



April 22, 2021

Siderius Developments Ltd.
588 Scotland Road
Odessa, ON K0H 2H0

E-mail: nate@doornekamp.ca

Attention: Mr. Nate Doornekamp

Re: Noise Impact Feasibility Study Report
40 Sir John A. MacDonald Boulevard, Kingston, ON
Pinchin File: 270910Rev5

1.0 EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained by Siderius Developments Ltd. (Client) to prepare a noise impact feasibility study report of its proposed Development at 40 Sir John A. MacDonald Boulevard, Kingston, ON. This report has been prepared to support site plan control and/or zoning amendment applications.

An assessment of the proposed Development was completed by modelling the noise impacts of external stationary noise sources and road traffic on the Development. The measurements and the analytical assessment indicate that the predicted noise impacts from the stationary sources on the Development meet the NPC-300 noise criteria for Class 1 Areas.

The assessment of road traffic noise impact on the Development shows that the noise impacts would meet NPC-300 criteria for road traffic noise, with provisions for the installation of central air conditioning systems or alternative measures in the future, at occupants' discretion. Warning Clause Types A and C are recommended to be included in agreements of offers of purchase/sale, and lease/rental.

2.0 INTRODUCTION

Based on the information available to Pinchin, it is understood that the mixed use Development includes the construction of residential, retirement and commercial buildings.

Figure 1, Appendix B, shows the locations of the proposed Development and nearby noise sensitive receptors. A site plan is shown in Figure 2, Appendix B. It should be noted that Block A is intended for possible future high-rise building.

3.0 NOISE CRITERIA

The City of Kingston Noise Bylaw No. 2004-52 (last amended on April 4, 2017) [1] does not provide specific noise criteria for mixed use Development. Therefore, Pinchin adopted the noise criteria outlined



in the Ministry of Environment, Conservation and Parks (MECP) Publication NPC-300 [2]. The applicable noise criteria for this proposed Development are described as follows:

3.1 Outdoor Noise Criteria

The daytime noise criterion for outdoor living areas (OLAs) is 55 dBA for road noise sources. Where it is not technically, economically, or administratively feasible to meet the 55 dBA limit, up to 60 dBA is permissible with warning clauses. Where the daytime sound level is greater than 60 dBA, control measures are required to reduce the sound level to 60 dBA or less.

It should be noted that, as per the NPC-300 guidelines, balconies with a depth less than 4 m are not considered OLAs. The site plan shows that there are provisions for outdoor patios around residential and commercial buildings. As such, OLAs were selected from those locations that have direct exposures to the roads.

3.2 External Building Façade Criteria

Where the sound levels at the exterior of the building facades exceed 55 dBA at bedroom or living/dining room windows during daytime hours and 50 dBA during nighttime periods, the unit should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

Where the sound levels exceed by more than 10 dB (i.e. 65 dBA during daytime hours and 60 dBA during nighttime hours), installation of central air conditioning should be implemented, with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits, as per the OBC requirements.

It should be noted that in high and medium density residential developments, other forms of mechanical ventilation may be available. Ventilation methods other than central air conditioning are acceptable for high and medium density residential developments, subject to the following conditions:

- the noise produced by the proposed ventilation system in the space served does not exceed 40 dBA;
- the ventilation system complies with all national, provincial and municipal standards and codes;
- the ventilation system is designed by a heating and ventilation professional; and
- the ventilation system enables the windows and exterior doors to remain closed.

3.3 Noise Criteria for Stationary Sources

For non-transportation sources (i.e. rooftop HVACs and exhausts, etc.), the applicable MECP noise criteria at a point of reception (POR) are dictated by MECP Publication NPC-300 [2] for Class 1 Areas. These guidelines state that the one-hour sound exposures (Leq, 1 hour) from stationary noise sources in Class 1 areas shall not exceed:

- the higher of 50 dBA or background noise between 0700h and 1900h;
- the higher of 50 dBA or background noise between 1900h and 2300h; and
- the higher of 45 dBA or background noise between 2300h and 0700h.

The sound level limits for the testing of emergency generator are 5 dBA higher than the above exclusionary limits.

4.0 POINT OF RECEPTION DESCRIPTION

To evaluate the noise impact from the nearby stationary sources on the Development, three (3) receptors were selected from three buildings with most affected façade windows facing Union Street. Receptors R1 and R2 represent the north facing windows on the possible future high-rise building, Block A. Receptor R3 represents the north facing windows on Building A, Block C.

To evaluate the traffic noise impacts from nearby roads (Union Street, Sir John A. MacDonald Boulevard and King Street West), eleven (11) onsite noise sensitive receptors were selected from the affected building facades and outdoor living areas. Receptors ON-R1 to ON-R3 represent the hotel windows and outdoor patio. Receptors ON-R4 to ON-R9 represent the residential building windows and outdoor patio associated with possible future high-rise building, Block A. Receptors ON-R10 and ON-R11 represent the windows associated with buildings A and B, Block C.

The locations of the selected onsite receptors are shown in Figure 2, Appendix B.

5.0 NOISE IMPACT ASSESSMENT

5.1 Noise Impact from External Stationary Sources on the Development

A review of aerial photos showed that there are a few stationary sources that may have potential noise impacts on the Development. The stationary sources may include the following buildings:

- Queen's University buildings to the north along Union Street;
- An institutional building to the east along Union Street;
- The former Kingston Penitentiary site located to the south along King Street West;
- A museum located to the south of the Development site; and



- A heating plant located to the southeast corner of the Development site.

To collect the external noise source information from the above facilities, site visits were conducted by Pinchin on September 9 and 10, 2020.

It was observed during the site visit that the Queen's buildings include Duncan McArthur Hall, Jean Royce Hall and a heating plant. The significant noise sources associated with these buildings include a cooling tower, generator, a dust collector, kitchen and general exhausts. Specifically, the significant noise sources include the following:

- One (1) cooling tower (source CT);
- One (1) emergency generator (sources EG and EG_EX);
- One (1) dust collector (source DC);
- Three (3) condensers (sources CND1 to CND3);
- Five (5) kitchen exhausts (sources K_EX1 to K_EX5); and
- Twenty-two (22) general exhausts (sources GE1 to GE22).

Locations of the above significant noise sources are shown in Figures 3a and 3b, Appendix B. Sound data for the above noise sources were obtained from a combination of on-site measurements and past measurements on similar type units. The details of the sound data information are provided in Table 1 Appendix A. The measurement weather conditions and equipment information are summarized in Appendices C and D.

An acoustic model for the stationary sources was prepared using CadnaA (Version 2021). CadnaA calculates sound levels surrounding the facility according to the ISO standard 9613-2 [3], "Acoustics – Attenuation of Sound during Propagation Outdoors." The ISO calculation method, considered conservative, accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation, and acoustical shielding. Calculation parameters were set in accordance with the ISO standard, and detailed protocols can be provided upon request.

The noise impacts from external stationary sources are predicted in Tables 2a and 2b, Appendix A. Noise impact contour maps are presented in Figures 3a and 3b, Appendix B.

It was observed during the site visit that the institutional building to the east of the site has one HVAC unit on the roof and four air conditioners on the ground. A review of the units' make and model information indicated that these units have low sound levels. Since these units are located approximately 120 m away from the Development site and are shielded by its own building, it is our opinion that the noise impact from these units is anticipated to be insignificant.



The former Kingston Penitentiary complex is located to the south of the Development site along King Street West. Its operation was closed in September 2013 and it is now operated as a tourist attraction by St. Lawrence Parks Commission. It was observed during the site visit that the majority of the rooftop and kitchen units were no longer in use. There were only a few window air conditioners being used at the site. Considering the low sound levels of these units, large setback and shielding effect, it is our opinion that the noise impact from these units is anticipated to be insignificant.

The Penitentiary Museum is located to the immediate south of the site. It was observed during the site visit that the Museum only has several window air conditioners installed on different façade windows. Considering the low sound levels of these units and shielding effect, it is our opinion that the noise impact from these units is anticipated to be insignificant.

To the immediate southeast corner of the site is a heating plant owned and operated by The Correctional Service of Canada (CSC). The plant previously provided heating to the former Penitentiary complex, the former Prison for Women and other nearby buildings. Since both the Penitentiary complex and the Prison for Women are no longer in operation, the heating requirement has been significantly reduced. As a result, only one boiler is being used to generate heating in winter months. The outdoor stack and two generators (one outdoor and one indoor) are no longer in use. Since the boiler stack typically has a low sound level, it is our opinion that the noise impact from the heating plant is anticipated to be insignificant.

5.2 Noise Impact from Transportation Sources on the Development

The Annual Average Daily Traffic (AADT) volume data in 2014 for Union Street, Sir John A. Macdonald Boulevard, and King Street West were provided by the City of Kingston. The AADT volumes were projected to year 2030 using an annual growth rate of 1.8%. Medium and heavy truck percentages were assumed at 2% and 2%, respectively, typical for city roads.

Traffic noise impacts were predicted using the MECP computer program STAMSON (Version 5.04) [4]. STAMSON uses the traffic volumes for the road and basic topographical information for the site in its calculations. The program accounts for adjustments in sound levels with vehicle volume, distance, finite segment, pavement surface, and acoustical shielding. Details of STAMSON calculations are included in Appendix E.

The traffic noise impact prediction results are provided in Table 3, Appendix A.

In summary, the predicted traffic noise impacts range from 51 dBA to 62 dBA at the selected onsite receptors. The predicted levels indicate that the units should be designed with provisions for the installation of central air conditioning systems or alternative measures in the future, at occupants' discretion. Warning clauses types A and C are also recommended. Details of the warning clauses are included in Appendix F.



5.3 Noise Impact from the Development on Nearby PORs

At the time this report was prepared, rooftop mechanical equipment (if any) had not been selected. As such, the noise impact from the Development on nearby noise sensitive receptors could not be assessed. It is recommended that detailed noise analysis should be performed when information on mechanical equipment is available. Noise control measures may be required if the impact from the mechanical equipment exceeds the applicable noise criteria. This is to ensure that the noise impacts from the Development on nearby receptors will not exceed the MECP noise guidelines.

6.0 CONCLUSIONS

A detailed noise assessment of the proposed Development was completed by modelling the noise impacts of the significant stationary noise sources and road traffic at selected receptor locations on the Development. The assessment shows that the predicted noise impacts from the stationary sources on the Development meet the NPC-300 criteria for Class 1 Areas.

The assessment of road traffic noise impact on the Development shows that the noise impacts would meet NPC-300 criteria for road traffic noise, with provisions for the installation of central air conditioning systems in the future, at occupants' discretion. Warning Clause Types A and C are recommended to be included in agreements of offers of purchase/sale, and lease/rental.

Since the rooftop mechanical equipment (if any) had not been selected for the Development, the noise impact from the Development on nearby noise sensitive receptors could not be assessed. It is recommended that detailed noise analysis should be performed when information on mechanical equipment is available. Noise control measures may be required if the impact from the mechanical equipment exceeds the applicable noise criteria.

7.0 TERMS AND LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.



8.0 CLOSURE

Should you have any questions or concerns regarding the contents of this study, please contact the undersigned.

Sincerely,

Pinchin Ltd.

Prepared by:

Reviewed by:

Weidong Li, PhD., P.Eng.
Senior Project Engineer
(905)-363-1375
wli@pinchin.com

Aidan Maher, P.Eng.
Senior Project Manager
(416) 271-9333
amaher@pinchin.com





8.0 REFERENCES

1. City of Kingston, By-Law Number 2004-52, last amended April 4, 2017.
2. Ministry of the Environment Publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", August 2013.
3. ISO 9613-2: 1996, Acoustics –Attenuation of Sound During Propagation outdoors. Part 2 – General Method of Calculation.
4. Ministry of the Environment's STAMSON/STEAM Computer Programme, (Version 5.04), 1989.

J:\270000s\0270910.000 HRDoornekamp,40SirJohnA,ERC,NOISE\Deliverables\Report\270910Rev5 Noise Impact Study Rpt, 40 Sir John A McDonald, Kingston, HRDoornekamp 20210422.docx1

Template: Master Noise Impact Study Letter, ERC, March 5, 2020

APPENDIX A
Tables
(7 Pages)

Table 1: Stationary Noise Source Summary Table

Source ID ^[1]	Source Description	Lw(A) ^[2]	Source Location ^[3]	Sound Characteristics ^[4]	Noise Control Measures ^[5]	Source of Data ^[6]
CND1	Condenser	78	O	S	U	Mea
CND2	Condenser	78	O	S	U	Mea
CND3	Condenser	78	O	S	U	Mea
CT	Cooling Tower	97	O	S	U	Mea
DC	Dust Collector Exhaust	91	O	S	U	Mea
EG	Emergency Generator Combustion Exhaust	81	O	S	S	Mea
EG_EX	Emergency Generator Room Exhaust	104	O	S	S	Mea
GE1	General Exhaust	79	O	S	U	Mea
GE10	General Exhaust	79	O	S	U	Mea
GE11	General Exhaust	79	O	S	U	Mea
GE12	General Exhaust	79	O	S	U	Mea
GE13	General Exhaust	79	O	S	U	Mea
GE14	General Exhaust	79	O	S	U	Mea
GE15	General Exhaust	79	O	S	U	Mea
GE16	General Exhaust	79	O	S	U	Mea
GE17	General Exhaust	79	O	S	U	Mea
GE18	General Exhaust	79	O	S	U	Mea
GE19	General Exhaust	79	O	S	U	Mea
GE2	General Exhaust	79	O	S	U	Mea
GE20	General Exhaust	79	O	S	U	Mea
GE21	General Exhaust	79	O	S	U	Mea
GE22	General Exhaust	79	O	S	U	Mea
GE3	General Exhaust	79	O	S	U	Mea
GE4	General Exhaust	79	O	S	U	Mea
GE5	General Exhaust	79	O	S	U	Mea
GE6	General Exhaust	79	O	S	U	Mea
GE7	General Exhaust	92	O	S	U	Mea
GE8	General Exhaust	92	O	S	U	Mea
GE9	General Exhaust	79	O	S	U	Mea

Table 1: Stationary Noise Source Summary Table

Source ID ^[1]	Source Description	Lw(A) ^[2]	Source Location ^[3]	Sound Characteristics ^[4]	Noise Control Measures ^[5]	Source of Data ^[6]
K_EX1	Kitchen Exhaust	89	O	S	U	Mea
K_EX2	Kitchen Exhaust	79	O	S	U	Mea
K_EX3	Kitchen Exhaust	79	O	S	U	Mea
K_EX4	Kitchen Exhaust	79	O	S	U	Mea
K_EX5	Kitchen Exhaust	87	O	S	U	Mea

Notes:

- [1] Wherever possible, the Source ID is identical with that used in the ESDM report.
- [2] Sound Power Levels of continuous noise sources, in dBA, do not include sound characteristic adjustments per NPC-104.
Sound Power Levels of impulsive noise sources, in dBAI, are A-weighted incorporating an impulsive time weighting.
- [3] Source Location:
O - located/installed outside the building, including on the roof
I - located/installed inside the building
- [4] Sound Characteristic
S = Steady
Q = Quasi-Steady Impulsive
- [5] Noise Control Measures
S = Silencer/Muffler
A = Acoustic lining, plenum
B = Barrier, berm, screening
- [6] Mea - Measured
Cal = Engineering Calculations

Table 2a: Acoustic Assessment Summary Table - Stationary Sources

Point of Reception ID	Point of Reception Description	Time Period ^[1]	Total Level at POR (L_{eq} , 1-hr) ^[2]	Verified by Acoustic Audit (Yes/No)	Performance Limit (L_{eq} 1-hr) ^[3]	Compliance with Performance Limit (Yes/No)
R1	Block A Building - North Façade (Possible Future High-rise Building)	Daytime	44	No	50	Yes
		Evening	44	No	50	Yes
		Nighttime	44	No	45	Yes
R2	Block A Building - North Façade (Possible Future High-rise Building)	Daytime	44	No	50	Yes
		Evening	44	No	50	Yes
		Nighttime	44	No	45	Yes
R3	Block C, Building A - North Façade, 7th Floor	Daytime	42	No	50	Yes
		Evening	42	No	50	Yes
		Nighttime	42	No	45	Yes

Notes:

- [1] The predictable worst-case one (1) hour period was considered in the study.
- [2] Worst-case one hour equivalent sound level from all applicable sources operating in dBA.
- [3] NPC-300 exclusionary sound level limits of one hour L_{eq} for Class 1 Areas.

Table 2b: Acoustic Assessment Summary Table - Emergency Generator Testing

Point of Reception ID	Point of Reception Description	Time Period ^[1]	Total Level at POR (L_{eq} , 1-hr) ^[2]	Verified by Acoustic Audit (Yes/No)	Performance Limit (L_{eq} 1-hr) ^[3]	Compliance with Performance Limit (Yes/No)
R1	Block A Building - North Façade (Possible Future High-rise Building)	Daytime	32	No	55	Yes
		Evening	32	No	55	Yes
		Nighttime	32	No	50	Yes
R2	Block A Building - North Façade (Possible Future High-rise Building)	Daytime	32	No	55	Yes
		Evening	32	No	55	Yes
		Nighttime	32	No	50	Yes
R3	Block C, Building A - North Façade, 7th Floor	Daytime	29	No	55	Yes
		Evening	29	No	55	Yes
		Nighttime	29	No	50	Yes

Notes:

- [1] The predictable worst-case one (1) hour period was considered in the study.
- [2] Worst-case one hour equivalent sound level from all applicable sources operating in dBA.
- [3] NPC-300 exclusionary sound level limits of one hour L_{eq} for Class 1 Areas, plus 5 dBA for emergency generator testing.

Table 3 - STAMSON Calculation Results

Point of Reception ID	ON-R1	ON-R2	ON-R3	ON-R4
Point of Reception Description	Bloc B, Hotel East	Block B, Hotel South	Block B, Hotel East OLA	Block A Building, NE Corner
Roads	SJAM & King	King & SJAM	SJAM	SJAM & Union
Daytime Level (Leq (16hr))	61.29	60.31	58.31	60.05
Nighttime Level (Leq (8hr))	54.79	53.79	-	53.56
Noise Control Measures	Provision for A/C	Provision for A/C	n/a	Provision for A/C
Warning Clause	Type C	Type C	Type A	Type C

Table C3 - STAMSON Calculation Results

Point of Reception ID	ON-R5	ON-R6	ON-R7	ON-R8
Point of Reception Description	Block A Building, NE Corner OLA	Building A, NE Corner OLA	Block A Building, North	Block A Building, South
Roads	SJAM & Union	SJAM & Union	SJAM & Union	SJAM & King
Daytime Level (Leq (16hr))	59.52	56.31	60.68	57.09
Nighttime Level (Leq (8hr))	-	-	54.18	50.57
Noise Control Measures	n/a	n/a	Provision for A/C	Provision for A/C
Warning Clause	Type A	Type A	Type C	Type C

Table C3 - STAMSON Calculation Results

Point of Reception ID	ON-R9	ON-R10	ON-R11
Point of Reception Description	Block A Building, North	Block C, Retirement, North	Block C, Retirement, South
Roads	Union	Union	Union
Daytime Level (Leq (16hr))	61.76	60.35	58.94
Nighttime Level (Leq (8hr))	55.27	53.86	52.41
Noise Control Measures	Provision for A/C	Provision for A/C	Provision for A/C
Warning Clause	Type C	Type C	Type C

APPENDIX B
Figures
(4 Pages)

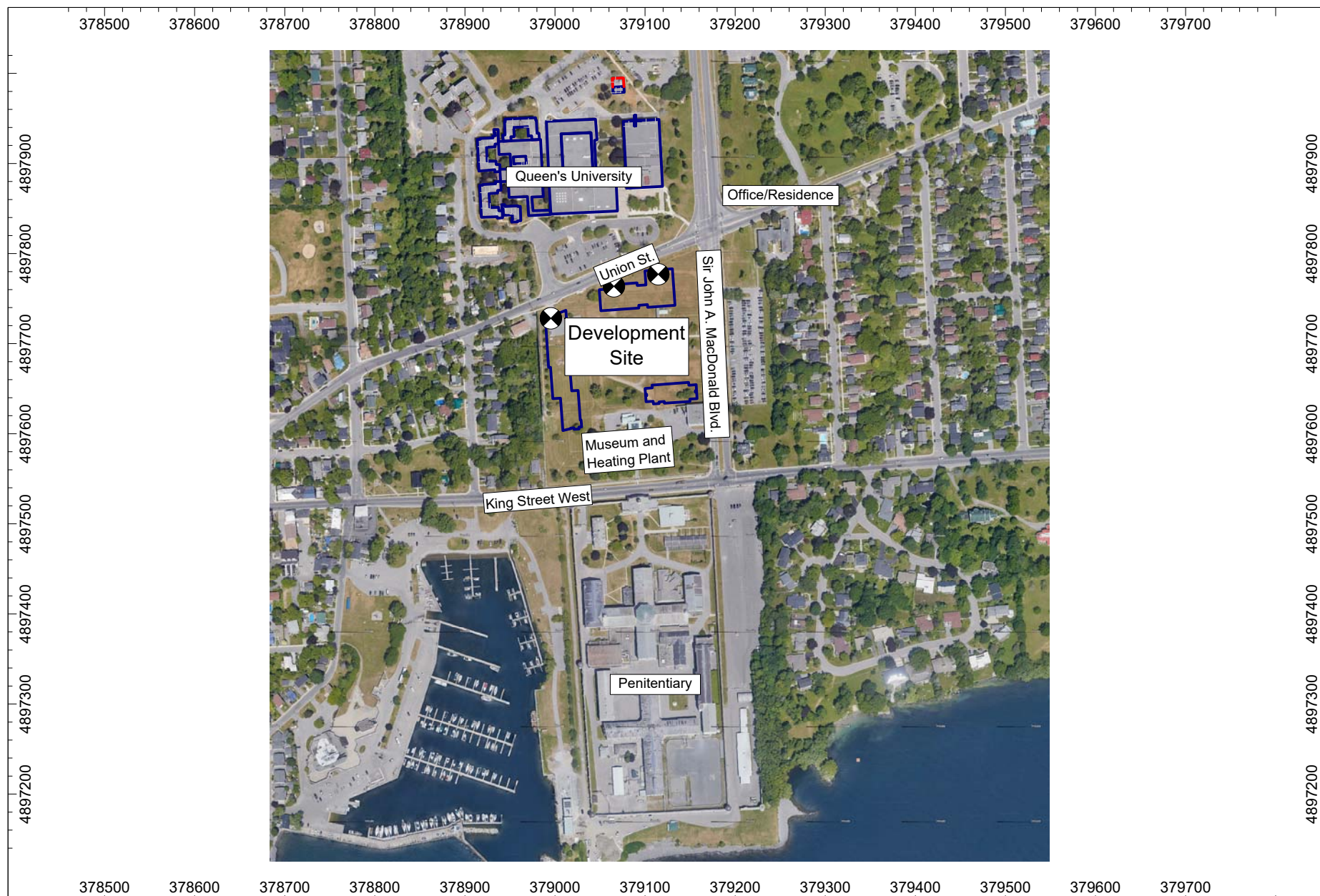


Figure 1 - Scaled Area Plan, Showing the Development Site and Nearby Areas



Siderius Developments Ltd., 40 Sir John A. MacDonald Blvd., Kingston ON

Pinchin Project: 270910

Drawn by: WNL

Scale: 1:6000

Date: April 22, 2021



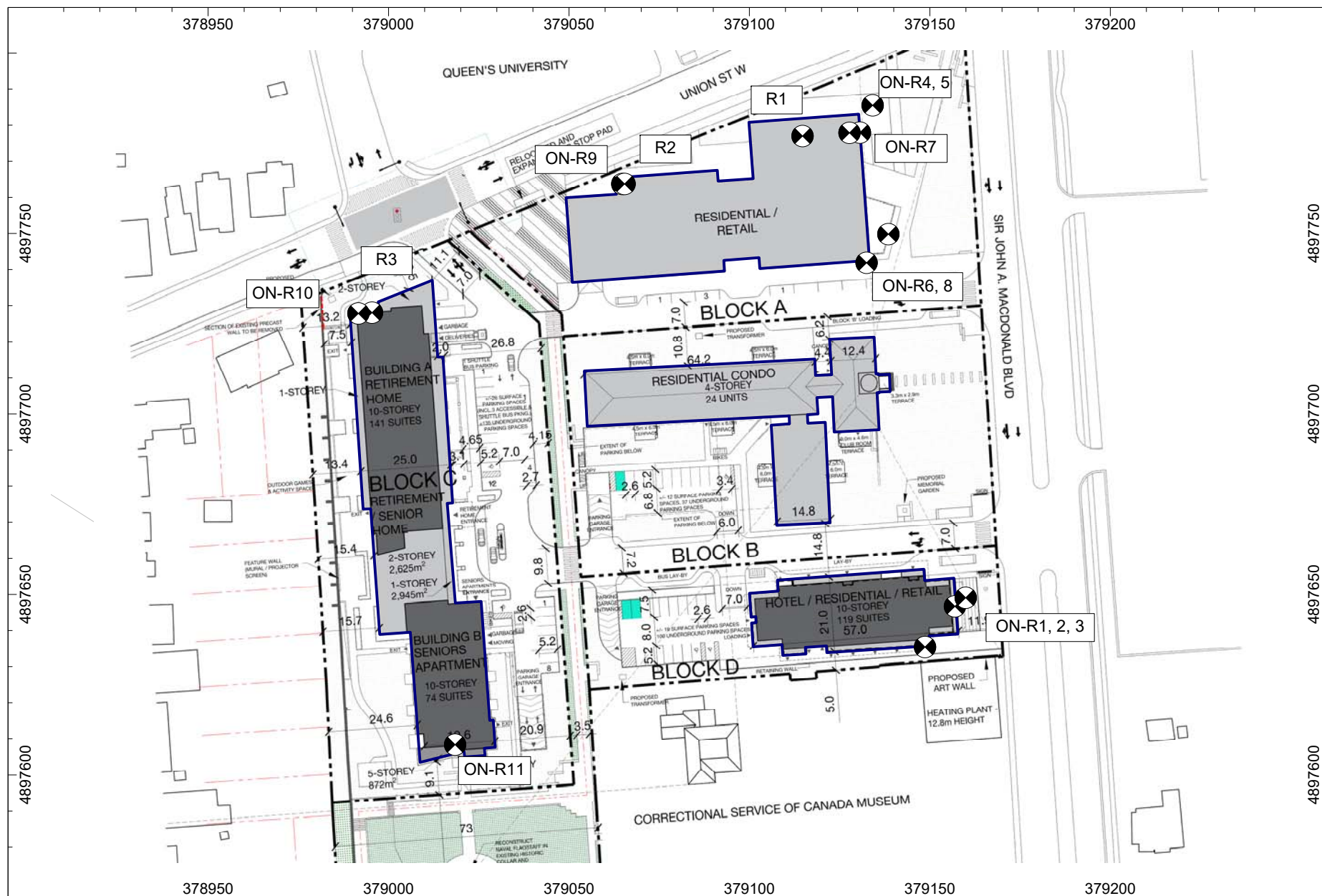


Figure 2 -Site Plan, Showing the Proposed Buildings and On-site Receptors



Drawn by: WNL

Scale: 1:6000

Date: April 22, 2021



Siderius Developments Ltd., 40 Sir John A. MacDonald Blvd., Kingston ON

Pinchin Project: 270910

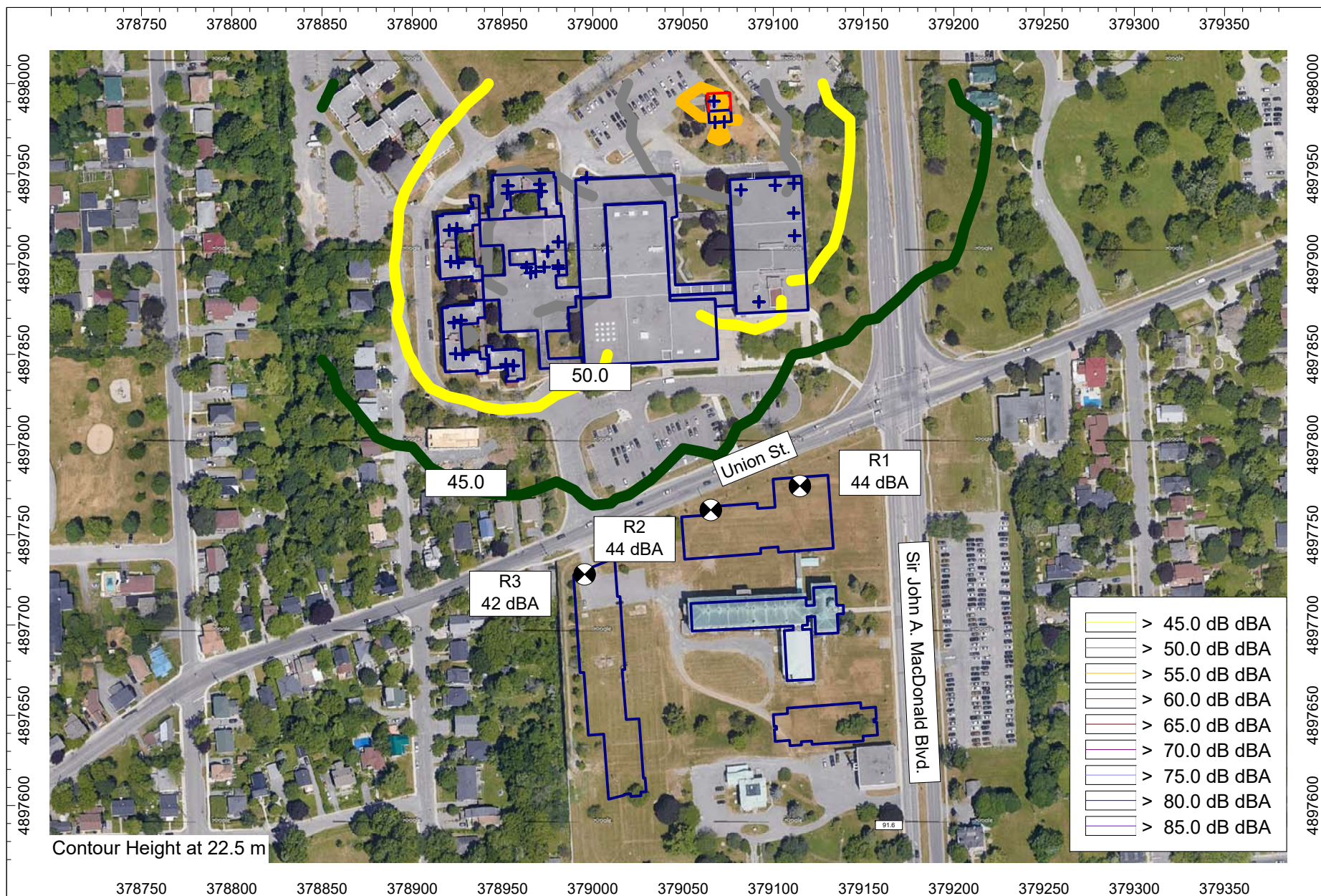


Figure 3a - Noise Impact Contour Map - Stationary Sources



Drawn by: WNL

Scale: 1:3000

Date: April 22, 2021



Siderius Developments Ltd., 40 Sir John A. MacDonald Blvd., Kingston ON

Pinchin Project: 270910

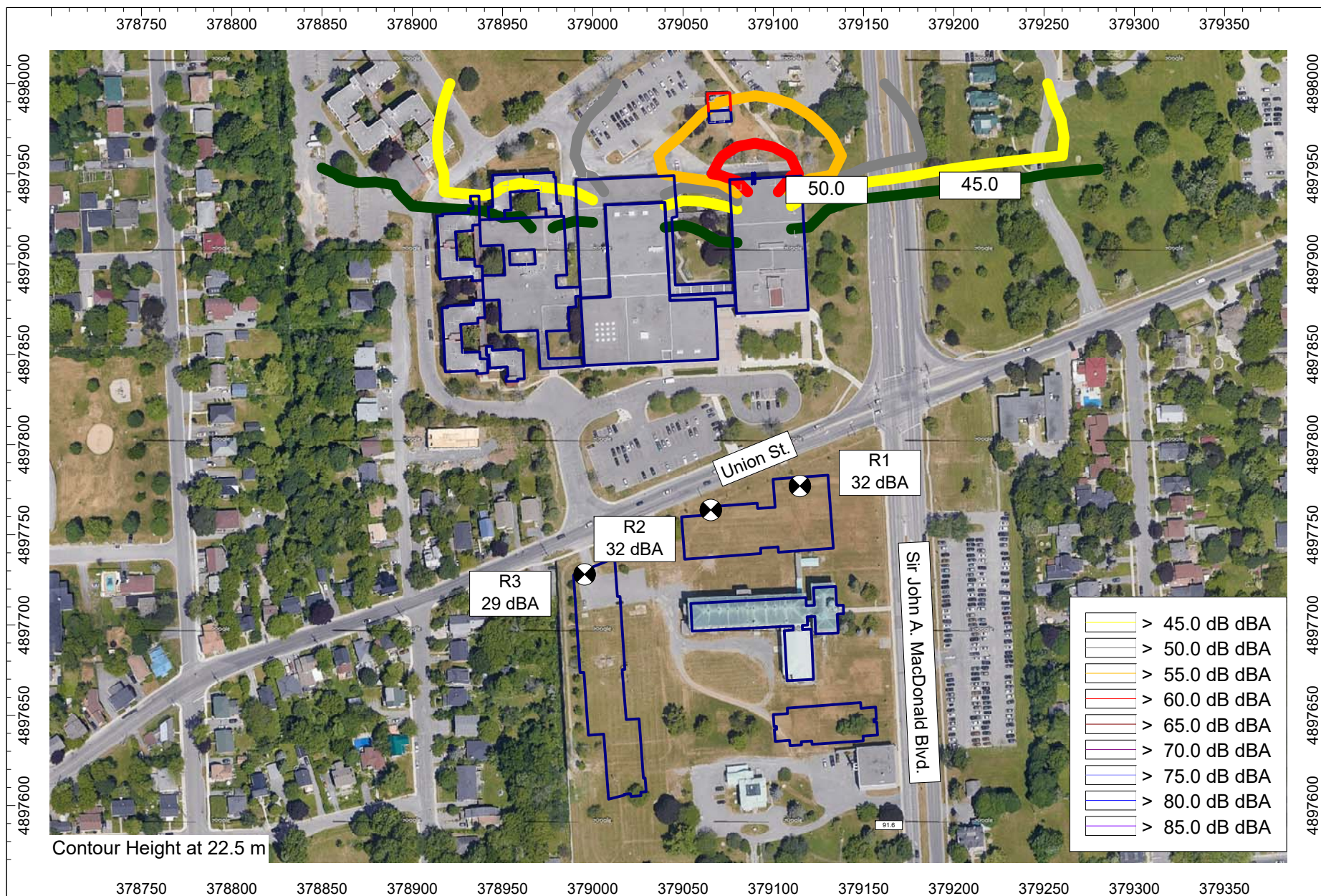


Figure 3b - Noise Impact Contour Map - Emergency Generator Testing



Drawn by: WNL

Scale: 1:3000

Date: April 22, 2021



Siderius Developments Ltd., 40 Sir John A. MacDonald Blvd., Kingston ON

Pinchin Project: 270910

APPENDIX C
Measurement Weather Information
(3 Pages)



MEASUREMENT WEATHER CONDITIONS

Meteorological conditions during the noise measurements on September 9, 2020 were as follows.

Daytime temperature was about 18°C. The sky was cloudy and the average wind speed was approximately 15 km/h.

Meteorological conditions during the noise measurements on September 10, 2020 were as follows.

Daytime temperature was about 18°C. The sky was cloudy and the average wind speed was approximately 10 km/h.



Hourly Data Report for September 09, 2020

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

KINGSTON A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	44°13'33.000" N	Longitude:	76°35'48.000" W	Elevation:	92.40 m
Climate ID:	6104152	WMO ID:		TC ID:	YGK

TIME	Temp °C	Dew Point °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	13.3	12.3	93	3	15	M	101.11			NA
01:00	13.2	12.1	93	36	14	M	101.17			NA
02:00	13.2	12.0	92	4	12	M	101.17			NA
03:00	12.8	11.9	94	3	12	M	101.13			NA
04:00	12.8	12.1	95	1	12	M	101.19			NA
05:00	12.9	12.3	96	1	16	M	101.29			NA
06:00	13.0	12.2	95	5	14	M	101.32			NA
07:00	13.6	12.6	93	4	18	M	101.36			NA
08:00	14.1	12.8	92	5	16	M	101.40			NA
09:00	14.9	13.4	91	4	18	M	101.45			NA
10:00	15.4	13.9	91	3	13	M	101.49			NA
11:00	16.4	14.0	85	3	17	M	101.47			NA
12:00	16.9	14.5	86	4	14	M	101.50			NA
13:00	18.2	15.2	83	7	17	M	101.44			NA
14:00	18.9	15.6	81	1	14	M	101.43			NA
15:00	19.6	15.7	78	1	12	M	101.39			NA
16:00	18.6	15.2	81	2	17	M	101.40			NA
17:00	17.6	14.6	83	3	17	M	101.41			NA
18:00	16.7	14.4	86	4	15	M	101.40			NA
19:00	16.3	14.2	88	2	16	M	101.45			NA
20:00	16.1	14.3	89	5	20	M	101.50			NA
21:00	16.0	14.4	90	4	12	M	101.46			NA
22:00	15.7	14.6	93	4	13	M	101.44			NA
23:00	15.5	14.6	94	5	16	M	101.39			NA

Legend

- E = Estimated
- M = Missing
- NA = Not Available*
- [empty] = Indicates an unobserved value

Date modified:



Hourly Data Report for September 10, 2020

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

KINGSTON A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	44°13'33.000" N	Longitude:	76°35'48.000" W	Elevation:	92.40 m
Climate ID:	6104152	WMO ID:		TC ID:	YGK

TIME	Temp °C	Dew Point °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	15.4	14.6	95	1	9	M	101.37			NA
01:00	15.2	14.6	96	1	10	M	101.32			NA
02:00	15.1	14.7	97	2	5	M	101.25			NA
03:00	15.0	14.8	99	2	3	M	101.19			NA
04:00	14.9	14.9	100	32	10	M	101.24			NA
05:00	14.8	14.8	100	34	9	M	101.25			NA
06:00	14.8	14.8	100	35	7	M	101.27			NA
07:00	14.8	14.8	100	35	13	M	101.35			NA
08:00	15.1	15.1	100	35	11	M	101.37			NA
09:00	16.3	16.2	100	12	7	M	101.33			NA
10:00	18.2	17.0	93	13	2	M	101.32			NA
11:00	18.7	17.3	91	21	6	M	101.30			NA
12:00	19.2	17.7	91	22	8	M	101.29			NA
13:00	18.5	16.5	88	32	17	M	101.30			NA
14:00	19.5	16.1	81	32	14	M	101.30			NA
15:00	18.1	15.6	85	2	10	M	101.30			NA
16:00	18.0	14.8	81	1	13	M	101.31			NA
17:00	16.1	13.0	82	2	22	M	101.37			NA
18:00	14.9	11.5	80	2	21	M	101.42			NA
19:00	14.0	10.8	81	1	23	M	101.46			NA
20:00	13.4	10.5	82	36	22	M	101.48			NA
21:00	13.1	9.8	80	2	14	M	101.44			NA
22:00	12.8	9.6	81	3	14	M	101.45			NA
23:00	12.5	9.3	81	2	9	M	101.49			NA

Legend

- E = Estimated
- M = Missing

- NA = Not Available*
- [empty] = Indicates an unobserved value

Date modified:

APPENDIX E
Measurement Equipment Information
(1 Page)



MEASUREMENT EQUIPMENT INFORMATION

The instruments used in this acoustic assessment included one B&K Sound Level Meter with the following specifications.

Sound Level Meter	Hand-held Analyzer Type: 2270 Serial No: 3008653
Pre-amplifier	Type: ZC0032 Serial No: 23105
Microphone	B&K Prepolarized Free-field 1/2" Microphone Type: 4189 Serial No: 2985587
Calibrator	B&K Sound Calibrator Type: 4231 Serial No: 3014389

APPENDIX E
Traffic Data and STAMSON Calculation Results
(32 Pages)

Table E1 - Summary of Traffic Data and Projections

	King St. W.	Notes
AADT - Year 2014	14282	Provided by the City of Kinston
Annual Growth	1.8%	Advised by the City of Kingston
Years of Growth	16	Projected to year 2030
AADT - 2030	19000	Projected to year 2030
Day Split	90%	As per the MTO Protocol
Cars	18240	96% for Cars
Medium Trucks	380	2% for Medium Trucks
Heavy Trucks	380	2% for Heavy Trucks
Speed Limit, km/hr	50	Assumed Speed Limit

Table E2 - Summary of Traffic Data and Projections

	Sir John A. Macdonald Blvd.	Notes
AADT - Year 2014	6319	Provided by the City of Kinston
Annual Growth	1.8%	Advised by the City of Kingston
Years of Growth	16	Projected to year 2030
AADT - 2030	8406	Projected to year 2030
Day Split	90%	As per the MTO Protocol
Cars	8070	96% for Cars
Medium Trucks	168	2% for Medium Trucks
Heavy Trucks	168	2% for Heavy Trucks
Speed Limit, km/hr	50	Assumed Speed Limit

Table E3 - Summary of Traffic Data and Projections

	Union St.	Notes
AADT - Year 2014	7787	Provided by the City of Kinston
Annual Growth	1.8%	Advised by the City of Kingston
Years of Growth	16	Projected to year 2030
AADT - 2030	10359	Projected to year 2030
Day Split	90%	As per the MTO Protocol
Cars	9945	96% for Cars
Medium Trucks	207	2% for Medium Trucks
Heavy Trucks	207	2% for Heavy Trucks
Speed Limit, km/hr	40	Assumed Speed Limit

Filename: hotel_e.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R1

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : -90.00 deg 70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 24.00 / 24.00 m
Receiver height : 22.50 / 22.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: King (day/night)

Car traffic volume : 16416/1824 veh/TimePeriod *
Medium truck volume : 342/38 veh/TimePeriod *
Heavy truck volume : 342/38 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 14282
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: King (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 102.00 / 102.00 m
Receiver height : 24.00 / 24.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 60.11 + 0.00) = 60.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	70	0.04	62.83	0.00	-2.12	-0.60	0.00	0.00	0.00
60.11									

Segment Leq : 60.11 dBA

Results segment # 2: King (day)

Source height = 1.19 m

ROAD (0.00 + 55.04 + 0.00) = 55.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	0	0.00	66.38	0.00	-8.33	-3.01	0.00	0.00	0.00
55.04									

Segment Leq : 55.04 dBA

Total Leq All Segments: 61.29 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 53.62 + 0.00) = 53.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	70	0.04	56.33	0.00	-2.12	-0.60	0.00	0.00	0.00
53.62									

Segment Leq : 53.62 dBA

Results segment # 2: King (night)

Source height = 1.19 m

ROAD (0.00 + 48.51 + 0.00) = 48.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	0	0.00	59.85	0.00	-8.33	-3.01	0.00	0.00	0.00
48.51									

Segment Leq : 48.51 dBA

Total Leq All Segments: 54.79 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.29

(NIGHT): 54.79

Filename: hotel_s.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R2

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : 0.00 deg 70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 22.50 / 22.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: King (day/night)

Car traffic volume : 16416/1824 veh/TimePeriod *
Medium truck volume : 342/38 veh/TimePeriod *
Heavy truck volume : 342/38 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 14282
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: King (day/night)

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 91.00 / 91.00 m
Receiver height       : 24.00 / 24.00 m
Topography           :      1           (Flat/gentle slope; no barrier)
Reference angle       :      0.00

```

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 55.55 + 0.00) = 55.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	70	0.04	62.83	0.00	-3.13	-4.15	0.00	0.00	0.00
55.55									

Segment Leq : 55.55 dBA

Results segment # 2: King (day)

Source height = 1.19 m

ROAD (0.00 + 58.55 + 0.00) = 58.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	66.38	0.00	-7.83	0.00	0.00	0.00	0.00
58.55									

Segment Leq : 58.55 dBA

Total Leq All Segments: 60.31 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 49.05 + 0.00) = 49.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	70	0.04	56.33	0.00	-3.13	-4.15	0.00	0.00	0.00
49.05									

Segment Leq : 49.05 dBA

Results segment # 2: King (night)

Source height = 1.19 m

ROAD (0.00 + 52.02 + 0.00) = 52.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	59.85	0.00	-7.83	0.00	0.00	0.00	0.00
52.02									

Segment Leq : 52.02 dBA

Total Leq All Segments: 53.79 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.31

(NIGHT): 53.79

STAMSON 5.0 NORMAL REPORT Date: 18-09-2020 23:09:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: h_ola.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R3

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : -90.00 deg 65.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 22.00 / 22.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 58.31 + 0.00) = 58.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90 65 0.66 62.83 0.00 -2.76 -1.76 0.00 0.00 0.00
58.31

Segment Leq : 58.31 dBA

Total Leq All Segments: 58.31 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 51.82 + 0.00) = 51.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90	65	0.66	56.33	0.00	-2.76	-1.76	0.00	0.00	0.00
51.82									

Segment Leq : 51.82 dBA

Total Leq All Segments: 51.82 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.31
(NIGHT): 51.82

STAMSON 5.0 NORMAL REPORT Date: 19-09-2020 11:34:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b_nel.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R4

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : -90.00 deg 70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 58.50 / 58.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Union (day/night)

Car traffic volume : 8951/995 veh/TimePeriod *
Medium truck volume : 186/21 veh/TimePeriod *
Heavy truck volume : 186/21 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 7787
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Union (day/night)

```

-----
Angle1   Angle2           :    0.00 deg   90.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height       : 58.50 / 58.50 m
Topography           :           1       (Flat/gentle slope; no barrier)
Reference angle       :           0.00

```

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 57.75 + 0.00) = 57.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	70	0.00	62.83	0.00	-4.57	-0.51	0.00	0.00	0.00
57.75									

Segment Leq : 57.75 dBA

Results segment # 2: Union (day)

Source height = 1.19 m

ROAD (0.00 + 56.20 + 0.00) = 56.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	90	0.00	61.76	0.00	-2.55	-3.01	0.00	0.00	0.00
56.20									

Segment Leq : 56.20 dBA

Total Leq All Segments: 60.05 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 51.25 + 0.00) = 51.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	70	0.00	56.33	0.00	-4.57	-0.51	0.00	0.00	0.00
51.25									

Segment Leq : 51.25 dBA

Results segment # 2: Union (night)

Source height = 1.19 m

ROAD (0.00 + 49.71 + 0.00) = 49.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	90	0.00	55.27	0.00	-2.55	-3.01	0.00	0.00	0.00
49.71									

Segment Leq : 49.71 dBA

Total Leq All Segments: 53.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.05

(NIGHT): 53.56

Filename: b_olal.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R5

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 39.00 / 43.00 m
Receiver height : 1.50 / 60.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Union (day/night)

Car traffic volume : 8951/995 veh/TimePeriod *
Medium truck volume : 186/21 veh/TimePeriod *
Heavy truck volume : 186/21 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 7787
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Union (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 21.00 / 21.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 54.49 + 0.00) = 54.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	62.83	0.00	-6.89	-1.46	0.00	0.00	0.00
54.49									

Segment Leq : 54.49 dBA

Results segment # 2: Union (day)

Source height = 1.19 m

ROAD (0.00 + 57.88 + 0.00) = 57.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	61.76	0.00	-2.43	-1.46	0.00	0.00	0.00
57.88									

Segment Leq : 57.88 dBA

Total Leq All Segments: 59.52 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 51.76 + 0.00) = 51.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	56.33	0.00	-4.57	0.00	0.00	0.00	0.00
51.76									

Segment Leq : 51.76 dBA

Results segment # 2: Union (night)

Source height = 1.19 m

ROAD (0.00 + 51.39 + 0.00) = 51.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	55.27	0.00	-2.43	-1.46	0.00	0.00	0.00
51.39									

Segment Leq : 51.39 dBA

Total Leq All Segments: 54.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.52

(NIGHT): 54.59

Filename: b_ola2.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R6

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 37.00 / 37.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Union (day/night)

Car traffic volume : 8951/995 veh/TimePeriod *
Medium truck volume : 186/21 veh/TimePeriod *
Heavy truck volume : 186/21 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 7787
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Union (day/night)

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 56.00 / 56.00 m
Receiver height       :  1.50 / 1.50 m
Topography           :      1           (Flat/gentle slope; no barrier)
Reference angle       :      0.00

```

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 54.87 + 0.00) = 54.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	62.83	0.00	-6.51	-1.46	0.00	0.00	0.00
54.87									

Segment Leq : 54.87 dBA

Results segment # 2: Union (day)

Source height = 1.19 m

ROAD (0.00 + 50.81 + 0.00) = 50.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	61.76	0.00	-9.50	-1.46	0.00	0.00	0.00
50.81									

Segment Leq : 50.81 dBA

Total Leq All Segments: 56.31 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 48.37 + 0.00) = 48.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	56.33	0.00	-6.51	-1.46	0.00	0.00	0.00
48.37									

Segment Leq : 48.37 dBA

Results segment # 2: Union (night)

Source height = 1.19 m

ROAD (0.00 + 44.32 + 0.00) = 44.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.66	55.27	0.00	-9.50	-1.46	0.00	0.00	0.00
44.32									

Segment Leq : 44.32 dBA

Total Leq All Segments: 49.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.31
(NIGHT): 49.81

Filename: b_ne2.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R7

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 58.50 / 58.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Union (day/night)

Car traffic volume : 8951/995 veh/TimePeriod *
Medium truck volume : 186/21 veh/TimePeriod *
Heavy truck volume : 186/21 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 7787
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Union (day/night)

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height       : 58.50 / 58.50 m
Topography           :      1           (Flat/gentle slope; no barrier)
Reference angle       :      0.00

```

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 55.25 + 0.00) = 55.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	0	0.00	62.83	0.00	-4.57	-3.01	0.00	0.00	0.00

SubLeq

```

-----
---
-90      0      0.00  62.83      0.00  -4.57  -3.01      0.00      0.00      0.00
55.25
-----
---
```

Segment Leq : 55.25 dBA

Results segment # 2: Union (day)

Source height = 1.19 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
-90	90	0.00	61.76	0.00	-2.55	0.00	0.00	0.00	0.00

SubLeq

```

-----
---
-90      90      0.00  61.76      0.00  -2.55      0.00      0.00      0.00      0.00
59.21
-----
---
```

Segment Leq : 59.21 dBA

Total Leq All Segments: 60.68 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 48.75 + 0.00) = 48.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	0	0.00	56.33	0.00	-4.57	-3.01	0.00	0.00	0.00
48.75									

Segment Leq : 48.75 dBA

Results segment # 2: Union (night)

Source height = 1.19 m

ROAD (0.00 + 52.72 + 0.00) = 52.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	55.27	0.00	-2.55	0.00	0.00	0.00	0.00
52.72									

Segment Leq : 52.72 dBA

Total Leq All Segments: 54.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.68

(NIGHT): 54.18

STAMSON 5.0 NORMAL REPORT Date: 19-09-2020 11:36:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b_s.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R8

Road data, segment # 1: SJAM (day/night)

Car traffic volume : 7263/807 veh/TimePeriod *
Medium truck volume : 151/17 veh/TimePeriod *
Heavy truck volume : 151/17 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6319
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: SJAM (day/night)

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 58.50 / 58.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: King (day/night)

Car traffic volume : 16416/1824 veh/TimePeriod *
Medium truck volume : 342/38 veh/TimePeriod *
Heavy truck volume : 342/38 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 14282
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: King (day/night)

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 200.00 / 200.00 m
Receiver height       :  58.50 / 58.50 m
Topography           :      1           (Flat/gentle slope; no barrier)
Reference angle       :      0.00

```

Results segment # 1: SJAM (day)

Source height = 1.19 m

ROAD (0.00 + 52.69 + 0.00) = 52.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	50	0.00	62.83	0.00	-4.57	-5.56	0.00	0.00	0.00
52.69									

Segment Leq : 52.69 dBA

Results segment # 2: King (day)

Source height = 1.19 m

ROAD (0.00 + 55.13 + 0.00) = 55.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	66.38	0.00	-11.25	0.00	0.00	0.00	0.00
55.13									

Segment Leq : 55.13 dBA

Total Leq All Segments: 57.09 dBA

Results segment # 1: SJAM (night)

Source height = 1.19 m

ROAD (0.00 + 46.20 + 0.00) = 46.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	50	0.00	56.33	0.00	-4.57	-5.56	0.00	0.00	0.00
46.20									

Segment Leq : 46.20 dBA

Results segment # 2: King (night)

Source height = 1.19 m

ROAD (0.00 + 48.60 + 0.00) = 48.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	59.85	0.00	-11.25	0.00	0.00	0.00	0.00
48.60									

Segment Leq : 48.60 dBA

Total Leq All Segments: 50.57 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.09

(NIGHT): 50.57

STAMSON 5.0 NORMAL REPORT Date: 19-09-2020 11:38:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a_n.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R9

Road data, segment # 1: Union (day/night)

Car traffic volume : 8951/995 veh/TimePeriod *
Medium truck volume : 186/21 veh/TimePeriod *
Heavy truck volume : 186/21 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 7787
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Union (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 34.50 / 34.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Union (day)

Source height = 1.19 m

ROAD (0.00 + 61.76 + 0.00) = 61.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90 90 0.00 61.76 0.00 0.00 0.00 0.00 0.00 0.00
61.76

Segment Leq : 61.76 dBA

Total Leq All Segments: 61.76 dBA

Results segment # 1: Union (night)

Source height = 1.19 m

ROAD (0.00 + 55.27 + 0.00) = 55.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.00	55.27	0.00	0.00	0.00	0.00	0.00	0.00
55.27									

Segment Leq : 55.27 dBA

Total Leq All Segments: 55.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.76
(NIGHT): 55.27

STAMSON 5.0 NORMAL REPORT Date: 17-11-2020 10:03:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ret_n.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R10

Road data, segment # 1: Union (day/night)

Car traffic volume : 8951/995 veh/TimePeriod *
Medium truck volume : 186/21 veh/TimePeriod *
Heavy truck volume : 186/21 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 7787
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Union (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 22.50 / 22.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Union (day)

Source height = 1.19 m

ROAD (0.00 + 60.35 + 0.00) = 60.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90 90 0.04 61.76 0.00 -1.30 -0.11 0.00 0.00 0.00
60.35

Segment Leq : 60.35 dBA

Total Leq All Segments: 60.35 dBA

Results segment # 1: Union (night)

Source height = 1.19 m

ROAD (0.00 + 53.86 + 0.00) = 53.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90	90	0.04	55.27	0.00	-1.30	-0.11	0.00	0.00	0.00
53.86									

Segment Leq : 53.86 dBA

Total Leq All Segments: 53.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.35
(NIGHT): 53.86

STAMSON 5.0 NORMAL REPORT Date: 17-11-2020 10:05:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ret_s.te Time Period: Day/Night 16/8 hours
Description: Traffic Noise Impact at Receptor ON-R11

Road data, segment # 1: King (day/night)

Car traffic volume : 16416/1824 veh/TimePeriod *
Medium truck volume : 342/38 veh/TimePeriod *
Heavy truck volume : 342/38 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 14282
Percentage of Annual Growth : 1.80
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: King (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 76.00 / 76.00 m
Receiver height : 22.50 / 22.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: King (day)

Source height = 1.19 m

ROAD (0.00 + 58.94 + 0.00) = 58.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90 90 0.04 66.38 0.00 -7.32 -0.11 0.00 0.00 0.00
58.94

Segment Leq : 58.94 dBA

Total Leq All Segments: 58.94 dBA

Results segment # 1: King (night)

Source height = 1.19 m

ROAD (0.00 + 52.41 + 0.00) = 52.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90	90	0.04	59.85	0.00	-7.32	-0.11	0.00	0.00	0.00
-----	----	------	-------	------	-------	-------	------	------	------

52.41

Segment Leq : 52.41 dBA

Total Leq All Segments: 52.41 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.94
(NIGHT): 52.41

APPENDIX F
Warning Clauses
(1 Page)



Warning Clause Type A

“Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.”

Warning Clause Type C

“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning by the occupant in low and medium density Development s will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”

Note:

As stated in Section 3.2 of this report, ventilation methods other than central air conditioning are acceptable for high and medium density residential developments, subject to the conditions outlined in this report.