

April 12, 2018

Reference No. JJ-00109-R1

Obei Mujawaz
Salah Zeino
Milestone Development Canada Inc.
2278 Shardawn Mews
Mississauga, ON L5C 1W5
T: (416) 876-7778

Dear Mr. Mujawaz:

**Re: Road Traffic Noise Impact Study
316 King Street North Building 1, Waterloo, Ontario**

1. Introduction

JJ Acoustic Engineering Ltd. (JJAE) was retained to complete a Road Traffic Noise Impact Study (Study) for the Condominium development located at 316 King Street North Building 1 in Waterloo, Ontario (Site).

Currently the Site is occupied by a 10-storey apartment building with surface parking on both sides and to the rear.

In 2012, Site Plan Approval (SPA) was granted for an additional apartment building of 15-storeys to the North of the current 10-storey building sharing the Site and an underground parking garage. The existing building contains 25 units and 125 bedrooms.

The proposed 15-storey building included 40 units and 200 bedrooms. A total of 65 units and 325 bedrooms were envisioned as student oriented rental units.

Milestone's purchased the property in 2017 with the goal of repositioning the development to suit the current market and to appeal to a wider demographic consistent with the City of Waterloo growth.

JJ Acoustic Engineering Ltd.
joey@jjae.ca
226-346-6473

Milestone's vision for the property includes smaller units, better amenities and improved street presence.

The existing building will be retrofitted to divide the 5-bedroom units into 2-bedroom units each, resulting in 50 2-bedroom units.

The Site Plan is provided as Attachment A. A preliminary assessment of the Stationary Noise Impact Sources for the existing building and the neighboring buildings has been completed. Based on this assessment it has been determined that the Site is feasible for a residential infill of the proposed size.

A full stationary noise impact study will be completed at the Site Plan Approval stage to determine if the noise sources from the new building will affect the neighboring buildings. JJAЕ will also review the noise sources from the existing building to determine if there are any negative noise impacts, since a stationary noise study was not completed for this building previously. If there is a noise impact due to the existing building, JJAЕ will determine the most effective approach to mitigate and minimize the noise impact.

The Study was prepared consistent with Ontario Ministry of the Environment and Climate Change (MOECC) NPC 300, "Environmental Noise Guideline, Stationary and Transportation Sources—Approval and Planning", August 2013, and the Region's land use planning policies and guidelines. This Study has determined that the potential environmental noise impact from road traffic noise is significant. The proposed development will require a provision for central air-conditioning and noise warning clauses. Road traffic noise control requirements for the Site were determined based on road traffic volumes forecast for 2028 and were provided by the Region of Waterloo (Region). Stationary noise impact exposure for the Site is below the applicable MOECC noise limit requirements.

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 – Consultant's Declaration
- Attachment D – Owner's Statement

2. Land Development and Site Conditions

The Site has one significant roadway in the vicinity of the development: King Street North which is 15 m to the West. There are several intervening and off-site structures that provide line-of-sight obstruction to the roads. In evaluating the worse-case noise impact exposure for the most critical residential dwelling, the line-of-sight obstruction was not included in the analysis. Line of sight obstruction afforded by the building itself was considered to reduce the impact exposure of the roadways in the analysis.

3. Road Traffic Analysis

3.1 Road Traffic Noise Modeling Methodology

The road traffic noise impact was conducted using STAMSON, the MOE'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.

3.2 Road Traffic Model Input Parameters

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

3.2.1 Road Traffic Parameters

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

King Street North:

- Forecast AADT (2028): 17,020
- Commercial Vehicle Rates: 1.5% medium trucks and 1.8% heavy trucks
- Posted Speed Limit: 50 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 of Waterloo. The Region of Waterloo AADT Forecast for Noise Studies reports have been supplied in Attachment B.

3.3 Road Traffic Noise Modeling Results

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

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

3.4 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.

There are several outdoor amenity areas designated in this building. However, there is only one that is a quiet OLA. This OLA is located on the 16th Floor, rooftop, area and is the only OLA calculated in this report. This location has a partially blocked line-of-sight to select roadways. The noise impact has been summarized in Table B.1.

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 condominium itself blocks line-of-sight (full or partial).

The following summarizes NPC 300 POW noise impact requirements:

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 clauses are 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 and Climate Change."

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 and Climate Change."

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

The building must be constructed to standard Ontario Building Code requirements. Improved building components are required for the first 3 floors of the West façade as summarized in Table B.1.

4. Preliminary Stationary Noise Feasibility Study

A preliminary assessment of the Stationary Noise Impact Sources for the existing building and the neighboring buildings has been completed and determined that the Site is feasible for residential build of the proposed size. A full stationary noise impact study will be completed at Site Plan to determine if the new building's noise sources will affect the neighboring buildings. JJAE will also review the existing building's noise sources to determine if there are any negative noise impacts, since a stationary noise study was not completed for this building previously. If there is a noise impact due to the existing building, JJAE will determine the most effective approach to mitigate and minimize the noise impact.

5. 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, noise warning clauses for each unit and for the first 3-storeys special building components must be used as described in Attachment B1.

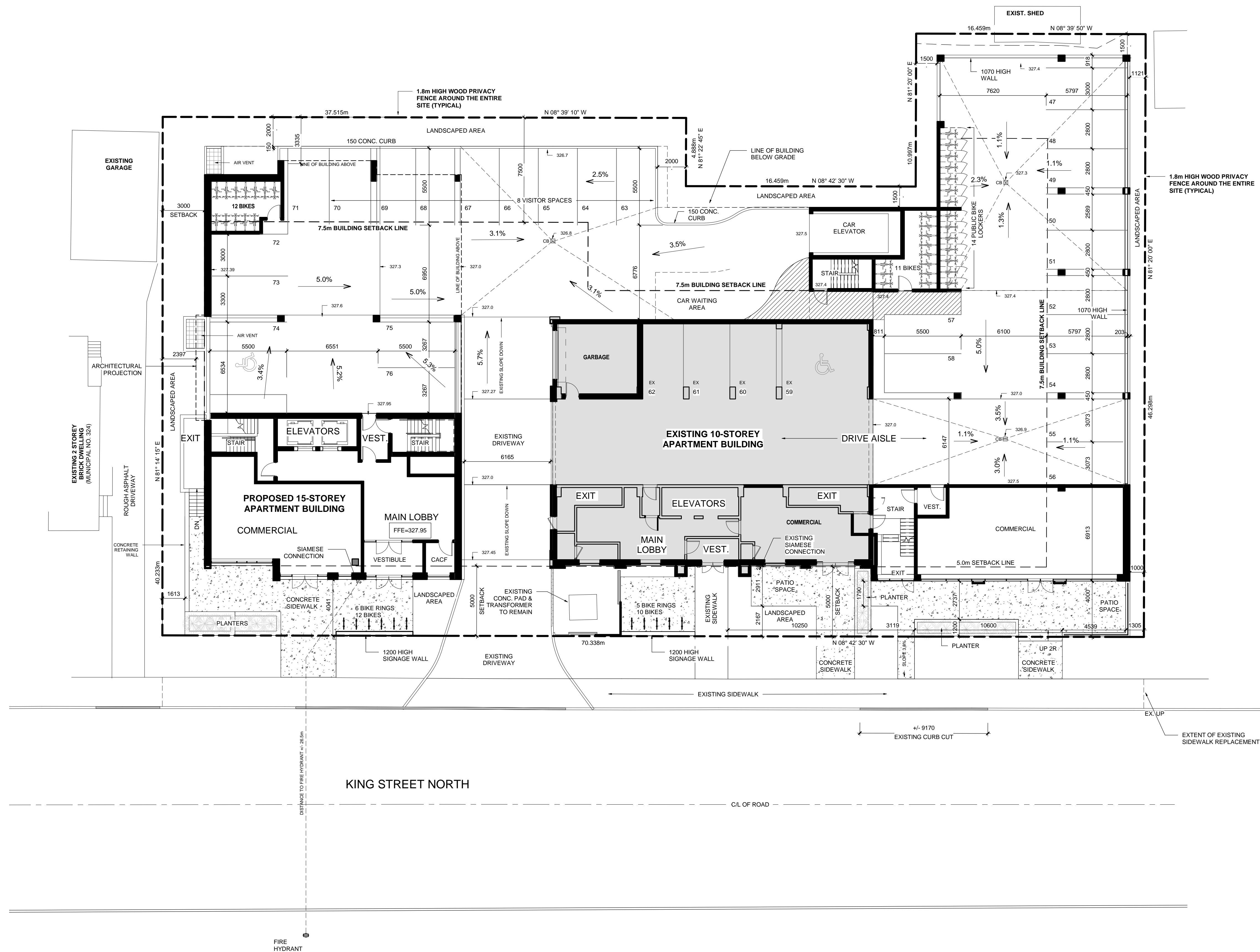
Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,



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

ATTACHMENT A



1 PROPOSED SITE PLAN
A1.0 SCALE: 1 : 150

DETAILS OF DEVELOPMENT		
DATA	REQUIRED	PROVIDED
MR-25 RMU-81		
LOT GROSS AREA	2634.80 m ²	
ROW & DLT AREA	N/A	
LOT NET AREA	2634.80 m ²	
BUILDING AREA	406.2m ² (Existing) 723.9m ² (Proposed) 1130.1m ² (Total)	
BUILDING COVERAGE	38.6%	
SETBACKS	FY	5.0m 4.0m
	RY	7.5m 1.5m-9m
	N.SY	3.0m min 3.0m
	S.SY	3.0m min 1.0m
COMBINATION.SY	10.0m	4.0m
MIN. FRONTAGE	N/A	70.338
MIN. FLANKAGE YARD	N/A	-
LOW RISE RES. SETBACK 1/2 HEIGHT OF BUILD.	N/A	-
NUMBER OF STOREYS	25	15
BUILDING HEIGHT (m)	75 m	54m
DENSITY CALCULATION	100-250 unit/ha	494 unit/ha
	min: 100x0.26348=26.348unit	
	max: 250x0.26348=65.87unit	
	provided: 130unit/0.26348=494unit/ha	
NUMBER OF UNITS	26-65	80 (Proposed) 130 (Total)
TOTAL BEDROOM	197	160 (Proposed) 260 (Total)
TOTAL BEDROOM/ha	750	986
LANDSCAPE AREA (m ²)	790	686m ²
	On grade : 341.4 m ²	
	Level 2 Terrace: 80 m ²	
	Level 12 Terrace: 57 m ²	
	Level 16 Terrace: 208 m ²	
LANDSCAPE (%)	30%	20%
IMPERVIOUS AREA		1573.5
PARKING REQUIRED 1 SPACE / UNIT	130	84
VISITOR AND COMMERCIAL PARKING (COMBINED)	N/A	8
TOTAL PARKING	130	92
BARRIER FREE SPACES 2% -5% OF TOTAL	2	2
BIKE RACK (2PER UNIT)	260 (RECM)	200
GARBAGE ENCLOSURE		INTERIOR
COMMERCIAL AREA		192 m ²
MIXED-USE COMMERCIAL PARKING 2/100m ²	4	1 / 14 RESIDENTIAL STALLS PROVIDED = 6

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND DISCREPANCIES TO THE CONSULTANT.

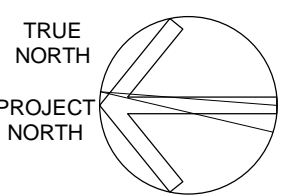
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REVISIONS:

NO.	DATE	ISSUED:
1	2018.03.02	PRECONSULTATION
2	2018.04.12	ZBA APPLICATION



PROJECT:
316 King St Redevelopment

MILESTONE DEVELOPMENTS CANADA INC.

DRAWING TITLE:

SITE PLAN

DATE: 2018.04.12 DRAWING NO.:
SCALE: 1 : 150
DRAWN: AJ
STATUS: ZBA
JOB NO.: 1806

A1.0

ATTACHMENT B

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location

316 King Street North, Waterloo, ON

2. Current AADT (2018)

15,410

3. Forecast AADT (2028)

17,020

4. Commercial Vehicle Rates

% Medium Trucks	1.5%
% Heavy Trucks	1.8%

5. Posted Speed Limit

50 km/h

6. Day/Night Splits

Regional Standard 90/10 Day/Night Split

7. Expiry Date

December 31st, 2019

8. Notes

This forecast is intended for the purpose of carrying out a noise study for the development at 316 King Street North, Waterloo. The AADT represents the estimated volumes along King Street North (University Ave to Columbia St West). 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.

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

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

Car traffic volume : 14813/1646 veh/TimePeriod *
Medium truck volume : 230/26 veh/TimePeriod *
Heavy truck volume : 276/31 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): 17020
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.50
Heavy Truck % of Total Volume : 1.80
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: King St. N (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 : 15.00 / 15.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Results segment # 1: King St. N (day)

Source height = 1.16 m

ROAD (0.00 + 65.56 + 0.00) = 65.56 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 65.56 0.00 0.00 0.00 0.00 0.00 0.00 65.56

Segment Leq : 65.56 dBA

Total Leq All Segments: 65.56 dBA

↑
Results segment # 1: King St. N (night)

Source height = 1.16 m

ROAD (0.00 + 59.06 + 0.00) = 59.06 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 59.06 0.00 0.00 0.00 0.00 0.00 0.00 59.06

Segment Leq : 59.06 dBA

Total Leq All Segments: 59.06 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 65.56
(NIGHT): 59.06



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

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

Car traffic volume : 14813/1646 veh/TimePeriod *
Medium truck volume : 230/26 veh/TimePeriod *
Heavy truck volume : 276/31 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): 17020
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.50
Heavy Truck % of Total Volume : 1.80
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: King St. N (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 : 15.00 / 15.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: King St. N (day)

Source height = 1.16 m

ROAD (0.00 + 62.55 + 0.00) = 62.55 dBA

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

0 90 0.00 65.56 0.00 0.00 -3.01 0.00 0.00 0.00 62.55

Segment Leq : 62.55 dBA

Total Leq All Segments: 62.55 dBA

↑

Results segment # 1: King St. N (night)

Source height = 1.16 m

ROAD (0.00 + 56.05 + 0.00) = 56.05 dBA

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

0 90 0.00 59.06 0.00 0.00 -3.01 0.00 0.00 0.00 56.05

Segment Leq : 56.05 dBA

Total Leq All Segments: 56.05 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 62.55
(NIGHT): 56.05



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

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

Car traffic volume : 14813/1646 veh/TimePeriod *
Medium truck volume : 230/26 veh/TimePeriod *
Heavy truck volume : 276/31 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): 17020
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.50
Heavy Truck % of Total Volume : 1.80
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: King St. N (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 : 15.00 / 15.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Results segment # 1: King St. N (day)

Source height = 1.16 m

ROAD (0.00 + 62.55 + 0.00) = 62.55 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.00 65.56 0.00 0.00 -3.01 0.00 0.00 0.00 62.55

Segment Leq : 62.55 dBA

Total Leq All Segments: 62.55 dBA

↑
Results segment # 1: King St. N (night)

Source height = 1.16 m

ROAD (0.00 + 56.05 + 0.00) = 56.05 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.00 59.06 0.00 0.00 -3.01 0.00 0.00 0.00 56.05

Segment Leq : 56.05 dBA

Total Leq All Segments: 56.05 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 62.55
(NIGHT): 56.05



Table B1

Road Traffic Noise Levels and Noise Mitigation Measures Summary
316 King Street North, Waterloo, Ontario

<i>Point-of-Reception ID</i>	<i>Road Sound Level at Point-of-Reception (Day) (Average Leq)</i>	<i>Road Sound Level at Point-of-Reception (Night) (Average Leq)</i>	<i>Ventilation Requirements NPC 300</i>	<i>Warning Clause NPC 300</i>	<i>Special Building Components</i>
<u>North Façade</u>					
North Façade 1	62.6 (dBA)	56.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 2	62.3 (dBA)	55.8 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 3	62.0 (dBA)	55.5 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 4	61.6 (dBA)	55.1 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 5	61.2 (dBA)	54.7 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 6	60.8 (dBA)	54.2 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 7	60.3 (dBA)	53.8 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 8	59.9 (dBA)	53.4 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 9	59.5 (dBA)	53.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 10	59.2 (dBA)	52.6 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 11	58.8 (dBA)	52.3 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 12	58.5 (dBA)	52.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 13	58.2 (dBA)	51.7 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 14	57.9 (dBA)	51.4 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
North Façade 15	57.6 (dBA)	51.1 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
<u>South Façade</u>					
South Façade 1	62.6 (dBA)	56.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 2	62.3 (dBA)	55.8 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 3	62.0 (dBA)	55.5 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 4	61.6 (dBA)	55.1 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 5	61.2 (dBA)	54.7 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 6	60.8 (dBA)	54.2 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 7	60.3 (dBA)	53.8 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 8	59.9 (dBA)	53.4 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 9	59.5 (dBA)	53.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 10	59.2 (dBA)	52.6 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 11	58.8 (dBA)	52.3 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 12	58.5 (dBA)	52.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 13	58.2 (dBA)	51.7 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 14	57.9 (dBA)	51.4 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade 15	57.6 (dBA)	51.1 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code

Table B1

**Road Traffic Noise Levels and Noise Mitigation Measures Summary
316 King Street North, Waterloo, Ontario**

East Façade

East Façade 1	55.6 (dBA)	49.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade 2	55.3 (dBA)	48.8 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade 3	55.0 (dBA)	48.5 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade 4	54.6 (dBA)	48.1 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 5	54.2 (dBA)	47.7 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 6	53.8 (dBA)	47.2 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 7	53.3 (dBA)	46.8 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 8	52.9 (dBA)	46.4 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 9	52.6 (dBA)	46.0 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 10	52.2 (dBA)	45.6 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 11	51.8 (dBA)	45.3 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 12	51.5 (dBA)	45.0 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 13	51.2 (dBA)	44.7 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 14	50.9 (dBA)	44.4 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade 15	50.7 (dBA)	44.1 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code

West Façade

West Façade 1	65.6 (dBA)	59.0 (dBA)	Provisions for Air Conditioning	Type D	Minimum Window STC Rating of 30
West Façade 2	65.3 (dBA)	58.8 (dBA)	Provisions for Air Conditioning	Type D	Minimum Window STC Rating of 29
West Façade 3	65.0 (dBA)	58.5 (dBA)	Provisions for Air Conditioning	Type D	Minimum Window STC Rating of 29
West Façade 4	64.6 (dBA)	58.1 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 5	64.2 (dBA)	57.7 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 6	63.8 (dBA)	57.2 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 7	63.3 (dBA)	56.8 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 8	62.9 (dBA)	56.4 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 9	62.6 (dBA)	56.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 10	62.2 (dBA)	55.6 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 11	61.8 (dBA)	55.3 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 12	61.5 (dBA)	55.0 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 13	61.2 (dBA)	54.7 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 14	60.9 (dBA)	54.4 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade 15	60.7 (dBA)	54.1 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code

Outdoor Amenity

16th Floor Rooftop OLA	50.7 (dBA)	44.1 (dBA)	Not Required	N/A	N/A
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Table B2
Road Traffic Noise Level Summary Table
316 King Street North, Waterloo, Ontario

Road Parameter Summary

Road	Annual Average Daily Traffic	Medium Trucks (%)	Heavy Trucks (%)	Daytime Traffic Split (%)	Road Gradient (%)	Pavement Type	Speed (km/h)
King St. N.	17020	1.5	1.8	90	0	1	50
North Facade Storey	Leq Day	Leq Night		East Facade Storey	Note 1 Leq Day	Leq Night	
	1	62.55	56.01		1	55.56	49.02
	2	62.32	55.78		2	55.33	48.79
	3	62.01	55.47		3	55.02	48.48
	4	61.62	55.08		4	54.63	48.09
	5	61.19	54.65		5	54.20	47.66
	6	60.76	54.22		6	53.77	47.23
	7	60.33	53.79		7	53.34	46.80
	8	59.92	53.38		8	52.93	46.39
	9	59.54	53.00		9	52.55	46.01
	10	59.17	52.63		10	52.18	45.64
	11	58.83	52.29		11	51.84	45.30
	12	58.50	51.96		12	51.51	44.97
	13	58.20	51.66		13	51.21	44.67
	14	57.91	51.37		14	50.92	44.38
	15	57.64	51.10		15	50.65	44.11

Note 1 - A 10 dBA reduction has been added to the East Façade due to Line of Sight to the Road from the Building

Table B2
Road Traffic Noise Level Summary Table
316 King Street North, Waterloo, Ontario

South Facade			West Facade		
Storey	Leq Day	Leq Night	Storey	Leq Day	Leq Night
	1	62.55		1	65.56
	2	62.32		2	65.33
	3	62.01		3	65.02
	4	61.62		4	64.63
	5	61.19		5	64.20
	6	60.76		6	63.77
	7	60.33		7	63.34
	8	59.92		8	62.93
	9	59.54		9	62.55
	10	59.17		10	62.18
	11	58.83		11	61.84
	12	58.50		12	61.51
	13	58.20		13	61.21
	14	57.91		14	60.92
	15	57.64		15	60.65

ATTACHMENT C

ATTACHMENT D

Name: _____

Address: _____

Re: Road Traffic Noise Impact Study, 316 King Street North, 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 Noise Impact Study, 316 King Street North, Waterloo, Ontario, dated April 11, 2018.

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.

Obie Mujawaz

Name



Signature

April 5, 2018

Date