Road Traffic and Stationary Noise Impact Study

215 Lexington Road, Waterloo, Ontario

JJ-00388 NIS1

December 23, 2021, Reference No. JJ-00388-NIS1

Dave Galbraith

Associate - Manager, Planning
IBI GROUP
410 Albert Street, Suite 101
Waterloo ON N2L 3V3 Canada

Dear Mr. Galbraith:

Re: Road Traffic and Stationary Noise Impact Study
215 Lexington Road, Waterloo, Ontario

1. Introduction

JJ Acoustic Engineering Ltd. (JJAE) was retained to complete a Road Traffic and Stationary Noise Impact Study (Study) for the residential development located 215 Lexington Road in Waterloo, Ontario (Site). The Site will be developed into one 7-storey residential building and one 12-storey residential building. JJAE has provided a copy of the most up-to-date Site Plan in Attachment A.

The Study was prepared consistent with Ontario Ministry of the Environment, Conservation and Park (MOECP) NPC 300, "Environmental Noise Guideline, Stationary and Transportation Sources– Approval and Planning" dated August 2013.

This Study has determined that the potential environmental noise impact from road traffic noise is significant. The proposed development will need the following: a requirement for central air-conditioning, noise warning clauses and special building components. Road traffic noise control requirements for the Site were determined based on road traffic volumes provided by the Region of Waterloo (Region) and forecasted to 10 years from the date of this study.

The following attachments were included with this Study:

- Attachment A – Site Plan
- Attachment B – Traffic Data Summary Table & Sample Stamson Traffic Model Outputs
- Attachment C – Stationary Noise Impact Figures
- Attachment D – Stationary Noise Impact Source Table
- Attachment E – Owners Statement
- Attachment F – Consultant's Declaration

2. Road Traffic Analysis

2.1 Road Traffic Noise Modeling Methodology

The road traffic noise impact was conducted using STAMSON, the MOECP's computerized model of ORNAMENT. The Application of the model for the site was consistent with the ORNAMENT technical documents. The computer model input parameters include, among other data, the number of road segments, number of house rows, the positional relationship of the receptor to a noise source or barrier in terms of distance, elevation and angle of exposure to the source, the basic site topography, the ground surface type, traffic volumes, traffic composition and speed limit.

The predicted sound level is based on the 1-hour equivalent sound level, designated as Leq, and is adjusted by the STAMSON program to the 16-hour daytime and the 8-hour nighttime equivalent sound level. The applicable noise criteria for noise sensitive spaces are specified in terms of the 16-hour daytime period (7:00 a.m. to 11:00 p.m.) and 8-hour nighttime period (11:00 p.m. to 7:00 a.m.) enabling a direct comparison between the STAMSON model output and the noise limits.

2.2 Road Traffic Model Input Parameters

This section describes the STAMSON model input parameters used to predict road traffic noise impact for the Site.

The Site has four significant roadways in the vicinity of the development: Lexington Road approximately 25 meters to the North of building A, Davenport Road approximately 45 meters to the North of building A and Highway 85 Northbound/Southbound. Where there are intervening and off-site structures that provide line-of-sight obstruction to the roads, JJAE did not include line-of-sight obstruction in our analysis as to calculate worst-case noise impact.

2.2.1 Road Traffic Parameters

The traffic data provided by the Region has been summarized below:

Lexington Road:

- Current AADT (2021): 17,300
- Forecast AADT (2031): 18,200
- Commercial Vehicle Rates: 1% medium trucks and 2% heavy trucks
- Posted Speed Limit: 50 km/h
- Day Night Splits: 90% day and 10% night

Davenport Road:

- Current AADT (2021): 13,600
- Forecast AADT (2031): 15,100
- Commercial Vehicle Rates: 1% medium trucks and 2% heavy trucks
- Posted Speed Limit: 50 km/h
- Day Night Splits: 90% day and 10% night

Highway 85 Northbound:

- Current AADT (2018): 19,900
- Forecast AADT (2031): 27,432
- Commercial Vehicle Rates: 6.10% medium trucks and 4.10% heavy trucks
- Posted Speed Limit: 90 km/h
- Day Night Splits: 90% day and 10% night

Highway 85 Southbound:

- Current AADT (2018): 19,900
- Forecast AADT (2031): 27,432
- Commercial Vehicle Rates: 6.10% medium trucks and 4.10% heavy trucks
- Posted Speed Limit: 90 km/h
- Day Night Splits: 90% day and 10% night

The traffic data is the foundation of this analysis and the Study will be updated if the values change. Traffic data was supplied by the Region. The Region's AADT report for this Noise Studies report has been supplied in Attachment B.

2.3 Road Traffic Noise Modeling Results

JJAE calculated the Plane of Window (POW) noise exposure for each floor at the Site for the separate daytime and nighttime periods.

The STAMSON road traffic model outputs are provided in Attachment B.

2.4 Road Traffic Modeling Discussion

Noise control requirements will be defined based on NPC 300.

Daytime Outdoor Living Area Assessment (NPC 300, Section C7.1.1)

NPC 300 section A5 (pages 13-14) defines an Outdoor Living Area (OLA). As part of this definition, a balcony or terrace is considered an OLA if it has a minimum depth of 4 meters. All balconies are less than 4 m in depth and therefore will not be considered as OLAs.

The Site does not have any feasible location for an OLA and thus, JJAE has not provided any calculations for an OLA at the Site.

Plane of a Window – Ventilation Requirements (NPC 300, Section C7.1.2)

The predicted daytime and nighttime Plane of Window (POW) noise impact assumes a worst-case and direct line of sight noise exposure to both roads, unless the building itself blocks line-of-sight (full or partial).

JJAE has used the following criteria, which is a summary of NPC 300 requirements, to evaluate the Site noise impacts from road traffic noise:

Daytime Level (dBA)	Nighttime Level (dBA)	Ventilation Requirements and Warning Clauses	Special Building Components
55	50	Not Required	Not Required
55 – 65	50 – 60	Yes, with Type C Warning Clause	Not Required
66 or more	60 or more	Yes, with Type D Warning Clause	Yes

Table B.1 summarizes the predicted worst-case sound levels and the requirements for the units. The following warning clause is required:

Warning Clause 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 developments 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, Conservation and Parks."

Warning Clause D: "This dwelling unit has been supplied with a central air conditioning system which 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, Conservation and Parks."

Indoor Living Areas – Building Components (NPC 300, Section C7.1.3)

At minimum, the building must be constructed to standard Ontario Building Code requirements. Improved building components are required and summarized in Table B.1. JJAE has assumed 35% window to floor area coverage and that windows are thick and operable.

3. Stationary Noise Impact Analysis

3.1 Stationary Noise Impact Sound Level Criteria

The general criteria for stationary noise sources are defined by NPC 300. The criteria defined in Table C-5 and C-6, "Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA) Outdoor Points of Reception" and "Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA) Plane of Window of Noise Sensitive Spaces" are used to evaluate the noise impact at the proposed development.

The criteria for a Class 1 area have been summarized below:

Receiver Category	**Time Period**	**Stationary Noise Criteria**
Outdoor Living Area (OLA)	Day = 7:00 to 23:00	Leq = 50 dBA
Plane of Window (POW)	Day = 7:00 to 23:00	Leq = 50 dBA
	Night = 23:00 to 7:00	Leq = 45 dBA

3.2 Modelling Methodology

The stationary noise impact was evaluated using the CADNA A acoustic modelling software that is based on the ISO 9613-2 standard. The data for all potential stationary noise sources was summarized in Attachment D.

4. Noise Impact Summary – From Site

The noise from the Site to the neighboring buildings could not be accounted for because the site has not undergone mechanical design yet. An addendum to this report should be completed once a mechanical design is done to account for noise from the Site to the neighboring building.

5. Noise Impact Summary – From Environment to Site

There are several buildings near the site. JJAE has identified several potential stationary noise sources including:

- Medium HVAC Units
- Small HVAC Units
- HVAC 2 FAN

A summary of the noise sources used in our modelling is provided in Attachment D.

JJAE modelled the noise impact from all significant noise sources to the Site. The results are summarized in the table below and illustrated on Figure 1.

Building #1	**Worst Case Daytime Sound Level (dBA)**	**Daytime Noise Limit (dBA)**	**Worst Case Nighttime Sound Level (dBA)**	**Nighttime Noise Limit (dBA)**	**Limits met**
North	39	50	36	45	Yes
East	48	50	45	45	Yes
South	46	50	43	45	Yes
West	34	50	31	45	Yes

Building #2	**Worst Case Daytime Sound Level (dBA)**	**Daytime Noise Limit (dBA)**	**Worst Case Nighttime Sound Level (dBA)**	**Nighttime Noise Limit (dBA)**	**Limits met**
North	46	50	43	45	Yes
East	46	50	43	45	Yes
South	24	50	21	45	Yes
West	36	50	33	45	Yes

From the table above it can be seen that both buildings meeting noise limits.

6. Recommendations

The road traffic noise impacts were above the NPC 300 requirements. Noise mitigation measures include:

Building #A:

- Warning Clause Type C for the South and East façades.
- Warning Clause Type D for North and West façades.
- Requirement for Air Conditioning for the entire building.
- A minimum of STC 30 is required for all exterior glazing for the North façade.
- A minimum of STC 31 is required for all exterior glazing for the West façade.

Building #B:

- Warning Clause Type C for the East façades.
- Warning Clause Type D for North, South and West façades.
- Requirement for Air Conditioning for the entire building.
- A minimum of STC 25 is required for all exterior glazing for the North and South façade.
- A minimum of STC 31 is required for all exterior glazing for the West façade.

These have been summarized in Attachment B under Table B1.

The stationary noise impacts from to the site were evaluated and the sound level predictions were determined to be below the noise limits for all façades

7. Conclusions

The results of this Study indicate that the potential environmental impact from road traffic noise sources is significant. Mitigation measures will be required including ventilation requirements, special building components and noise warning clauses for each unit.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

Written by: Reviewed by:

December 23, 2021

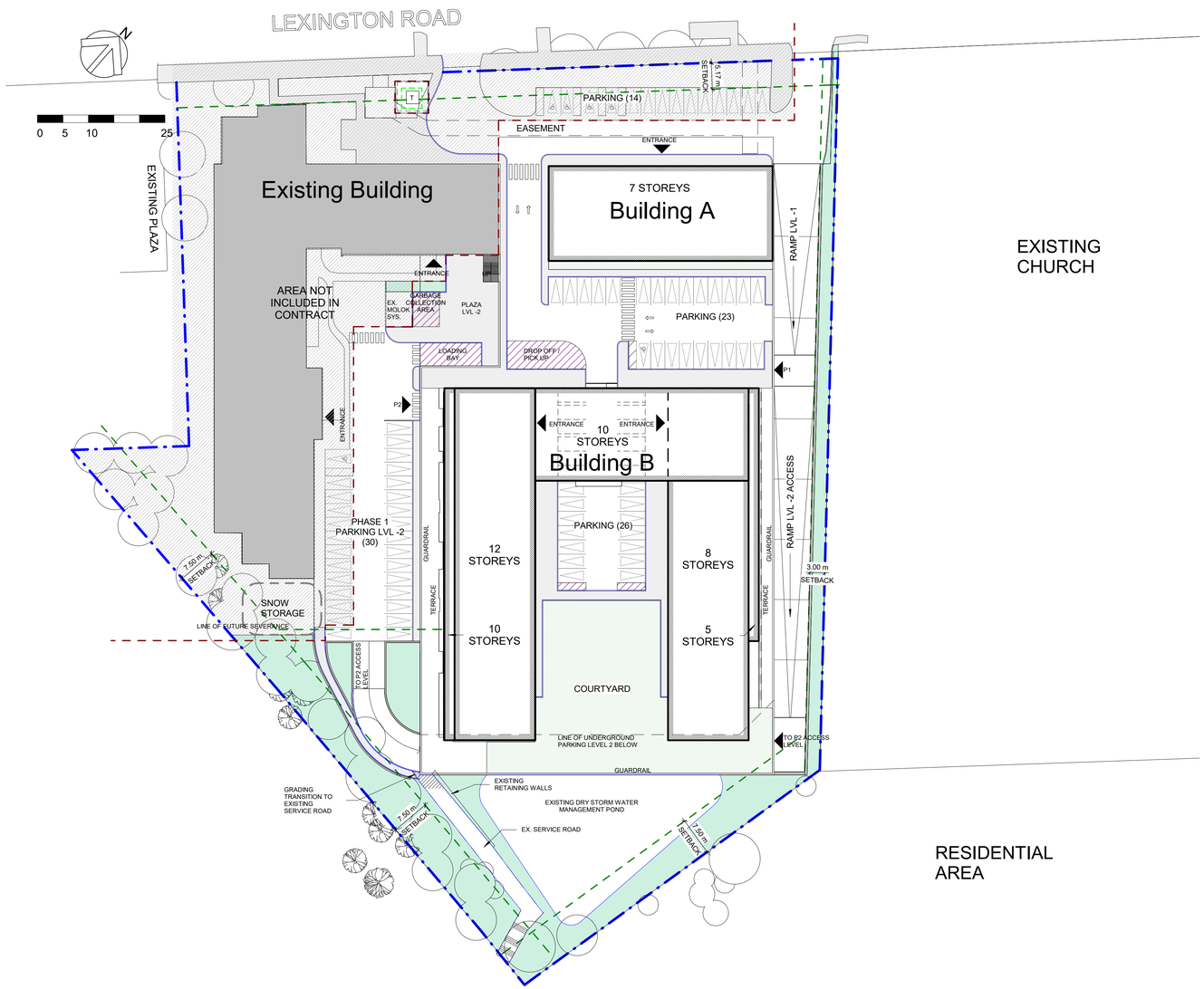


Emmanuel Ghiorghis,
Acoustic Technician

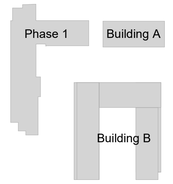
Joey Jraige, P.Eng., B.A.Sc.
President

JJ Acoustic Engineering Ltd.
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226-346-6473

ATTACHMENT A



1 / A-1002 SITE PLAN
Scale: 1 : 500



UNITS		
Name	Count	Bedrooms
1B	167	167
1B+D	122	122
2B	164	328
	453	617

GFA
35,410.78 m²

PARKING SCHEDULE	
Level	Count
P2	250
P1	237
LEVEL 01	64
	551

DETAILS OF DEVELOPMENT
215 Lexington Rd. Waterloo

PROVISION		REQUIRED	PROVIDED
ZONING		---	
GROSS LOT AREA (m²)		19,037.29	
AREA OF ROW & DLT (m²)		N/A	
NET LOT AREA (m²)		19,026.51	
SETBACKS	Front Yard (m)	5.0	5.0
	Rear Yard (m)	7.5	7.5
	East Ext. Side Yard (m)	3.0	3.0
	West Ext. Side Yard (m)	3.0	3.0
DENSITY	G.F.A.	-	32,631 m²
	FSR	-	-
BUILDING AREA (m²) (Including existing building, no additional structures)		-	3,255.7m2 EX. BUILDING 2,359.7m2
BUILDING COVERAGE(%) (Including existing building, no additional structures)		-	17% EX. BUILDING 12%
NUMBER OF STOREYS		6	12
BUILDING HEIGHT (m)		20.0m	38.55m
RES. UNITS TOTAL		-	454
PARKING	TOTAL	551	551
	RESIDENTIAL	0	0
	VISITOR	0	0
B.F. PARKING (Included)		12	12
BIKE STR.	TOTAL		0
	OUTDOOR		0
	INDOOR		0
LANDSCAPE AREA (m²)		5,711.19m2	
LANDSCAPE AREA (%)		30%	
AMENITY AREA (m²)		EX. BUILDING 712m2	EX. BUILDING 2,120m2

CLIENT

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ISSUES

NO.	ISSUANCE	STATUS	DATE
2	ISSUED FOR COORDINATION		06/05/22
1	ISSUED FOR COSTING		29/04/22

SEAL

SUB CONSULTANT

PRIME CONSULTANT

IBI GROUP
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PROJECT
215 Lexington Rd, Waterloo

PROJECT NO:	133176
DRAWN BY:	JCM/AH
CHKD' BY:	RG
SCALE:	As indicated
DATE:	28/04/2022

SHEET TITLE
Proposed Site Plan

SHEET NUMBER
A-1002

ATTACHMENT B

Table B1

Road Traffic Noise Levels and Mitigation Measures Summary
215 Lexington Road, Waterloo, Ontario
Building A

Point of Reception	Road Sound Level Daytime (dBA)	Road Sound Level Nighttime (dBA)	Ventilation Requirements	Warning Clauses From NPC 300	Special Building Components
North Façade					
Plane of Window Level 1	68 (dBA)	62 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 2	68 (dBA)	62 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 3	68 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 4	68 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 5	68 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 6	68 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 7	68 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
East Façade					
Plane of Window Level 1	62 (dBA)	56 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	62 (dBA)	56 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	62 (dBA)	56 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 4	62 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 5	62 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 6	62 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 7	61 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade					
Plane of Window Level 1	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 4	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 5	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 6	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 7	64 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code

West Façade					
Plane of Window Level 1	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 2	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 3	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 4	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 5	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 6	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 7	69 (dBA)	63 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31

Table B1

Road Traffic Noise Levels and Mitigation Measures Summary
215 Lexington Road, Waterloo, Ontario
Building B

Point of Reception	Road Sound Level Daytime (dBA)	Road Sound Level Nighttime (dBA)	Ventilation Requirements NPC 300	Warning Clauses From NPC 300	Special Building Components
North Façade					
Plane of Window Level 1	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 2	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 3	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 4	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 5	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 6	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 7	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 8	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 9	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 10	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 11	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 12	67 (dBA)	61 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
East Façade					
Plane of Window Level 1	60 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	60 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	60 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 4	60 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 5	60 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 6	60 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 7	59 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 8	59 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 9	59 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 10	59 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 11	59 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 12	59 (dBA)	53 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade					
Plane of Window Level 1	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 2	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 3	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 4	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 5	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25

Plane of Window Level 6	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 7	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 8	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 9	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 10	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 11	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
Plane of Window Level 12	67 (dBA)	60 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 25
West Façade					
Plane of Window Level 1	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 2	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 3	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 4	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 5	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 6	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 7	73 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 31
Plane of Window Level 8	72 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 9	72 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 10	72 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 11	72 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30
Plane of Window Level 12	72 (dBA)	66 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 30

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location

215 Lexington Rd, Waterloo, ON

2. Current AADT (2021)

Lexington Rd	Davenport Rd
17,300	13,600

3. Forecast AADT (2031)

Lexington Rd	Davenport Rd
18,200	15,100

4. Commercial Vehicle Rates

	Lexington Rd	Davenport Rd
% Medium Trucks	1%	1%
% Heavy Trucks	2%	2%

5. Posted Speed Limit

Lexington Rd	Davenport Rd
50 km/h	50 km/h

6. Day/Night Splits

Regional Standard 90/10 Day/Night Split

7. Expiry

Dec 31 2022

8. Notes

This forecast is intended for the purpose of carrying out a noise study for **215 Lexington Rd** only. The above AADT represents the traffic volumes at the intersection of Lexington Rd with Davenport Rd. As Lexington Rd and Davenport Rd are under the jurisdiction of the City of Waterloo, the City should be contacted to verify the forecast.

Ministry of Transportation (MTO) should be contacted to provide the forecasts for Conestoga Parkway. Please refer to this link to acquire MTO traffic data:
https://www.library.mto.gov.on.ca/SydneyPLUS/TechPubs/Portal/tp/tvSplash.aspx

This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Outdoor Sound Level	65	Day/Night	Day
Indoor Sound Level	45	Road/Rail	Road
Noise Reduction	23		
Angle of Sound	0 to 90 Degrees	Angle Correction	0
		Sum	23

Component	Window	Sum	23
Sound Energy Transmitted	100 %	Table 3	0
Component Area	35 % Floor Area		
Room Floor Area	100	31	
Room Absorption Category	Intermediate	Table 4	-4
Noise Spectrum Type	Mixed Road Traffic, Distance Aircraft		
Component Category	Openable Thick Window	Table 5	4
REQUIRED STC FOR COMPONENT			23

Component	Exterior Wall	Sum	23
Sound Energy Transmitted	100 %	Table 3	0
Component Area	25 % Floor Area		
Room Floor Area	100	6	
Room Absorption Category	Intermediate	Table 4	-11
Noise Spectrum Type	Mixed Road Traffic, Distance Aircraft		
Component Category	Openable Thin Window	Table 5	2
REQUIRED STC FOR COMPONENT			14

STAMSON 5.0 NORMAL REPORT Date: 24-12-2021 12:01:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: northf1.te Time Period: Day/Night 16/8 hours
Description: Buildling A North Floor 1

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

Car traffic volume : 15889/1765 veh/TimePeriod *
Medium truck volume : 164/18 veh/TimePeriod *
Heavy truck volume : 328/36 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): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lexington Rd (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 25.00 / 25.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: Davenport Rd (day/night)

Car traffic volume : 13182/1465 veh/TimePeriod *
Medium truck volume : 136/15 veh/TimePeriod *
Heavy truck volume : 272/30 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): 15100
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00

```
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Davenport Rd (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  50.00 / 50.00  m
Receiver height           :   2.00 / 2.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```



```
Road data, segment # 3: HWY85NB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: HWY85NB (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 140.00 / 140.00 m
Receiver height           :   3.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00
```



```
Road data, segment # 4: HWY85SB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 4: HWY85SB (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 165.00 / 165.00 m
Receiver height           :   2.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Results segment # 1: Lexington Rd (day)
------------------------------------

Source height = 1.19 m

ROAD (0.00 + 63.73 + 0.00) = 63.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  65.95   0.00  -2.22   0.00   0.00   0.00   0.00  63.73
-------------------------------------------------------------------------------

Segment Leq : 63.73 dBA

↟
Results segment # 2: Davenport Rd (day)
------------------------------------

Source height = 1.19 m

ROAD (0.00 + 56.90 + 0.00) = 56.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.14   0.00  -5.23  -3.01   0.00   0.00   0.00  56.90
-------------------------------------------------------------------------------

Segment Leq : 56.90 dBA
```

↟
Results segment # 3: HWY85NB (day)

Source height = 1.42 m

ROAD (0.00 + 62.85 + 0.00) = 62.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.56	0.00	-9.70	-3.01	0.00	0.00	0.00	62.85

Segment Leq : 62.85 dBA

↟
Results segment # 4: HWY85SB (day)

Source height = 1.42 m

ROAD (0.00 + 62.14 + 0.00) = 62.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.56	0.00	-10.41	-3.01	0.00	0.00	0.00	62.14

Segment Leq : 62.14 dBA

Total Leq All Segments: 68.07 dBA

↟
Results segment # 1: Lexington Rd (night)

Source height = 1.19 m

ROAD (0.00 + 57.17 + 0.00) = 57.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.39	0.00	-2.22	0.00	0.00	0.00	0.00	57.17

Segment Leq : 57.17 dBA

↟
Results segment # 2: Davenport Rd (night)

Source height = 1.19 m

ROAD (0.00 + 50.35 + 0.00) = 50.35 dBA

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

```
-------------------------------------------------------------------------------
     0     90   0.00  58.59   0.00  -5.23  -3.01   0.00   0.00   0.00  50.35
-------------------------------------------------------------------------------

Segment Leq : 50.35 dBA

♠
Results segment # 3: HWY85NB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 56.31 + 0.00) = 56.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  69.02   0.00  -9.70  -3.01   0.00   0.00   0.00  56.31
-------------------------------------------------------------------------------

Segment Leq : 56.31 dBA

♠
Results segment # 4: HWY85SB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 55.60 + 0.00) = 55.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  69.02   0.00 -10.41  -3.01   0.00   0.00   0.00  55.60
-------------------------------------------------------------------------------

Segment Leq : 55.60 dBA

Total Leq All Segments: 61.52 dBA

♠



TOTAL Leq FROM ALL SOURCES (DAY): 68.07
                           (NIGHT): 61.52
♠
♠
```

STAMSON 5.0 NORMAL REPORT Date: 24-12-2021 12:01:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: eastf1.te Time Period: Day/Night 16/8 hours
Description: Buildling A East Floor 1

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

Car traffic volume : 15889/1765 veh/TimePeriod *
Medium truck volume : 164/18 veh/TimePeriod *
Heavy truck volume : 328/36 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): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lexington Rd (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 25.00 / 25.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Davenport Rd (day/night)

Car traffic volume : 13182/1465 veh/TimePeriod *
Medium truck volume : 136/15 veh/TimePeriod *
Heavy truck volume : 272/30 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): 15100
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00

```
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Davenport Rd (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  50.00 / 50.00  m
Receiver height           :   2.00 / 2.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: Lexington Rd (day)
---------------------------------------

Source height = 1.19 m

ROAD (0.00 + 60.72 + 0.00) = 60.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  65.95   0.00  -2.22  -3.01   0.00   0.00   0.00  60.72
-------------------------------------------------------------------------------

Segment Leq : 60.72 dBA

↟
Results segment # 2: Davenport Rd (day)
---------------------------------------

Source height = 1.19 m

ROAD (0.00 + 56.90 + 0.00) = 56.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  65.14   0.00  -5.23  -3.01   0.00   0.00   0.00  56.90
-------------------------------------------------------------------------------

Segment Leq : 56.90 dBA

Total Leq All Segments: 62.23 dBA

↟
Results segment # 1: Lexington Rd (night)
-----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 54.16 + 0.00) = 54.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
```

```
-------------------------------------------------------------------------------
   -90      0   0.00  59.39   0.00  -2.22  -3.01   0.00   0.00   0.00  54.16
-------------------------------------------------------------------------------

Segment Leq : 54.16 dBA

♠
Results segment # 2: Davenport Rd (night)
----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 50.35 + 0.00) = 50.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  58.59   0.00  -5.23  -3.01   0.00   0.00   0.00  50.35
-------------------------------------------------------------------------------

Segment Leq : 50.35 dBA

Total Leq All Segments: 55.67 dBA

♠



TOTAL Leq FROM ALL SOURCES (DAY): 62.23
                           (NIGHT): 55.67
♠
♠
```

STAMSON 5.0 NORMAL REPORT Date: 24-12-2021 12:01:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: southf1.te Time Period: Day/Night 16/8 hours
Description: Buildling A South Floor 1

Road data, segment # 1: HWY85NB (day/night)

Car traffic volume : 16423/8211 veh/TimePeriod
Medium truck volume : 1115/558 veh/TimePeriod
Heavy truck volume : 750/375 veh/TimePeriod
Posted speed limit : 90 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HWY85NB (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 160.00 / 160.00 m
Receiver height : 2.00 / 2.00 m
Topography : 3 (Elevated; no barrier)
Elevation : 18.00 m
Reference angle : 0.00

↟
Road data, segment # 2: HWY85SB (day/night)

Car traffic volume : 16423/8211 veh/TimePeriod
Medium truck volume : 1115/558 veh/TimePeriod
Heavy truck volume : 750/375 veh/TimePeriod
Posted speed limit : 90 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HWY85SB (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 180.00 / 180.00 m
Receiver height : 2.00 / 2.00 m
Topography : 3 (Elevated; no barrier)
Elevation : 18.00 m
Reference angle : 0.00

↟
Results segment # 1: HWY85NB (day)

Source height = 1.42 m

ROAD (0.00 + 60.97 + 0.00) = 60.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	74.26	0.00	-10.28	-3.01	0.00	0.00	0.00	60.97

Segment Leq : 60.97 dBA

↟
Results segment # 2: HWY85SB (day)

Source height = 1.42 m

ROAD (0.00 + 60.46 + 0.00) = 60.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	74.26	0.00	-10.79	-3.01	0.00	0.00	0.00	60.46

Segment Leq : 60.46 dBA

Total Leq All Segments: 63.73 dBA

↟
Results segment # 1: HWY85NB (night)

Source height = 1.42 m

ROAD (0.00 + 60.97 + 0.00) = 60.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	74.26	0.00	-10.28	-3.01	0.00	0.00	0.00	60.97

Segment Leq : 60.97 dBA

↟
Results segment # 2: HWY85SB (night)

Source height = 1.42 m

ROAD (0.00 + 60.46 + 0.00) = 60.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	74.26	0.00	-10.79	-3.01	0.00	0.00	0.00	60.46

```
--------------------------------------------------------------------------------

Segment Leq : 60.46 dBA

Total Leq All Segments: 63.73 dBA

↑



TOTAL Leq FROM ALL SOURCES (DAY): 63.73
                           (NIGHT): 63.73
↑
↑
```

STAMSON 5.0 NORMAL REPORT Date: 24-12-2021 12:01:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: westf1.te Time Period: Day/Night 16/8 hours
Description: Buildling A West Floor 1

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

Car traffic volume : 15889/1765 veh/TimePeriod *
Medium truck volume : 164/18 veh/TimePeriod *
Heavy truck volume : 328/36 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): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lexington Rd (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 35.00 / 35.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Davenport Rd (day/night)

Car traffic volume : 13182/1465 veh/TimePeriod *
Medium truck volume : 136/15 veh/TimePeriod *
Heavy truck volume : 272/30 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): 15100
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00

```
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Davenport Rd (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :   2.00 / 2.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 3: HWY85NB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: HWY85NB (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 140.00 / 140.00 m
Receiver height           :   3.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Road data, segment # 4: HWY85SB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 4: HWY85SB (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 165.00 / 165.00 m
Receiver height           :   2.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Results segment # 1: Lexington Rd (day)
----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 59.26 + 0.00) = 59.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.95   0.00  -3.68  -3.01   0.00   0.00   0.00  59.26
-------------------------------------------------------------------------------

Segment Leq : 59.26 dBA

↟
Results segment # 2: Davenport Rd (day)
----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 55.44 + 0.00) = 55.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.14   0.00  -6.69  -3.01   0.00   0.00   0.00  55.44
-------------------------------------------------------------------------------

Segment Leq : 55.44 dBA
```

↟
Results segment # 3: HWY85NB (day)

Source height = 1.42 m

ROAD (0.00 + 65.86 + 0.00) = 65.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.56	0.00	-9.70	0.00	0.00	0.00	0.00	65.86

Segment Leq : 65.86 dBA

↟
Results segment # 4: HWY85SB (day)

Source height = 1.42 m

ROAD (0.00 + 65.15 + 0.00) = 65.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.56	0.00	-10.41	0.00	0.00	0.00	0.00	65.15

Segment Leq : 65.15 dBA

Total Leq All Segments: 69.20 dBA

↟
Results segment # 1: Lexington Rd (night)

Source height = 1.19 m

ROAD (0.00 + 52.70 + 0.00) = 52.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.39	0.00	-3.68	-3.01	0.00	0.00	0.00	52.70

Segment Leq : 52.70 dBA

↟
Results segment # 2: Davenport Rd (night)

Source height = 1.19 m

ROAD (0.00 + 48.89 + 0.00) = 48.89 dBA

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

```
-------------------------------------------------------------------------------
     0     90   0.00  58.59   0.00  -6.69  -3.01   0.00   0.00   0.00  48.89
-------------------------------------------------------------------------------

Segment Leq : 48.89 dBA

♠
Results segment # 3: HWY85NB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 59.32 + 0.00) = 59.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  69.02   0.00  -9.70   0.00   0.00   0.00   0.00  59.32
-------------------------------------------------------------------------------

Segment Leq : 59.32 dBA

♠
Results segment # 4: HWY85SB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 58.61 + 0.00) = 58.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  69.02   0.00 -10.41   0.00   0.00   0.00   0.00  58.61
-------------------------------------------------------------------------------

Segment Leq : 58.61 dBA

Total Leq All Segments: 62.66 dBA

♠



TOTAL Leq FROM ALL SOURCES (DAY): 69.20
                           (NIGHT): 62.66
♠
♠
```

STAMSON 5.0 NORMAL REPORT Date: 24-12-2021 12:02:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2north.te Time Period: Day/Night 16/8 hours
Description: Buildling B North Floor 1

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

Car traffic volume : 15889/1765 veh/TimePeriod *
Medium truck volume : 164/18 veh/TimePeriod *
Heavy truck volume : 328/36 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): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lexington Rd (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Davenport Rd (day/night)

Car traffic volume : 13182/1465 veh/TimePeriod *
Medium truck volume : 136/15 veh/TimePeriod *
Heavy truck volume : 272/30 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): 15100
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00

```
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Davenport Rd (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :   2.00 / 2.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 3: HWY85NB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: HWY85NB (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 115.00 / 115.00 m
Receiver height           :   3.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Road data, segment # 4: HWY85SB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 4: HWY85SB (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 135.00 / 135.00 m
Receiver height           :   2.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Results segment # 1: Lexington Rd (day)
------------------------------------

Source height = 1.19 m

ROAD (0.00 + 58.96 + 0.00) = 58.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  65.95   0.00  -6.99   0.00   0.00   0.00   0.00  58.96
-------------------------------------------------------------------------------

Segment Leq : 58.96 dBA

↟
Results segment # 2: Davenport Rd (day)
------------------------------------

Source height = 1.19 m

ROAD (0.00 + 53.89 + 0.00) = 53.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.14   0.00  -8.24  -3.01   0.00   0.00   0.00  53.89
-------------------------------------------------------------------------------

Segment Leq : 53.89 dBA
```

Results segment # 3: HWY85NB (day)

Source height = 1.42 m

ROAD (0.00 + 63.71 + 0.00) = 63.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.56	0.00	-8.85	-3.01	0.00	0.00	0.00	63.71

Segment Leq : 63.71 dBA

Results segment # 4: HWY85SB (day)

Source height = 1.42 m

ROAD (0.00 + 63.01 + 0.00) = 63.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.56	0.00	-9.54	-3.01	0.00	0.00	0.00	63.01

Segment Leq : 63.01 dBA

Total Leq All Segments: 67.31 dBA

Results segment # 1: Lexington Rd (night)

Source height = 1.19 m

ROAD (0.00 + 52.40 + 0.00) = 52.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.39	0.00	-6.99	0.00	0.00	0.00	0.00	52.40

Segment Leq : 52.40 dBA

Results segment # 2: Davenport Rd (night)

Source height = 1.19 m

ROAD (0.00 + 47.34 + 0.00) = 47.34 dBA

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

```
-------------------------------------------------------------------------------
     0     90   0.00  58.59   0.00  -8.24  -3.01   0.00   0.00   0.00  47.34
-------------------------------------------------------------------------------

Segment Leq : 47.34 dBA

♠
Results segment # 3: HWY85NB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 57.17 + 0.00) = 57.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  69.02   0.00  -8.85  -3.01   0.00   0.00   0.00  57.17
-------------------------------------------------------------------------------

Segment Leq : 57.17 dBA

♠
Results segment # 4: HWY85SB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 56.47 + 0.00) = 56.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  69.02   0.00  -9.54  -3.01   0.00   0.00   0.00  56.47
-------------------------------------------------------------------------------

Segment Leq : 56.47 dBA

Total Leq All Segments: 60.77 dBA

♠



TOTAL Leq FROM ALL SOURCES (DAY): 67.31
                           (NIGHT): 60.77
♠
♠
```

STAMSON 5.0 NORMAL REPORT Date: 24-12-2021 12:02:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2east.te Time Period: Day/Night 16/8 hours
Description: Buildling B East Floor 1

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

Car traffic volume : 15889/1765 veh/TimePeriod *
Medium truck volume : 164/18 veh/TimePeriod *
Heavy truck volume : 328/36 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): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lexington Rd (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 50.00 / 50.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Davenport Rd (day/night)

Car traffic volume : 13182/1465 veh/TimePeriod *
Medium truck volume : 136/15 veh/TimePeriod *
Heavy truck volume : 272/30 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): 15100
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00

```
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Davenport Rd (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :   2.00 / 2.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: Lexington Rd (day)
---------------------------------------

Source height = 1.19 m

ROAD (0.00 + 57.71 + 0.00) = 57.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  65.95   0.00  -5.23  -3.01   0.00   0.00   0.00  57.71
-------------------------------------------------------------------------------

Segment Leq : 57.71 dBA

↟
Results segment # 2: Davenport Rd (day)
---------------------------------------

Source height = 1.19 m

ROAD (0.00 + 55.44 + 0.00) = 55.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  65.14   0.00  -6.69  -3.01   0.00   0.00   0.00  55.44
-------------------------------------------------------------------------------

Segment Leq : 55.44 dBA

Total Leq All Segments: 59.73 dBA

↟
Results segment # 1: Lexington Rd (night)
-----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 51.15 + 0.00) = 51.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
```

```
-------------------------------------------------------------------------------
   -90      0   0.00  59.39   0.00  -5.23  -3.01   0.00   0.00   0.00  51.15
-------------------------------------------------------------------------------

Segment Leq : 51.15 dBA

↑
Results segment # 2: Davenport Rd (night)
----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 48.89 + 0.00) = 48.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  58.59   0.00  -6.69  -3.01   0.00   0.00   0.00  48.89
-------------------------------------------------------------------------------

Segment Leq : 48.89 dBA

Total Leq All Segments: 53.18 dBA

↑



TOTAL Leq FROM ALL SOURCES (DAY): 59.73
                           (NIGHT): 53.18
↑
↑
```

STAMSON 5.0 NORMAL REPORT Date: 27-12-2021 11:13:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2south.te Time Period: Day/Night 16/8 hours
Description: Building B South Facade Floor 1

Road data, segment # 1: HWY85NB (day/night)

Car traffic volume : 22171/2463 veh/TimePeriod *
Medium truck volume : 1506/167 veh/TimePeriod *
Heavy truck volume : 1012/112 veh/TimePeriod *
Posted speed limit : 90 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): 19900
Percentage of Annual Growth : 2.50
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 6.10
Heavy Truck % of Total Volume : 4.10
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: HWY85NB (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 2.00 / 2.00 m
Topography : 3 (Elevated; no barrier)
Elevation : 18.00 m
Reference angle : 0.00

↑
Road data, segment # 2: HWY85SB (day/night)

Car traffic volume : 22171/2463 veh/TimePeriod *
Medium truck volume : 1506/167 veh/TimePeriod *
Heavy truck volume : 1012/112 veh/TimePeriod *
Posted speed limit : 90 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): 19900
Percentage of Annual Growth : 2.50
Number of Years of Growth : 13.00

```
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: HWY85SB (day/night)
-----------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 120.00 / 120.00 m
Receiver height           :   2.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Results segment # 1: HWY85NB (day)
----------------------------------

Source height = 1.42 m

ROAD (0.00 + 64.31 + 0.00) = 64.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  75.56   0.00  -8.24  -3.01   0.00   0.00   0.00  64.31
-------------------------------------------------------------------------------

Segment Leq : 64.31 dBA

↟
Results segment # 2: HWY85SB (day)
----------------------------------

Source height = 1.42 m

ROAD (0.00 + 63.52 + 0.00) = 63.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  75.56   0.00  -9.03  -3.01   0.00   0.00   0.00  63.52
-------------------------------------------------------------------------------

Segment Leq : 63.52 dBA

Total Leq All Segments: 66.94 dBA

↟
Results segment # 1: HWY85NB (night)
------------------------------------

Source height = 1.42 m
```

ROAD (0.00 + 57.77 + 0.00) = 57.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	69.02	0.00	-8.24	-3.01	0.00	0.00	0.00	57.77

Segment Leq : 57.77 dBA

↑

Results segment # 2: HWY85SB (night)

Source height = 1.42 m

ROAD (0.00 + 56.98 + 0.00) = 56.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	69.02	0.00	-9.03	-3.01	0.00	0.00	0.00	56.98

Segment Leq : 56.98 dBA

Total Leq All Segments: 60.40 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 66.94
(NIGHT): 60.40

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 27-12-2021 11:24:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2west.te Time Period: Day/Night 16/8 hours
Description: Building B West Facade Floor 1

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

Car traffic volume : 15889/1765 veh/TimePeriod *
Medium truck volume : 164/18 veh/TimePeriod *
Heavy truck volume : 328/36 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): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lexington Rd (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 140.00 / 140.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Davenport Rd (day/night)

Car traffic volume : 13182/1465 veh/TimePeriod *
Medium truck volume : 136/15 veh/TimePeriod *
Heavy truck volume : 272/30 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): 15100
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00

```
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Davenport Rd (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 160.00 / 160.00 m
Receiver height           :   2.00 / 2.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 3: HWY85NB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: HWY85NB (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  50.00 / 50.00  m
Receiver height           :   2.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Road data, segment # 4: HWY85SB (day/night)
-------------------------------------------
Car traffic volume  : 22171/2463  veh/TimePeriod  *
Medium truck volume :  1506/167   veh/TimePeriod  *
Heavy truck volume  :  1012/112   veh/TimePeriod  *
Posted speed limit  :    90 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):  19900
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   6.10
    Heavy Truck  % of Total Volume     :   4.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 4: HWY85SB (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :   2.00 / 2.00   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  18.00 m
Reference angle           :   0.00

↟
Results segment # 1: Lexington Rd (day)
----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 53.24 + 0.00) = 53.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.95   0.00  -9.70  -3.01   0.00   0.00   0.00  53.24
-------------------------------------------------------------------------------

Segment Leq : 53.24 dBA

↟
Results segment # 2: Davenport Rd (day)
----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 51.85 + 0.00) = 51.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.14   0.00 -10.28  -3.01   0.00   0.00   0.00  51.85
-------------------------------------------------------------------------------

Segment Leq : 51.85 dBA
```

↟
Results segment # 3: HWY85NB (day)

Source height = 1.42 m

ROAD (0.00 + 70.33 + 0.00) = 70.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.56	0.00	-5.23	0.00	0.00	0.00	0.00	70.33

Segment Leq : 70.33 dBA

↟
Results segment # 4: HWY85SB (day)

Source height = 1.42 m

ROAD (0.00 + 68.87 + 0.00) = 68.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.56	0.00	-6.69	0.00	0.00	0.00	0.00	68.87

Segment Leq : 68.87 dBA

Total Leq All Segments: 72.76 dBA

↟
Results segment # 1: Lexington Rd (night)

Source height = 1.19 m

ROAD (0.00 + 46.68 + 0.00) = 46.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.39	0.00	-9.70	-3.01	0.00	0.00	0.00	46.68

Segment Leq : 46.68 dBA

↟
Results segment # 2: Davenport Rd (night)

Source height = 1.19 m

ROAD (0.00 + 45.30 + 0.00) = 45.30 dBA

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

```
-------------------------------------------------------------------------------
     0     90   0.00  58.59   0.00 -10.28  -3.01   0.00   0.00   0.00  45.30
-------------------------------------------------------------------------------

Segment Leq : 45.30 dBA

♠
Results segment # 3: HWY85NB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 63.79 + 0.00) = 63.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  69.02   0.00  -5.23   0.00   0.00   0.00   0.00  63.79
-------------------------------------------------------------------------------

Segment Leq : 63.79 dBA

♠
Results segment # 4: HWY85SB (night)
-----------------------------------

Source height = 1.42 m

ROAD (0.00 + 62.33 + 0.00) = 62.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  69.02   0.00  -6.69   0.00   0.00   0.00   0.00  62.33
-------------------------------------------------------------------------------

Segment Leq : 62.33 dBA

Total Leq All Segments: 66.22 dBA

♠



TOTAL Leq FROM ALL SOURCES (DAY): 72.76
                           (NIGHT): 66.22
♠
♠
```

ATTACHMENT C



30.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0

Point Source
Building
Building Evaluation

STATIONARY NOISE IMPACT STUDY
215 LEXINGTON ROAD, WATERLOO, ONTARIO

Figure 1 - Stationary Noise Impact from Neighboring Buildings to Site

ATTACHMENT D

Table C1
Stationary Noise Impact Source Data
215 Lexington Road, Waterloo, Ontario

Noise Source Description	Cadna ID	Total SWL (dBA)	Data Source or Representative Data	Height Absolute (m)	Above Roof (m)	x	y
HVAC_2FAN	HVAC_2FAN	82.8	HVAC_2FAN	6.5	1.5	17539422	4815759
HVAC_2FAN	HVAC_2FAN	82.8	HVAC_2FAN	7.5	1.5	17539513	4815687
HVAC_2FAN	HVAC_2FAN	82.8	HVAC_2FAN	7.5	1.5	17539516	4815709
HVAC_2FAN	HVAC_2FAN	82.8	HVAC_2FAN	6.5	1.5	17539378	4815594
HVAC_2FAN	HVAC_2FAN	82.8	HVAC_2FAN	7.5	1.5	17539508	4815710
Medium_HVAC	Medium_HVAC	90.9	Medium_HVAC	7.5	1.5	17539525	4815709
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539426	4815763
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539432	4815771
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539373	4815588
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539369	4815584
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539364	4815580
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539360	4815576
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539354	4815571
Small_HVAC	Small_HVAC	78.9	Small_HVAC	6.25	1.25	17539351	4815571

ATTACHMENT E

Owner's Name: Hygate Development Corp.
Owner's Address: 1700 Langstaff Rd., Suite 2001, Vaughan, L4K 3S3

Re: Road Traffic and Stationary Noise Impact Study, 215 Lexington Road, Waterloo, Ontario

OWNER'S STATEMENT

I am the owner of the property, or the owner's agent, and that I understand and agree with the noise assessment and potential attenuation measures detailed in the study entitled Road Traffic and Stationary Noise Impact Study, 215 Lexington Road, Waterloo, Ontario, dated December 23, 2021.

The application has been designed to avoid the use of berms or walls as noise attenuation features where feasible. Where berms or walls are recommended, the Noise Study provides economic, planning and engineering justification.

If the application is changed in a way that may affect the noise level calculations, I will have a revised noise study submitted to the Region of Waterloo.

Patrick Sun
Name


Signature

June 2, 2022
Date

ATTACHMENT F

CANADA

PROVINCE OF ONTARIO

In the Matter of the Environmental Protection Act and the Planning Act

And in the Matter of 215 Lexington Road, Waterloo, Ontario in the Regional Municipality of Waterloo

I, Joey Jraige, of JJ Acoustic Engineering Ltd., in the Town of Tilbury, SOLEMNLY DECLARE THAT:

1. I am a Professional Engineer employed by JJ Acoustic Engineering Ltd. which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as 215 Lexington Road, Waterloo, Ontario.
3. I have the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the letter report entitled "Road Traffic and Stationary Noise Impact Study" dated December 23, 2021, is the best available information as of the date of the study.
5. The noise level calculations, the interpretation of noise attenuation requirements and the recommended measures are in accordance with Ministry of Environment and Climate Change Guidelines, Region of Waterloo policies, and any applicable policy or guidelines of the Area Municipality, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.
7. I acknowledge that this study may be subject to a peer review conducted at my cost.
8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath.

DECLARED before me in the Town of Tilbury, in the Regional Municipality of Chatham-Kent This 27th day of May 2022

LOUIS ELTERS
TAYLOR DELRUE
BARRISTER, SOLICITOR & NOTARY PUBLIC
40 QUEEN ST. S., P.O. BOX 459
TILBURY, ONTARIO N0P 2L0
MY COMMISSION DOES NOT EXPIRE