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NOISE IMPACT STUDY - **Project: 17220**

# 630 Cummings Avenue

Ottawa, Ontario

Prepared for:

**McIntosh Perry**
115 Walgreen Road, R.R. 3
Carp, ON K0A 1L0

Prepared by:

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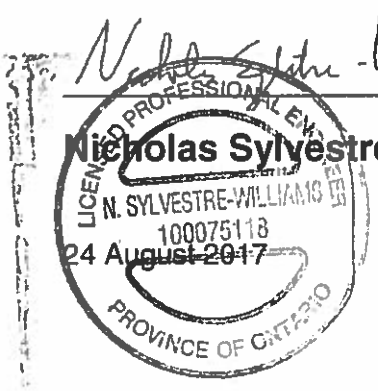
**Nicholas Sylvestre-Williams, P.Eng., M.Eng.**



# Executive Summary

McIntosh Perry has retained the services of Aercoustics Engineering Limited to prepare a Noise Impact Study for a proposed renovation and addition to a residential building in the city of Ottawa at 630 Cummings Avenue.

The purpose of this study was to examine the existing noise environment in the development area and evaluate its impact potential on the noise sensitive receptors. This report also investigates the noise control features that are required for the development in order to meet the noise guidelines of the Ontario Ministry of the Environment and Climate Change (MOECC) and to satisfy the requirements of the City of Ottawa. This report considers the MOECC guideline NPC-300 "*Stationary and Transportation Sources – Approval and Planning*" (August 2013).

The proposed renovation and addition is on a two-storey brick apartment building that will have forty-three (43) units. The site is located on the west side of Cummings Avenue between Montreal Road and Wilson Street. The adjacent land-uses include existing commercial buildings to the east and west, and residential surrounding in all directions.

The impact potential of the surrounding outdoor noise on the proposed project has been examined and is further discussed in this document in accordance with the MOECC noise guidelines. The results of this study indicate that the exterior wall and window construction meeting the minimum requirements of the OBC are expected to be sufficient to ensure compliance with the MOECC criteria for indoor sound levels.

# Table of Contents

# 1 Introduction

McIntosh Perry has retained the services of Aercoustics Engineering Limited to prepare a Noise Impact Study for a proposed renovation and addition to a residential building in the city of Ottawa at 630 Cummings Avenue.

The purpose of this study was to examine the existing and future noise environment in the development area and evaluate its impact potential on the noise sensitive receptors. This report also investigates the noise control features that are required for the development in order to meet the noise guidelines of the Ontario Ministry of the Environment and Climate Change (MOECC) and to satisfy the requirements of the City of Ottawa. This report considers the MOECC guideline NPC-300 "*Stationary and Transportation Sources – Approval and Planning*" (August 2013).

Figure 1 provides a key plan showing the building location. Figure 2 shows the draft site/concept plan of the building, including the critical road noise receptors.

The proposed renovation and addition is on a two-storey brick apartment building that will have forty-three (43) units. The site is located on the west side of Cummings Avenue between Montreal Road and Wilson Street. The adjacent land-uses include existing commercial buildings to the east and west, and residential surrounding in all directions. The most significant nearby noise sources are trucking movements and stationary sources belonging to the commercial plaza approximately 200 m west of the site. A three-storey building between the plaza and the site provides ample shielding of the noise and hence their impact will not be evaluated in this study. A zoning map obtained from the website of the City of Ottawa is attached in Appendix A.

The proposed site is identified as:

630 Cummings Avenue
City of Ottawa

This report is based on the following information:

- Proposed Site Plan prepared by Liff & Tolot Architects Inc., dated 15 June 2017;

The dominant road traffic source in the subject study area is Montreal Road, located approximately 120 m north from the site. Road traffic noise from Cummings Avenue has also been considered in this assessment.

This site is not affected by aircraft traffic or rail noise or vibration.

# 2 Guidelines and Criteria

## 2.1 Road Noise - Indoor Living Spaces

Indoor noise levels due to road traffic were also examined with respect to the MOECC Guidelines. Bedrooms are required to meet an indoor Leq-8hr of 40 dBA from road traffic. The required indoor sound level limit for living or dining rooms is a Leq-16hr of 45 dBA from road traffic. To achieve these levels, the MOECC Guidelines provide a basis for the type of windows, exterior walls and doors that will be required based on projected outdoor noise levels.

It is also an MOECC requirement that a central air conditioning system be installed for dwellings when the night-time or daytime outdoor transportation noise levels at the façade of the dwelling are above 60 dBA and 65 dBA, respectively. The provision for the future installation of central air conditioning must be made if the night-time sound level is greater than 50 dBA and less than or equal to 60 dBA on the outside face of a bedroom window or the daytime sound level is greater than 55 dBA and less than or equal to 65 dBA on the outside face of a living/dining room window. This provision involves a ducted heating system sized to accommodate the addition of central air conditioning by the occupant.

The applicable limits as per NPC-300 are summarized in Table 1 below.

Table 1 – Noise Limits Due to Road Traffic

| Type of Space | Time Period | Minimum LEQ (dBA) Road |
|---|---|---|
| Living/dining, den areas of residences | 07:00 – 23:00 | 45 dBA |
| Living/dining, den areas of residences | 23:00 – 07:00 | 45 dBA |
| Sleeping quarters (Indoor) | 07:00 – 23:00 | 45 dBA |
| | 23:00 – 07:00 | 40 dBA |
| Outdoor Living Areas (OLA) | 07:00 – 23:00 | 55 dBA |

# 3 Noise Level Predictions

## 3.1 Road Noise Calculations Procedure

The dominant road traffic sources in the subject study area include Montreal Road and Cummings Avenue. The proposed site is considered an MOECC Class 1 area due to existing road traffic.

Noise level calculations were performed in accordance with the MOECC Guidelines and by the Guidelines of the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT). Sample copies of the traffic noise predictions from MOECC's Road and Rail Traffic Noise Prediction Model STAMSON are included in Appendix B.

The equivalent sound levels (Leq) due to road traffic were calculated at worst case noise sensitive receptors in the proposed development. Calculations were performed for both daytime and night-time conditions at receiver heights representing the top residential storey.

## 3.2 Road Traffic Data

Predictions of road traffic noise were based on the road traffic data outlined in Table 2 below. Planned (forecasted) road traffic volume counts and truck percentages were obtained from the City of Ottawa. This planned data accounts for future growth in the area. Copies of the correspondence and data received are included in Appendix B.

Table 2 – Road Traffic Volumes

| | Montreal Road | Cummings Avenue |
|---|---|---|
| 24hr Volumes (Forecasted AADT) | 27047 | 2334 |
| Day/Night Split (%) | 76/24 | 76/24 |
| Heavy Vehicle Day (%) | 3.0 | 2.7 |
| Heavy Vehicle Night (%) | 2.5 | 2.1 |
| Number of lanes | 5 | 2 |
| Posted Speed (km/hr) | 60 | 50 |

# 4 Road Noise Predictions

Table 3 below lists the daytime and night-time Leq's due to road traffic as predicted at the noise sensitive location in the building, labelled as location R1 on the site plan in Figure 2. Sample calculations are provided in Appendix B.

Table 3 – Calculated Unmitigated Noise Levels Due to Road Traffic

| Calculation Location (Figure 2) | Receptor Height (m) | Description | Source | Distance (m) | Leq (dBA) | |
|---|---|---|---|---|---|---|
| | | | | | Day | Night |
| R1 | 7.5 | North Facade | Montreal Road | 110 | 58 | 56 |
| | | | Cummings Avenue | 15 | | |

# 5 Noise Control Recommendations

## 5.1 Indoor Living Spaces

Indoor sound levels have been examined with respect to MOECC Guidelines as summarized in Section 2 of this report.

Table 4 – Recommended Exterior Construction

| Location | Façade | Window STC | Exterior Wall STC |
|---|---|---|---|
| 630 Cummings Avenue | All Façades | OBC* | OBC* |

*Exterior wall and window components meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate acoustical protection for the future indoor daytime living spaces.

The building façade levels on the worst case side closest to Montreal Road are not in exceedance of the limits outlined in the MOECC Guidelines. It is then sufficient of a required that all exterior wall and window components comply with the OBC.

# 6 Conclusions

McIntosh Perry has retained the services of Aercoustics Engineering Limited to prepare a Noise Impact Study for a proposed renovation and addition to a residential building in the city of Ottawa at 630 Cummings Avenue.

The results of this study indicate that the exterior wall and window construction meeting the minimum requirements of the OBC are expected to be sufficient to ensure compliance with the MOECC criteria for indoor sound levels. No noise control measures need to be implemented however as per MOECC requirements, the dwelling should be designed with a provision for the installation of central air conditioning in the future, and Warning Clause 4 found in Section 7 is also recommended.

# 7 Warning Clauses

Warning Clause 4:

*"This dwelling unit has been supplied with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment and Climate Change."*

# 8 References

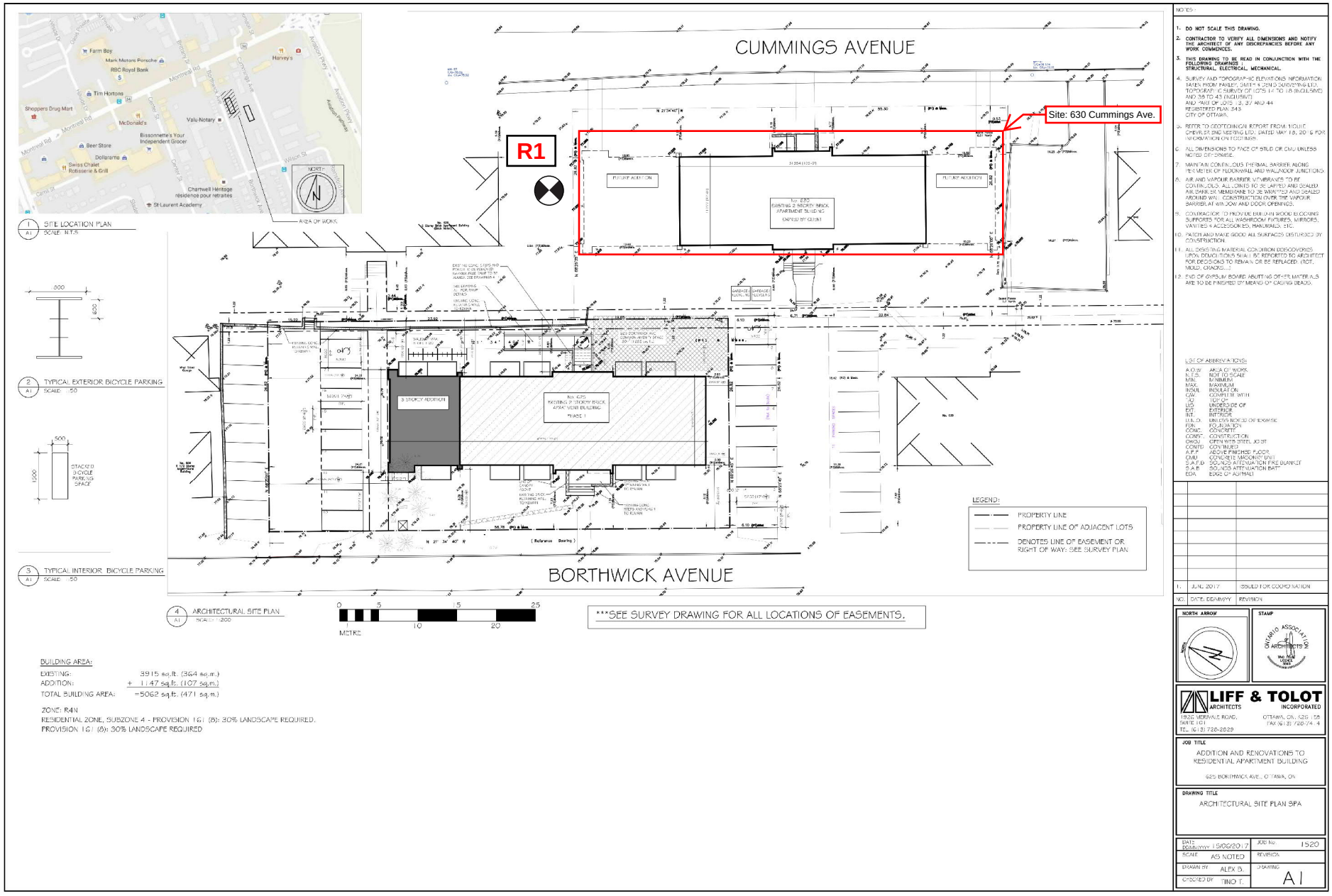
1. ORNAMENT – “Ontario Road Noise Analysis Method for Environmental and Transportation”, Ontario Ministry of the Environment, October, 1989.

2. “Stationary and Transportation Sources – Approval and Planning”, Ontario Ministry of the Environment, Publication NPC-300, August, 2013.

3. “Residential Air Conditioning Devices” – Ministry of the Environment and Energy, Publication NPC-216, October 1995.


| | | |
|---|---|---|
| aercoustics | Project ID: 17220<br>Scale: NTS<br>Drawn by: NA<br>Reviewed by: NSW<br>Date: July 2017<br>Revision: 1 | **Project Name**<br>630 Cummings Avenue NIS - McIntosh Perry Consulting Engineers<br>**Figure Title**<br>Key Plan |

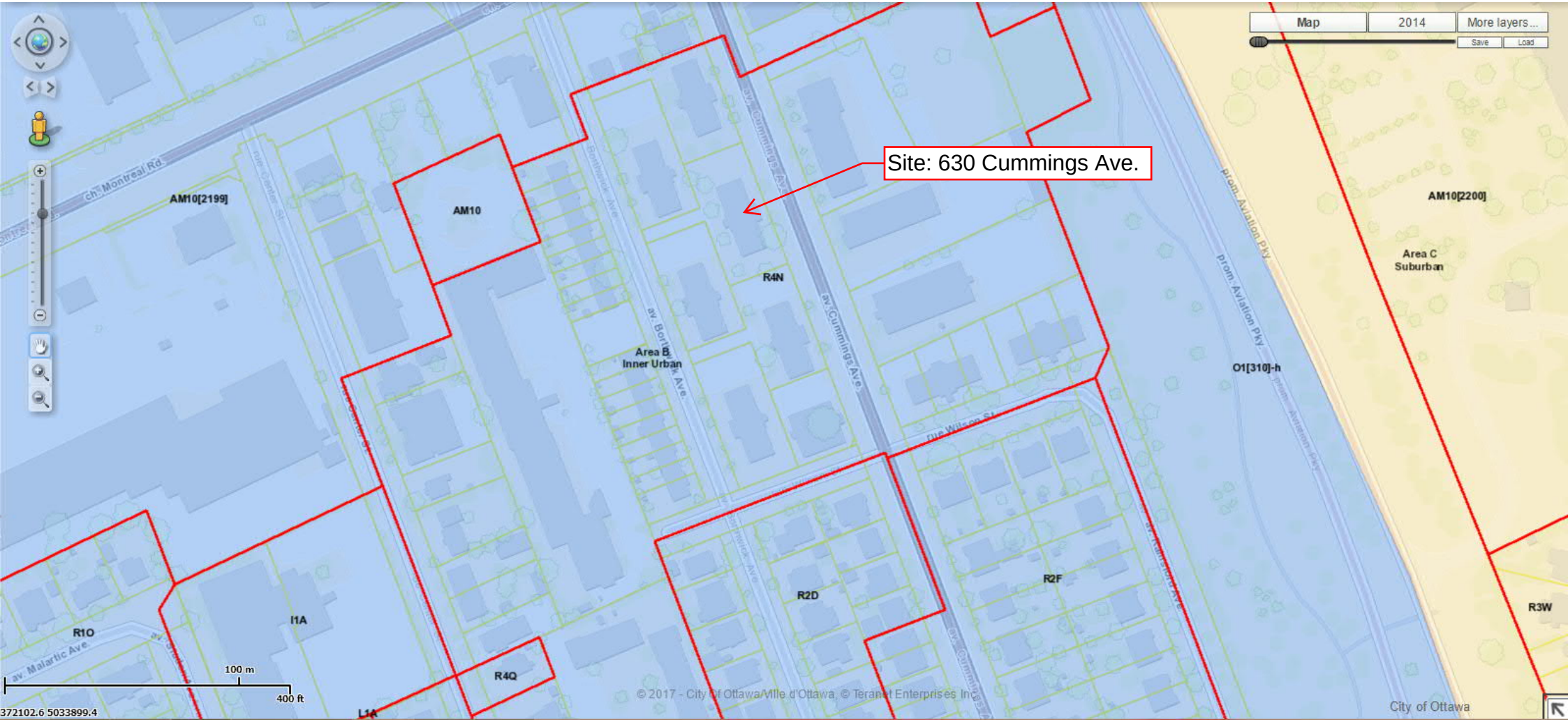
**Figure 1**




| | | |
|---|---|---|
| aercoustics | Project ID: 17220<br>Scale: NTS<br>Drawn by: NA<br>Reviewed by: NSW<br>Date: July 2017<br>Revision: 1 | **Project Name**<br>630 Cummings Avenue NIS - McIntosh Perry Consulting Engineers<br>**Figure Title**<br>Site Plan |

**Figure 2**

# Appendix A: Zoning Map Obtained From City of Ottawa


Site: 630 Cummings Ave.
Map
2014
More layers...
Save
Load
AM10[2199]
AM10
AM10[2200]
R4N
Area B
Inner Urban
Area C
Suburban
O1[310]-h
R2F
R2D
I1A
R1O
R4Q
R3W
L1A
av. Cummings Ave
av. Bonnaire Ave
prom. Aviation Pky
rue Wilson St
av. Malartic Ave
100 m
400 ft
372102.6 5033899.4
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City of Ottawa

**TABLE 35(B)- LIST OF PRIMARY ZONES AND CODES**

| (I) Zone Name | (II) Zone Code |
|---|---|
| **RESIDENTIAL ZONES** | |
| (1) Residential First Density Zone | R1 |
| (2) Residential Second Density Zone | R2 |
| (3) Residential Third Density Zone | R3 |
| (4) Residential Fourth Density Zone | R4 |
| (5) Residential Fifth Density Zone | R5 |
| (6) Mobile Home Park Zone | RM |

# Appendix B: Road Traffic Data &

# Sample Calculations of Road Noise Predictions

# Transportation Services - Traffic Services

**Work Order** 1178

## Turning Movement Count - Full Study Summary Report

## CUMMINGS AVE @ MONTREAL RD

**Survey Date:** Thursday, July 03, 2014

**Total Observed U-Turns**

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

**AADT Factor** .90

### Full Study

| | CUMMINGS AVE | | | | | | | | | MONTREAL RD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Period | LT | ST | RT | **NB TOT** | LT | ST | RT | **SB TOT** | **STR TOT** | LT | ST | RT | **EB TOT** | LT | ST | RT | **WB TOT** | **STR TOT** | **Grand Total** |
| 07:00 08:00 | 28 | 0 | 33 | **61** | 0 | 0 | 0 | **0** | **61** | 0 | 750 | 48 | **798** | 61 | 930 | 0 | **991** | **1789** | **1850** |
| 08:00 09:00 | 55 | 0 | 59 | **114** | 0 | 0 | 0 | **0** | **114** | 0 | 687 | 26 | **713** | 53 | 1155 | 0 | **1208** | **1921** | **2035** |
| 09:00 10:00 | 73 | 0 | 66 | **139** | 0 | 0 | 0 | **0** | **139** | 0 | 557 | 34 | **591** | 44 | 993 | 0 | **1037** | **1628** | **1767** |
| 11:30 12:30 | 96 | 0 | 106 | **202** | 0 | 0 | 0 | **0** | **202** | 0 | 746 | 65 | **811** | 71 | 1064 | 0 | **1135** | **1946** | **2148** |
| 12:30 13:30 | 96 | 0 | 109 | **205** | 0 | 0 | 0 | **0** | **205** | 0 | 839 | 42 | **881** | 73 | 1047 | 0 | **1120** | **2001** | **2206** |
| 15:00 16:00 | 133 | 0 | 110 | **243** | 0 | 0 | 0 | **0** | **243** | 0 | 1060 | 57 | **1117** | 59 | 1230 | 0 | **1289** | **2406** | **2649** |
| 16:00 17:00 | 112 | 0 | 127 | **239** | 0 | 0 | 0 | **0** | **239** | 0 | 1121 | 70 | **1191** | 75 | 1380 | 0 | **1455** | **2646** | **2885** |
| 17:00 18:00 | 111 | 0 | 110 | **221** | 0 | 0 | 0 | **0** | **221** | 0 | 934 | 41 | **975** | 76 | 1116 | 0 | **1192** | **2167** | **2388** |
| **Sub Total** | 704 | 0 | 720 | **1424** | 0 | 0 | 0 | **0** | **1424** | 0 | 6694 | 383 | **7077** | 512 | 8915 | 0 | **9427** | **16504** | **17928** |
| **U Turns** | | | | **0** | | | | **0** | **0** | | | | **0** | | | | **0** | **0** | **0** |
| **Total** | 704 | 0 | 720 | **1424** | 0 | 0 | 0 | **0** | **1424** | 0 | 6694 | 383 | **7077** | 512 | 8915 | 0 | **9427** | **16504** | **17928** |
| **EQ 12Hr** | 979 | 0 | 1001 | **1979** | 0 | 0 | 0 | **0** | **1979** | 0 | 9305 | 532 | **9837** | 712 | 12392 | 0 | **13104** | **22941** | **24920** |
| Note: These values are calculated by multiplying the totals by the appropriate expansion factor. | | | | | | | | | | | | | **1.39** | | | | | | |
| **AVG 12Hr** | 881 | 0 | 901 | **1781** | 0 | 0 | 0 | **0** | **1781** | 0 | 8374 | 479 | **8853** | 641 | 11153 | 0 | **11793** | **20646** | **22427** |
| Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. | | | | | | | | | | | | | **.90** | | | | | | |
| **AVG 24Hr** | 1154 | 0 | 1180 | **2334** | 0 | 0 | 0 | **0** | **2334** | 0 | 10970 | 628 | **11598** | 839 | 14610 | 0 | **15449** | **27047** | **29381** |
| Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. | | | | | | | | | | | | | **1.31** | | | | | | |

**Comments:**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

# Transportation Services - Traffic Services

**W.O.** 1178

## Turning Movement Count - Heavy Vehicle Report

## CUMMINGS AVE @ MONTREAL RD

**Survey Date:** Thursday, July 03, 2014

| | | CUMMINGS AVE | | | | | | | | | MONTREAL RD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Time Period | | LT | ST | RT | **N TOT** | LT | ST | RT | **S TOT** | **STR TOT** | LT | ST | RT | **E TOT** | LT | ST | RT | **W TOT** | **STR TOT** | **Grand Total** |
| 07:00 | 08:00 | 0 | 0 | 3 | **3** | 0 | 0 | 0 | **0** | **3** | 0 | 28 | 0 | **28** | 4 | 30 | 0 | **34** | **62** | **65** |
| 08:00 | 09:00 | 1 | 0 | 2 | **3** | 0 | 0 | 0 | **0** | **3** | 0 | 29 | 0 | **29** | 3 | 37 | 0 | **40** | **69** | **72** |
| 09:00 | 10:00 | 1 | 0 | 3 | **4** | 0 | 0 | 0 | **0** | **4** | 0 | 33 | 1 | **34** | 3 | 44 | 0 | **47** | **81** | **85** |
| 11:30 | 12:30 | 4 | 0 | 2 | **6** | 0 | 0 | 0 | **0** | **6** | 0 | 28 | 0 | **28** | 5 | 42 | 0 | **47** | **75** | **81** |
| 12:30 | 13:30 | 2 | 0 | 3 | **5** | 0 | 0 | 0 | **0** | **5** | 0 | 25 | 1 | **26** | 6 | 32 | 0 | **38** | **64** | **69** |
| 15:00 | 16:00 | 0 | 0 | 4 | **4** | 0 | 0 | 0 | **0** | **4** | 0 | 26 | 0 | **26** | 2 | 31 | 0 | **33** | **59** | **63** |
| 16:00 | 17:00 | 1 | 0 | 5 | **6** | 0 | 0 | 0 | **0** | **6** | 0 | 21 | 1 | **22** | 2 | 25 | 0 | **27** | **49** | **55** |
| 17:00 | 18:00 | 0 | 0 | 7 | **7** | 0 | 0 | 0 | **0** | **7** | 0 | 26 | 2 | **28** | 2 | 26 | 0 | **28** | **56** | **63** |
| **Sub Total** | | 9 | 0 | 29 | **38** | 0 | 0 | 0 | **0** | **38** | 0 | 216 | 5 | **221** | 27 | 267 | 0 | **294** | **515** | **553** |
| **U-Turns (Heavy Vehicles)** | | | | | **0** | | | | **0** | **0** | | | | **0** | | | | **0** | **0** | **0** |
| **Total** | | 9 | 0 | 29 | **0** | 0 | 0 | 0 | **0** | **38** | 0 | 216 | 5 | **221** | 27 | 267 | 0 | **294** | **515** | **553** |

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

STAMSON 5.0 NORMAL REPORT Date: 19-07-2017 15:33:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: MTLCMNGS.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Montreal Rd. (day/night)
---
Car traffic volume : 20646/6400 veh/TimePeriod
Medium truck volume : 0/0 veh/TimePeriod
Heavy truck volume : 515/160 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal Rd. (day/night)
---
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 110.00 / 110.00 m
Receiver height : 7.50 / 7.50 m
Topography : 0 (Define your own alpha.)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Alpha : 0.66
Reference angle : 0.00

Road data, segment # 2: Cummings Ave (day/night)
---
Car traffic volume : 1781/552 veh/TimePeriod
Medium truck volume : 0/0 veh/TimePeriod
Heavy truck volume : 38/12 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Cummings Ave (day/night)
---
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 7.50 / 7.50 m
Topography : 0 (Define your own alpha.)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Alpha : 0.66
Reference angle : 0.00

Results segment # 1: Montreal Rd. (day)
---

Source height = 1.25 m

ROAD (0.00 + 53.64 + 0.00) = 53.64 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.66 69.46 0.00 -14.36 -1.46 0.00 0.00 0.00 53.64
---

Segment Leq : 53.64 dBA

Results segment # 2: Cummings Ave (day)
---

Source height = 1.20 m

ROAD (0.00 + 55.37 + 0.00) = 55.37 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.66 56.83 0.00 0.00 -1.46 0.00 0.00 0.00 55.37
---

Segment Leq : 55.37 dBA

Total Leq All Segments: 57.60 dBA

Results segment # 1: Montreal Rd. (night)
---

Source height = 1.25 m

ROAD (0.00 + 51.57 + 0.00) = 51.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.66 67.39 0.00 -14.36 -1.46 0.00 0.00 0.00 51.57
---

Segment Leq : 51.57 dBA

Results segment # 2: Cummings Ave (night)
---

Source height = 1.21 m

ROAD (0.00 + 53.35 + 0.00) = 53.35 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.66 54.80 0.00 0.00 -1.46 0.00 0.00 0.00 53.35
---

Segment Leq : 53.35 dBA

Total Leq All Segments: 55.56 dBA

TOTAL Leq FROM ALL SOURCES **(DAY): 57.60**
**(NIGHT): 55.56**