

**Noise Assessment Report -134
Robinson Avenue**

Project # 160401443



Prepared for:
Robinson Village III Limited
Partnership

Prepared by:
Stantec Consulting Ltd.

August 15, 2019

NOISE ASSESSMENT REPORT -134 ROBINSON AVENUE

Introduction
August 15, 2019

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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

Stantec Consulting Ltd. has been retained by Robinson Village III Limited Partnership to prepare an environmental noise assessment for the proposed 4 storey building at 134 Robinson Avenue, located in the City of Ottawa. A site plan control application is being prepared and a Noise Assessment Study is required to address City policies regarding residential development adjacent to a 400-series highway.

The purpose of this report is to:

- outline the Ministry's guidelines and criteria for noise levels and residential land use;
- apply the noise level standards of the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 to the site in conjunction with the City of Ottawa document "Environmental Noise Control Guidelines" dated January 2016;
- determine the extent to which noise levels will be of concern to future residents users of the proposed development, using the computerized version (STAMSON 5.03) of the MECP's noise model;
- outline recommendations for noise attenuation, as necessary, to achieve acceptable noise levels for future residents of the proposed development.

1.2 LOCATION

The proposed development consists of 52 units and the site is located along the southern section of Robinson Avenue north of Hurdman Road. The proposed site is illustrated in **Figure 1**. This report will focus on the rooms with exposure to the 417 Highway.

Surrounding land uses are as follows:

- north – existing park and residential;
- east – existing commercial and residential;
- south – existing commercial;
- west – existing commercial.

The main potential noise source that may impact the subject site is vehicular traffic along the Highway 417. The traffic volumes for these roadways are based on the City of Ottawa document "Environmental Noise Control Guidelines" (2016).

Additional noise sources considered for assessment in this report were the Hurdman Bus Station, the Ottawa Train Station, and the City of Ottawa municipal work yard. It was found that the

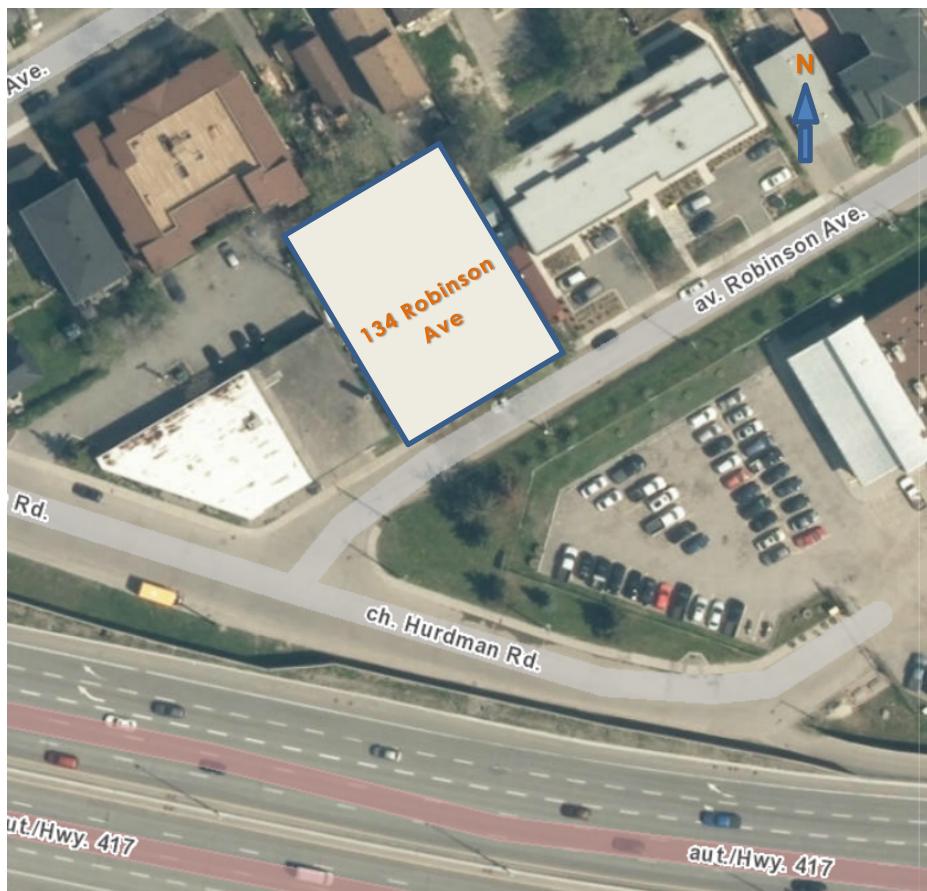
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Hurdman Bus Station falls outside of the required 300m distance from the proposed site set out by the City of Ottawa Environmental Noise Control Guidelines, and was not assessed in this report. The railway alignment for the Ottawa Train Station is approximately 295m away from the site, however, the alignment at that point has an obstructive grade differential due to its crossing under the 417 highway (as well as obstruction by the Lees interchange crossing over the 417) and was therefore not considered as a potential noise source. Lastly, the Ottawa municipal work yard, despite falling within the required 300m distance, has an anticipated use that was not deemed to be a stationary noise concern due to lack of an existing noise ECA, and work yard development taking place after existing residential buildings in proximity to the site, implying no significant changes to anticipated noise levels beyond background urban hum.

Figure 1 – 134 Robinson Avenue Development



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Noise Level Criteria
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2.0 NOISE LEVEL CRITERIA

2.1 GUIDELINES

The Ontario Ministry of the Environment, Conservation and Parks (MECP) has produced guidelines for noise levels for use in noise assessment and land use planning. Noise level criteria for residential land use are summarized in **Table 1** below. Noise levels in excess of the guidelines presented are acceptable under certain conditions and with certain provisions.

Table 1 Noise Criteria for Residential Land Use

Location	7 a.m. - 11 p.m.	11 p.m. - 7 a.m.
Outdoor Living Areas	55 dBA	N/A
Indoor Living Areas	55 dBA at plane of living room windows	50 dBA at plane of bedroom windows

Table 2 and **Table 3** on the following page set out the required provisions to allow residential activity in locations where noise level criteria exceedances prior to mitigation are expected.

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**Table 2 Combination of Road and Rail Noise
Day-Time Outdoor, Ventilation and Warning Clause Requirements**

Location	Leq (16 hr) (dBA)	Ventilation Requirements	Outdoor Control Measures	Warning Clause
Outdoor Living Area	Leq16hr less than or equal to 55 dBA	N/A	None required	Not required
	Leq16hr greater than 55 dBA to less than or equal to 60 dBA	N/A	Control measures (barriers) may not be required but should be considered	Required if resultant Leq exceeds 55 dBA Clause GO
	Leq16hr greater than 60 dBA	N/A	Control measures (barriers) required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible	Required if resultant Leq exceeds 60 dBA Clause MO
Plane of Living Room Window	Leq16hr less than or equal to 55 dBA	None required	N/A	Not required
	Leq16hr greater than 55 dBA to less than or equal to 65 dBA	Forced air heating with provision for central air conditioning	N/A	Required Clause GI
	Leq16hr greater than 65 dBA	Central air conditioning	N/A	Required Clause MI

(Source: Ministry of the Environment Conservation and Parks, Environmental Noise Guideline – Stationary and Transportation Sources- Approval and Planning – Publication NPC-300, August 2013 and City of Ottawa, Environmental Noise Control Guidelines, January 2016)

**Table 3 Combination of Road and Rail Noise,
Night-Time Ventilation and Warning Clause Requirements**

Location	Leq (8 hr) (dBA)	Ventilation Requirements	Outdoor Control Measures	Warning Clause
Plane of Bedroom Window	Leq8hr greater than 50 dBA to less or equal to 60 dBA	Forced air heating with provision for central air conditioning	N/A	Required Clause GI
	Leq8hr greater than 60 dBA	Central air conditioning	N/A	Required Clause MI

(Source: Ministry of the Environment Conservation and Parks, Environmental Noise Guideline – Stationary and Transportation Sources- Approval and Planning – Publication NPC-300, August 2013 and City of Ottawa, Environmental Noise Control Guidelines, January 2016)

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The MECP also specifies building component requirements when indoor noise levels exceed the criteria by certain levels. These requirements are summarized in **Table 4**.

Table 4 Road and Rail Noise – Building Component Requirements

Location		Leq (16 hr) (dBA)	Building Component Requirements
Plane of Living Room Window – Daytime	Road	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
		Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	Rail	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
Plane of Bedroom Window - Nighttime	Road	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	Rail	Less than or equal to 55 dBA	Building compliant with the Ontario Building Code
		Greater than 55 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

(Source: Ministry of the Environment Conservation and Parks, Environmental Noise Guideline - Stationary and Transportation Sources- Approval and Planning - Publication NPC-300, August 2013 and City of Ottawa, Environmental Noise Control Guidelines, January 2016)

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Observations and Calculations
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3.0 OBSERVATIONS AND CALCULATIONS

3.1 NOISE LEVEL PREDICTIONS

Noise predictions in this report were completed using the computerized version (STAMSON 5.03) of the MECP noise model ORNAMENT to calculate noise levels from various sources. The program accepts variables related to noise sources and receivers, road traffic volumes, and the nature and extent of noise mitigation features, if required.

3.2 ROAD TRAFFIC VOLUMES

Traffic volume data for Highway 417 was provided by the City of Ottawa document "Environmental Noise Control Guidelines" dated January 2016. The document indicates that the average annual daily traffic volume for Highway 417 will be 18,333 vehicles per lane per day for a 4-lane eastbound and 4-lane westbound highway. Additional information regarding applicable assumptions and ratios for day/night traffic and car/ truck traffic is summarized as follows:

- heavy truck traffic for this segment is estimated to be 5% of total traffic volume;
- medium truck traffic for this segment is estimated to be 7% of total traffic volume; the rest is assumed to be car traffic;
- daytime (7 am – 11 pm) traffic is assumed to be 92%, with the remaining 8% at night (11 pm – 7 am); and
- the speed limit for Highway 417 is 100 km/hr

Table 5 and **Table 6** summarizes the traffic volumes used for calculations in this report.

Table 5 Traffic Volumes, 4-Lane Eastbound Highway

	Day	Night	Total
Car	59,370	5,163	64,532
Medium Truck	4,723	411	5,133
Heavy Truck	3,373	293	3,667
TOTAL	67,465	5,867	73,332
Speed Limit	100 km/h		
Gradient	1%		
Surface	Asphalt		

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Table 6 Traffic Volumes, 4-Lane Westbound Highway

	Day	Night	Total
Car	59,370	5,163	64,532
Medium Truck	4,723	411	5,133
Heavy Truck	3,373	293	3,667
TOTAL	67,465	5,867	73,332
Speed Limit	100 km/h		
Gradient	1%		
Surface	Asphalt		

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3.3 PROJECTED NOISE LEVELS

Using the MECP noise model ORNAMENT, noise levels were calculated for daytime and nighttime conditions at the point representing the anticipated building location based on the site plan prepared by Figurr Architects Collective. The resulting receiver sites are illustrated in **Figure 2** and **Figure 3**.

The receiver heights for indoor, daytime, and nighttime noise level calculations for the proposed buildings were assessed at the mid-height of each floor. Building elevation drawings are provided in **Appendix B** as well as the floor plans indicating the receiver locations.

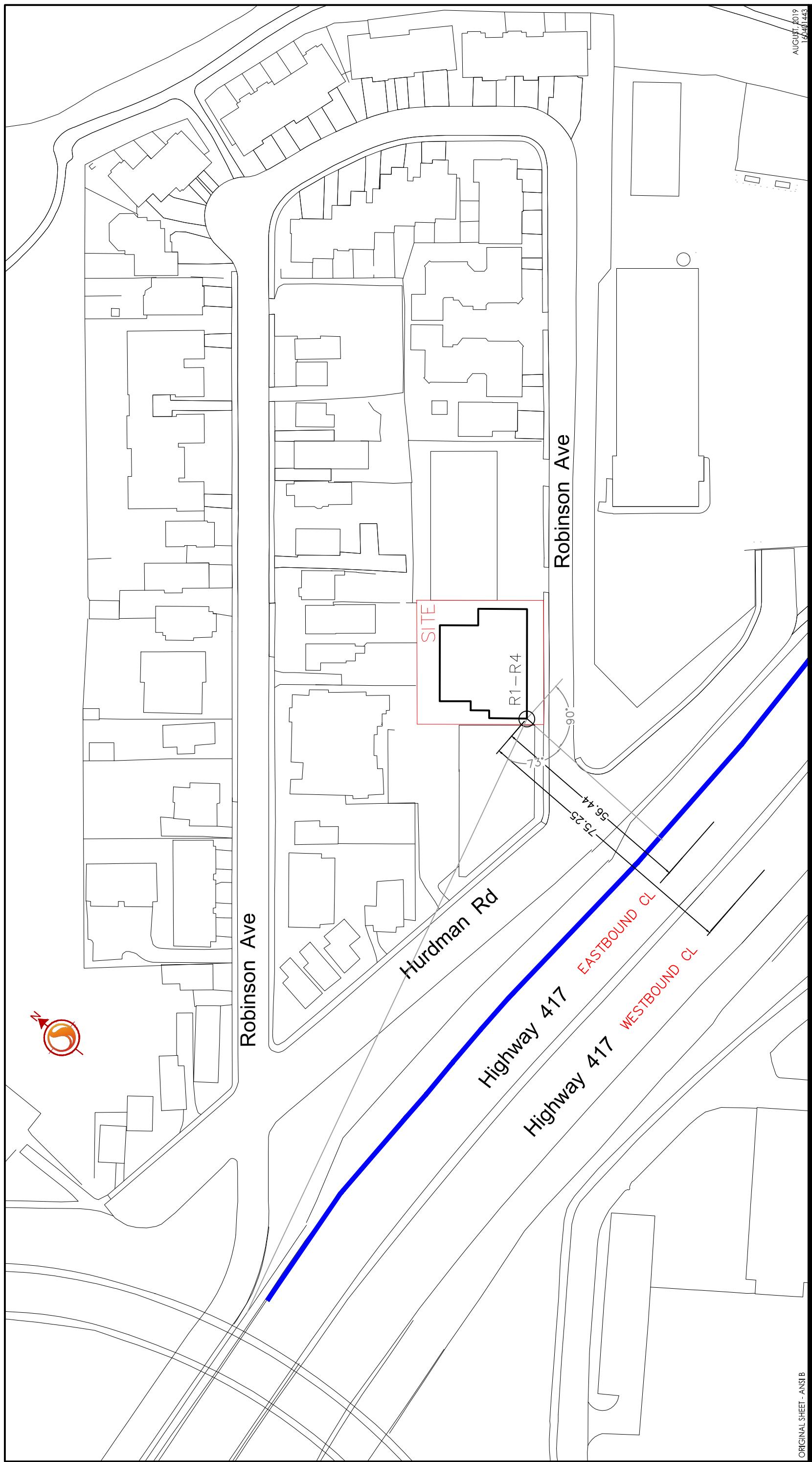
Upon assessing the developments noise exposure to the Highway 417 it was found that an embankment conceals the development from noise west of the Robinson Avenue overpass, and the Hurdman Yard garage and additional greenspace along the Rideau River shield the development east of the river. Moreover, an adjacent row of housing was considered to affect the indoor noise levels of the basement and first floor of the building as well as the outdoor ground floor amenity area. Such impacts were not considered for the receivers on the second to fourth floor as the building was based on the height of the adjacent row of housing.

The difference in the anticipated noise levels at each floor height is reflected in **Table 7**.

The unattenuated receiver noise levels have been summarized in **Table 7**, and noise level calculations are provided in **Appendix A** for sound levels at daytime and nighttime building face.

Table 7 Summary of Projected Unattenuated Noise Levels

Receiver Site	Location	Elevation (m)	Daytime-Building Face (dBA)	Nighttime-Building Face (dBA)	Outdoor Amenity Area (dBA)
R1	South Building Face – Basement Floor	0.6	65.2	57.6	-
R2	South Building Face - 1st Floor	4.4	67.2	59.6	-
R3	South Building Face - 2nd Floor	7.1	69.0	61.5	-
R4	South Building Face - 3rd Floor	9.9	70.2	62.6	-
R5	South Building Face – 4th Floor	12.6	74.5	66.9	-
ROUT	Outdoor Amenity Area	1.5	-	-	52.9
RROOF	Rooftop Amenity Area	15.5	-	-	74.0



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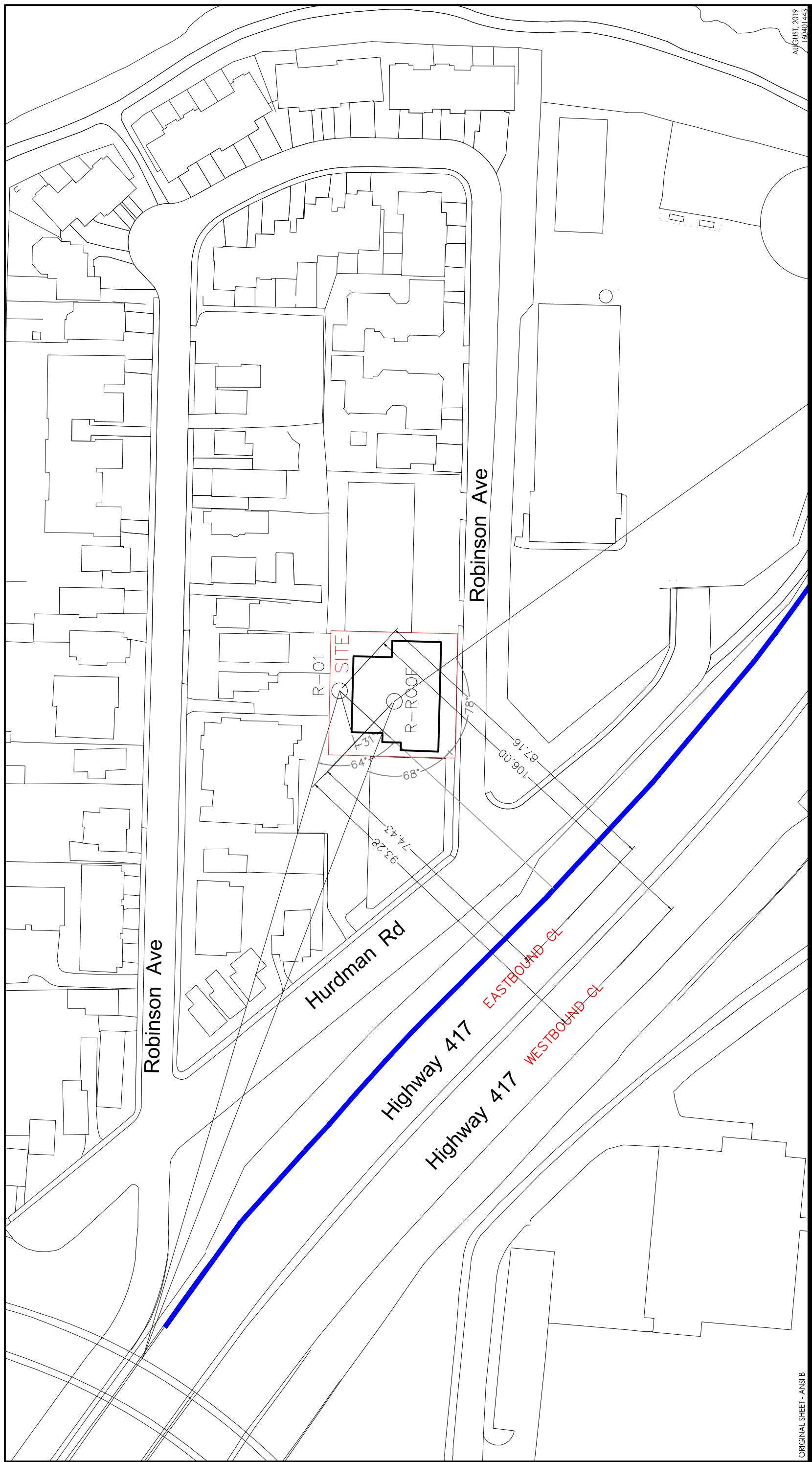
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INDOOR RECEIVERS
PLAN VIEW

— EXISTING NOISE WALL—5m



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— EXISTING NOISE WALL—5m

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134 ROBINSON AVENUE
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Figure No.
3.0

Title
OUTDOOR RECEIVER
PLAN VIEW

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4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 OUTDOOR NOISE IMPACTS

Predicted noise levels lie within City of Ottawa and MECP criteria at the outdoor living area for the potential building with exposure to Highway 417.

The predicted noise level for the outdoor ground floor amenity area located at the rear of the proposed building is 52.9 dBA. This falls within the accepted City of Ottawa and MECP criteria noise level standards and therefore there are no additional measures required for outdoor noise mitigation.

A sensitivity analysis was conducted for the rooftop amenity area with the intent to reduce the resulting noise levels to below the 55 dBA threshold via noise walls with a minimum surface density of 20kg/m². The rooftop terrace would require noise barriers with heights above 2.5m to attenuate noise levels in the OLA to 55dBA, and reduction of noise levels to 60 dBA is unachievable at the 2.5m maximum wall height. Due to limitations in the STAMSON software which only allows one barrier to be modeled, the existing 5.0m noise barrier along Highway 417 was not included.

Three noise wall heights surrounding the terrace were modeled to compare the anticipated attenuated noise level. A summary of the attenuated noise generated can be found in Table 8. A noise barrier of 1.5 m is currently proposed to mitigate the outdoor noise levels on the rooftop to provide a minimum noise reduction of 5dBA beyond background levels.

Table 8 Summary of Projected Attenuated Outdoor Living Area Noise Levels

Receiver	Unattenuated Noise Level (dBA)	Noise Wall Height (m)	Attenuated Noise Level (dBA)	Δ Noise Level (dBA)
RROOF 1.5	73.97	1.50	66.74	7.23
RROOF 1.8	73.97	1.80	65.69	8.28
RROOF 2.5	73.97	2.50	63.42	10.55

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4.2 INDOOR NOISE IMPACTS

Predicted noise levels are above City of Ottawa and MECP criteria at the daytime building face and the nighttime building face for the proposed units with exposure to Highway 417.

The following summarizes the measures required by the City of Ottawa and MECP criteria for the development to occur within accepted standards:

- Based on the predicted noise levels proposed units within 134 Robinson Avenue on the basement floor units fall under the noise warning clause Generic Indoor Noise Mitigation (GI) that requires the provision for a central air conditioning system to be installed.
- On all offers of purchase for units with noise warning clause GI, the following information is required to be disclosed:
 - "Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks."
- Based on the predicted noise levels proposed units within 134 Robinson Avenue on the first to fourth floors fall under the noise warning clause Extensive Indoor Noise Mitigation (MI). These units require the installation of a central air conditioning system to be installed and attenuation features as a part of the building construction that should reduce the noise levels to accepted standards, see Table 9.
- On all offers of purchase for units with noise warning clause MI, the following information is required to be disclosed:
 - "This dwelling unit has been supplied with a forced central air conditioning system and other measures 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 City of Ottawa and the Ministry of the Environment Conservation and Parks."

Noise warning clauses are provided in **Appendix C**.

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4.3 INDOOR NOISE MITIGATION – AIF METHOD

The following building components will apply based on the Acoustical Insulation Factor (AIF) method, as per “Environmental Noise Assessment in Land Use Planning Manual”, 1999. The AIF value and minimum building component were based off the preliminary unit floor plans and were calculated using the predicted noise levels on the third and fourth floor as they are the worst-case condition. The calculated noise levels requiring mitigation were between 70.2 dBA - 74.5 dBA at the west side of the building during the daytime and between 62.6 dBA -66.9 dBA during the nighttime. These noise levels were used to determine the typical building components required for the building façade.

Table 9 summarizes the AIF values and minimum building components and **Appendix B** provides the floor plans and sample calculations.

Table 9 AIF Summary

Floor	Room	Wall	AIF Value	Type of Window Glazing	Type of Exterior Wall	Type of Door
1 st , 2nd and 3rd Floor	Units 105-405	1	30	2 (28) 2	EW1	D2
	Units 105-405 Bedroom	1	30	2 (22) 2	EW1	-
	Units 102-104, 202-204, 302-304, and 402-404	1	30	2 (13) 2	EW1	D2
	Units 101-401	1	33	2 (18) 2	EW1	D4
		2	33	2 (35) 2		
	Units 101-401Bedroom 1	1	30	2 (22) 2	EW1	-
	Units 101-401Bedroom 2	2	30	2 (6) 2	EW1	-
	Stairwell	2	27	-	EW1	-
	Units 110-410	2	27	-	EW1	-
	Units 110-410 Bedroom 1	2	30	2 (22) 2	EW1	-
4 th Floor	Units 105-405	1	35	2 (63) 2	EW1	D5

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Units 105-405 Bedroom	1	35	2 (63) 2	EW1	-
Units 102-104, 202-204, 302-304, and 402-404	1	35	2 (28) 2	EW1	D5
Units 101-401	1	38	2 (50) 2	EW1	D2-sd
	2	38	2 (100) 2	EW2	
Units 101-401 Bedroom 1	1	35	2 (63) 2	EW2	-
Units 101-401 Bedroom 2	2	35	2 (50) 2	EW2	-
Stairwell	2	32	-	EW1	-
Units 110-410	2	32	-	EW1	-
Units 110-410 Bedroom 1	2	35	2 (50) 2	EW1	-
Units 110-410 Bedroom 2	2	32	2 (28) 2	EW1	-

As the noise levels exceed the MECP Criteria, building components including walls and windows are to be designed so the indoor sound levels comply with MECP noise criteria by using EW1 and EW2 as illustrated above. In this situation, double glazed windows with 2mm and 3mm thickness and various spacing outlined above would be required. The building windows with an equivalent AIF may be substituted for the recommended thickness, glazing and spacing. E.g. a double glazed 3mm pane with 6mm spacing may be substituted for double glazed 2mm panes with 15mm spacing.

EW1 construction consists of:

- 12.7 mm gypsum board, vapour barrier, and 38x89 studs with 50 mm mineral wool or glass fibre batts in inner stud cavities. As well as sheathing and wood siding or metal siding and fibre backer board.

EW2 construction consists of:

- 12.7 mm gypsum board, vapour barrier, and 38x89 studs with 50 mm mineral wool or glass fibre batts in inner stud cavities. As well as rigid insulation(25-30mm) and wood siding or metal siding and fibre backer board.

Should the actual floor plans differ from the plans shown in **Appendix B**, updated calculations must be performed prior to the issuance of building permits.

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The inclusion of these measures will allow the residential development to proceed in accordance with MECP criteria with respect to environmental noise.

Respectfully submitted by:



Cameron Odam
Engineering Intern



Dustin Thiffault, P.Eng.,
Project Engineer

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Appendix A Noise Level Calculations
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Appendix A NOISE LEVEL CALCULATIONS

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Appendix A Noise Level Calculations
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A.1 INDOOR RECEIVER STAMSON REPORTS

STAMSON 5.0 NORMAL REPORT Date: 14-08-2019 08:41:53
 MINISTRY OF ENVIRONMENT AND ENERGY / NOTE ASSESSMENT
 Filename: r1.te Time Period: Day/Night 16/8 hours
 Description: R1 - INDOOR

Road data, segment # 1: East 417 (day/night)

Car traffic volume	: 59370/5163	veh/TimePeriod	*
Medium truck volume	: 4723/411	veh/TimePeriod	*
Heavy truck volume	: 3373/293	veh/TimePeriod	*
Posted speed limit	: 100 km/h		
Road gradient	:	1 %	(Typical asphalt or concrete)
Road pavement	:	1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	: 73332
Percentage of Annual Growth	: 0.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 7.00
Heavy Truck % of Total Volume	: 5.00
Day (16 hrs) % of Total Volume	: 92.00

Data for Segment # 1: East 417 (day/night)

Ang1e1	Angle2	: -73.00 deg	90.00 deg
Wood depth		0	(No woods.)
No of house rows		1 / 1	
House density		50 %	
Receiver source distance		56.44 / 56.44 m	(Reflective ground surface)
Topography		0.62 / 0.62 m	(Flat/gentle slope; with barrier)
Barrier angle1		-73.00 deg	Angle2 : 90.00 deg
Barrier height		49.20 / 49.20 m	
Barrier receiver distance		60.43 m	
Source elevation		60.43 m	
Barrier elevation		60.00 m	
Reference angle		0.00	

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

24 hr Traffic Volume (AADT or SADT)	: 73332
Percentage of Annual Growth	: 0.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 7.00
Heavy Truck % of Total Volume	: 5.00
Day (16 hrs) % of Total Volume	: 92.00

Road data, segment # 2: west 417 (day/night)

Car traffic volume	: 59370/5163	veh/TimePeriod	*
Medium truck volume	: 4723/411	veh/TimePeriod	*
Heavy truck volume	: 3373/293	veh/TimePeriod	*
Posted speed limit	: 100 km/h		
Road gradient	:	1 %	(Typical asphalt or concrete)
Road pavement	:	1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	: 73332
Percentage of Annual Growth	: 0.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 7.00
Heavy Truck % of Total Volume	: 5.00
Day (16 hrs) % of Total Volume	: 92.00

INDOOR.txt INDOOR.txt
 Data for Segment # 2: west 417 (day/night)
 Ang1e1 Angle2 : -73.00 deg 90.00 deg
 wood depth : 0.00 (No woods.)
 No of house rows : 1 / 1
 House density : 50 % (Reflective ground surface)
 Surface receiver distance : 75.25 / 75.25 m
 Receiver height : 0.62 / 0.62 m (Reflective ground surface)
 Topography : -73.00 deg (Flat/gentle slope; with barrier)
 Barrier angle1 : 5.00 m Angle2 : 90.00 deg
 Barrier height : 49.20 / 49.20 m
 Barrier receiver distance : 60.20 m
 Source elevation : 60.43 m
 Receiver elevation : 60.00 m
 Reference angle : 0.00 m
 Results segment # 1: East 417 (day)
 Source height = 1.50 m
 Barrier height for grazing incidence
 Source Height (m) : 1.50 ! Barrier Height (m) : 0.62 ! Elevation of Barrier Top (m) : 61.61 !
 ROAD (0.00 + 61.22 + 0.00) = 61.22 dBa
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -73 90 0.00 81.40 0.00 -5.75 -0.43 0.00 -2.71 0.00 -13.99 61.22
 -73 90 0.00 81.40 0.00 -5.75 -0.43 0.00 0.00 0.00 -13.99 61.22
 Segment Leq : 61.22 dBa
 Results segment # 2: west 417 (day)
 Source height = 1.50 m
 Barrier height for grazing incidence
 Source Height (m) : 1.50 ! Barrier Height (m) : 0.62 ! Elevation of Barrier Top (m) : 61.47 !
 ROAD (0.00 + 62.93 + 0.00) = 62.93 dBa
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -73 90 0.00 81.40 0.00 -7.00 -0.43 0.00 -2.67 0.00 71.29
 -73 90 0.00 81.40 0.00 -7.00 -0.43 0.00 0.00 0.00 62.93
 Segment Leq : 62.93 dBa

Total Leq All Segments: 65.17 dBA
Results segment # 1: East 417 (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	0.62	1.61	61.61

ROAD (0.00 + 53.62 * 0.00) = 53.62 dBA
Angle1 Angle2 Alpha RefEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubEq

Angle1	Angle2	Alpha	RefEq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubEq
-73	90	0.00	73.80	0.00	-5.75	-0.43	0.00	-2.71	0.00	64.90
-73	90	0.00	73.80	0.00	-5.75	-0.43	0.00	-13.99	53.62	-

Segment Leq : 53.62 dBA

Results segment # 2: West 417 (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	0.62	1.47	61.47

ROAD (0.00 + 55.33 * 0.00) = 55.33 dBA
Angle1 Angle2 Alpha RefEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubEq

Angle1	Angle2	Alpha	RefEq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubEq
-73	90	0.00	73.80	0.00	-7.00	-0.43	0.00	-2.67	0.00	63.69
-73	90	0.00	73.80	0.00	-7.00	-0.43	0.00	-11.03	55.33	-

Segment Leq : 55.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.17

(NIGHT): 57.57

STAMSON 5.0 NORMAL REPORT Date: 14-08-2019 08:48:11

MINISTRY OF ENVIRONMENT AND ENERGY / NOTE ASSESSMENT

File name: r2-te Time Period: Day/Night 16/8 hours

Description: R2 - INDOOR

Road data, segment # 1: East 417 (day/night)

Car traffic volume	veh/TimePeriod	Medium truck volume	veh/TimePeriod	Heavy truck volume	veh/TimePeriod	Posted speed limit	km/h	Road gradient	1%	Road pavement
59370/5163	*	4723/411	*	3373/293	*	100	100	1	(Typical asphalt or concrete)	-

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

24 hr Traffic volume (AADT or SADT): 73332

File name: r2-te

Description: R2 - INDOOR

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

24 hr Traffic volume (AADT or SADT): 73332

File name: r2-te

Description: R2 - INDOOR

INDOOR.txt

Percentage of Annual Growth	Number of Years of Growth	Medium Truck % of Total Volume	Heavy Truck % of Total Volume	Day (16 hrs) % of Total Volume	
:	:	7.00	5.00	92.00	:

Data for Segment # 1: East 417 (day/night)

Angle1	Angle2	wood depth	No of house rows	Surface	Receiver source distance	Receiver height	Topography	Barrier angle1	Barrier receiver distance	Barrier height	Source elevation	Receiver elevation	Barrier elevation	Reference angle
:	:	-73.00 deg	(No woods.)	1 / 1	50 %	56.44 / 56.44 m	4.35 / 4.35 m	56.44 / 56.44 m	49.20 / 49.20 m	5.00 m	60.20 m	60.43 m	60.00 m	0.00

Road data, segment # 2: west 417 (day/night)

Angle1	Angle2	wood depth	No of house rows	Surface	Receiver source distance	Receiver height	Topography	Barrier angle1	Barrier receiver distance	Barrier height	Source elevation	Receiver elevation	Barrier elevation	Reference angle
:	:	-73.00 deg	(No woods.)	1 / 1	50 %	75.25 / 75.25 m	4.35 / 4.35 m	75.25 / 75.25 m	49.20 / 49.20 m	5.00 m	60.20 m	60.43 m	60.00 m	0.00

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

24 hr Traffic volume (AADT or SADT)	Car traffic volume	Medium truck volume	Heavy truck volume	Posted speed limit	Road gradient	Road Pavement
73332	59370/5163	4723/411	3373/293	100 km/h	1 %	1 (typical asphalt or concrete)

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

24 hr Traffic volume (AADT or SADT)	Car traffic volume	Medium truck volume	Heavy truck volume	Posted speed limit	Road gradient	Road Pavement
73332	59370/5163	4723/411	3373/293	100 km/h	1 %	1 (typical asphalt or concrete)

INDOOR.txt

Results segment # 1: East 417 (day)

Source height = 1.50 m					
Barrier height for grazing incidence					
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)		
1.50	4.35	2.09	62.09		

ROAD (0.00 + 62.34 + 0.00) = 62.34 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLq
 -73 90 0.00 81.40 0.00 -5.75 -0.43 0.00 -2.71 -0.00 -0.43 0.00 -2.71 -0.00 -12.87 62.34
 -73 90 0.00 81.40 0.00 -5.75 -0.43 0.00 -2.71 -0.00 -0.43 0.00 -2.71 -0.00 -12.87 62.34

Segment Leq : 62.34 dBA

Results segment # 2: West 417 (day)

Source height = 1.50 m					
Barrier height for grazing incidence					
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)		
1.50	4.35	2.76	62.76		

ROAD (0.00 + 65.48 + 0.00) = 65.48 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLq
 -73 90 0.00 81.40 0.00 -7.00 -0.43 0.00 -2.67 0.00 71.29
 -73 90 0.00 81.40 0.00 -7.00 -0.43 0.00 -2.67 0.00 65.48

Segment Leq : 65.48 dBA

Total Leq All Segments: 67.20 dBA

Results segment # 1: East 417 (night)

Source height = 1.49 m					
Barrier height for grazing incidence					
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)		
1.49	4.35	2.09	62.09		

Segment Leq : 54.74 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLq
 -73 90 0.00 73.80 0.00 -5.75 -0.43 0.00 -2.71 0.00 64.90
 -73 90 0.00 73.80 0.00 -5.75 -0.43 0.00 -2.71 0.00 54.74

INDOOR.txt

Segment Leq : 54.74 dBA
 Results segment # 2: west 417 (night)

Source height = 1.49 m					
Barrier height for grazing incidence					
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)		
1.49	4.35	2.76	62.76		

ROAD (0.00 + 57.89 + 0.00) = 57.89 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLq
 -73 90 0.00 73.80 0.00 -7.00 -0.43 0.00 -2.67 0.00 63.69
 -73 90 0.00 73.80 0.00 -7.00 -0.43 0.00 -2.67 0.00 57.89

Segment Leq : 57.89 dBA
 Total Leq All Segments: 59.60 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.20
 (NIGHT): 59.60

STAMSON 5.0
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te
 Description: R3 - INDOOR
 Time Period: Day/Night 16/8 hours

Road data, segment # 1: East 417 (day/night)

Car traffic volume	: 59370/5163	veh/TimePeriod	*
Medium truck volume	: 4723/411	veh/TimePeriod	*
Heavy truck volume	: 3323/293	veh/TimePeriod	*
Posted speed limit	: 10 km/h		
Road gradient	: 1 %		
Road pavement	: 1 (typical asphalt or concrete)		

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

24 hr Traffic Volume (AADT or SADT)	: 73332
Percentage of Annual Growth	: 0.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 7.00
Heavy Truck % of Total Volume	: 5.00
Day (16 hrs) % of Total Volume	: 92.00
Surface	
Angle1, Angle2	: -73.00 deg
wood depth	: 0 / 0
No of house rows	: 0 / 0
Receiver source distance	: 57.28 / 57.28 m
Receiver height	: 7.11 / 7.11 m
Topography	: 2 (Flat/gentle slope; with barrier)
Barrier angle1	: -73.00 deg
Barrier height	: 5.00 m
Barrier receiver distance	: 49.20 / 49.20 m

Source elevation : 60.20 m
 Receiver elevation : 60.43 m
 Barrier elevation : 60.00 m
 Reference angle : 0.00

INDOOR.txt

Results segment # 2: west 417 (day)

Source height = 1.50 m

Road data, segment # 2: west 417 (day/night)

Car traffic volume	: 59370/5163 veh/TimePeriod *
Medium truck volume	: 4723/411 veh/TimePeriod *
Heavy truck volume	: 3373/293 veh/TimePeriod *
Posted speed limit	: 100 km/h
Road gradient	: 1 %
Road pavement	: 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	: 73332
Percentage of Annual Growth	: 0.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 7.00
Heavy Truck % of Total Volume	: 5.00
Day (16 hrs) % of Total Volume	: 92.00

Data for Segment # 2: west 417 (day/night)

Ang1, Angle2	: -73.00 deg
Wood depth	: 0 / 0 (No woods.)
No of house rows	: 2
Surface	: 76.11 / 76.11 m (Reflective ground surface)
Receiver source distance	: 7.11 / 7.11 m
Receiver height	: 1.50 m
Topography	: Flat/gentle slope; with barrier
Barrier angle1	: -73.00 deg
Barrier height	: 5.00 m
Barrier receiver distance	: 49.20 / 49.20 m
Source elevation	: 60.20 m
Receiver elevation	: 60.43 m
Barrier elevation	: 60.00 m
Reference angle	: 0.00

Results segment # 1: East 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Elevation of Barrier Top (m)
1.50	+ 7.11	+ 2.52

ROAD (0.00 + 63.68 + 0.00) = 63.68 dBa

Angle1 Angle2 Alpha RefLq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLq	-73 90 0.00 81.40 0.00 -5.82 -0.43 0.00 0.00 -11.47 63.68
---	---

Segment Leq : 63.68 dBa

INDOOR.txt

Results segment # 2: west 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Elevation of Barrier Top (m)
1.50	+ 7.11	+ 2.52

ROAD (0.00 + 67.55 + 0.00) = 67.55 dBa

Angle1 Angle2 Alpha RefLq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLq	-73 90 0.00 81.40 0.00 -7.05 -0.43 0.00 0.00 -6.36 67.55
---	--

Segment Leq : 59.96 dBa

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Total Leq All Segments: 61.45 dBA
 TOTAL Leq FROM ALL SOURCES (DAY): 69.04
 (NIGHT): 61.45

INDOOR.txt

STANSON 5.0 NORMAL REPORT
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Date: 14-08-2019 12:12:14

Time Period: Day/Night 16/8 hours

Description: R4 - INDOOR

Road data, segment # 1: East 417 (day/night)

Car. traffic volume :	59370/5163
Medium truck volume :	4723/411
Heavy truck volume :	3373/293
Posted speed limit :	100 km/h
Road gradient :	1 %
Road pavement :	1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: East 417 (day/night)

Angle1	Angle2	-73.00 deg
wood depth		0 / 0 (No woods.)

No of house rows		0 / 0 (Reflective ground surface)
------------------	--	-----------------------------------

Receiver source distance		5.44 / 56.44 m
--------------------------	--	----------------

Receiver height		9.86 / 9.86 m
-----------------	--	---------------

Topography		2 (Flat/gentle slope; with barrier)
------------	--	-------------------------------------

Barrier angle1		-73.00 deg
----------------	--	------------

Barrier height		5.00 m
----------------	--	--------

Barrier receiver distance		49.20 / 49.20 m
---------------------------	--	-----------------

Source elevation		60.20 m
------------------	--	---------

Barrier elevation		60.43 m
-------------------	--	---------

Reference angle		0.00
-----------------	--	------

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

24 hr Traffic Volume (AADT or SADT): 73332

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

INDOOR.txt

Medium Truck % of Total Volume : 69.04
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: west 417 (day/night)

Angle1	Angle2	-73.00 deg
wood depth		0 / 0 (No woods.)

No of house rows		0 / 0 (Reflective ground surface)
------------------	--	-----------------------------------

Receiver source distance		5.44 / 56.44 m
--------------------------	--	----------------

Receiver height		9.86 / 9.86 m
-----------------	--	---------------

Topography		2 (Flat/gentle slope; with barrier)
------------	--	-------------------------------------

Barrier angle1		-73.00 deg
----------------	--	------------

Barrier height		5.00 m
----------------	--	--------

Barrier receiver distance		49.20 / 49.20 m
---------------------------	--	-----------------

Source elevation		60.20 m
------------------	--	---------

Barrier elevation		60.43 m
-------------------	--	---------

Reference angle		0.00
-----------------	--	------

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

24 hr Traffic Volume (AADT or SADT): 73332

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

INDOOR.txt

Medium Truck % of Total Volume : 69.04
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: west 417 (day/night)

Angle1	Angle2	-73.00 deg
wood depth		0 / 0 (No woods.)

No of house rows		0 / 0 (Reflective ground surface)
------------------	--	-----------------------------------

Receiver source distance		5.44 / 56.44 m
--------------------------	--	----------------

Receiver height		9.86 / 9.86 m
-----------------	--	---------------

Topography		2 (Flat/gentle slope; with barrier)
------------	--	-------------------------------------

Barrier angle1		-73.00 deg
----------------	--	------------

Barrier height		5.00 m
----------------	--	--------

Barrier receiver distance		49.20 / 49.20 m
---------------------------	--	-----------------

Source elevation		60.20 m
------------------	--	---------

Barrier elevation		60.43 m
-------------------	--	---------

Reference angle		0.00
-----------------	--	------

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

24 hr Traffic Volume (AADT or SADT): 73332

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

INDOOR.txt

Medium Truck % of Total Volume : 69.04
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: west 417 (day/night)

Angle1	Angle2	-73.00 deg
wood depth		0 / 0 (No woods.)

No of house rows		0 / 0 (Reflective ground surface)
------------------	--	-----------------------------------

Receiver source distance		5.44 / 56.44 m
--------------------------	--	----------------

Receiver height		9.86 / 9.86 m
-----------------	--	---------------

Topography		2 (Flat/gentle slope; with barrier)
------------	--	-------------------------------------

Barrier angle1		-73.00 deg
----------------	--	------------

Barrier height		5.00 m
----------------	--	--------

Barrier receiver distance		49.20 / 49.20 m
---------------------------	--	-----------------

Source elevation		60.20 m
------------------	--	---------

Barrier elevation		60.43 m
-------------------	--	---------

Reference angle		0.00
-----------------	--	------

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Total Leq All Segments: 70.15 dBA

INDOOR.txt

INDOOR.txt

Results segment # 1: East 417 (night)

Source height = 1.49 m
Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	9.86	2.80	62.80

ROAD (0.00 + 56.69 + 0.00) = 56.69 dBA
Angle1 Angle2 Alpha RefLefg P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLen

-73	90	0.00	73.80	0.00	-5.75	-0.43	0.00	0.00	-10.92	56.69
-----	----	------	-------	------	-------	-------	------	------	--------	-------

Segment Leg : 56.69 dBA

Results segment # 2: West 417 (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	9.86	4.67	64.67

ROAD (0.00 + 61.25 + 0.00) = 61.25 dBA
Angle1 Angle2 Alpha RefLefg P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLen

-73	90	0.00	73.80	0.00	-7.00	-0.43	0.10	0.00	-5.11	61.25
-----	----	------	-------	------	-------	-------	------	------	-------	-------

Segment Leg : 61.25 dBA

Total Leq All Segments: 62.55 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 70.15
(NIGHT) : 62.55
STANSON 5.0 NORMAL REPORT Date: 14-08-2019 08:50:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOTE ASSESSMENT

Filename: R5-te Time Period: Day/Night 16/8 hours

Description: R5 - INDOOR

Road data, segment # 1: East 417 (day/night)

Car traffic volume	Medium truck volume	Heavy truck volume	Posted speed limit
59370/5163 veh/TimePeriod	4723/411 veh/TimePeriod	3373/293 veh/TimePeriod	100 km/h

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Road gradient : 1 % (typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 73332
Percentage of Annual Growth : 0.00
Number of years of Growth : 0.00
Medium truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: East 417 (day/night)

Angle1 Angle2 : -73.00 deg (No woods.)
wood depth : 0 / 0 (Reflective ground surface)

No of house rows : 0 / 0
Surface : 56.44 / 56.44 m
Receiver source distance : 12.64 / 12.64 m
Receiver height : 12.64 / 12.64 m
Topography : -73.00 deg (Flat/gentle slope; with barrier)
Barrier angle1 : 90.00 deg
Barrier height : 5.00 m
Barrier receiver distance : 49.20 / 49.20 m
Source elevation : 60.20 m
Receiver elevation : 60.43 m
Barrier elevation : 60.00 m
Reference angle : 0.00

Road data, segment # 2: West 417 (day/night)

Angle1 Angle2 : -73.00 deg (No woods.)
wood depth : 0 / 0 (Reflective ground surface)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road Pavement : 1 (typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 73332
Percentage of Annual Growth : 0.00
Number of years of Growth : 0.00
Medium truck % of Total Volume : 5.00
Heavy Truck % of Total Volume : 7.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: West 417 (day/night)

Angle1 Angle2 : -73.00 deg (No woods.)
wood depth : 0 / 0 (Reflective ground surface)

No of house rows : 0 / 0
Surface : 75.25 / 75.25 m
Receiver source distance : 12.64 / 12.64 m
Receiver height : 5.00 m
Topography : -73.00 deg (Flat/gentle slope; with barrier)
Barrier angle1 : 90.00 deg
Barrier height : 5.00 m
Barrier receiver distance : 49.20 / 49.20 m
Source elevation : 60.20 m
Receiver elevation : 60.43 m
Barrier elevation : 60.00 m
Reference angle : 0.00

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Barrier elevation : 60.00 m INDOOR.txt
 Reference angle : 0.00

	Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
	-73	90	0.00	73.80	0.00	-5.75	-0.43	0.00	-9.79	57.82	

Results segment # 1: East 417 (day)

	Source height = 1.50 m	Barrier height for grazing incidence	Source height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
	1.50 !	12.64 !	3.15 !	63.15		

ROAD (0.00 + 65.42 + 0.00) = 65.42 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

	-73	90	0.00	81.40	0.00	-5.75	-0.43	0.00	-9.79	65.42	

Segment Leq : 65.42 dBA

Results segment # 2: West 417 (day)

	Source height = 1.50 m	Barrier height for grazing incidence	Source height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
	1.50 !	12.64 !	5.63 !	65.63		

ROAD (0.00 + 73.96 + 0.00) = 73.96 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

	-73	90	0.00	81.40	0.00	-7.00	-0.43	0.00	-4.56	69.40*	

* Bright Zone !

Segment Leq : 73.96 dBA
 Total Leq A11 Segments: 74.53 dBA

Results segment # 1: East 417 (night)

	Source height = 1.49 m	Barrier height for grazing incidence	Source height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
	1.49 !	12.64 !	3.15 !	63.15		

ROAD (0.00 + 57.82 + 0.00) = 57.82 dBA

NOISE ASSESSMENT REPORT -134 ROBINSON AVENUE

Appendix A Noise Level Calculations
August 15, 2019

A.2 OUTDOOR RECEIVER STAMSON REPORT

STAMSON 5.0 NORMAL REPORT Date: 14-08-2019 08:56:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ro1te Time Period: Day/Night 16/8 hours
Description: RO1 - OUTDOOR

Road data, segment # 2: West 417 (day/night)		
Car traffic volume	:	59370/5163
Medium truck volume	:	4723/411
Heavy truck volume	:	3373/293

Road data, segment # 1: East 417 (day/night)	
Car traffic volume	59370/5163 veh/Time Period *
Medium truck volume	4723/411 veh/Time Period *
Heavy truck volume	3373/293 veh/Time Period *
Posted speed limit	100 km/h
Road gradient	1 %
Road pavement	1 (Typical asphalt or concrete)

Road pavement : 1 (Typical asphalt or concrete)

24 hr Traffic Volume (AADT or SADT) :	733.32
Percentage of Annual Growth	: 0.00
Number of Years of Growth	: 0.00
Medium Truck % of Total Volume	: 7.00
Heavy Truck % of Total Volume	: 5.00
Day (16 hrs) % of Total Volume	: 92.00
Data for Segment # 1: East 417 (day/night)	
Angle1	: 33.00 deg
Angle2	: 64.00 deg
Wood depth	: 0 (No woods)
No of house rows	: 1 / 1
House density	: 90 %
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 87.16 / 87.16 m
Receiver height	: 1.50 / 1.50 m
Topography	: 2 (Flat/gentle slope; with barrier)
Barrier angle1	: 33.00 deg
Barrier height	: 5.00 m
Barrier receiver distance	: 78.96 / 78.96 m
Source elevation	: 60.20 m
Receiver elevation	: 61.00 m
Barrier elevation	: 60.00 m
Reference angle	: 0.00

STAMSON 5.0 NORMAL REPORT Date: 14-08-2019 12:07:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rroof.te Time Period: Day/Night 16/8 hours
Description: RROOF - UNATTENUATED OUTDOOR

Results segment # 1: East 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.77	61.77
48.66	64	0.36	81.40

$$\text{ROAD } (0.00 + 48.66 + 0.00) = 48.66 \text{ dBA}$$

Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg

$$52.17 \quad 33 \quad 64 \quad 0.66 \quad 81.40 \quad 0.00 \quad -12.69 \quad -8.87 \quad 0.00 \quad -7.67 \quad 0.00$$

$$48.66 \quad 33 \quad 64 \quad 0.36 \quad 81.40 \quad 0.00 \quad -10.39 \quad -8.32 \quad 0.00 \quad 0.00 \quad -14.02$$

Segment Leq : 48.66 dBA

Results segment # 2: West 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.90	61.90
51.46	64	0.36	81.40

$$\text{ROAD } (0.00 + 50.91 + 0.00) = 50.91 \text{ dBA}$$

Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg

$$50.91 \quad 33 \quad 64 \quad 0.66 \quad 81.40 \quad 0.00 \quad -14.10 \quad -8.87 \quad 0.00 \quad -7.52 \quad 0.00$$

$$51.46 \quad 33 \quad 64 \quad 0.36 \quad 81.40 \quad 0.00 \quad -11.55 \quad -8.32 \quad 0.00 \quad 0.00 \quad -10.06$$

Segment Leq : 50.91 dBA

Total Lq All Segments: 52.94 dBA
TOTAL Lq FROM ALL SOURCES (DAY): 52.94

Road data, segment # 1: East 417 (day/night)

Car traffic volume	:	59370/5163	veh/TimePeriod *
Medium truck volume	:	4723/411	veh/TimePeriod *
Heavy truck volume	:	3373/293	veh/TimePeriod *
Posted speed limit	:	100 km/h	
Road gradient	:	1 %	
Road pavement	:	1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT):	:	73332
Percentage of Annual Growth :	:	0.00
Number of Years of Growth :	:	0.00
Medium Truck % of Total Volume :	:	7.00
Heavy Truck % of Total Volume :	:	5.00
Day (16 hrs) % of Total Volume :	:	92.00

Data for Segment # 1: East 417 (day/night)

Angle1 Angle2	:	-78.00	deg	68.00 deg
Wood depth	:	0	/	(No woods.)
No of house rows	:	0	/	
Surface	:	1	/	(Absorptive ground surface)
Receiver source distance	:	74.43	/	74.43 m
Receiver height	:	1.50	/	1.50 m
Topography	:	4	/	(Elevated; with barrier)
Barrier angle1	:	-78.00	deg	Angle2 : 68.00 deg
Barrier height	:	0.00	m	
Elevation	:	14.03	m	
Barrier receiver distance	:	6.50	/	6.50 m
Source elevation	:	60.20	m	
Receiver elevation	:	74.46	m	
Barrier elevation	:	74.46	m	
Reference angle	:	0.00		

Segment Leq : 50.91 dBA

Road data, segment # 2: West 417 (day/night)

Car traffic volume	:	59370/5163	veh/TimePeriod	*
Medium truck volume	:	4723/411	veh/TimePeriod	*
Heavy truck volume	:	3373/293	veh/TimePeriod	*
Posted speed limit	:	100	km/h	
Road gradient	:	1	%	
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT) :	73332			
Percentage of Annual Growth :	0.00			
Number of Years of Growth :	0.00			
Medium Truck % of Total Volume :	7.00			
Heavy Truck % of Total Volume :	5.00			
Day (16 hrs) % of Total Volume :	92.00			

Data for Segment # 2: West 417 (day/night)

Angle1 Angle2	:	-78.00 deg	68.00 deg	
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	1	(Absorptive ground surface)	
Receiver source distance	:	93.28	/ 93.28 m	
Receiver height	:	1.50	/ 1.50 m	
Topography	:	1.50	/ (Elevated; with barrier)	
Barrier angle	:	-78.00 deg	Angle2 : 68.00 deg	
Barrier height	:	0.00 m		
Elevation	:	14.03 m		
Barrier receiver distance	:	6.50	/ 6.50 m	
Source elevation	:	60.20 m		
Receiver elevation	:	74.46 m		
Barrier elevation	:	74.46 m		
Reference angle	:	0.00		

Results segment # 1: East 417 (day)

Source height = 1.50 m				
Barrier height for grazing incidence				
Source ! Receiver ! Barrier ! Elevation of				
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)				

1.50 ! 1.50 ! 0.25 ! 74.71				
----------------------------	--	--	--	--

ROAD (0.00 + 71.52 + 0.00) = 71.52 dBA				
Angle1 Angle2 Alpha RefLqg P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj				
SubLqg				

66.73* -78 68 0.24 81.40 0.00 -8.62 -1.25 0.00 0.00 -4.79				
66.73* -78 68 0.24 81.40 0.00 -8.62 -1.25 0.00 0.00 0.00				
71.52				

* Bright Zone !

Segment Leg : 71.52 Dba				
Results segment # 2: West 417 (day)				
Source height = 1.50 m				
Barrier height for grazing incidence				
Source ! Receiver ! Barrier ! Elevation of				
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)				

1.50 ! 1.50 ! 0.51 ! 74.97				
----------------------------	--	--	--	--

ROAD (0.00 + 70.31 + 0.00) = 70.31 dBA				
Angle1 Angle2 Alpha RefLqg P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj				
SubLqg				

66.18* -78 68 0.24 81.40 0.00 -9.84 -1.25 0.00 0.00 -4.13				
66.18* -78 68 0.24 81.40 0.00 -9.84 -1.25 0.00 0.00 0.00				
70.31				

* Bright Zone !

Segment Leg : 70.31 dBA
Total Leg All Segments: 73.97 dBA
TOTAL Leg FROM ALL SOURCES (DAY): 73.97

NORMAL REPORT Date: 14-08-2019 10:49:28
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rrof15.te Time Period: Day/Night 16/8 hours
 Description: RROF1.5m - OUTDOOR

Road data, segment # 1: East 417 (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: East 417 (day/night)

Angle1 Angle2 : -78.00 deg 68.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0 (Absorptive ground surface)
 Surface : 1 / 1 (Absorptive ground surface)
 Receiver source distance : 74.43 / 74.43 m
 Receiver height : 1.50 / 1.50 m (Elevated; with barrier)
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -78.00 deg Angle2 : 68.00 deg
 Barrier height : 1.50 m
 Elevation : 14.03 m
 Barrier receiver distance : 6.50 / 6.50 m
 Source elevation : 60.20 m
 Receiver elevation : 74.46 m
 Barrier elevation : 74.46 m
 Reference angle : 0.00

Road data, segment # 2: West 417 (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: West 417 (day/night)

Angle1 Angle2 : -78.00 deg 68.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0 (Absorptive ground surface)
 Surface : 1 / 1 (Absorptive ground surface)
 Receiver source distance : 93.28 / 93.28 m
 Receiver height : 1.50 / 1.50 m (Elevated; with barrier)
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -78.00 deg Angle2 : 68.00 deg
 Barrier height : 1.50 m
 Elevation : 14.03 m
 Barrier receiver distance : 6.50 / 6.50 m
 Source elevation : 60.20 m
 Receiver elevation : 74.46 m
 Barrier elevation : 74.46 m
 Reference angle : 0.00

STAMSON 5.0 NORMAL REPORT Date: 14-08-2019 10:49:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rroof18.te Time Period: Day/Night 16/8 hours
Description: RROOF1.8m - OUTDOOR

Results segment # 1: East 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	0.25	74.71

$$\text{ROAD } (0.00 + 63.78 + 0.00) = 63.78 \text{ dBA}$$

Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg

$$-78 \quad 68 \quad 0.15 \quad 81.40 \quad 0.00 \quad -7.99 \quad -1.13 \quad 0.00 \quad 0.00 \quad -8.50$$

$$63.78$$

Segment Leg : 63.78 dBA

Results segment # 2: West 417 (day)

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	0.51	74.97

$$\text{ROAD } (0.00 + 63.68 + 0.00) = 63.68 \text{ dBA}$$

Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg

$$-78 \quad 68 \quad 0.15 \quad 81.40 \quad 0.00 \quad -9.12 \quad -1.13 \quad 0.00 \quad 0.00 \quad -7.47$$

$$63.68$$

Segment Leg : 63.68 dBA

Total Leg All Segments: 66.74 dBA

TOTAL Leg FROM ALL SOURCES (DAY) : 66.74

Road data, segment # 1: East 417 (day/night)

Car traffic volume : 59370/5153 veh/TimePeriod *

Medium truck volume : 4723/411 veh/TimePeriod *

Heavy truck volume : 3373/293 veh/TimePeriod *

Posted speed limit : 100 km/h

Road gradient : 1 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 73332

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: East 417 (day/night)

Angle1 Angle2 : -78.00 deg 68.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0 (Absorptive ground surface)

Surface : 1 (Elevated; with barrier)

Receiver source distance : 74.43 / 74.43 m

Receiver height : 1.50 / 1.50 m

Topography : 4 (Elevated)

Barrier angle1 : -78.00 deg Angle2 : 68.00 deg

Barrier height : 1.80 m

Elevation : 14.03 m

Barrier receiver distance : 6.50 / 6.50 m

Source elevation : 60.20 m

Receiver elevation : 74.46 m

Barrier elevation : 74.46 m

Reference angle : 0.00

Road data, segment # 2: West 417 (day/night)

Car traffic volume	:	59370/5163	veh/TimePeriod	*
Medium truck volume	:	4723/411	veh/TimePeriod	*
Heavy truck volume	:	3373/293	veh/TimePeriod	*
Posted speed limit	:	100	km/h	
Road gradient	:	1	%	
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT) :	73332
Percentage of Annual Growth :	0.00
Number of Years of Growth :	0.00
Medium Truck % of Total Volume :	7.00
Heavy Truck % of Total Volume :	5.00
Day (16 hrs) % of Total Volume :	92.00

Data for Segment # 2: West 417 (day/night)

Angle1 Angle2	:	-78.00	deg	68.00	deg
Wood depth	:	0	(No woods.)		
No of house rows	:	0	/	0	
Surface	:	1	(Absorptive ground surface)		
Receiver source distance	:	93.28	/	93.28	m
Receiver height	:	1.50	/	1.50	m
Topography	:	1.50	(Elevated; with barrier)		
Barrier angle	:	-78.00	deg	Angle2 :	68.00 deg
Barrier height	:	1.80	m		
Barrier receiver distance	:	14.03	m		
Source elevation	:	6.50	/	6.50	m
Receiver elevation	:	60.20	m		
Barrier elevation	:	74.46	m		
Reference angle	:	74.46	m		
	:	0.00			

Results segment # 1: East 417 (day)

Source height	:	1.50	m
Barrier height for grazing incidence	:		
Source Height (m)	:	1.50	!
Receiver Height (m)	:	1.50	!
Barrier Top (m)	:	74.71	
ROAD (0.00 + 62.71 + 0.00) = 62.71	dBA		
Angle1 Angle2 Alpha RefLeg SubLeg	F.Adj D.Adj P.Adj	H.Adj W.Adj	B.Adj
Day -78 68 0.13 81.40 0.00 -7.87 -1.10 0.00 0.00 -9.71	62.71		
Segment Leg : 62.71 dBA			
Results segment # 2: West 417 (day)			
Source height	:	1.50	m
Barrier height for grazing incidence	:		
Source Height (m)	:	1.50	!
Receiver Height (m)	:	1.50	!
Barrier Top (m)	:	74.97	
ROAD (0.00 + 62.64 + 0.00) = 62.64	dBA		
Angle1 Angle2 Alpha RefLeg SubLeg	F.Adj D.Adj P.Adj	H.Adj W.Adj	B.Adj
Day -78 68 0.13 81.40 0.00 -8.98 -1.10 0.00 0.00 -8.68	62.64		
Segment Leg : 62.64 dBA			
Total Leg All Segments: 65.69 dBA			
TOTAL Leg FROM ALL SOURCES (DAY): 65.69			

File name: roof25_te Date: 14-08-2019 10:50:27
Description: RRoof2.5m - OUTDOOR Time Period: Day/Night 16/8 hours
STANSTON 5.0 NORMAL REPORT Date: 14-08-2019 10:50:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Road data, segment # 1: East 417 (day/night)

Car traffic volume	:	59370/5163	veh/TimePeriod
Medium truck volume	:	4723/411	veh/TimePeriod
Heavy truck volume	:	3373/293	veh/TimePeriod
Posted speed limit	:	100 km/h	
Road gradient	:	1 %	
Road pavement	:	1 (Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT)	:	73332	
Percentage of Annual Growth	:	0.10	
Number of Years of Growth	:	0.00	
Medium Truck % of Total Volume	:	7.00	
Heavy Truck % of Total Volume	:	5.00	
Day (16 hrs) % of Total Volume	:	92.00	

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

24 hr Traffic Volume (AADT or SADT)	:	73332	
Percentage of Annual Growth	:	0.10	
Number of Years of Growth	:	0.00	
Medium Truck % of Total Volume	:	7.00	
Heavy Truck % of Total Volume	:	5.00	
Day (16 hrs) % of Total Volume	:	92.00	

Data for Segment # 1: East 417 (day/night)

Angle1 Angle2	:	-78.00 deg	68.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Source surface	:	1	(Absorptive ground surface)
Receiver source distance	:	74.43 / 74.43 m	
Receiver height	:	1.50 / 1.50 m	
Topography	:	4	(Elevated; with barrier)
Barrier angle	:	-78.00 deg	Angle2 : 68.00 deg
Barrier height	:	2.50 m	
Elevation	:	14.03 m	
Barrier receiver distance	:	6.50 / 6.50 m	
Source elevation	:	60.20 m	
Receiver elevation	:	74.46 m	
Barrier elevation	:	74.46 m	
Reference angle	:	0.00	

Results segment # 1: East 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	0.25	74.71
60.48	-78	68	60.48

ROAD (0.00 + 60.48 + 0.00) = 60.48 dBA
Angle1 Angle2 Alpha RefEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

-78 68 0.09 81.40 0.00 -7.58 -1.04 0.00 0.00 -12.30
60.48

Segment Leq : 60.48 dBA

Results segment # 2: West 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	0.51	74.97
60.33	-78	68	60.33

ROAD (0.00 + 60.33 + 0.00) = 60.33 dBA
Angle1 Angle2 Alpha RefEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

-78 68 0.09 81.40 0.00 -8.65 -1.04 0.00 0.00 -11.38
60.33

Segment Leq : 60.33 dBA

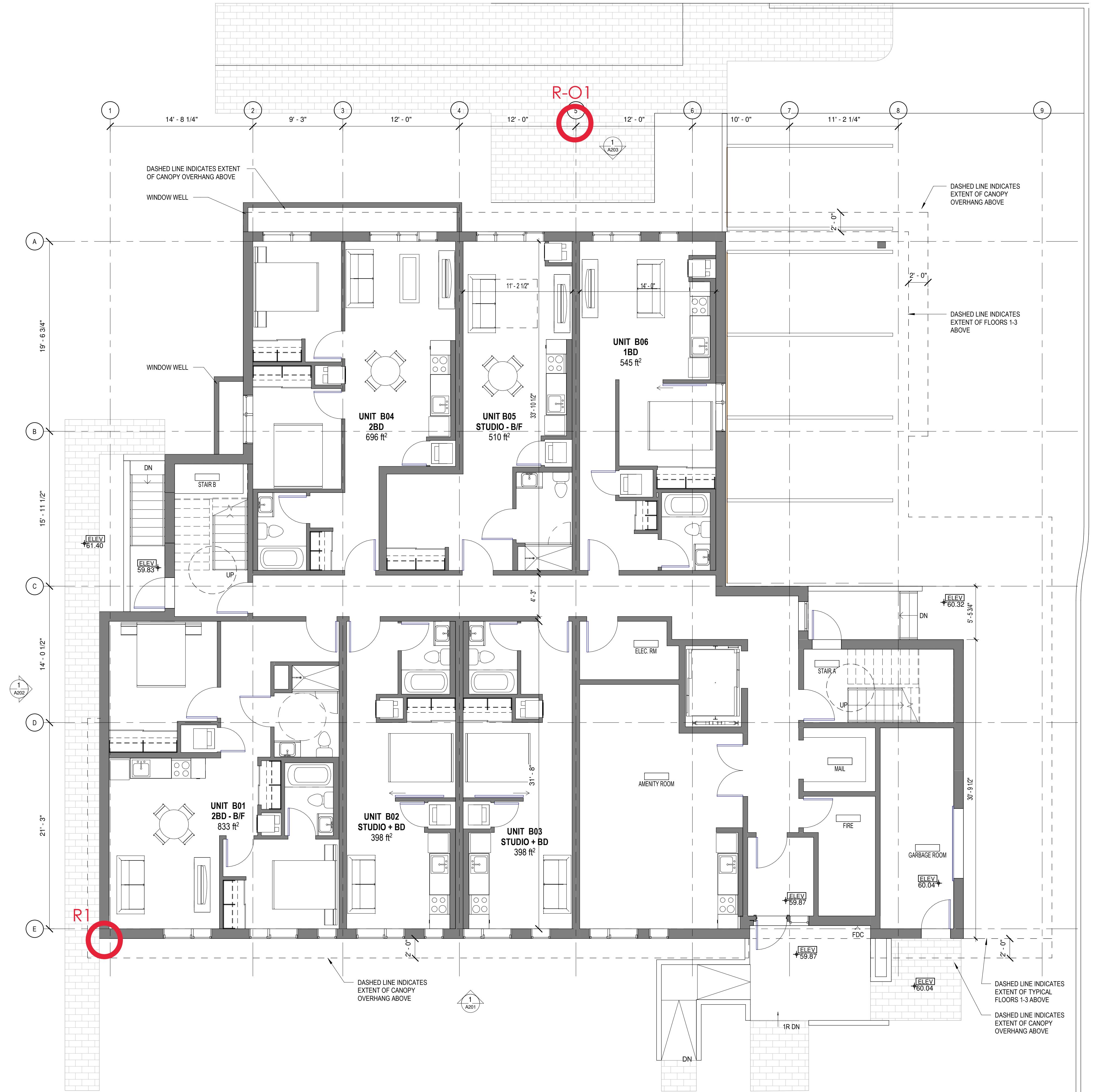
Total Lqg All Segments: 63.42 dBA

TOTAL Lqg FROM ALL SOURCES (DAY) : 63.42

NOISE ASSESSMENT REPORT -134 ROBINSON AVENUE

Appendix B FLOOR PLANS AND AIF CALCULATIONS
August 15, 2019

Appendix B FLOOR PLANS AND AIF CALCULATIONS



pour / Object
ORDINATION
ORDINATION
PLAN CONTROL

Collectif d'architectes / Architects Collective



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aviser immédiatement
l'architecte de toutes erreurs
ou omissions.

*Contractor shall verify all
information and dimensions*

*On site and immediately
report any errors or
omissions to the architect.*

For further information, please contact:

— SECRET APARTMENT —

THE STOREY APARTMENT BUILDING

BOLEBING

134 Robinson Ave, Ottawa ON

BASEMENT PLAN

wn by No. projet / Project number
1600

0" 5

A120

A120

No. Date Émis pour / Object
 1 2018-07-25 COORDINATION
 2 2018-10-01 COORDINATION
 3 2018-11-12 SITE PLAN CONTROL



1 FIRST FLOOR PLAN
 A121 3/16" = 1'-0"

A121

Ingénier / Engineer (Mécanique & Électrique / Mechanical & Electrical)

Ingénier / Engineer (Structure / Structure)

Client / Client

Robinson Village III Limited Partnership

Architecte / Architect Collectif d'architectes / Architects Collective

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Projet / Project

THREE STOREY APARTMENT BUILDING

134 Robinson Ave, Ottawa ON

FIRST FLOOR PLAN

Dessiné par / Drawn by No. projet / Project number

Author 1838

Vérifié par / Checked by No. dessin / Drawing number

Verifier / Verified by Checker

Echelle / Scale 3/16" = 1'-0"

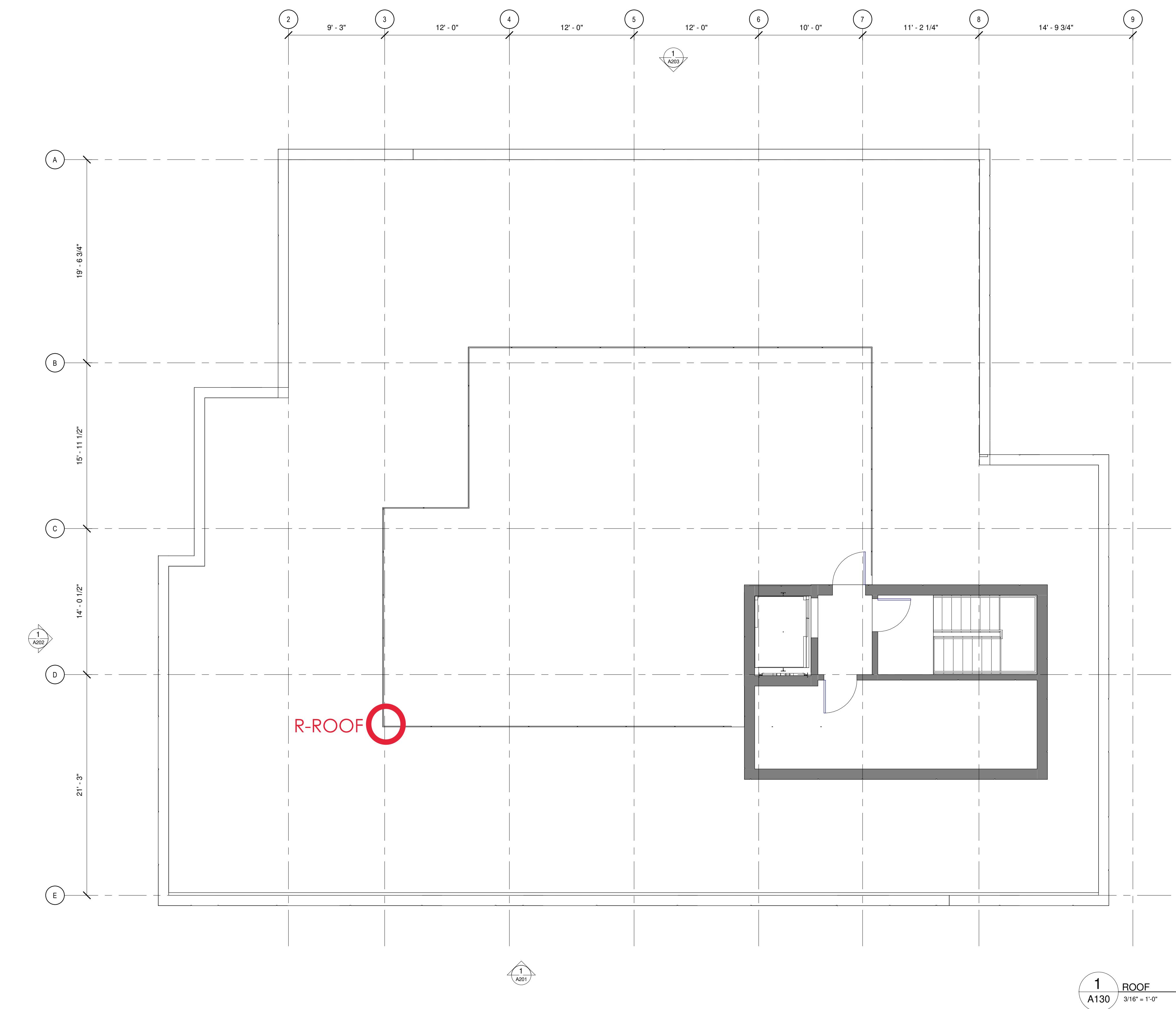
Date de création du dessin / Drawing creation date 05/18/18

Révision / Revision 5









1
A130
ROOF
3/16" = 1'-0"

A130

Ingénieur / Engineer
(Mécanique & Électrique / Mechanical & Electrical)

Ingénieur / Engineer
(Structure / Structure)

Client / Client
Robinson Village III Limited Partnership

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Projet / Project

THREE STOREY APARTMENT BUILDING

134 Robinson Ave, Ottawa ON

Titre / Title
ROOF PLAN

Dessiné par / Drawn by
MD
No. projet / Project number
1838

Vérifié par / Verified by
RC
No. dessin / Drawing number

Echelle / Scale
3/16" = 1'-0"

Date de création du dessin /
Drawing creation date
10/30/18

Révision / Revision
5





1 WEST ELEVATION
A202
3/16" = 1'-0"

LEGEND - ELEVATIONS		No. Date Émis pour / Object
1	FIBER CEMENT PANELS COLOUR: DARK GREY	3 2018-10-04 COORDINATION
2	FIBER CEMENT PANELS COLOUR: LIGHT GREY	4 2018-10-31 REVIEW
3	ALUMINUM SPANDREL PANELS COLOUR: DARK GREY	5 2018-11-12 SITE PLAN CONTROL
4a	MASONRY UNITS COLOUR: LIGHT GREY	
4b	MASONRY UNITS COLOUR: RED	
5	RESERVED	
6	GLASS GUARDRAIL	
7	PRIVACY SCREEN	
8	PRIVACY SCREEN - ROOFTOP TERRACE	
		Ingénieur / Engineer (Mécanique & Électrique)
		Ingénieur / Engineer (Structure / Structure)
		Client / Client
Robinson Village III Limited Partnership		
Architecte / Architect		Collectif d'architectes / Architects Collective
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Projet / Project		
THREE STOREY APARTMENT BUILDING		
134 Robinson Ave, Ottawa ON		
Titre / Title		
EXTERIOR ELEVATIONS		
Dessiné par / Drawn by Author	No. projet / Project number 1838	
Vérifié par / Verified by Checker	No. dessin / Drawing number	
Echelle / Scale As indicated	Révision / Revision 5	
Date de création du dessin / Drawing creation date 06/05/18		



NORTH ELEVATION
3'16" = 1'-0"

LEGEND - ELEVATIONS		No. Date Émis pour / Object
1	FIBER CEMENT PANELS COLOUR: DARK GREY	
2	FIBER CEMENT PANELS COLOUR: LIGHT GREY	
3	ALUMINUM SPANDREL PANELS COLOUR: DARK GREY	
4a	MASONRY UNITS COLOUR: LIGHT GREY	
4b	MASONRY UNITS COLOUR: RED	
5	RESERVED	
6	GLASS GUARDRAIL	
7	PRIVACY SCREEN	
8	PRIVACY SCREEN - ROOFTOP TERRACE	
Ingenieur / Engineer (Mécanique & Électrique / Mechanical & Electrical)		
Ingenieur / Engineer (Structure / Structure)		
Client / Client		
Robinson Village III Limited Partnership		
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Projet / Project		
THREE STOREY APARTMENT BUILDING		
134 Robinson Ave, Ottawa ON		Title / Title
EXTERIOR ELEVATIONS		
Dessiné par / Drawn by Author	No. projet / Project number 1838	
Vérifié par / Verified by Checker	No. dessin / Drawing number	
Échelle / Scale As indicated	Révision / Revision Triangle	
Date de création du dessin / Drawing creation date 08/06/19		



1 EAST ELEVATION
A204

LEGEND - ELEVATIONS		No. Date Émis pour / Object
1	FIBER CEMENT PANELS COLOUR: DARK GREY	
2	FIBER CEMENT PANELS COLOUR: LIGHT GREY	
3	ALUMINUM SPANDREL PANELS COLOUR: DARK GREY	
4a	MASONRY UNITS COLOUR: LIGHT GREY	
4b	MASONRY UNITS COLOUR: RED	
5	RESERVED	
6	GLASS GUARDRAIL	
7	PRIVACY SCREEN	
8	PRIVACY SCREEN - ROOFTOP TERRACE	
Ingenieur / Engineer (Mécanique & Électrique / Mechanical & Electrical)		
Ingenieur / Engineer (Structure / Structure)		
Client / Client		
Robinson Village III Limited Partnership		
Architecte / Architect		Collectif d'architectes / Architects Collective
fig. 1 3550, Saint-Antoine O. Montréal QC H2C 1A9 T. 514 861-5122		
fig. 2 190 Somerset St W #206 Ottawa ON K2P 0J4 T. 613 820-6122 Formerly Rubin & Rotman www.figur.ca		
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Seau / Seal		
Note: L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et assurer une construction fiable sans toutes erreurs ou omissions.		
Contractor shall verify all dimensions and dimensions on site and ensure a reliable construction free of errors or omissions.		
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Seau / Seal		
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Contractor shall verify all dimensions and dimensions on site and ensure a reliable construction free of errors or omissions.		
Projet / Project		
THREE STOREY APARTMENT BUILDING		
134 Robinson Ave, Ottawa ON		
Titre / Title		
EXTERIOR ELEVATIONS		
Dessiné par / Drawn by Author	No. projet / Project number 1838	
Vérifié par / Verified by Checker	No. dessin / Drawing number	
Echelle / Scale As indicated	Révision / Revision	
Date de création du dessin / Drawing creation date 08/06/19		

Sample Calculation: AIF Calc - 1st-3rd Floor Units 105-405 70.2 62.6

Table 1.1

Wall 1 dBA:	70.3 dBA		62.7 dBA		
70.2	70.2	70.3	70.2	62.7	62.6
0	0		-15	0	0
70.2	70.2	70.3	55.2	62.7	62.6

Table 1.3

Equation:	$= 70.2 - 45 + 10 * \text{LOG}(3) + 2$		$= 62.6 - 40 + 10 * \text{LOG}(3) + 2$
AIF:	32		29

Adjustment for Geometry

40-90 degrees

Table 1.5

Equation:	= AIF + Adjustment
Required AIF:	32

Floor Area:	230	ft
Wall Area:	56	ft
Window Area:	100	ft
Door Area:	17	ft

Table 2.2

Wall % of Floor Area:	24	%
Window % of Floor Area:	43	%
Window % of Floor Area:	7	%

Room	Window	Wall	Door
Unit 101	2 (28) 2	EW1	D2

134 Robinson Avenue- 1st-3rd Floor

Source: Road Traffic

Predicted free-field day time sound level: 70.2 dBA

Predicted free-field night time sound level: 62.6 dBA

Table 1.1 - Sound level at building facade

	Day (Living Area)				Night (Bedroom)			
	Wall 1	Wall 2	Wall 3	Wall 4	Wall 1	Wall 2	Wall 3	Wall 4
Source 1	70.2	70.2	70.2	70.2	62.6	62.6	62.6	62.6
Shielding Correction	0	0	-15	-15	0	0	-15	-15
Resultant Sound Level	70.2	70.2	55.2	55.2	62.6	62.6	47.6	47.6

Table 1.2 - Number of Components

Room	Wall 1			Wall 2			Wall 3			Wall 4			Total Number of Components
	Window	Wall	Door										
Units 105-405	1	1	1										3
Units 105-405 Bedroom	1	1											2
Units 102-104, 202-204, 302-304, and 402-404	1	1	1										3
Units 101-401	1	1	1	1	1								5
Units 101-401 Bedroom 1	1	1											2
Units 101-401 Bedroom 2				1	1								2
Stairwell						1							1
Units 110-410						1							1
Units 110-410 Bedroom 1				1	1								2
Units 110-410 Bedroom 2						1							1

Note: Ignore if sound level below 55 dBA

* Component AIF exceeds required value by 10 or more and has been ignored as a component

Table 1.3 - AIF

	Wall 1	Wall 2	
Units 105-405	32		
Units 105-405 Bedroom	30		
Units 102-104, 202-204, 302-304, and 402-404	32		
Units 101-401	34	34	
Units 101-401 Bedroom 1	30		
Units 101-401 Bedroom 2	30		
Stairwell	27		
Units 110-410	27		
Units 110-410 Bedroom 1	30		
Units 110-410 Bedroom 2	27		

Note: Max AIF Selected between Day and Night

Table 1.4 - Adjustment for Geometry

	Wall 1	Wall 2	
Exposure Angle	40-90	40-90	
Adjustment	0	0	

Table 1.5 - Required AIF

	Wall 1	Wall 2	
Units 105-405	32		
Units 105-405 Bedroom	30		
Units 102-104, 202-204, 302-304, and 402-404	32		
Units 101-401	34	34	
Units 101-401 Bedroom 1	30		
Units 101-401 Bedroom 2	30		
Stairwell	27		
Units 110-410	27		
Units 110-410 Bedroom 1	30		
Units 110-410 Bedroom 2	27		

Table 2.1 - Component Area (ft²)

Room	Wall 1			Wall 2			Wall 3			Wall 4			Room Floor Area
	Window	Wall	Door										
Units 105-405	56	100	17										230
Units 105-405 Bedroom	30	60											105
Units 102-104, 202-204, 302-304, and 402-404	26	65	17										264
Units 101-401	26	56	17	60	113								230
Units 101-401 Bedroom 1	30	78											96
Units 101-401 Bedroom 2				30	100								120
Stairwell					151								120
Units 110-410					144								264
Units 110-410 Bedroom 1					30	52							120
Units 110-410 Bedroom 2					30	96							120

Note: Susan D. Smith Architect Layout

Table 2.2 - Component Percentages per Room Floor Area (%)

Room	Wall 1			Wall 2			Wall 3			Wall 4		
	Window	Wall	Door									
Units 105-405	24	43	7									
Units 105-405 Bedroom	29	57										
Units 102-104, 202-204, 302-304, and 402-404	10	25	6									
Units 101-401	11	24	7	26	49							
Units 101-401 Bedroom 1	31	81										
Units 101-401 Bedroom 2				25	83							
Stairwell					126							
Units 110-410					55							
Units 110-410 Bedroom 1					25	44						
Units 110-410 Bedroom 2					25	80						

Table 2.3 - Component Selection

Room	Wall 1			Wall 2			Wall 3			Wall 4		
	Window	Wall	Door	Window	Wall	Door	Window	Wall	Door	Window	Wall	Door
Units 105-405	2 (28) 2	EW1	D2									
Units 105-405 Bedroom	2 (22) 2	EW1										
Units 102-104, 202-204, 302-304, and 402-404	2 (13) 2	EW1	D2									
Units 101-401	2 (18) 2	EW1	D4	2 (35) 2	EW1							
Units 101-401 Bedroom 1	2 (22) 2	EW1										
Units 101-401 Bedroom 2				2 (6) 2	EW1							
Stairwell					EW1							
Units 110-410					EW1							
Units 110-410 Bedroom 1				2 (22) 2	EW1							
Units 110-410 Bedroom 2				2 (6) 2	EW1							

Note 1: Use Tables 7.2 - 7.4, "Topic 7, Environmental Noise Assessment in Land Use Planning Manual"

Note 2: Windows are based on 2 mm glass thickness (Double Glaze Windows)

134 Robinson Avenue- 4th Floor

Source: Road Traffic

Predicted free-field day time sound level: 74.5 dBA

Predicted free-field night time sound level: 66.9 dBA

Table 1.1 - Sound level at building facade

	Day (Living Area)				Night (Bedroom)			
	Wall 1	Wall 2	Wall 3	Wall 4	Wall 1	Wall 2	Wall 3	Wall 4
Source 1	74.5	74.5	74.5	74.5	66.9	66.9	66.9	66.9
Shielding Correction	0	0	-15	-15	0	0	-15	-15
Resultant Sound Level	74.5	74.5	59.5	59.5	66.9	66.9	51.9	51.9

Table 1.2 - Number of Components

Room	Wall 1			Wall 2			Wall 3			Wall 4			Total Number of Components
	Window	Wall	Door										
Units 105-405	1	1	1										3
Units 105-405 Bedroom	1	1											2
Units 102-104, 202-204, 302-304, and 402-404	1	1	1										3
Units 101-401	1	1	1	1	1								5
Units 101-401 Bedroom 1	1	1											2
Units 101-401 Bedroom 2				1	1								2
Stairwell						1							1
Units 110-410						1							1
Units 110-410 Bedroom 1				1	1								2
Units 110-410 Bedroom 2						1							1

Note: Ignore if sound level below 55 dBA

* Component AIF exceeds required value by 10 or more and has been ignored as a component

Table 1.3 - AIF

	Wall 1	Wall 2	
Units 105-405	36		
Units 105-405 Bedroom	35		
Units 102-104, 202-204, 302-304, and 402-404	36		
Units 101-401	38	38	
Units 101-401 Bedroom 1	35		
Units 101-401 Bedroom 2	35		
Stairwell	32		
Units 110-410	32		
Units 110-410 Bedroom 1	35		
Units 110-410 Bedroom 2	32		

Note: Max AIF Selected between Day and Night

Table 1.4 - Adjustment for Geometry

	Wall 1	Wall 2	
Exposure Angle	40-90	40-90	
Adjustment	0	0	

Table 1.5 - Required AIF

	Wall 1	Wall 2	
Units 105-405	36		
Units 105-405 Bedroom	35		
Units 102-104, 202-204, 302-304, and 402-404	36		
Units 101-401	38	38	
Units 101-401 Bedroom 1	35		
Units 101-401 Bedroom 2		35	
Stairwell		32	
Units 110-410		32	
Units 110-410 Bedroom 1		35	
Units 110-410 Bedroom 2		32	

Table 2.1 - Component Area (ft²)

Room	Wall 1			Wall 2			Wall 3			Wall 4			Room Floor Area
	Window	Wall	Door										
Units 105-405	56	100	17										230
Units 105-405 Bedroom	30	60											105
Units 102-104, 202-204, 302-304, and 402-404	26	65	17										264
Units 101-401	26	56	17	60	113								230
Units 101-401 Bedroom 1	30	78											96
Units 101-401 Bedroom 2				30	100								120
Stairwell					151								120
Units 110-410					144								264
Units 110-410 Bedroom 1					30	52							120
Units 110-410 Bedroom 2					30	96							120

Note: Susan D. Smith Architect Layout

Table 2.2 - Component Percentages per Room Floor Area (%)

Room	Wall 1			Wall 2			Wall 3			Wall 4		
	Window	Wall	Door									
Units 105-405	24	43	7									
Units 105-405 Bedroom	29	57										
Units 102-104, 202-204, 302-304, and 402-404	10	25	6									
Units 101-401	11	24	7	26	49							
Units 101-401 Bedroom 1	31	81										
Units 101-401 Bedroom 2				25	83							
Stairwell					126							
Units 110-410					55							
Units 110-410 Bedroom 1					25	44						
Units 110-410 Bedroom 2					25	80						

Table 2.3 - Component Selection

Room	Wall 1			Wall 2			Wall 3			Wall 4		
	Window	Wall	Door	Window	Wall	Door	Window	Wall	Door	Window	Wall	Door
Units 105-405	2 (63) 2	EW1	D5									
Units 105-405 Bedroom	2 (63) 2	EW1										
Units 102-104, 202-204, 302-304, and 402-404	2 (28) 2	EW1	D5									
Units 101-401	2 (50) 2	EW1	D2-sd	2 (100) 2	EW2							
Units 101-401 Bedroom 1	2 (63) 2	EW2										
Units 101-401 Bedroom 2				2 (50) 2	EW2							
Stairwell					EW2							
Units 110-410					EW1							
Units 110-410 Bedroom 1				2 (50) 2	EW1							
Units 110-410 Bedroom 2				2 (28) 2	EW2							

Note 1: Use Tables 7.2 - 7.4, "Topic 7, Environmental Noise Assessment in Land Use Planning Manual"

Note 2: Windows are based on 2 mm glass thickness (Double Glaze Windows)

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Appendix C NOISE WARNING CLAUSE
August 15, 2019

Appendix C NOISE WARNING CLAUSE

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Appendix C NOISE WARNING CLAUSE
August 15, 2019

WARNING CLAUSES

The following warning clauses may be used individually or in combination:

Generic Mitigation of Indoor Area (GI):

Indoor environment - $L_{eq}(16)$ greater than 55 dBA and less than or equal to 65 dBA or $(L_{eq}(8)$ greater than 50dBA and less than or equal to 60 dBA

To help address the need for sound attenuation this development has been designed so as to provide an indoor environment that is within provincial guidelines. Measures for sound attenuation include:

- a setback of buildings from the noise source;
- the provision for adding central air conditioning at the occupant's discretion.

To be included in all offers of purchase:

"Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks."

Extensive Mitigation of Indoor Area (MI):

Indoor environment - $L_{eq}(16)$ greater than 65 dBA or $(L_{eq}(8)$ greater than 60dBA

To help address the need for sound attenuation this development has been designed so as to provide an indoor environment that is within provincial guidelines. Measures for sound attenuation include:

- multi-pane glass;
- exterior wall insulation;
- a forced central air conditioning system.

To ensure that provincial sound level limits are not exceeded, it is important to maintain these sound attenuation features.

To be included in all offers of purchase:

"This dwelling unit has been supplied with a forced central air conditioning system and other measures which will allow windows and exterior doors to remain closed, thereby ensuring

NOISE ASSESSMENT REPORT -134 ROBINSON AVENUE

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August 15, 2019

that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks."

To be included in all offers of purchase:

Generic Mitigation of Outdoor Amenity Area (GO):

Outdoor amenity areas- $L_{eq}(16)$ in the OLA greater than 55 dBA and less than or equal to 60 dBA.

To help address the need for outdoor sound attenuation occupants are to be informed this development may potentially require the inclusion of:

- an acoustic barrier.

To be included in all offers of purchase:

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may, on occasion, interfere with some activities of the dwelling occupants in their outdoor amenity area as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment and Conservation and Parks."

Extensive Mitigation of Outdoor Amenity Area (MO):

Outdoor amenity areas- $L_{eq}(16)$ in the OLA greater than 60 dBA.

To help address the need for outdoor sound attenuation this development is to includes outdoor noise attenuation with the use of:

- an acoustic barrier.

To be included in all offers of purchase:

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks."

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Source: City of Ottawa - Environmental Noise Control Guidelines, January 2016 and Ontario Ministry of the Environment Conservation and Parks, Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning Publication NPC-300, Queen's Printer for Ontario, 2013.