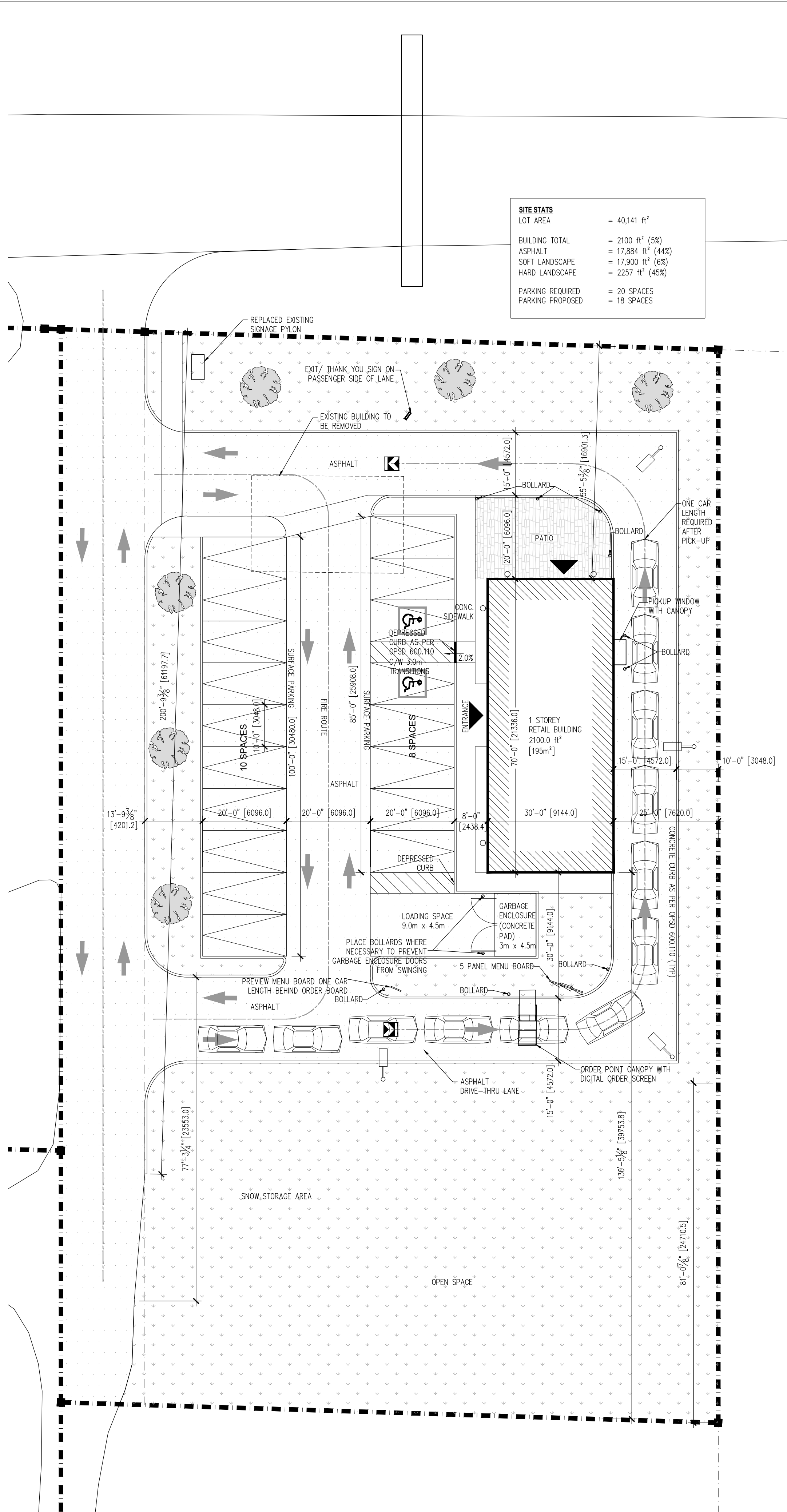
THE LOCATION OF ALL EXISTING SERVICES AND UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPALITY AND UTILITY PROVIDERS. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE LOCATION AND STATUS OF THESE SERVICES AND UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE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

LANDSCAPING NOTES

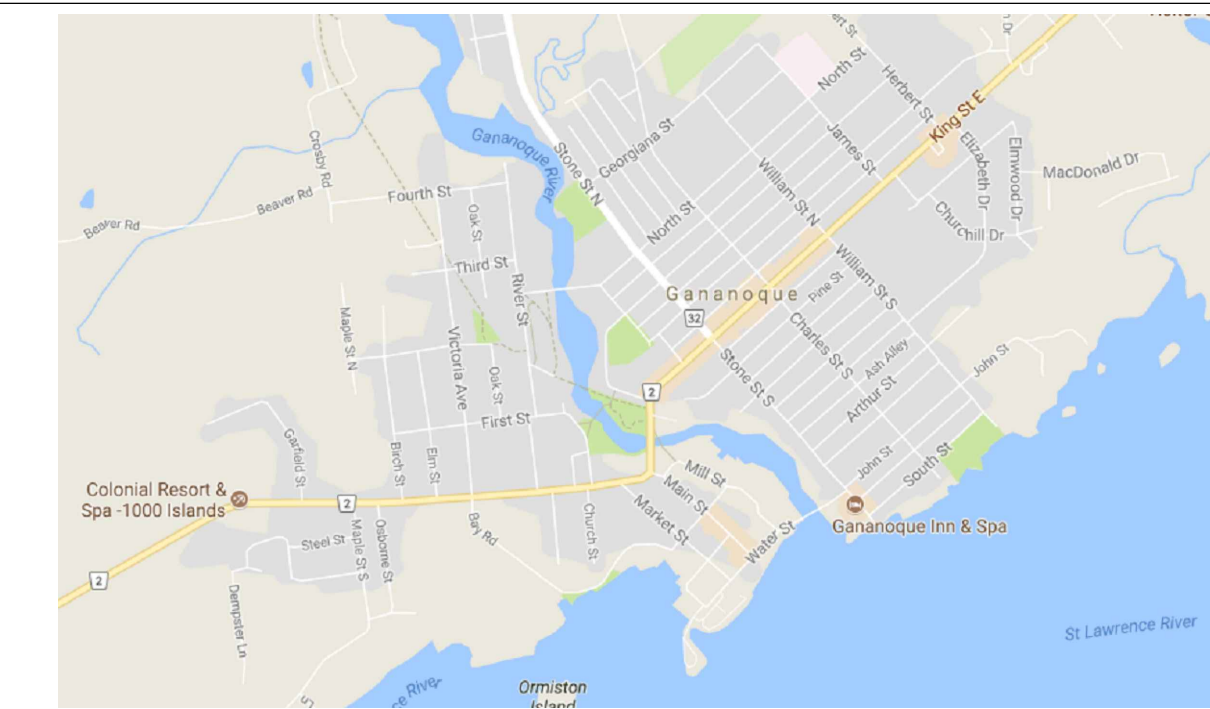
1. ALL LANDSCAPED PORTIONS OF THE SITE TO BE FINISHED WITH 100mm TOPSOIL & SEED
2. ALL SWALES TO BE COMPLETED WITH 100mm TOPSOIL AND 2 ROWS OF SOD IN THE BOTTOM
3. ALL DISTURBED PORTIONS OF THE BOULEVARD TO BE RESTORED TO PROPERTY LIMITS WITH 100mm TOPSOIL AND SOD.

NOTE:

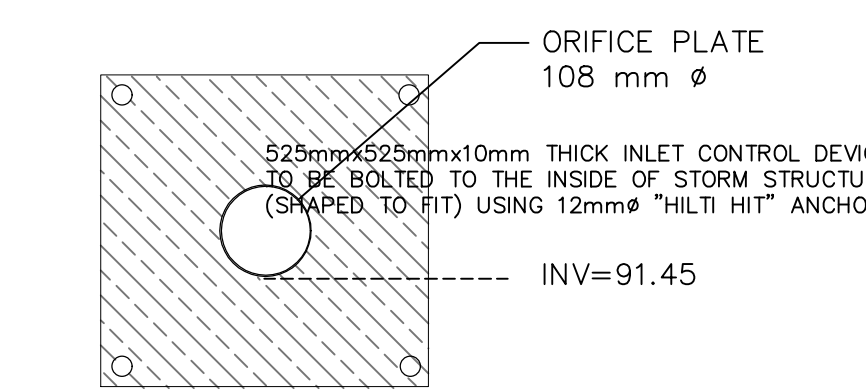
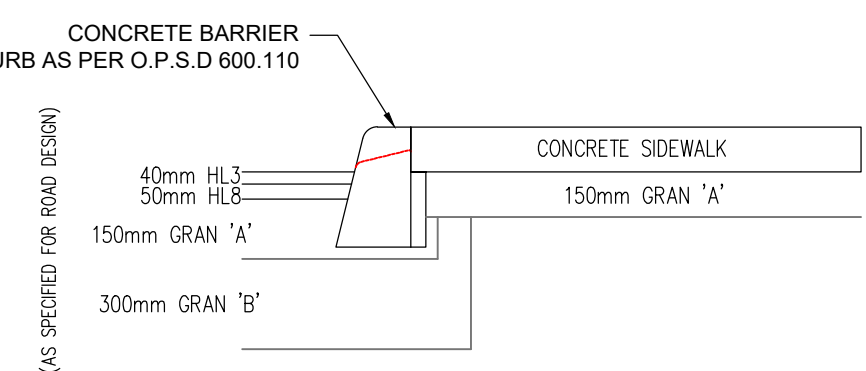
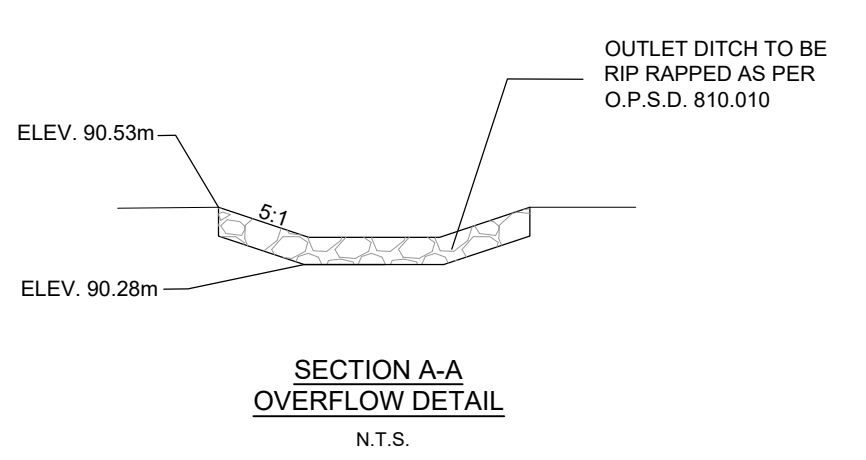
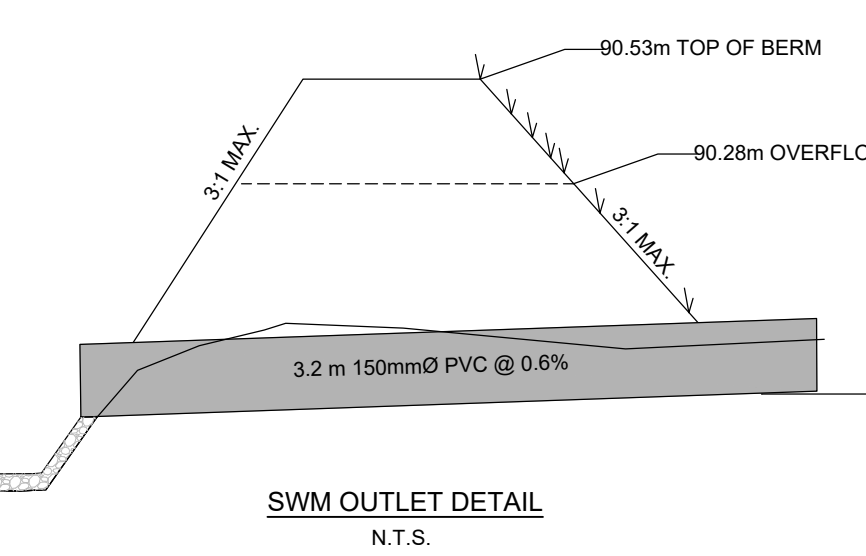
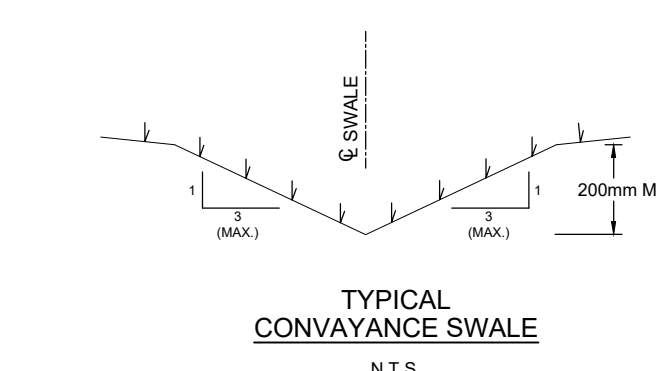
SITE GRADING TO BE COMPLETED TO ENSURE POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS. SURPLUS MATERIAL TO BE REMOVED FROM SITE. ALL DISTURBED AREAS ARE TO BE REINSTATED.



1 SITE PLAN
SP01 SCALE: 1:200



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



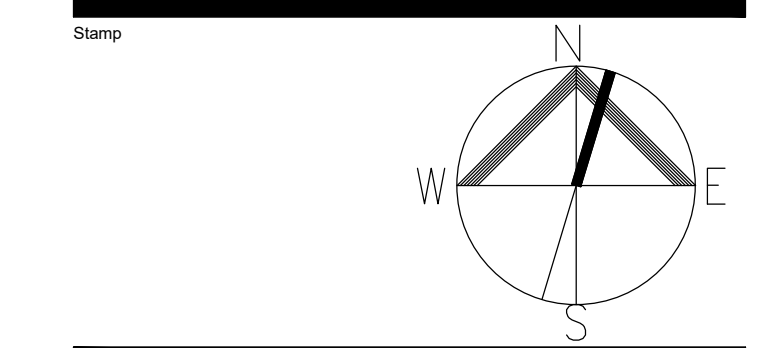
INLET CONTROL DEVICE
N.T.S.

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.

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

LEGEND	
	EXIT/ENTRANCE
	TRAFFIC FLOW
	LIGHT STANDARD
	GRASS SEED
	ASPHALT
	LOT BOUNDARY
	FIRE ROUTE

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Project
NEW STARBUCKS GANANOQUE
787 King Street
Gananoque, Ontario
Drawing

SITE PLAN

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

1:1

SITE INFORMATION WITHIN THESE DRAWINGS HAVE BEEN PROVIDED BY ANLEY GROUP. ALEXANDER WILSON ARCHITECT INC ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY INFORMATION PROVIDED.

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Road data, segment # 3: pkwywest

Car traffic volume : 1827 veh/TimePeriod
Medium truck volume : 342 veh/TimePeriod
Heavy truck volume : 114 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: pkwywest

Angle1 Angle2 : -78.00 deg -50.00 deg
Wood depth : 2 (Wood depth 60 metres or more)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 403.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 4: pkwywest

Car traffic volume : 1827 veh/TimePeriod
Medium truck volume : 342 veh/TimePeriod
Heavy truck volume : 114 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: pkwywest

Angle1 Angle2 : -50.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 403.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 5: pkwywest

Car traffic volume : 1827 veh/TimePeriod
Medium truck volume : 342 veh/TimePeriod
Heavy truck volume : 114 veh/TimePeriod

Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 5: pkwywest

Angle1 Angle2 : -28.00 deg 28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 287.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

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Road data, segment # 6: kingste

Car traffic volume : 13028 veh/TimePeriod
Medium truck volume : 693 veh/TimePeriod
Heavy truck volume : 139 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 6: kingste

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: pkweast

Source height = 1.49 m

ROAD (0.00 + 34.03 + 0.00) = 34.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.21	65.03	0.00	-13.90	-7.10	-10.00	0.00	0.00	34.03

Segment Leq : 34.03 dBA

↑
Results segment # 2: pkweast

Source height = 1.49 m

ROAD (0.00 + 43.87 + 0.00) = 43.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	33	0.51	65.03	0.00	-17.34	-3.82	0.00	0.00	0.00	43.87

Segment Leq : 43.87 dBA

↑
Results segment # 3: pkwywest

Source height = 1.49 m

ROAD (0.00 + 29.50 + 0.00) = 29.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	-50	0.21	65.68	0.00	-17.30	-8.88	-10.00	0.00	0.00	29.50

Segment Leq : 29.50 dBA

↑
Results segment # 4: pkwywest

Source height = 1.49 m

ROAD (0.00 + 34.39 + 0.00) = 34.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	-28	0.51	65.68	0.00	-21.58	-9.71	0.00	0.00	0.00	34.39

Segment Leq : 34.39 dBA

↑
Results segment # 5: pkwywest

Source height = 1.49 m

ROAD (0.00 + 41.16 + 0.00) = 41.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	28	0.51	65.68	0.00	-19.36	-5.16	0.00	0.00	0.00	41.16

Segment Leq : 41.16 dBA

↑
Results segment # 6: kingste

Source height = 1.00 m

ROAD (0.00 + 58.64 + 0.00) = 58.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.10	0.00	-5.00	-1.46	0.00	0.00	0.00	58.64

Segment Leq : 58.64 dBA

Total Leq All Segments: 58.89 dBA

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TOTAL Leq FROM ALL SOURCES: 58.89

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Filename: Time Period: 8 hours
 Description:

Road data, segment # 1: kingste

Car traffic volume : 1448 veh/TimePeriod
 Medium truck volume : 77 veh/TimePeriod
 Heavy truck volume : 15 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: kingste

Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 22.00 m
 Receiver height : 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑
 Results segment # 1: kingste

Source height = 0.99 m

ROAD (0.00 + 54.57 + 0.00) = 54.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.59	58.53	0.00	-2.64	-1.33	0.00	0.00	0.00	54.57

Segment Leq : 54.57 dBA

Total Leq All Segments: 54.57 dBA

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 TOTAL Leq FROM ALL SOURCES: 54.57
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Road data, segment # 3: pkwywest

Car traffic volume : 2018 veh/TimePeriod
Medium truck volume : 378 veh/TimePeriod
Heavy truck volume : 126 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: pkwywest

Angle1 Angle2 : -78.00 deg -50.00 deg
Wood depth : 2 (Wood depth 60 metres or more)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 403.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 4: pkwywest

Car traffic volume : 2018 veh/TimePeriod
Medium truck volume : 378 veh/TimePeriod
Heavy truck volume : 126 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: pkwywest

Angle1 Angle2 : -50.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 403.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 5: pkwywest

Car traffic volume : 2018 veh/TimePeriod
Medium truck volume : 378 veh/TimePeriod
Heavy truck volume : 126 veh/TimePeriod

Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 5: pkwywest

Angle1 Angle2 : -28.00 deg 28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 287.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 6: kingste

Car traffic volume : 14138 veh/TimePeriod
Medium truck volume : 752 veh/TimePeriod
Heavy truck volume : 150 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 6: kingste

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: pkweast

Source height = 1.50 m

ROAD (0.00 + 34.47 + 0.00) = 34.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.21	65.47	0.00	-13.89	-7.10	-10.00	0.00	0.00	34.47

Segment Leq : 34.47 dBA

↑
Results segment # 2: pkweast

Source height = 1.50 m

ROAD (0.00 + 44.31 + 0.00) = 44.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	33	0.51	65.47	0.00	-17.34	-3.82	0.00	0.00	0.00	44.31

Segment Leq : 44.31 dBA

↑
Results segment # 3: pkwywest

Source height = 1.50 m

ROAD (0.00 + 29.94 + 0.00) = 29.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	-50	0.21	66.11	0.00	-17.30	-8.88	-10.00	0.00	0.00	29.94

Segment Leq : 29.94 dBA

↑
Results segment # 4: pkwywest

Source height = 1.50 m

ROAD (0.00 + 34.82 + 0.00) = 34.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	-28	0.51	66.11	0.00	-21.58	-9.71	0.00	0.00	0.00	34.82

Segment Leq : 34.82 dBA

↑
Results segment # 5: pkwywest

Source height = 1.50 m

ROAD (0.00 + 41.59 + 0.00) = 41.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	28	0.51	66.11	0.00	-19.36	-5.16	0.00	0.00	0.00	41.59

Segment Leq : 41.59 dBA

↑
Results segment # 6: kingste

Source height = 1.00 m

ROAD (0.00 + 58.99 + 0.00) = 58.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.45	0.00	-5.00	-1.46	0.00	0.00	0.00	58.99

Segment Leq : 58.99 dBA

Total Leq All Segments: 59.25 dBA

↑

TOTAL Leq FROM ALL SOURCES: 59.25

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↑

Road data, segment # 3: pkwywest

Car traffic volume : 2018 veh/TimePeriod
Medium truck volume : 378 veh/TimePeriod
Heavy truck volume : 126 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: pkwywest

Angle1 Angle2 : -78.00 deg -50.00 deg
Wood depth : 2 (Wood depth 60 metres or more)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 403.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 4: pkwywest

Car traffic volume : 2018 veh/TimePeriod
Medium truck volume : 378 veh/TimePeriod
Heavy truck volume : 126 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: pkwywest

Angle1 Angle2 : -50.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 403.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00

↑

Road data, segment # 5: pkwywest

Car traffic volume : 2018 veh/TimePeriod
Medium truck volume : 378 veh/TimePeriod
Heavy truck volume : 126 veh/TimePeriod

Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 5: pkwywest

Angle1 Angle2 : -28.00 deg 28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 287.00 m
Receiver height : 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 5.00 m
Reference angle : 0.00



Road data, segment # 6: kingste

Car traffic volume : 14849 veh/TimePeriod
Medium truck volume : 790 veh/TimePeriod
Heavy truck volume : 158 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 6: kingste

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Results segment # 1: pkweast

Source height = 1.50 m

ROAD (0.00 + 34.47 + 0.00) = 34.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.21	65.47	0.00	-13.89	-7.10	-10.00	0.00	0.00	34.47

Segment Leq : 34.47 dBA

↑
Results segment # 2: pkwyeast

Source height = 1.50 m

ROAD (0.00 + 44.31 + 0.00) = 44.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	33	0.51	65.47	0.00	-17.34	-3.82	0.00	0.00	0.00	44.31

Segment Leq : 44.31 dBA

↑
Results segment # 3: pkwywest

Source height = 1.50 m

ROAD (0.00 + 29.94 + 0.00) = 29.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	-50	0.21	66.11	0.00	-17.30	-8.88	-10.00	0.00	0.00	29.94

Segment Leq : 29.94 dBA

↑
Results segment # 4: pkwywest

Source height = 1.50 m

ROAD (0.00 + 34.82 + 0.00) = 34.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	-28	0.51	66.11	0.00	-21.58	-9.71	0.00	0.00	0.00	34.82

Segment Leq : 34.82 dBA

↑
Results segment # 5: pkwywest

Source height = 1.50 m

ROAD (0.00 + 41.59 + 0.00) = 41.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	28	0.51	66.11	0.00	-19.36	-5.16	0.00	0.00	0.00	41.59

Segment Leq : 41.59 dBA

↑
Results segment # 6: kingste

Source height = 1.00 m

ROAD (0.00 + 59.21 + 0.00) = 59.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.66	0.00	-5.00	-1.46	0.00	0.00	0.00	59.21

Segment Leq : 59.21 dBA

Total Leq All Segments: 59.45 dBA

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TOTAL Leq FROM ALL SOURCES: 59.45

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