

**Noise Assessment Report -
29 Robinson Avenue**

Project # 160401428



Prepared for:
Robinson Village II Limited
Partnership

Prepared by:
Stantec Consulting Ltd.

October 24, 2018

**NOISE ASSESSMENT REPORT -
29 ROBINSON AVENUE**

Introduction
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Introduction
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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

Stantec Consulting Ltd. has been retained by Robinson Village II Limited Partnership to prepare an environmental noise assessment for the proposed 3 storey building at 29 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 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 level contours will be of concern to future residents/institutional users of the proposed development, using the computerized version (STAMSON 5.03) of the MOECP'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 northern section of Robinson Avenue, north of Hurdman Road. The proposed site is illustrated in **Figure 1**. The proposed development consists of 52 units. This report will focus on the rooms with exposure to the Highway 417.

Surrounding land uses are as follows:

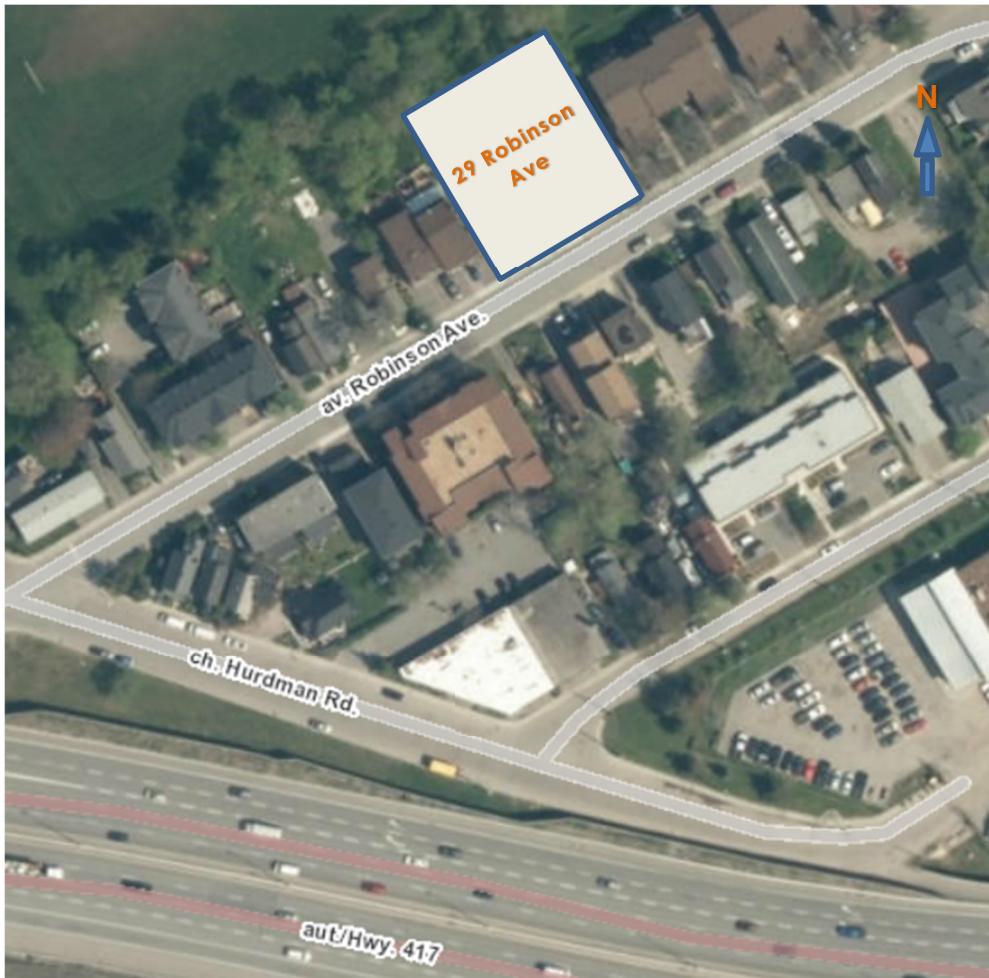
- north – existing park and residential;
- east – existing residential;
- south – existing residential;
- west – existing residential.

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".

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Figure 1 29 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 (MOECP) 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** 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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Noise Level Criteria
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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 MOECP 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 summarizes the traffic volumes used for calculations in this report.

Table 5 Traffic Volumes, 4-Lane eastbound and westbound Highway 417

| | 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 MOECP 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 Rubin & Rotman Architects. The resulting receiver sites are illustrated in **Figure 2** and **Figure 3**.

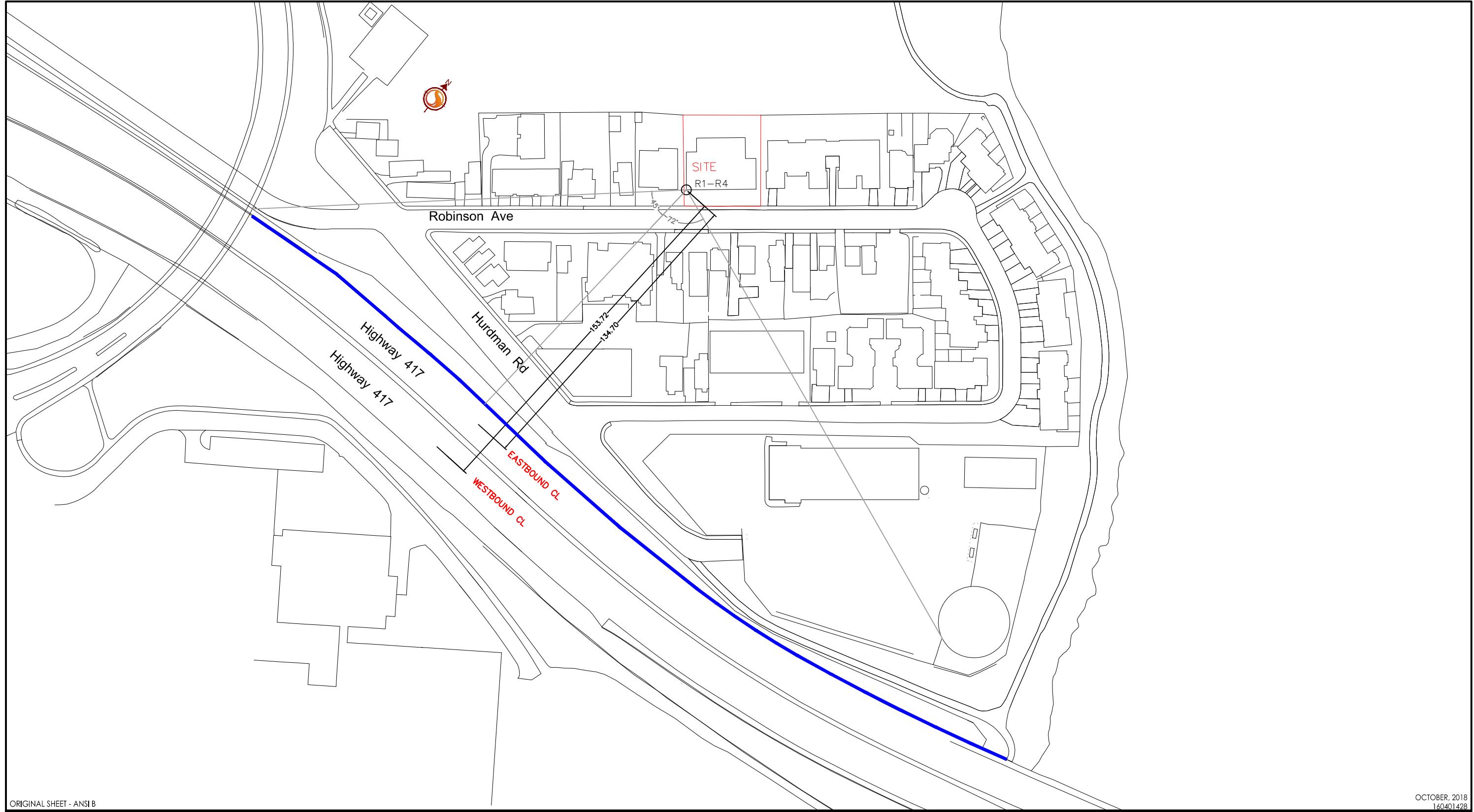
The receiver heights for indoor, daytime, and nighttime noise level calculations for the proposed buildings were assessed at the mid-height of each floor. Building elevation drawings are provided in **Appendix B** as well as the floor plans indicating the receiver locations.

Upon assessing the developments noise exposure to the Highway 417 it was found that the embankment conceals the development from noise west of the Robinson Avenue overpass, and the Hurdman Yard garage and the greenspace along the Rideau River shield the development east of the river.

The unattenuated receiver noise levels have been summarized in **Table 6**, and noise level calculations are provided in **Appendix A** for sound levels at daytime and nighttime building face.

Table 6 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 | 59.9 | 52.3 | - |
| R2 | South Building Face - 1st Floor | 3 | 60.6 | 53 | - |
| R3 | South Building Face - 2nd Floor | 6.8 | 61.9 | 54.3 | - |
| R4 | South Building Face - 3rd Floor | 9.6 | 62.1 | 54.5 | - |
| ROUT | Outdoor Amenity Area | 1.5 | - | - | 55 |

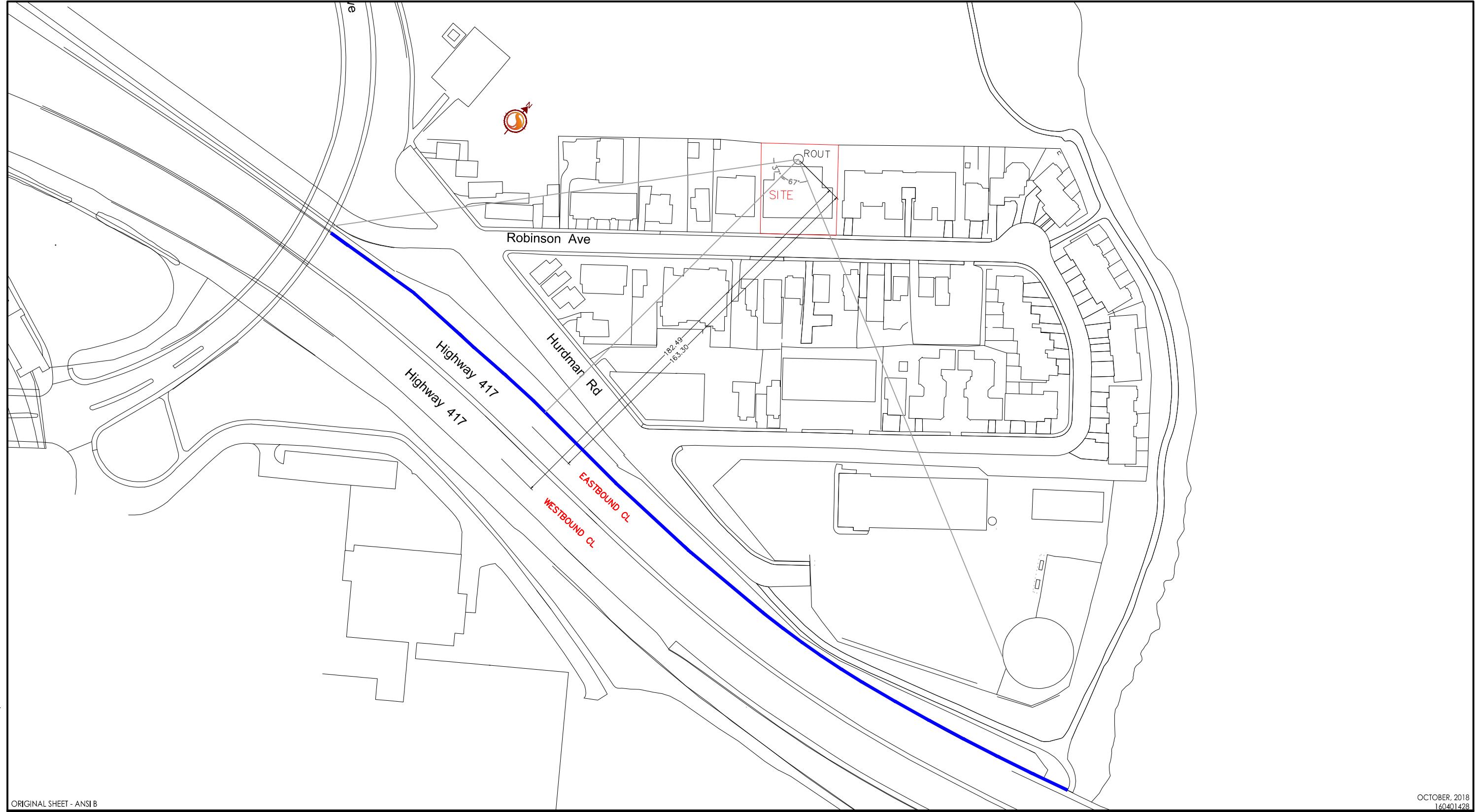


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— EXISTING NOISE WALL-5m

Client/Project
ROBINSON VILLAGE II LIMITED PARTNERSHIP
29 ROBINSON AVENUE
NOISE ASSESSMENT REPORT

Figure No.
2.0
Title
INDOOR RECEIVERS
PLAN VIEW



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Client/Project
ROBINSON VILLAGE II LIMITED PARTNERSHIP
29 ROBINSON AVENUE
NOISE ASSESSMENT REPORT
Figure No.
3.0
Title
OUTDOOR RECEIVER
PLAN VIEW

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Conclusions and Recommendations
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4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 OUTDOOR NOISE IMPACTS

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

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

- The predicted noise level for the outdoor amenity area located at the rear of the proposed building is 55 dBA. This falls within the accepted noise level standards and therefore there are no additional measures required for outdoor noise mitigation.

4.2 INDOOR NOISE IMPACTS

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

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

- Provision for a central air conditioning system to be installed at the occupant's discretion for all units within the proposed building on 29 Robinson Avenue.
- Noise Warning Clause Generic Indoor mitigation (GI) is to be included in all offers of purchase and sale for 29 Robinson Avenue.

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

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The consideration of these measures will allow the residential development to proceed in accordance with City of Ottawa's planning approval process and form the basis for meeting the City of Ottawa's and MOECP criteria with respect to environmental noise.

Respectfully submitted by:



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Engineering Intern



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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
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Date: 24-10-2018 15:04:34
File name: r1.tte Time Period: Day/Night 16/8 hours
Description: Indoor Receiver 1 - Basement floor

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 : -45.00 deg 72.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 2 / 2  
House density : 90 %  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 134.70 / 134.70 m  
Topography : 0.60 / 0.60 m (Flat/gentle slope; with barrier)  
Barrier angle : -45.00 deg Angle2 : 72.00 deg  
Barrier height : 5.00 m  
Receiver receiver distance : 126.42 / 126.42 m  
Source elevation : 60.20 m  
Receiver elevation : 59.79 m  
Barrier elevation : 60.00 m  
Reference angle : 0.00
```

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

```
-----  
Angle1 Angle2 : -45.00 deg 72.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 2 / 2  
House density : 90 %  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 134.70 / 134.70 m  
Topography : 0.60 / 0.60 m (Flat/gentle slope; with barrier)  
Barrier angle : -45.00 deg Angle2 : 72.00 deg  
Barrier height : 5.00 m  
Receiver receiver distance : 126.42 / 126.42 m  
Source elevation : 60.20 m  
Receiver elevation : 59.79 m  
Barrier elevation : 60.00 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) : 73322  
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 : -45.00 deg 72.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 2 / 2  
House density : 90 %  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 153.72 / 153.72 m  
Topography : 0.60 / 0.60 m (Flat/gentle slope; with barrier)  
Barrier angle : -45.00 deg Angle2 : 72.00 deg  
Barrier height : 5.00 m  
Receiver receiver distance : 126.42 / 126.42 m  
Source elevation : 60.20 m  
Receiver elevation : 59.79 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 ! Receiver ! Barrier ! Elevation of  
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
-----  
1.50 ! 0.60 ! 1.62 ! 61.62
```

```
ROAD (0.00 + 55.03 + 0.00) = 55.03 dBA  
Angle1 Angle2 Alpha RefLeg P.ADJ D.ADJ F.ADJ W.ADJ H.ADJ B.ADJ  
Subleg  
-----  
-----
```

```
-----  
-45 72 0.00 81.40 0.00 -9.53 -1.87 0.00 -8.83 0.00  
61.17 -45 72 0.00 81.40 0.00 -9.53 -1.87 0.00 0.00 -14.97  
55.03 -----  
-----
```

Segment Leg : 55.03 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 | 0.60 | 1.46 | 61.46 |

ROAD (0.00 + 58.17 + 0.00) = 58.17 dBA
Angle1 Angle2 Alpha RefEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

| -45 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | -8.73 | 0.00 |
|-------|----|------|-------|------|--------|-------|------|-------|--------|
| 60.69 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | 0.00 | -11.25 |
| 58.17 | | | | | | | | | |

Segment Leg : 58.17 dBA

Total Leg All Segments: 59.89 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 | 0.60 | 1.61 | 61.61 |

ROAD (0.00 + 47.43 + 0.00) = 47.43 dBA
Angle1 Angle2 Alpha RefEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

| -45 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | -8.83 | 0.00 |
|-------|----|------|-------|------|-------|-------|------|-------|--------|
| 53.57 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | 0.00 | -14.97 |
| 47.43 | | | | | | | | | |

Segment Leg : 47.43 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) |
|-------------------|---------------------|--------------------|------------------------------|
| 1.50 | 0.60 | 1.46 | 61.46 |

ROAD (0.00 + 50.57 + 0.00) = 50.57 dBA

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

| -45 | 72 | 0.00 | 73.80 | 0.00 | -10.11 | -1.87 | 0.00 | -8.73 | 0.00 |
|-------|----|------|-------|------|--------|-------|------|-------|--------|
| 53.09 | 72 | 0.00 | 73.80 | 0.00 | -10.11 | -1.87 | 0.00 | 0.00 | -11.25 |
| 50.57 | | | | | | | | | |

TOTAL Leg FROM ALL SOURCES (DAY) : 59.89
(NIGHT) : 52.29

Segment Leg : 50.57 dBA

Total Leg All Segments: 52.29 dBA

STAMSON 5.0 NORMAL REPORT Date : 24-10-2018 15:07:09
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 2 - First floor

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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 | : -45.00 deg | 72.00 deg |
| Wood depth | | : 0 | (No woods.) |
| No of house rows | | : 2 / 2 | |
| House density | | : 90 % | |
| Surface | | : 2 | (Reflective ground surface) |
| Receiver source distance | | : 134.70 / 134.70 m | |
| Receiver height | | : 3.00 / 3.00 m | |
| Topography | | : 2 | (Flat/gentle slope; with barrier) |
| Barrier angle | | : -45.00 deg | Angle2 : 72.00 deg |
| Barrier height | | : 5.00 m | |
| Barrier receiver distance | | : 126.42 / 126.42 m | |
| Source elevation | | : 60.20 m | |
| Receiver elevation | | : 59.79 m | |
| Barrier elevation | | : 60.00 m | |
| Reference angle | | : 0.00 | |

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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) : | 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 # 2: West 417 (day/night) | |
| Angle1 Angle2 | -45.00 deg |
| Wood depth | 72.00 deg (No woods.) |
| No of house rows | 0 / 2 |
| House density | 90 % |
| Surface | 2 (Reflective ground surface) |
| Receiver source distance | 153.72 / 153.72 m |
| Receiver height | 3.00 / 3.00 m (Flat/gentle slope; with barrier) |
| Topography | 2 |
| Barrier angle1 | -45.00 deg |
| Barrier height | Angle2 : 72.00 deg |
| Barrier receiver distance | 5.00 m |
| Source elevation | 126.42 / 126.42 m |
| Receiver elevation | 60.20 m |
| Barrier elevation | 59.79 m |
| Reference angle | 60.00 m |
| | 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 | 3.00 ! 1.76 ! 61.76 |
| ROAD (0.00 + 55.41 + 0.00) = 55.41 dBa | |
| Angle1 Angle2 Alpha RefLdg P.Adj D.Adj F.Adj W.Adj H.Adj B. | |
| SubLdg | |
| -- | |
| -45 | 72 0.00 81.40 0.00 -9.53 -1.87 0.00 -8.83 0 |
| 61.17 | 72 0.00 81.40 0.00 -9.53 -1.87 0.00 0.00 -14 |
| 55.41 | |
| Segment Toc : 55.41 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 | 3.00 | 1.89 | 61.89 |

| 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 SubLeg |
|--|---|
| 60.69 | 72 0.00 81.40 0.00 -10.11 -1.87 0.00 -8.73 0.00 |
| 59.06 | 72 0.00 81.40 0.00 -10.11 -1.87 0.00 0.00 -10.36 |

| ROAD (0.00 + 51.46 + 0.00) = 51.46 dBA | Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg |
|--|---|
| 53.09 | 72 0.00 73.80 0.00 -10.11 -1.87 0.00 -8.73 0.00 |
| 51.46 | 72 0.00 73.80 0.00 -10.11 -1.87 0.00 0.00 -10.36 |

Segment Leg : 59.06 dBA

Total Leg All Segments: 60.62 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 | 3.00 | 1.76 | 61.76 |

| ROAD (0.00 + 47.81 + 0.00) = 47.81 dBA | Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg |
|--|---|
| 53.57 | 72 0.00 73.80 0.00 -9.53 -1.87 0.00 -8.83 0.00 |
| 47.81 | 72 0.00 73.80 0.00 -9.53 -1.87 0.00 0.00 -14.58 |

Segment Leg : 47.81 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 | 3.00 | 1.89 | 61.89 |

| ROAD (0.00 + 51.46 + 0.00) = 51.46 dBA | Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeg |
|--|---|
| 53.09 | 72 0.00 73.80 0.00 -10.11 -1.87 0.00 -8.73 0.00 |
| 51.46 | 72 0.00 73.80 0.00 -10.11 -1.87 0.00 0.00 -10.36 |

Segment Leg : 51.46 dBA

Total Leg All Segments: 53.02 dBA

TOTAL Leg FROM ALL SOURCES (DAY) : 60.62
(NIGHT) : 53.02

STAMSON 5.0 NORMAL REPORT Date : 24-10-2018 15:08:59
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: x3.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 3 - Second floor

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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 | : -45.00 deg | 72.00 deg |
| Wood depth | | : 0 | (No woods.) |
| No of house rows | | : 2 / 2 | |
| House density | | : 90 % | |
| Surface | | : 2 | (Reflective ground surface) |
| Receiver source distance | : 134.70 | / 134.70 m | |
| Receiver height | : 6.80 | / 6.80 m | |
| Topography | | : 2 | (Flat/gentle slope; with barrier) |
| Barrier angle | | : -45.00 deg | Angle2 : 72.00 deg |
| Barrier height | | : 5.00 m | |
| Barrier receiver distance | | : 126.42 / 126.42 m | |
| Source elevation | | : 60.20 m | |
| Receiver elevation | | : 59.79 m | |
| Barrier elevation | | : 60.00 m | |
| Reference angle | | : 0.00 | |

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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) : | 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 # 2: West 417 (day/night) | |
| Angle1 Angle2 | -45.00 deg |
| Wood depth | 72.00 deg (No woods.) |
| No of house rows | 0 / 2 |
| House density | 90 % |
| Surface | 2 (Reflective ground surface) |
| Receiver source distance | 153.72 / 153.72 m |
| Receiver height | 6.80 / 6.80 m (Flat/gentle slope; with barrier) |
| Topography | 2 |
| Barrier angle1 | -45.00 deg |
| Barrier height | Angle2 : 72.00 deg |
| Barrier receiver distance | 5.00 m |
| Source elevation | 126.42 / 126.42 m |
| Receiver elevation | 60.20 m |
| Barrier elevation | 59.79 m |
| Reference angle | 60.00 m |
| | 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 | 6.80 ! 2.00 ! 62.00 |
| ROAD (0.00 + 56.05 + 0.00) = 56.05 dBA | |
| Angle1 Angle2 Alpha RefLdg P.Adj D.Adj F.Adj W.Adj H.Adj B. | |
| SubLdg | |
| -- | |
| -45 | 72 0.00 81.40 0.00 -9.53 -1.87 0.00 -8.83 0 |
| 61.17 | 72 0.00 81.40 0.00 -9.53 -1.87 0.00 0.00 -13 |
| 56.05 | |
| Segment Tot : 56.05 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 | 6.80 | 2.56 | 62.56 |

ROAD (0.00 + 60.55 + 0.00) = 60.55 dBA
Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

| 60.69 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | -8.73 | 0.00 |
|-------|----|------|-------|------|--------|-------|------|-------|-------|
| 60.55 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | 0.00 | -8.87 |

Segment Leg : 60.55 dBA

Total Leg All Segments: 61.87 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 | 6.80 | 2.00 | 62.00 |

ROAD (0.00 + 48.46 + 0.00) = 48.46 dBA
Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

| 53.57 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | -8.83 | 0.00 |
|-------|----|------|-------|------|-------|-------|------|-------|--------|
| 48.46 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | 0.00 | -13.94 |

Segment Leg : 48.46 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 | 6.80 | 2.56 | 62.56 |

ROAD (0.00 + 52.96 + 0.00) = 52.96 dBA
Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeg

| 53.09 | 72 | 0.00 | 73.80 | 0.00 | -10.11 | -1.87 | 0.00 | -8.73 | 0.00 |
|-------|----|------|-------|------|--------|-------|------|-------|-------|
| 52.96 | 72 | 0.00 | 73.80 | 0.00 | -10.11 | -1.87 | 0.00 | 0.00 | -8.87 |

Segment Leg : 52.96 dBA

Total Leg All Segments: 54.28 dBA

STAMSON 5.0 NORMAL REPORT Date : 24-10-2018 15:10:09
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 4 - Third floor

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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 | : | -45.00 deg | 72.00 deg |
| Wood depth | | : | 0 | (No woods.) |
| No of house rows | | : | 2 / 2 | |
| House density | | : | 90 % | |
| Surface | | : | 2 | (Reflective ground surface) |
| Receiver source distance | : | 134.70 | / 134.70 m | |
| Receiver height | : | 9.60 | / 9.60 m | |
| Topography | | : | 2 | (Flat/gentle slope; barrier) |
| Barrier angle | | : | -45.00 deg | Angle2 : 72.00 deg |
| Barrier height | | : | 5.00 m | |
| Barrier receiver distance | | : | 126.42 / 126.42 m | |
| Source elevation | | : | 60.20 m | |
| Receiver elevation | | : | 59.79 m | |
| Barrier elevation | | : | 60.00 m | |
| Reference angle | | : | 0.00 | |

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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) : | 73,332 |
| 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 | -45.00 deg |
| Wood depth | 72.00 deg (No woods.) |
| No of house rows | 0 |
| House density | 2 / 2 |
| Surface | 90 % |
| Receiver source distance | 2 |
| Receiver height | 153.72 / 153.72 m |
| Topography | 9.60 / 9.60 m (Flat/gentle slope; with barrier) |
| Barrier angle1 | -45.00 deg |
| Barrier height | Angle2 : 72.00 deg |
| Barrier receiver distance | 5.00 m |
| Source elevation | 126.42 / 126.42 m |
| Receiver elevation | 60.20 m |
| Barrier elevation | 59.79 m |
| Reference angle | 60.00 m |
| | 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 ! 9.60 ! 2.17 ! 62.17 | |
| ROAD (0.00 + 56.55 + 0.00) = 56.55 dBA | |
| Angle1 Angle2 Alpha RefLdg P.Adj D.Adj F.Adj W.Adj H.Adj B. | |
| SubLdg | |
| -- | |
| -45 72 0.00 81.40 0.00 -9.53 -1.87 0.00 -8.83 0 | |
| 61.17 72 0.00 81.40 0.00 -9.53 -1.87 0.00 0.00 -13 | |
| 56.55 | |
| Segment Toc : 56.55 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 | 9.60 | 3.06 | 63.06 |

| ROAD (0.00 + 60.69 + 0.00) = 60.69 dBA | Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj |
|--|--|
| SubLeg | |

| 60.69 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | -8.73 | 0.00 |
|-------|----|------|-------|------|--------|-------|------|-------|------|
| -45 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | -7.75 | |

| 61.67 | | | | | | | | | |
|-------|----|------|-------|------|--------|-------|------|-------|--|
| -45 | 72 | 0.00 | 81.40 | 0.00 | -10.11 | -1.87 | 0.00 | -7.75 | |

Segment Leg : 60.69 dBA

Total Leg All Segments: 62.11 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 | 9.60 | 2.17 | 62.17 |

| ROAD (0.00 + 48.96 + 0.00) = 48.96 dBA | Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj |
|--|--|
| SubLeg | |

| 53.57 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | -8.83 | 0.00 |
|-------|----|------|-------|------|-------|-------|------|--------|------|
| -45 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | -13.44 | |

| 48.96 | | | | | | | | | |
|-------|----|------|-------|------|-------|-------|------|--------|--|
| -45 | 72 | 0.00 | 73.80 | 0.00 | -9.53 | -1.87 | 0.00 | -13.44 | |

Segment Leg : 48.96 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) |
|-------------------|---------------------|--------------------|------------------------------|
| 1.50 | 9.60 | 3.06 | 63.06 |

| ROAD (0.00 + 53.09 + 0.00) = 53.09 dBA | Angle1 Angle2 Alpha ReflEq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj |
|--|--|
| SubLeg | |

| 53.09 | | | | | | | | | |
|-------|----|------|-------|------|--------|-------|------|-------|------|
| -45 | 72 | 0.00 | 73.80 | 0.00 | -10.11 | -1.87 | 0.00 | -8.73 | 0.00 |

| 54.08 | | | | | | | | | |
|-------|----|------|-------|------|--------|-------|------|------|-------|
| -45 | 72 | 0.00 | 73.80 | 0.00 | -10.11 | -1.87 | 0.00 | 0.00 | -7.75 |

TOTAL Leg FROM ALL SOURCES (DAY) : 62.11
(NIGHT) : 54.51

Segment Leg : 53.09 dBA

Total Leg All Segments: 54.51 dBA

**NOISE ASSESSMENT REPORT -
29 ROBINSON AVENUE**

Appendix A Noise Level Calculations
October 24, 2018

A.2 OUTDOOR RECEIVER STAMSON REPORT

STAMSON 5.0 NORMAL REPORT Date : 24-10-2018 15:01:57
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: role Time Period: Day/Night 16/8 hours
 Description: Outdoor Receiver 1 - Outdoor amenity area

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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 | : -37.00 deg | 67.00 deg |
| Wood depth | | : 0 | (No woods.) |
| No of house rows | | : 3 / 3 | |
| House density | | : 95 % | |
| Surface | | : 2 | (Reflective ground surface) |
| Receiver source distance | | : 163.30 / 163.30 m | |
| Receiver height | | : 1.50 / 1.50 m | (Flat/gentle slope; with barrier) |
| Topography | | : 2 | |
| Barrier angle1 | | : -37.00 deg | Angle2 : 67.00 deg |
| Barrier height | | : 5.00 m | |
| Barrier receiver distance | | : 154.91 / 154.91 m | |
| Source elevation | | : 60.20 m | |
| Receiver elevation | | : 59.70 m | |
| Barrier elevation | | : 60.00 m | |
| Reference angle | | : 0.00 | |

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

| | | | |
|---------------------|-----------------------------------|----------------|---|
| Car traffic volume | : 59370/5163 | veh/TimePeriod | * |
| Medium truck volume | : 473/411 | 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 : -37.00 deg 67.00 deg Wood depth : 0 (No woods.) |
| No of house rows : 3 / 3 |
| House density : 95 % |
| Surface : Absorptive ground surface |
| Receiver source distance : 182.49 / 182.49 m |
| Receiver height : 1.50 / 1.50 m Topography : 2 (Flat/gentle slope; with barrier) |
| Barrier angle1 : -37.00 deg Angle2 : 67.00 deg |
| Barrier height : 5.00 m |
| Barrier receiver distance : 154.91 / 154.91 m |
| Source elevation : 60.20 m |
| Receiver elevation : 59.70 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 ! Receiver ! Barrier ! Elevation of Height (m) ! Height (m) ! Height (m) ! Barrier Top (m) |
| -----+-----+-----+-----+-----+-----+ |
| 1.50 ! 1.50 ! 1.67 ! 61.67 |
| ROAD (0.00 + 53.69 + 0.00) = 53.69 dBA |
| Angle1 Angle2 Alpha RefLgq P.Adj D.Adj F.Adj W.Adj H.Adj B. |
| SubLgq |
| --- |
| -37 67 0.00 81.40 0.00 -10.37 -2.38 0.00 -11.31 0 |
| 57.33 -37 67 0.00 81.40 0.00 -10.37 -2.38 0.00 0.00 -14 |
| 53.69 |

Segment Leg : 46.09 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) |
|-------------------|---------------------|--------------------|------------------------------|
| -37 | 67 | 0.36 | 81.40 |
| 49.29 | 67 | 0.66 | 81.40 |
| 53.01 | | | |

ROAD (0.00 + 49.29 + 0.00) = 49.29 dBA

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

| -37 | 67 | 0.36 | 81.40 | 0.00 | -14.76 | -2.68 | 0.00 | 0.00 |
|-------|----|------|-------|------|--------|-------|------|--------|
| 49.29 | 67 | 0.66 | 81.40 | 0.00 | -18.01 | -2.91 | 0.00 | -11.18 |
| 53.01 | | | | | | | | |

Segment Leg : 49.29 dBA

Total Leg All Segments: 55.04 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) |
|-------------------|---------------------|--------------------|------------------------------|
| -37 | 67 | 0.00 | 73.80 |
| 49.74 | 67 | 0.00 | 73.80 |
| 46.09 | | | |

ROAD (0.00 + 46.09 + 0.00) = 46.09 dBA

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

| -37 | 67 | 0.00 | 73.80 | 0.00 | -10.37 | -2.38 | 0.00 | -11.31 |
|-------|----|------|-------|------|--------|-------|------|--------|
| 49.74 | 67 | 0.00 | 73.80 | 0.00 | -10.37 | -2.38 | 0.00 | 0.00 |
| 46.09 | | | | | | | | |

TOTAL Leg FROM ALL SOURCES (DAY) : 55.04
(NIGHT) : 47.44

Segment Leg : 41.69 dBA

Total Leg All Segments: 47.44 dBA

**NOISE ASSESSMENT REPORT -
29 ROBINSON AVENUE**

Appendix B Site and FLOOR PLANS
October 24, 2018

Appendix B SITE AND FLOOR PLANS



1
A-121
FIRST FLOOR PLAN
3/16" = 1'-0"

| | |
|--|-------------------------------------|
| No. Date Émis pour / Object | 1 2018-05-28 CLIENT REVIEW |
| | 2 2018-05-18 COORDINATION |
| Ingenieur / Engineer (Mécanique & Électrotec / Mechanical & Electrical) | |
| Ingenieur / Engineer (Structure / Structure) | |
| Client / Client | |
| TCU | |
| Architecte / Architect | |
| Rubin & Rotman architectes 270 Prince Studio 200 Montréal Québec H3C 2N3 T 514 861 5122 F 514 861 5383 www.rubinrotman.com | |
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| Sceau / Seal | |
| L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et assurer une exactitude堪能 de toutes erreurs ou omissions. Contractor shall verify all information and dimensions on site and shall report any errors or omissions to the architect. | |
| Projet / Project | |
| 29 ROBINSON AVE. - THREE STOREY APARTMENT BUILDING | |
| 29 Robinson Avenue, Ottawa, ON | |
| Titre / Title | |
| FIRST FLOOR PLAN | |
| Dessiné par / Drawn by Author | No. projet / Project number 1821 |
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| Echelle / Scale 3/16" = 1'-0" | Révision / Revision 2 |
| Date de création du dessin / Drawing creation date 01/09/12 | |

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Ingénieur / Engineer
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Projet / Project
29 ROBINSON AVE. - THREE
STOREY APARTMENT
BUILDING

Title / Title
29 Robinson Avenue, Ottawa, ON

SECOND FLOOR PLAN

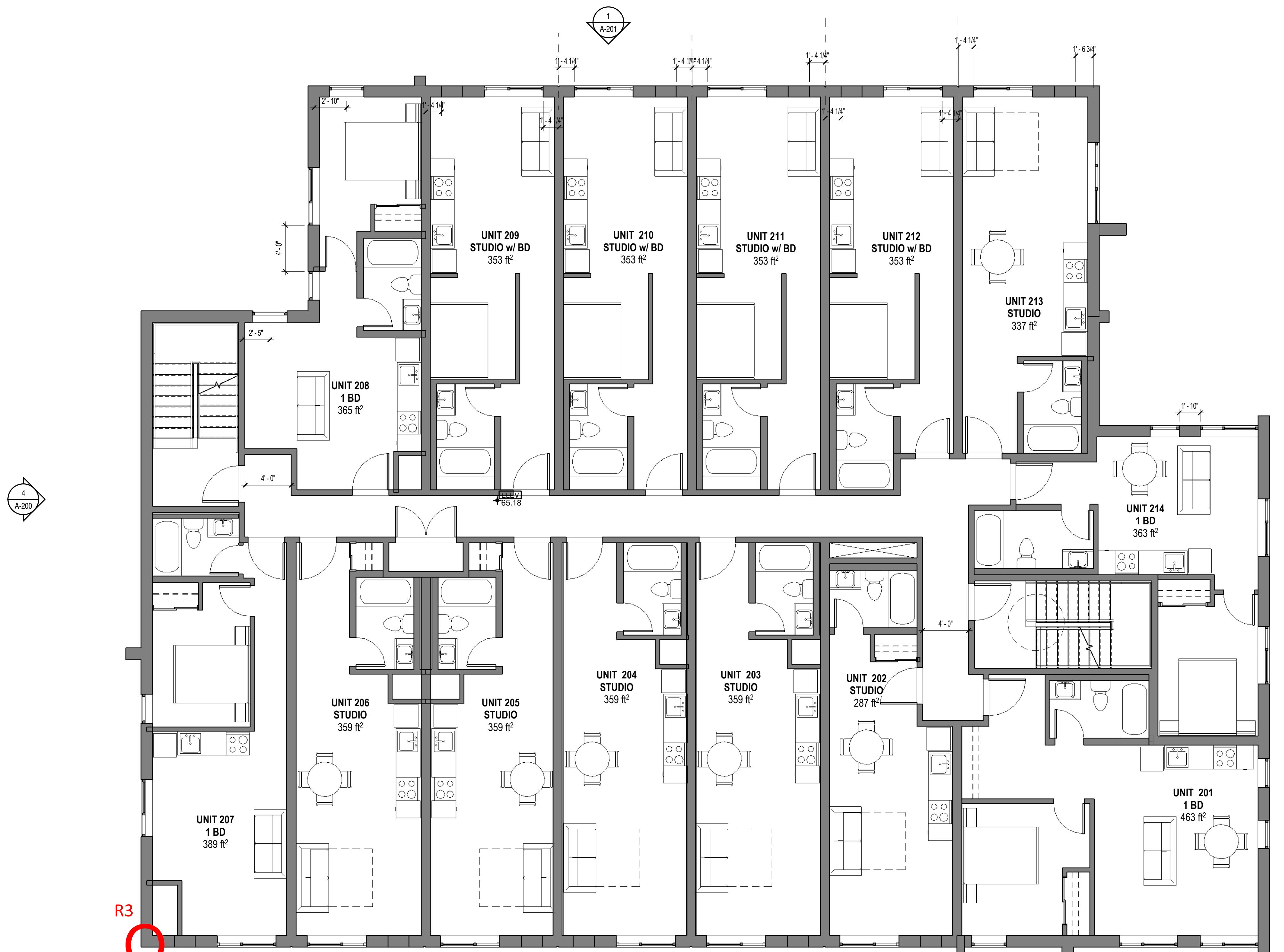
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2



A-122

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Note:
L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et assurer la conformité.
Furnished de toutes erreurs ou omissions.

Contractor shall verify all information and dimensions on site and assure compliance.
Report any errors or omissions to the architect.

Projet / Project
**29 ROBINSON AVE. - THREE
STOREY APARTMENT
BUILDING**

29 Robinson Avenue, Ottawa, ON
Titre / Title

THIRD FLOOR PLAN

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Author No. projet / Project number
1821

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Verifier / Verified by
Checker No. dessin / Drawing number
Echelle / Scale
3/16" = 1'-0"

Revision /
Révision /
2

Échelle / Scale
3/16" = 1'-0"

Date de création du dessin /
Drawing creation date
04/04/18



A-123





**NOISE ASSESSMENT REPORT -
29 ROBINSON AVENUE**

Appendix C NOISE WARNING CLAUSE
October 24, 2018

Appendix C NOISE WARNING CLAUSE

**NOISE ASSESSMENT REPORT -
29 ROBINSON AVENUE**

Appendix C NOISE WARNING CLAUSE
October 24, 2018

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 -
29 ROBINSON AVENUE**

Appendix C NOISE WARNING CLAUSE
October 24, 2018

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."

**NOISE ASSESSMENT REPORT -
29 ROBINSON AVENUE**

Appendix C NOISE WARNING CLAUSE
October 24, 2018

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.