

## **NOISE IMPACT STUDY**

**TOWN OF CALEDON  
PLANNING  
RECEIVED**  
May 29, 2020

### **CHICKADEE LANE ROUNDING OUT AREA "B"**

**13935, 13951 AND 13999 CHICKADEE LANE, 0 KING STREET**

**AND**

**550, 600 AND 615 GLASGOW ROAD**

**PART OF LOT 10, CONCESSION 5 AND 6**

**TOWN OF CALEDON**

**PREPARED FOR**

**ZANCOR HOMES (BOLTON) LTD.**

**MARCH 26<sup>TH</sup> 2019**

# ***NOISE IMPACT STUDY***

## **CHICKADEE LANE ROUNDING OUT AREA "B"**

**13935, 13951 AND 13999 CHICKADEE LANE, 0 KING STREET**

**AND**

**550, 600 AND 615 GLASGOW ROAD**

**PART OF LOT 10, CONCESSION 5 AND 6**

**TOWN OF CALEDON**

**PREPARED FOR**

**ZANCOR HOMES (BOLTON) LTD.**

**MARCH 26<sup>TH</sup> 2019**

## **TABLE OF CONTENTS**

	<b>Page</b>
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. NOISE ASSESSMENT</b>	<b>2</b>
<b>2.1 Roadway Traffic Noise Sources</b>	<b>2</b>
<b>2.2 Other Noise Sources</b>	<b>3</b>
<b>2.3 Aircraft Noise</b>	<b>4</b>
<b>2.4 Noise Criteria</b>	<b>4</b>
<b>2.5 Projected Sound Levels</b>	<b>7</b>
<b>3. NOISE ATTENUATION MEASURES</b>	<b>9</b>
<b>3.1 Outdoor Recreation Areas</b>	<b>9</b>
<b>3.2 Minimum Barrier Requirements</b>	<b>9</b>
<b>3.3 Ventilation and Warning Clause Requirements</b>	<b>10</b>
<b>3.4 Facade Components</b>	<b>11</b>
<b>4. SUMMARY</b>	<b>12</b>

## **APPENDICES**

<b>APPENDIX A:</b>	<b>Roadway Traffic Volume Data</b>
<b>APPENDIX B:</b>	<b>Warning Clauses</b>
<b>APPENDIX C:</b>	<b>Stamson 5.04 Sound Level Calculations</b>

## **TABLE OF CONTENTS (CONT'D)**

### **LIST OF TABLES**

		<b>Page</b>
<b>TABLE 1</b>	<b>Projected Roadway Traffic Volumes</b>	<b>3</b>
<b>TABLE 2</b>	<b>Region of Peel Noise Criteria (Road Traffic)</b>	<b>5</b>
<b>TABLE 3</b>	<b>Projected <math>L_{eq}</math> Sound Levels - Without Acoustical Barrier</b>	<b>8</b>
<b>TABLE 4</b>	<b>Projected <math>L_{eq}</math> Sound Levels - With Acoustical Barrier</b>	<b>10</b>

### **LIST OF FIGURES**

		<b>Following Page</b>
<b>FIGURE 1</b>	<b>Location Plan</b>	<b>1</b>
<b>FIGURE 2</b>	<b>Draft Plan of Subdivision</b>	<b>1</b>
<b>FIGURE 3</b>	<b>Receptor Location Plan</b>	<b>8</b>
<b>FIGURE 4</b>	<b>Noise Mitigation Plan</b>	<b>9</b>

## 1. INTRODUCTION

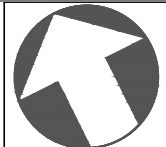
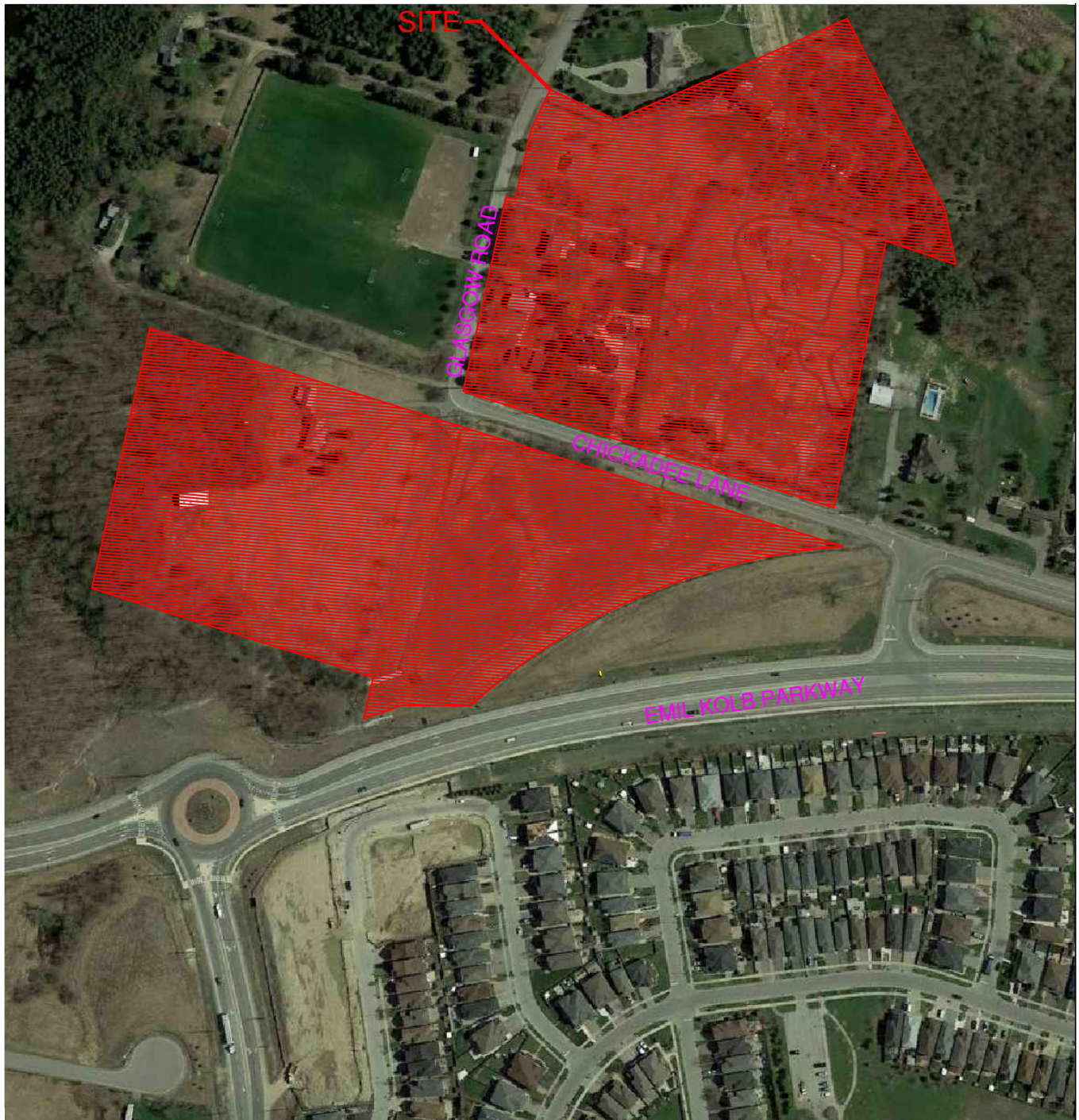
This Noise Impact Study for the proposed Residential Subdivision was prepared by CANDEVCON LIMITED on behalf of Zancor Homes (Bolton) Ltd. The purpose of the Study is to investigate the potential noise impacts on the proposed Residential Subdivision and to provide recommendations with respect to noise control measures.

The proposed Residential Subdivision is located immediately north of Emil Kolb Parkway and immediately east of Glasgow Road, in the Town of Caledon. **Figure 1** illustrates the location of the proposed Residential Subdivision. The proposed Residential Subdivision comprises three (3) blocks (open space (Blocks 31 and 32) and a park (Block 29)), 140 proposed townhouse units, one (1) proposed single detached unit, two (2) existing residential units, a storm water management pond and vacant lands. The subject subdivision also comprises the road widening of Glasgow Road and four (4) proposed Local Roads (Street 'A', Street 'B', Street 'C' and Street 'D').

The surrounding land uses in the vicinity of the proposed Residential Subdivision are: existing residential and woodlands to the north; existing residential, woodlands and vacant lands to the east; Emil Kolb Parkway, woodlands and existing residential beyond to the south; and Glasgow Road, an existing park and woodlands to the west. The proposed Draft Plan of Subdivision is provided in **Figure 2**.

This Study defines the projected noise levels from the nearby roads, specifically Emil Kolb Parkway, and recommends noise mitigation measures to satisfy the requirements of the Ministry of the Environment, Conservation and Parks (MECP), The Region of Peel and the Town of Caledon.





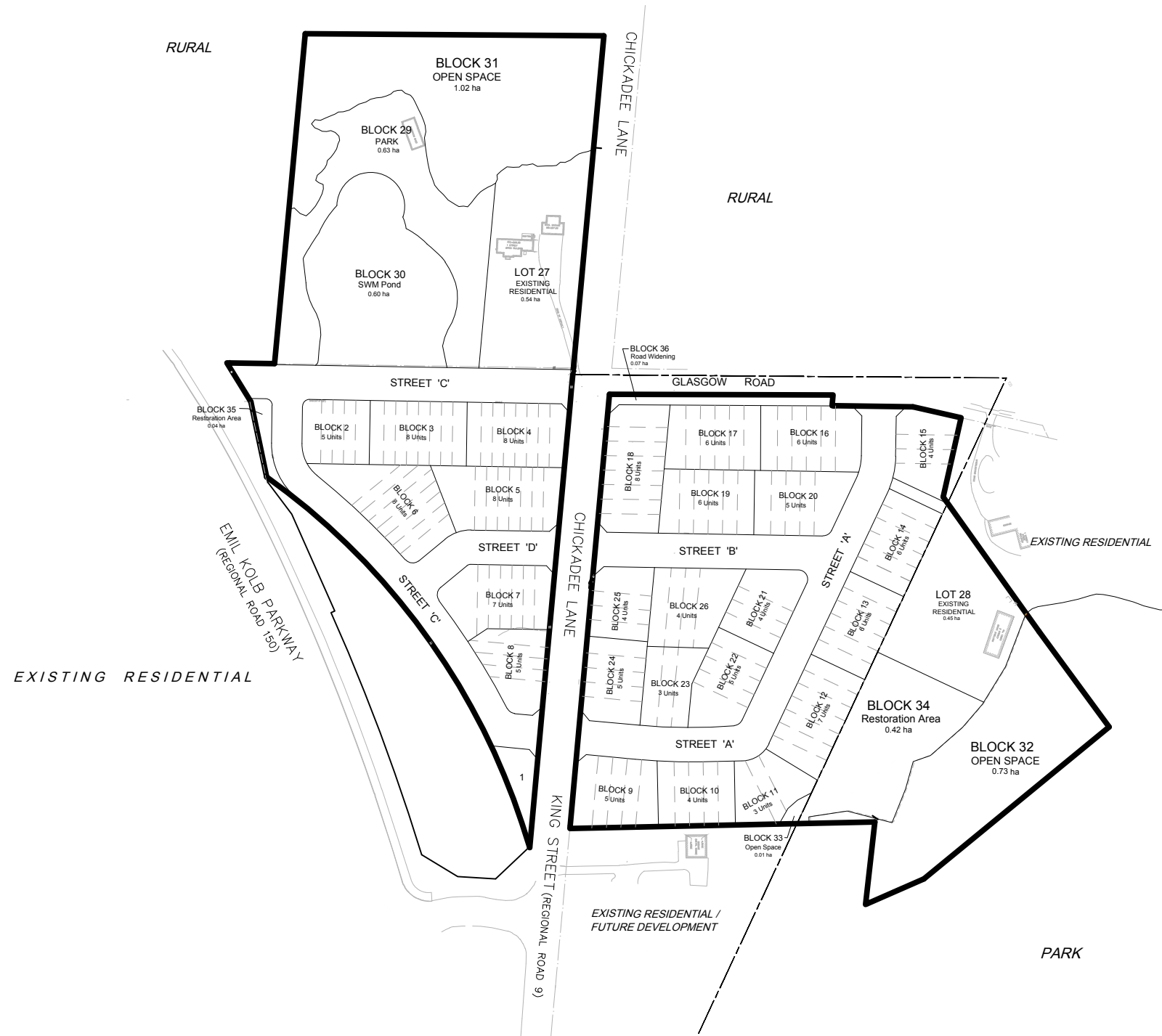
# ZANCOR HOMES (BOLTON) LTD.

CHICKADEE GROVE COMMUNITY  
PART OF LOT 10, CONCESSION 5 AND  
PART OF LOT 10, CONCESSION 6  
TOWN OF CALEDON

## LOCATION PLAN

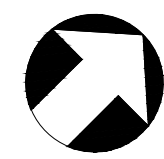
**CDG CANDEVCON LIMITED**  
CONSULTING ENGINEERS AND PLANNERS  
9358 GOREWAY DRIVE  
TEL. (905) 794-0600  
BRAMPTON, ONTARIO L6P 0M7  
FAX (905) 794-0611

DRAWN BY:	B.W.	PROJECT No.	W17003
CHECKED BY:	D.L.	FIGURE No.	1
SCALE:	N.T.S.		
DATE:	Mar. 26, 2019		



ZANCOR HOMES (BOLTON) LTD.  
 PROPOSED RESIDENTIAL SUBDIVISION  
 CHICKADEE GROVE COMMUNITY  
 TOWN OF CALEDON

## DRAFT PLAN OF SUBDIVISION



**CANDEVCON LIMITED**  
 CONSULTING ENGINEERS AND PLANNERS

TEL. (905) 794-0600

FAX (905) 794-0611

DATE: MAR. 26 2019

JOB No. W17003

DESIGN: B.W.

FIG. No.

SCALE: N.T.S.

2

## **2. NOISE ASSESSMENT**

### **2.1 Roadway Traffic Noise Sources**

The principal roadway noise source that will impact the subject subdivision is the vehicular traffic on Emil Kolb Parkway to the south. The roadway traffic data for Emil Kolb Parkway was obtained from the Region of Peel. The roadway traffic data is included in **Appendix A**.

Emil Kolb Parkway (Regional Road 150), within the vicinity of the proposed Residential Subdivision, is currently a four-lane arterial roadway with an urban cross-section and is under the jurisdiction of the Region of Peel. Emil Kolb Parkway has a posted speed limit of 60 km/h. The roadway is to remain at four (4) lanes in the future. During the daytime, the total percentage of trucks is anticipated to be 10 percent with a heavy to medium truck ratio of 1.86 (65%/35% split). During the night-time, the total percentage of trucks is anticipated to be 13 percent with a heavy to medium truck ratio of 1.67 (63%/37% split).

The percentages of daily traffic to be attributed to the daytime (7:00 a.m. to 11:00 p.m.) and the night-time (11:00 p.m. to 7:00 a.m.) periods were based on the recommended day-night traffic volume split of 90 percent - 10 percent from the Region of Peel.

**Table 1** summarizes the projected traffic volumes used in the analysis.



## 2. NOISE ASSESSMENT (CONT'D)

### 2.1 Roadway Traffic Noise Sources (Cont'd)

**TABLE 1**  
**PROJECTED (ULTIMATE) ROADWAY TRAFFIC VOLUMES**

<b>Road Characteristic</b>	<b>Emil Kolb Parkway</b>
<b>Jurisdiction</b>	Region of Peel
<b>Ultimate No. Lanes</b>	4
<b>Ultimate AADT</b>	32,400
<b>Posted Speed</b>	60 km/h
<b>% Day Trucks</b>	
<b>Medium</b>	3.50%
<b>Heavy</b>	6.50%
<b>% Night Trucks</b>	
<b>Medium</b>	4.90%
<b>Heavy</b>	8.20%
<b>Day/Night Volume Ratio</b>	90%/10%

### 2.2 Other Noise Sources

The subject subdivision is not located near any railways or major industrial facilities and is therefore not affected by rail or industrial noise sources.

## **2. NOISE ASSESSMENT (CONT'D)**

### **2.3 Aircraft Noise**

The 2000 Noise Exposure Forecast and the 1996 Noise Exposure Projections/2000 Noise Exposure Forecast Composite Noise Contour Maps for the Lester B. Pearson International Airport were obtained from Transport Canada. Aircraft noise exposure is rated by Transport Canada in terms of Noise Exposure Forecasts (NEF) for five-year time periods and Noise Exposure Projections (NEP) for longer time periods. NEF contours are available for 2000 and NEP contours for 1996.

The proposed Subdivision is well outside the NEP/NEF 25 contour (the lowest threshold of Noise Exposure Projections); therefore, there are no specific noise concerns or requirements in relation to attenuation of aircraft noise for the proposed Subdivision.

### **2.4 Noise Criteria**

Noise impact from the road traffic was assessed using the principles and procedures in the Environmental Noise Assessment In Land Use Planning<sup>1</sup> document. The sound level limits contained in the "Environmental Noise Assessment in Land Use Planning" document, adopted by the Region of Peel, have been used as criteria for acceptability. The criteria are summarized in **Table 2**.

---

<sup>1</sup> Environmental Noise Assessment in Land Use Planning, Volume 1: Analysis and Assessment, Technical Document, Ministry of the Environment, Conservation and Parks, 1990.

## 2. NOISE ASSESSMENT (CONT'D)

### 2.4 Noise Criteria (Cont'd)

**TABLE 2**  
**REGION OF PEEL NOISE CRITERIA (ROAD TRAFFIC)**

Location	Outdoor	Indoor
<b>Outdoor Living Area</b>	55 dBA (7 am - 11 pm) $L_{eq}$ (16 hour)	N/A
<b>Bedroom Window</b>	50 dBA (11 pm - 7 am) $L_{eq}$ (8 hour)	40 dBA (11 pm - 7 am) $L_{eq}$ (8 hour)
<b>Living Room Window</b>	55 dBA (7 am - 11 pm) $L_{eq}$ (16 hour)	45 dBA (7 am - 11 pm) $L_{eq}$ (16 hour)

An outdoor living area (OLA) in a residential subdivision generally refers to a rear yard. A minimum rear yard depth of 7.5m, measured from the rear face of the building, is required in the Town of Caledon. Where the noise levels exceed the noise criteria by no more than 5 dBA  $L_{eq}$ , noise mitigation measures should be considered. In those cases where daytime sound levels in the outdoor living area exceed 60 dBA  $L_{eq}$ , noise mitigation measures such as barriers are required to attenuate the sound levels to below 60 dBA  $L_{eq}$  and to the desired 55 dBA  $L_{eq}$  sound level limit. If the sound levels in the OLA exceed the noise criteria by no more than 5 dBA  $L_{eq}$  after noise mitigation measures are considered or implemented, a warning clause in the Development Agreement and in all Offers of Purchase and Sale for the specific lots is required.

## **2. NOISE ASSESSMENT (CONT'D)**

### **2.4 Noise Criteria (Cont'd)**

For residential buildings, the MECP have ventilation requirements which are based on the sound level at the exterior building facade. When the daytime (7:00-23:00) sound level in the plane of a bedroom or living/dining room window is greater than 65 dBA  $L_{eq}$  and/or when the night-time (23:00-7:00) sound level in the plane of a bedroom or living/dining room window is greater than 60 dBA  $L_{eq}$ , central air conditioning for the specific lots is required. Where the daytime (7:00-23:00) sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA  $L_{eq}$  and less than or equal to 65 dBA  $L_{eq}$ , and/or when the night-time (23:00-7:00) sound level in the plane of a bedroom or living/dining room window is greater than 50 dBA  $L_{eq}$  and less than or equal to 60 dBA  $L_{eq}$ , forced air heating with provision for central air conditioning for the specific lots is required.

In addition, where the daytime (7:00-23:00) sound levels outside the bedroom or living/dining room window exceed 65 dBA  $L_{eq}$  and/or the night-time sound levels outside the bedroom or living/dining room window exceed 60 dBA  $L_{eq}$ , building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limit criteria specified in **Table 2**.

## 2. NOISE ASSESSMENT (CONT'D)

### 2.5 Projected Sound Levels

$L_{eq}$  sound levels caused by the vehicular traffic on Emil Kolb Parkway were projected for specific units at the rear yard and at the building façade. All of the sound level projections were calculated using the computerized model<sup>2</sup> of the MECP's ORNAMENT procedure<sup>3</sup>.

Daytime sound levels were projected for an outdoor living area at a point located 3m from the rear wall of the building facade and 1.5m above the ground. In addition, daytime sound levels were projected for the first storey facade at a height of 1.5m above the ground. Night-time sound levels were projected for the second storey building facade at a height of 4.5 m above the ground.

Since the buildings are not sited yet on the individual lots/blocks, typical single detached 2- storey house and typical townhouse configurations and setbacks were assumed. It was also assumed that the building footprint would be setback approximately 7.5m (25 feet) from the street line for houses and 6m (20 feet) from the street line for townhouses.

The results from the Stamson 5.04 model for the daytime and night-time periods are summarized in **Table 3**, assuming no acoustical barriers. Typical computer reports are included in **Appendix C**.

---

<sup>2</sup> STAMSON 5.04 computer model, Ministry of the Environment, Conservation and Parks, 2000.

<sup>3</sup> ORNAMENT, Ontario Road Noise Analysis Method for Environment and Transportation, Technical Document, Ministry of the Environment, Conservation and Parks, 1989.

## 2. NOISE ASSESSMENT (CONT'D)

### 2.5 Projected Sound Levels (Cont'd)

**TABLE 3**  
**PROJECTED  $L_{eq}$  SOUND LEVELS - WITHOUT ACOUSTICAL BARRIER**

<b>Location</b>	<b>Daytime <math>L_{eq}</math> Rear Yard</b>	<b>Night-time <math>L_{eq}</math> 2<sup>nd</sup> Storey*</b>	<b>Daytime <math>L_{eq}</math> Side Facade</b>
<b>R1</b>	63.44 dBA	58.94 dBA	64.00 dBA
<b>R2</b>	59.84 dBA	55.10 dBA	59.93 dBA
<b>R3</b>	56.68 dBA	51.27 dBA	55.94 dBA
<b>R4</b>	52.29 dBA	56.81 dBA	61.74 dBA
<b>R5</b>	55.11 dBA	50.81 dBA	55.73 dBA
<b>R6</b>	52.68 dBA	49.34 dBA	54.17 dBA
<b>R7</b>	46.62 dBA	50.03 dBA	54.68 dBA
<b>R8</b>	48.47 dBA	49.86 dBA	54.64 dBA
<b>R9</b>	55.55 dBA	50.67 dBA	55.36 dBA

*Note: \* Night-time sound levels are at the 2<sup>nd</sup> storey front corner bedroom window.*

**Figure 3** illustrates the receptor locations which were analysed in this study.





ZANCOR HOMES (BOLTON) LTD.  
 PROPOSED RESIDENTIAL SUBDIVISION  
 CHICKADEE GROVE COMMUNITY  
 TOWN OF CALEDON

# RECEPTOR LOCATION PLAN



**CANDEVCON LIMITED**  
 CONSULTING ENGINEERS AND PLANNERS

TEL: (905) 794-0600	FAX: (905) 794-0611
DATE: MAR. 26 2019	JOB No. W17003
DESIGN: B.W.	FIG. No. 3
SCALE: N.T.S.	

### 3. NOISE ATTENUATION MEASURES

#### 3.1 Outdoor Recreation Areas

The data presented in **Table 3** indicates that for Lot 1, all of the units in Block 2, the two (2) units in Block 3 closest to Emil Kolb Parkway, the two (2) units in Block 7 closest to Emil Kolb Parkway, all of the units in Block 8 and the three (3) units in Block 9 closest to Emil Kolb Parkway will either require or need to consider noise mitigation measures such as barriers.

The MECP's criterion specifies that, if the daytime sound level in the outdoor living area is greater than 55 dBA  $L_{eq}$  and less than or equal to 60 dBA  $L_{eq}$ , physical control measures should be considered to reduce the sound level to the desired 55 dBA  $L_{eq}$  limit. If the daytime sound level in the outdoor living area is greater than 60 dBA  $L_{eq}$ , noise mitigation measures such as barriers are required to attenuate the sound levels to below 60 dBA  $L_{eq}$  and to the desired 55 dBA  $L_{eq}$  sound level limit. If the daytime sound level remains to be greater than 55 dBA  $L_{eq}$  after physical control measures are implemented or considered, a warning clause will be required on all titles and deeds to the properties to inform the purchasers of the potential noise problems.

#### 3.2 Minimum Barrier Requirements

As illustrated in **Figure 4**, the following acoustic fence barriers are proposed:

- A 3.1m high fence (consisting of a 2.2m acoustic fence and a 0.9m berm) along the east property line of Block 2 that returns to the south side of the building,
- A 2.2m high fence along the south property line of Blocks 7 and 8,
- A 2.2m high fence along the south property line of Lot 1.

The results from the Stamson 5.04 model for the sound level analysis with the recommended barriers is summarized in **Table 4**.



ZANCOR HOMES (BOLTON) LTD.  
PROPOSED RESIDENTIAL SUBDIVISION  
CHICKADEE GROVE COMMUNITY  
TOWN OF CALEDON

# NOISE MITIGATION PLAN



**CANDEVCON LIMITED**  
CONSULTING ENGINEERS AND PLANNERS

TEL: (905) 794-0600

FAX: (905) 794-0611

DATE: MAR. 26 2019

JOB No. W17003

DESIGN: B.W.

FIG. No.

SCALE: N.T.S.

4

### 3. NOISE ATTENUATION MEASURES (CONT'D)

#### 3.2 Minimum Barrier Requirements (Cont'd)

**TABLE 4**  
**PROJECTED  $L_{eq}$  SOUND LEVELS - WITH ACOUSTICAL BARRIERS**

Location	Recommended Barrier Height	Daytime $L_{eq}$ Rear Yard
<b>R1</b>	3.1m	55.24 dBA
<b>R3</b>	n/a*	55.14 dBA
<b>R10</b>	n/a*	54.14 dBA
<b>R11</b>	2.2m	54.33 dBA

*\* A barrier is not recommended for this property. However, the sound level projections would include the attenuation from the recommended barriers within the proposed Residential Subdivision.*

With the acoustic fence barriers recommended in **Figure 4**, all of the outdoor living areas will have a daytime sound level below the desired 55 dBA  $L_{eq}$  sound level limit.

#### 3.3 Ventilation and Warning Clause Requirements

The MECP have ventilation requirements for residential buildings which are based on the sound levels at the exterior building facades outside of a bedroom window (night-time sound levels) or a living/dinning room window (daytime sound levels). All of the units within the proposed Residential Subdivision will have a daytime sound level below 65 dBA  $L_{eq}$  and a night-time sound level below 60 dBA  $L_{eq}$ . Therefore, none of the units within the proposed Residential Subdivision will require mandatory air conditioning.

### **3. NOISE ATTENUATION MEASURES (CONT'D)**

#### **3.3 Ventilation and Warning Clause Requirements (cont'd)**

For Lot 1, all the units in Block 2, the three (3) units closest to Emil Kolb Parkway in Block 3, all the units in Block 6, the three (3) units closest to Emil Kolb Parkway in Block 7, all the units in Block 8 and the three (3) units closest to Emil Kolb Parkway in Block 9, since the night-time sound levels in the plane of the bedroom or living/dining room window is greater than 50 dBA  $L_{eq}$  and less than or equal to 60 dBA  $L_{eq}$  and/or the daytime sound levels in the plane of the bedroom or living/dining room window is greater than 55 dBA  $L_{eq}$  and less than or equal to 65 dBA  $L_{eq}$ , forced air heating with provision for central air conditioning is required.

The sound levels at the remaining units will be below the noise criteria of 50 dBA  $L_{eq}$  (night-time) and 55 dBA  $L_{eq}$  (daytime); no noise mitigation measures are required.

#### **3.4 Facade Components**

To comply with the MECP's interior sound level criterion of 40 dBA  $L_{eq}$  (night-time) for bedrooms and 45 dBA  $L_{eq}$  (daytime) for living rooms, STC rating requirements were examined for building facade components, namely windows, walls and doors.

For all of the lots/blocks, since the daytime sound levels in the plane of the bedroom or living/dining room window do not exceed 65 dBA  $L_{eq}$ , and the night-time sound levels in the plane of the bedroom or living/dining room window do not exceed 60 dBA  $L_{eq}$ , special building components will not be required to satisfy the MECP's criteria.

#### 4. SUMMARY

**Figure 4** illustrates the location and the length of the barriers along with the special ventilation and warning clause requirements for the appropriate units within the proposed Residential Subdivision.

The proposed Mitigation Plan has a 3.1m high acoustic fence for all the units in Block 2, a 2.2m high acoustic fence along the south side of Blocks 7 and 8 and a 2.2m high acoustic fence for Lot 1. With the location and the heights of the proposed acoustic barriers, all of the daytime sound levels at the outdoor living area will be below the desired 55 dBA  $L_{eq}$  sound level limit.

In addition, for Lot 1, all the units in Block 2, the three (3) units closest to Emil Kolb Parkway in Block 3, all the units in Block 6, the three (3) units closest to Emil Kolb Parkway in Block 7, all the units in Block 8 and the three (3) units closest to Emil Kolb Parkway in Block 9, since the night-time sound levels in the plane of the bedroom or living/dining room window is greater than 50 dBA  $L_{eq}$  and less than or equal to 60 dBA  $L_{eq}$  and/or the daytime sound levels in the plane of the bedroom or living/dining room window is greater than 55 dBA  $L_{eq}$  and less than or equal to 65 dBA  $L_{eq}$ , forced air heating with provision for central air conditioning is required. The units will also require a warning clause in the Development Agreement and in all Offers of Purchase and Sale. The wording of the Warning Clause is included in **Appendix B**.



#### 4. SUMMARY (CONT'D)

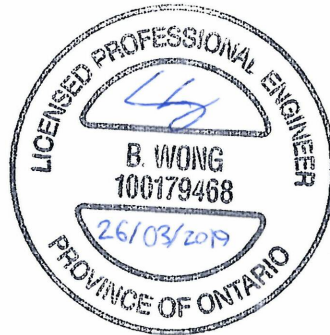
Based on the above analysis, with the requirements given, the proposed Residential Subdivision will meet the noise criteria set forth by the Ministry of Environment, Conservation and Parks and will meet the requirements set forth by the Region of Peel.

This Report was prepared by:

**CANDEVCON LIMITED**



**Brian Wong, P. Eng.**  
Intermediate Transportation Engineer



**David Lee, P. Eng.**  
Project Manager



## **APPENDIX A**

### **Roadway Traffic Volume Data**

February 13<sup>th</sup>, 2019

Brian Wong  
Candevcon  
Traffic Data Request

Brian:

As per your request, we are providing the following traffic data.

Emil Kolb Pkwy, north of King Street West

	Existing	Planned/Ultime
24 Hour Traffic Volume	11,681	32,400
# of Lanes	4	4
Day/Night Split	90/10	90/10
Day Trucks (% of Total Volume)	3.5% Medium 6.5% Heavy	3.5% Medium 6.5% Heavy
Night Trucks (% of Total Volume)	4.9% Medium 8.2% Heavy	4.9% Medium 8.2% Heavy
Right-of-Way Width	45 metres	
Posted Speed Limit	60 km/h	

If you require further assistance, please contact me at (905) 791-7800 ext. 8594

Regards,

Parsham Bahrami  
Transportation Planner, Infrastructure Planning & Design  
Transportation Division, Public Works, Region of Peel

10 Peel Centre Drive, Suite B, 4th Floor, Brampton, ON, L6T 4B9  
E: [parshan.bahrami@peelregion.ca](mailto:parshan.bahrami@peelregion.ca) • W: 905-791-7800 x8594

---

**Public Works**

10 Peel Centre Dr., Suite B, Brampton, ON L6T 4B9  
Tel: 905-791-7800 [www.peelregion.ca](http://www.peelregion.ca)

## **APPENDIX B**

### **Warning Clauses**

## **APPENDIX B**

### **Warning Clauses**

#### **Warning Clause “C”**

“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”

## APPENDIX C

### Stamson 5.04 Sound Level Calculations

	Page
<b>Proposed Subdivision, Receptor Location 1</b>	
Daytime, Rear Yard, No acoustic barrier	C-1
Night-time, Side Facade, No acoustic barrier	C-3
Daytime, Side Facade, No acoustic barrier	C-4
Daytime, Rear Yard, 3.1m high acoustic barrier	C-5



STAMSON REPORT - RECEPTOR LOCATION 1 - DAYTIME, OUTDOOR LIVING AREA

STAMSON 5.0                      NORMAL REPORT                      Date: 14-02-2019 13:42:03  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1D.te                      Time Period: 16 hours  
Description:

Road data, segment # 1: Chickadee

-----  
Car traffic volume : 26244 veh/TimePeriod \*  
Medium truck volume : 1021 veh/TimePeriod \*  
Heavy truck volume : 1895 veh/TimePeriod \*  
Posted speed limit : 60 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Chickadee

-----  
Angle1    Angle2 : -90.00 deg    -66.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 1  
House density : 95 %  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 48.00 m  
Receiver height : 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: Chickadee

-----  
Car traffic volume : 26244 veh/TimePeriod \*  
Medium truck volume : 1021 veh/TimePeriod \*  
Heavy truck volume : 1895 veh/TimePeriod \*  
Posted speed limit : 60 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Chickadee

-----  
Angle1    Angle2 : -66.00 deg    90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 48.00 m  
Receiver height : 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: Chickadee

-----

Source height = 1.60 m

ROAD (0.00 + 42.00 + 0.00) = 42.00 dBA

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

-----									
---									
-90	-66	0.66	73.52	0.00	-8.37	-13.47	0.00	-9.68	0.00
-----									
---									

Segment Leq : 42.00 dBA

Results segment # 2: Chickadee

-----

Source height = 1.60 m

ROAD (0.00 + 63.41 + 0.00) = 63.41 dBA

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

-----									
---									
-66	90	0.66	73.52	0.00	-8.37	-1.73	0.00	0.00	0.00
-----									
---									

Segment Leq : 63.41 dBA

Total Leq All Segments: 63.44 dBA

TOTAL Leq FROM ALL SOURCES: 63.44

STAMSON REPORT - RECEPTOR LOCATION 1 - NIGHT-TIME, FACADE

STAMSON 5.0                      NORMAL REPORT                      Date: 14-02-2019 13:48:58  
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1N.te                      Time Period: 8 hours  
 Description:

Road data, segment # 1: Chickadee

```
-----
Car traffic volume   : 2816 veh/TimePeriod *
Medium truck volume : 159 veh/TimePeriod *
Heavy truck volume  : 266 veh/TimePeriod *
Posted speed limit  : 60 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: Chickadee

```
-----
Angle1 Angle2      : -90.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0
Surface             : 1          (Absorptive ground surface)
Receiver source distance : 46.00 m
Receiver height      : 4.50 m
Topography           : 1          (Flat/gentle slope; no barrier)
Reference angle      : 0.00
```

Results segment # 1: Chickadee

Source height = 1.69 m

ROAD (0.00 + 58.94 + 0.00) = 58.94 dBA

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

```
-----
---
-90      90      0.56  67.85   0.00  -7.61  -1.29   0.00   0.00   0.00
58.94
-----
---
```

Segment Leq : 58.94 dBA

Total Leq All Segments: 58.94 dBA

TOTAL Leq FROM ALL SOURCES:                      58.94

STAMSON REPORT - RECEPTOR LOCATION 1 - DAYTIME, FACADE

STAMSON 5.0                      NORMAL REPORT                      Date: 14-02-2019 13:46:14  
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1DF.te                      Time Period: 16 hours  
 Description:

Road data, segment # 1: Chickadee

-----  
 Car traffic volume : 26244 veh/TimePeriod \*  
 Medium truck volume : 1021 veh/TimePeriod \*  
 Heavy truck volume : 1895 veh/TimePeriod \*  
 Posted speed limit : 60 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Chickadee

-----  
 Angle1 Angle2 : -90.00 deg 90.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 46.00 m  
 Receiver height : 1.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

Results segment # 1: Chickadee

-----  
 Source height = 1.60 m

ROAD (0.00 + 64.00 + 0.00) = 64.00 dBA

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

---									
-90	90	0.66	73.52	0.00	-8.06	-1.45	0.00	0.00	0.00
64.00									

-----  
 Segment Leq : 64.00 dBA

Total Leq All Segments: 64.00 dBA

TOTAL Leq FROM ALL SOURCES: 64.00

STAMSON REPORT - RECEPTOR LOCATION 1 - DAYTIME, OUTDOOR LIVING AREA WITH  
3.1m HIGH ACOUSTIC BARRIER

STAMSON 5.0                      NORMAL REPORT                      Date: 15-02-2019 09:30:59  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rldb.te                      Time Period: 16 hours  
Description:

Road data, segment # 1: Chickadee

-----  
Car traffic volume : 26244 veh/TimePeriod \*  
Medium truck volume : 1021 veh/TimePeriod \*  
Heavy truck volume : 1895 veh/TimePeriod \*  
Posted speed limit : 60 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Chickadee

-----  
Angle1    Angle2                      : -90.00 deg    -66.00 deg  
Wood depth                            : 0              (No woods.)  
No of house rows                      : 1  
House density                          : 95 %  
Surface                                : 1              (Absorptive ground surface)  
Receiver source distance : 48.00 m  
Receiver height                        : 1.50 m  
Topography                             : 1              (Flat/gentle slope; no barrier)  
Reference angle                        : 0.00

Road data, segment # 2: Chickadee

```

-----
Car traffic volume : 26244 veh/TimePeriod *
Medium truck volume : 1021 veh/TimePeriod *
Heavy truck volume : 1895 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

Data for Segment # 2: Chickadee

```

-----
Angle1 Angle2 : -66.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 48.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with
barrier)
Barrier angle1 : -66.00 deg Angle2 : 90.00 deg
Barrier height : 3.10 m
Barrier receiver distance : 6.60 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

```

Results segment # 1: Chickadee

Source height = 1.60 m

ROAD (0.00 + 42.00 + 0.00) = 42.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	-66	0.66	73.52	0.00	-8.37	-13.47	0.00	-9.68	0.00

SubLeq

42.00

Segment Leq : 42.00 dBA

Results segment # 2: Chickadee

Source height = 1.60 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.60	1.50	1.51	1.51

ROAD (0.00 + 55.03 + 0.00) = 55.03 dBA

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

-66	90	0.47	73.52	0.00	-7.43	-1.47	0.00	0.00	-9.59
55.03									

Segment Leq : 55.03 dBA

Total Leq All Segments: 55.24 dBA

TOTAL Leq FROM ALL SOURCES: 55.24