



## Manors of Belfountain

Shaws Creek Road, Caledon

### Noise Impact Study

Revision 1

SACL #SW17308A1

April 23, 2019

Submitted to:

**John Spina**

Manager

The Manors of Belfountain Corp.

55 Blue Willow Drive

Woodbridge, Ontario L4L 9E8

Tel: 905-265-1976

[ispina@mediterracorp.onmicrosoft.com](mailto:ispina@mediterracorp.onmicrosoft.com)

Submitted by:

**Pearlie Yung, M.Sc., P.Eng.**

Senior Project Engineer

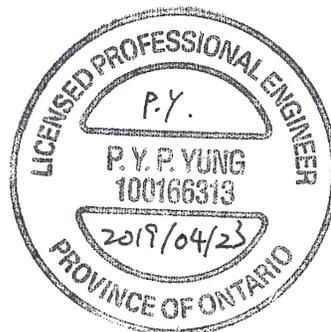
Swallow Acoustic Consultants Ltd.

23-366 Revus Ave.

Mississauga, Ontario L5G 4S5

Tel: 905-271-7888

[pyung@thorntomasetti.com](mailto:pyung@thorntomasetti.com)



Reviewed by:

**Galen Wong, M.A.Sc.**

Senior Project Director

## Table of Contents

<b>1. Introduction .....</b>	<b>1</b>
<b>2. Site .....</b>	<b>1</b>
<b>3. Noise Sources .....</b>	<b>1</b>
<b>4. Transportation Noise Impact .....</b>	<b>2</b>
4.1 Critical Noise Receptors.....	2
4.2 Sound Levels.....	2
4.3 Sound Level Limits.....	4
4.3.1 Outdoor Sound Level Limits.....	4
4.3.2 Indoor Sound Level Limits.....	4
4.3.3 Town of Caledon Requirements.....	6
4.4 Noise Control Measures.....	6
4.4.1 Outdoor Amenity Area.....	7
4.4.2 Ventilation.....	7
4.4.3 Building Components.....	7
4.4.4 Warning Clauses.....	7
<b>5. Stationary Noise Impact .....</b>	<b>7</b>
5.1 Stationary Noise Sources.....	7
5.2 Critical Noise Receptors.....	8
5.3 Sound Level Limits.....	8
5.4 Sound Level Calculation .....	8
5.5 Noise Impact from Project.....	9
<b>6. Concluding Comments.....</b>	<b>9</b>
<b>Figures .....</b>	<b>10</b>
<b>Appendices .....</b>	<b>14</b>

### LIST OF TABLES

<b>Table 1: Critical Noise Receptors .....</b>	<b>2</b>
<b>Table 2: Summary of Traffic Data.....</b>	<b>2</b>
<b>Table 3: Calculated Outdoor Sound Level.....</b>	<b>3</b>
<b>Table 4: MECP Outdoor Sound Level Limit.....</b>	<b>4</b>
<b>Table 5: MECP Noise Control Requirements for Outdoor Receptors .....</b>	<b>4</b>
<b>Table 6: MECP Indoor Sound Level Limit.....</b>	<b>4</b>
<b>Table 7: Combination of Road and Rail Noise, Ventilation and Warning Clause Requirements.....</b>	<b>5</b>
<b>Table 8: Road Noise Building Component Requirements .....</b>	<b>5</b>



**Table 9: Noise Control Measures ..... 6**  
**Table 10: Exclusion Limit Values of One-Hour Equivalent Sound Level ..... 8**

**LIST OF FIGURES**

- Figure 1: Site Plan**
- Figure 2: Aerial Photo**
- Figure 3: Haul Route**

**LIST OF APPENDICES**

- Appendix A: Traffic Data**
- Appendix B: STAMSON Calculations**
- Appendix C: Technical Information of Rooftop Units**



## 1. Introduction

---

This document is a Noise Impact Study for a proposed residential development located on Shaws Creek Road in Caledon, Ontario (Project). The legal location of the Project is part of east half and west half of Lot 9, Concession 5 W.H.S. (Hamlet of Belfountain) in the Town of Caledon. We understand that the study is required by the Town of Caledon for a development permit and approval of a draft plan of subdivision. This report has been updated from the December 17, 2017 version with a revised development concept plan and to address comments from the Niagara Escarpment Commission.

The proposed residential development consists of 70 estate residential lots. The development concept plan is shown in [Figure 1](#). The objective of this study is to determine if the proposed development can meet the requirements of the Town of Caledon, using criteria developed by the Ontario Ministry of the Environment, Conservation and Parks (MECP). Noise control recommendations are summarised in Section 4.4.

## 2. Site

---

The Project is located on the east side of Shaws Creek Road, between Bush Street and The Grange Side Road. An aerial photo of the area is provided in [Figure 2](#). The Project is surrounded by residential land use and agricultural land use except the Belfountain Public School immediately north of the Project. Farther away is green space to the northeast. There are commercial developments along Bush Street, where it intersects Mississauga Road and Shaws Creek Road but they are at least 300 m away. James Dick concrete-aggregate pit on Winston Churchill Boulevard is 1 km away. With the long separation distance, these commercial and industrial developments do not have significant noise impact to the Project.

The proposed residential develop consists of 70 estate residential lots. The existing woodlot and valley on the east side of the site will remain. One block will be designated as open space. The frontage of houses on Lot 1 to Lot 7 will be oriented towards Shaws Creek Road. The rest of the houses will have frontage oriented towards local streets. It is assumed that the designated outdoor living area will be the backyard of each of the houses.

## 3. Noise Sources

---

A site visit was conducted on December 13, 2017. The major noise source that may impact the site is the road traffic along Shaws Creek Road. The nearby Bush Street to the north and Mississauga Road to the east are more than 200 m from the nearest houses in the Project; therefore, the traffic on these roads are not considered significant noise sources.

There are two rooftop units near the main entrance of the Belfountain Public School. Stationary noise sources associated with the school are discussed in Section 4.

## 4. Transportation Noise Impact

### 4.1 Critical Noise Receptors

Critical Noise Receptors are those receptors likely to be most affected by the identified noise sources. The critical indoor noise receptors in the proposed development are the proposed houses along Shaws Creek Road. The critical outdoor noise receptors are the backyards of these proposed houses. A receptor farther away from Shaws Creek Road is also included to verify the extent of noise control requirements. The locations of the critical receptors are summarised in Table 1 and shown in [Figure 1](#).

**Table 1: Critical Noise Receptors**

<i>Receptor ID</i>	<i>Receptor Location</i>	<i>Height (m)</i>
POR1	House on Lot 1	4.5
POR2	House on Lot 19	4.5
OLA1	Backyard of Lot 1	1.5
OLA2	Backyard of Lot 18	1.5

The outdoor living areas (OLA1 and OLA2) are selected to represent different orientations of the house. OLA1 represents backyards of houses facing Shaws Creek Road and is shielded by the house itself. OLA2 represents backyards of houses along Shaws Creek Road facing local roads such that the backyard is exposed to Shaws Creek Road directly. It is assumed that the minimum setback of the house is 6 m from the west property line along Shaws Creek Road regardless of the orientation of the house.

### 4.2 Sound Levels

Traffic volume data for Shaws Creek Road was obtained from NexTrans Consulting Engineers. The traffic data are provided in [Appendix A](#). Existing or ultimate AADT for this road is not available. The AADT was estimated by multiplying the morning peak hour traffic volume by a factor of 12.05. A 2.5% per year increase for road traffic volume from 2017 to 2037, that is 20 years, was assumed. The traffic data are summarised in Table 2.

**Table 2: Summary of Traffic Data**

<i>Parameter</i>	<i>Shaws Creek Road</i>
Morning Peak Hour 7:30-8:30 in 2017	68
Estimated AADT	819
Annual increase	2.5%

<b>Parameter</b>	<b>Shaws Creek Road</b>
Medium truck % of total volume	19%
Heavy truck % of total volume	3%
Estimated day (16 hrs) % of total volume	90%
Estimated night (8 hrs) % of total volume	10%
Posted Speed Limit	60 km/h
Gradient	3.5%

According to the Town of Caledon Development Standards, Policies & Guidelines Version 4 – January 2009, the traffic speed for noise impact analysis should be 10 km/hr over the posted speed limit. Therefore the speed limit used in our traffic noise prediction model is 70 km/h. It is our understanding that there is no plan for increasing the number of lanes on Shaws Creek Road. Widening the road alone will not affect the traffic sound levels.

Calculations of traffic sound levels were performed using STAMSON 5.04, the traffic (and railway) noise prediction model developed and accepted by MECP. Paved road is assumed for Shaws Creek Road. The calculated sound levels are as follows:

**Table 3: Calculated Outdoor Sound Level**

<b>Receptor ID</b>	<b>Calculated Sound Level (dBA)</b>	
	<b>Day Leq (16 hrs)</b>	<b>Night Leq (8 hrs)</b>
POR1	59	53
POR2	50	43
OLA1	49	-
OLA2	54	-

A sample calculation report for traffic noise predictions is attached as [Appendix B](#). As the traffic volume for Shaws Creek Road is too low to be input into the STAMSON calculation model, the traffic volume and resultant sound level have been adjusted by a factor of 10, resulting in calculated levels being 10 dB higher. The levels reported in Table 3 are thus 10 dB lower than the levels calculated and presented in [Appendix B](#).

### 4.3 Sound Level Limits

Guidelines for acceptable sound levels of road traffic on residential developments are given in Part C of the MOE publication NPC-300 “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning” dated 2013.

#### 4.3.1 Outdoor Sound Level Limits

The MECP outdoor sound level limit for traffic noise is as follows:

**Table 4: MECP Outdoor Sound Level Limit**

<i>Time Period</i>	<i>Sound Level (Leq)</i>
Day-time (07:00 - 23:00)	55

In addition to the above outdoor levels, the MECP has a sliding scale to determine the need for outdoor noise reduction measures depending on outdoor sound levels:

**Table 5: MECP Noise Control Requirements for Outdoor Receptors**

<i>Outdoor Sound Level (Day-time Leq)</i>	<i>Need for Noise Reduction Measures</i>
56 to 60 dBA	Noise control measures may be implemented. If no noise control measures are planned, a warning clause must be included in the unit title or lease agreement.
Above 60 dBA	Control measures (barriers) required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible. A warning clause is required if resultant Leq exceeds 55 dBA.

#### 4.3.2 Indoor Sound Level Limits

The indoor sound levels limits developed by MECP for road sources are as follows:

**Table 6: MECP Indoor Sound Level Limit**

<i>Room</i>	<i>Time Period</i>	<i>Road Sound Level (Leq)</i>
Living rooms	Day-time (07:00 - 23:00)	45 dBA
	Night-time (23:00 - 07:00)	45 dBA



<i>Room</i>	<i>Time Period</i>	<i>Road Sound Level (Leq)</i>
Bedrooms	Day-time (07:00 - 23:00)	45 dBA
	Night-time (23:00 - 07:00)	40 dBA

In addition to the above indoor levels, the MECP has a sliding scale to determine the need for noise reduction measures depending on the outdoor sound level:

**Table 7: Combination of Road and Rail Noise, Ventilation and Warning Clause Requirements**

<i>ASSESSMENT LOCATION</i>	<i>Leq</i>	<i>VENTILATION REQUIREMENTS</i>	<i>WARNING CLAUSE</i>
PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00)	Greater than 55 dBA to less than or equal to 65 dBA.	Forced air heating with provision for central air conditioning.	Required
	Greater than 65 dBA.	Central air conditioning	Required
PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00)	Greater than 50 dBA to less than or equal to 60 dBA.	Forced air heating with provision for central air conditioning.	Required
	Greater than 60 dBA	Central air conditioning	Required

**Table 8: Road Noise Building Component Requirements**

<i>ASSESSMENT LOCATION</i>	<i>Leq</i>	<i>BUILDING COMPONENT REQUIREMENTS</i>
PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00)	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code.
	Greater than 65 dBA	Building components must be designed to achieve indoor sound level criteria.



<b>ASSESSMENT LOCATION</b>	<b>Leq</b>	<b>BUILDING COMPONENT REQUIREMENTS</b>
PLANE OF BEDROOM, LIVING ROOM WINDOW (23:00-07:00)	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code.
	Greater than 60 dBA	Building components must be designed to achieve indoor sound level criteria

#### 4.3.3 Town of Caledon Requirements

In addition to the MECP requirements, the Town of Caledon has the following sound level limits in their Development Standards, Policies & Guidelines Version 4 – January 2009:

- “The Town of Caledon will NOT accept sound levels in excess of the following levels, unless design features exceed standard detail.
- For outdoor areas the equivalent sound level Leq from 7:00 a.m. to 11:00 p.m. is 55 dBA.
- For indoor areas such as living rooms during the day the Leq is 45 dBA for roads and 40 dBA for rail.
- For bedrooms at night the Leq is 40 dBA for road and 35 dBA for rail.”

#### 4.4 Noise Control Measures

Noise control recommendations for the critical receptors are summarized in Table 9 and discussed in the subsequent sections.

**Table 9: Noise Control Measures**

<b>Receptor</b>	<b>Noise Barrier</b>	<b>Ventilation</b>	<b>Building Components</b>	<b>Warning Clause</b>
POR1	N/A	Forced air heating with provision for central air conditioning.	Ontario Building Code	Yes, Type C
POR2	N/A	None	Ontario Building Code	No
OLA1	No	N/A	N/A	No
OLA2	No	N/A	N/A	No



#### **4.4.1 Outdoor Amenity Area**

Since the predicted daytime sound levels at OLA1 and OLA2 are below 55 dBA, no noise control is required for outdoor amenity areas.

#### **4.4.2 Ventilation**

Since the predicted sound levels for POR1 on Shaws Creek Road are between 55 dBA and 60 dBA during daytime and between 50 dBA and 55 dBA during night-time, dwellings on Lot 1 to Lot 8 and Lot 18 should be designed with forced air heating with provision for installation of central air conditioning in the future.

#### **4.4.3 Building Components**

Since the predicted sound levels are below 65 dBA during daytime and below 60 dBA during night-time, building components that meet the Ontario Building Codes will be sufficient to meet the indoor sound level limits.

#### **4.4.4 Warning Clauses**

Since forced air heating with provision for central air conditioning is required for Lot 1 to Lot 8 and Lot 18 along Shaws Creek Road, the following Type C warning clause should be inserted in all development agreements of each of these dwellings:

“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 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.”

## **5. Stationary Noise Impact**

---

### **5.1 Stationary Noise Sources**

There are two rooftop units near the main entrance of the Belfountain Public School. Both were not in operation at the time of site visit due to winter weather. Based on information provided by the school personnel, the rooftop units are Lennox model KCB030S4D and KCA090S4B. According to manufacturer’s sound data as attached in Appendix C, the sound power levels of the rooftop units are 75 dBA and 79 dBA respectively.

According to the personnel in the school, school buses pick up and drop off students at the main entrance. The school buses may idle for about 10 minutes near the main entrance but they do not park or idle at the parking lot located on the south side of the school property. As the main entrance is about 160 m from the north property line of the Project, school bus movement and idling are not considered significant stationary noise sources.



The James Dick Pit is located on Winston Churchill Boulevard, north of Wellington Road 52. According to the “James Dick Construction Limited Erin Pit Extension Transportation Impact Study” prepared by Paradigm Transportation Solutions Limited dated November 2016, haul trucks do not travel along Shaws Creek Road. Please refer to the haul route in Figure 3, which was an excerpt from the Transportation Impact Study. Therefore haul truck movement associated with the James Dick Pit is not a significant noise source.

## 5.2 Critical Noise Receptors

The nearest proposed residential property to the rooftop units is Lot 18. The property line shared by Lot 18 and Belfountain Public School is therefore selected to be the critical point of reception for noise.

## 5.3 Sound Level Limits

The MECP Noise Publication NPC-300, Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning states that:

“For sound from a stationary source..., the sound level limit at a point of reception, expressed in terms of the One Hour Equivalent Sound Level (Leq) is the higher of the applicable exclusion limit value given in Table 11, or the background sound level for that point of reception.”

**Table 10: Exclusion Limit Values of One-Hour Equivalent Sound Level**

<i>Time of Day</i>	<i>Outdoor Points of Reception</i>		<i>Plane of Window</i>	
	<i>Class 1 Area</i>	<i>Class 2 Area</i>	<i>Class 1 Area</i>	<i>Class 2 Area</i>
07:00-19:00	50 dBA	50 dBA	50 dBA	50 dBA
19:00-23:00	50 dBA	45 dBA	50 dBA	50 dBA
23:00-07:00	-	-	45 dBA	45 dBA

The area surrounding the Project is considered to be in a Class 2 Area. The MECP exclusion limits are used to assess compliance in this report.

## 5.4 Sound Level Calculation

To be conservative, the louder rooftop unit, Lennox model KCA090S4B is assumed to be closer to Lot 18 at 148 m. The quieter rooftop unit, Lennox model KCB030S4D is assumed to be farther from Lot 18 at 159 m. In addition, hard ground is assumed in the calculation. The calculated sound level at the north property line of Lot 18 is 29 dBA.

The calculated sound level at Lot 18 meet MECP sound level limit for daytime, evening and night-time. Therefore no noise mitigation is required for stationary noise sources.



### 5.5 Noise Impact from Project

The Project consists of single family residential units only. The only potential stationary noise source associate with a single family residential unit is an outdoor condensing unit as part of the central air conditioning system. It is not anticipated to be significant stationary noise sources that will impact the existing community.

## 6. Concluding Comments

---

With the incorporation of the noise control measures as presented in Section 4.4 of this report, the noise impact from the transportation noise sources on the proposed residential development will meet the MECP criteria. There are no significant stationary noise sources near the project.

The proposed residential development Manors of Belfountain located at part of east half and west half of Lot 9, Concession 5 W.H.S. (Hamlet of Belfountain) in the Town of Caledon should therefore be approved from the noise aspect.



## Figures

---

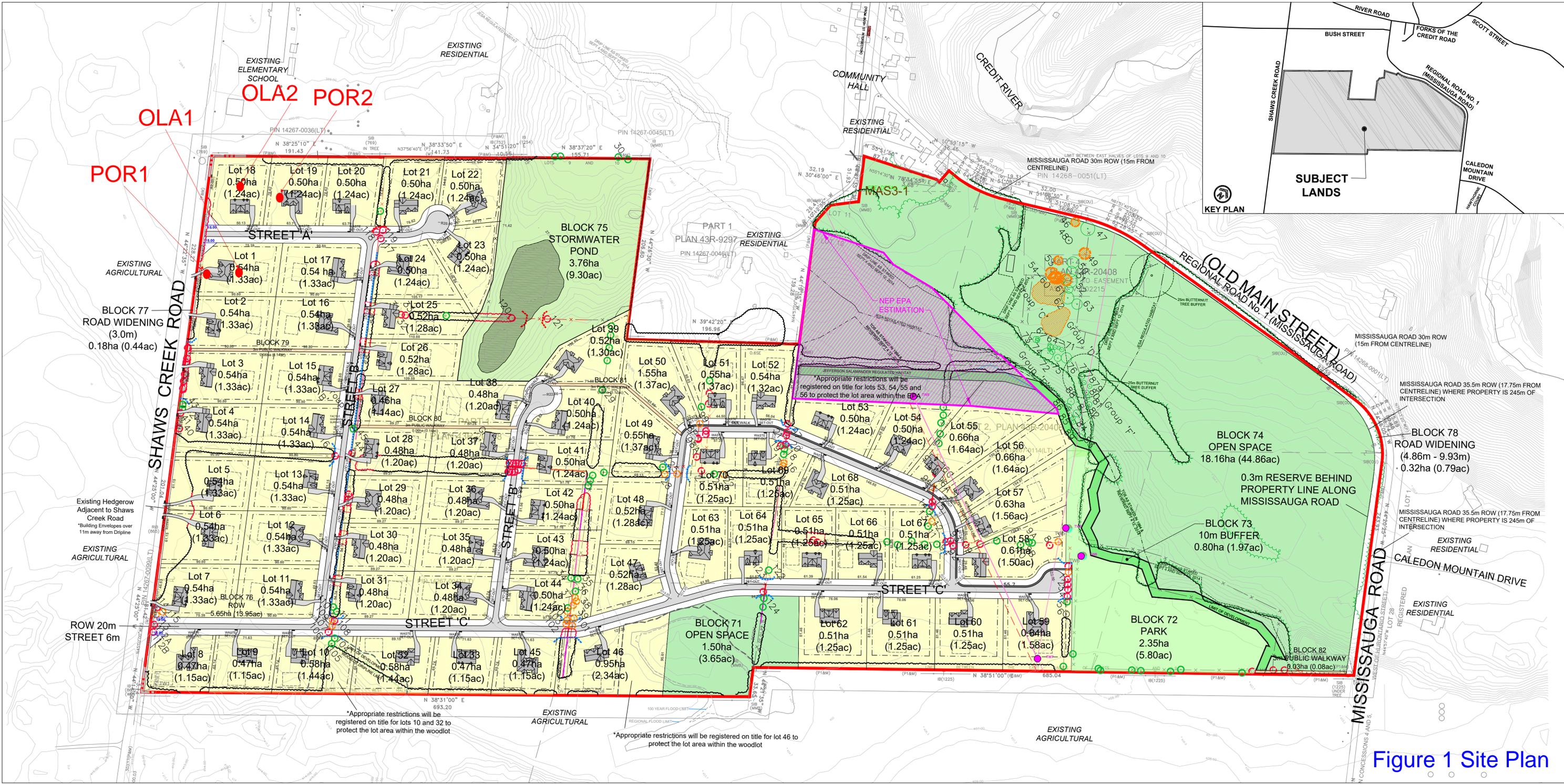


Figure 1 Site Plan

**DEVELOPMENT CONCEPT PLAN  
MANORS OF BELFOUNTAIN CORP**

**FILE # 21T-91015C**

PART OF EAST HALF AND WEST HALF LOT 9  
CONCESSION 5, W.H.S.  
(HAMLET OF BELFOUNTAIN)  
TOWN OF CALEDON,  
REGIONAL MUNICIPALITY OF PEEL

**SURVEYORS CERTIFICATE**

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED \_\_\_\_\_ DATE: \_\_\_\_\_  
ALISTER SANKEY, OLS  
DAVID B. SEARLES SURVEYING LTD.  
4255 SHERWOODTOWNE BLVD. SUITE 206  
MISSISSAUGA, ON, L4Z 1Y5  
PHONE: 905-273-6840  
EMAIL: info@dbsearles.ca

**ADDITIONAL INFORMATION**

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G, & J ARE SHOWN ON THE DRAFT AND KEY PLANS.  
H) DRILLED WELLS TO BE PROVIDED  
I) SANDY LOAM AND CLAY LOAM  
K) PRIVATE SEPTIC TO BE PROVIDED; STORMWATER DESIGN IN DISCUSSIONS WITH THE TOWN

**NOTES**

- Developable Area (excludes Open Space & Woodlot) = 45.90 ha (113.38 ac)
- 5% of Developable Area (2.35ha, 5.81ac) required for Park land dedication
- 70 Total Lots; average lot size: 0.53ha (1.32ac)
- 20m ROW; 22m ROW where sidewalks to be provided; Length - 2,634m (8.642')
- 3m Public Walkway Width; 1.5m Sidewalk Width
- 6m Street Width; Pavement illustration is diagrammatic only
- 22m/20m cul-de-sac Turning Radius
- Local to local radii - approx. 14m
- Streets 'A' & 'C' to Shaws Creek Rd. daylight triangles - 15.0 x 15.0
- Top of Slope as staked in 1994, reviewed September 4 & 12, 2014
- Dripline staked Septermber 4 & 12, 2014

**LEGEND:**

- Property Line
- Tree Protection - Snow Fence Hoarding
- Snow Fence to be Removed
- Existing Fence Line to Remain
- Existing Fence Line to be Removed
- Slope Direction and Percentage
- Existing Vegetation Grouping to Remain
- Existing Vegetation Grouping to be Removed
- Existing Vegetation Grouping to be Removed
- Existing Dead/Dying Vegetation Grouping to Remain
- Existing Tree to be Preserved
- Existing Tree to be Removed
- Existing Tree to be Removed Dead, Girdled or Dangerous
- Approximate Location and Extent of Stone Rock Wall
- Stone Rock Wall to be Removed
- Test Wells

**LAND USE SCHEDULE**

LAND USE	LOTS/BLOCKS	AREA (HA)	AREA (AC)	UNITS
ESTATE RESIDENTIAL	1-70	37.37	92.40	70
OPEN SPACE	71,74	19.66	48.51	
PARK	72	2.35	5.80	
10m BUFFER	73	0.80	1.97	
STORMWATER POND	75	3.76	9.30	
20.0m/22.0m ROW (2,634m LENGTH)	76	5.65	13.95	
ROAD WIDENING	77-78	0.50	1.23	
PUBLIC WALKWAYS	79-82	0.20	0.48	
<b>TOTAL</b>	<b>82</b>	<b>70.28</b>	<b>173.67</b>	<b>70</b>

Scale: 1=2000  
March 26, 2019



Figure 2 Aerial Photo

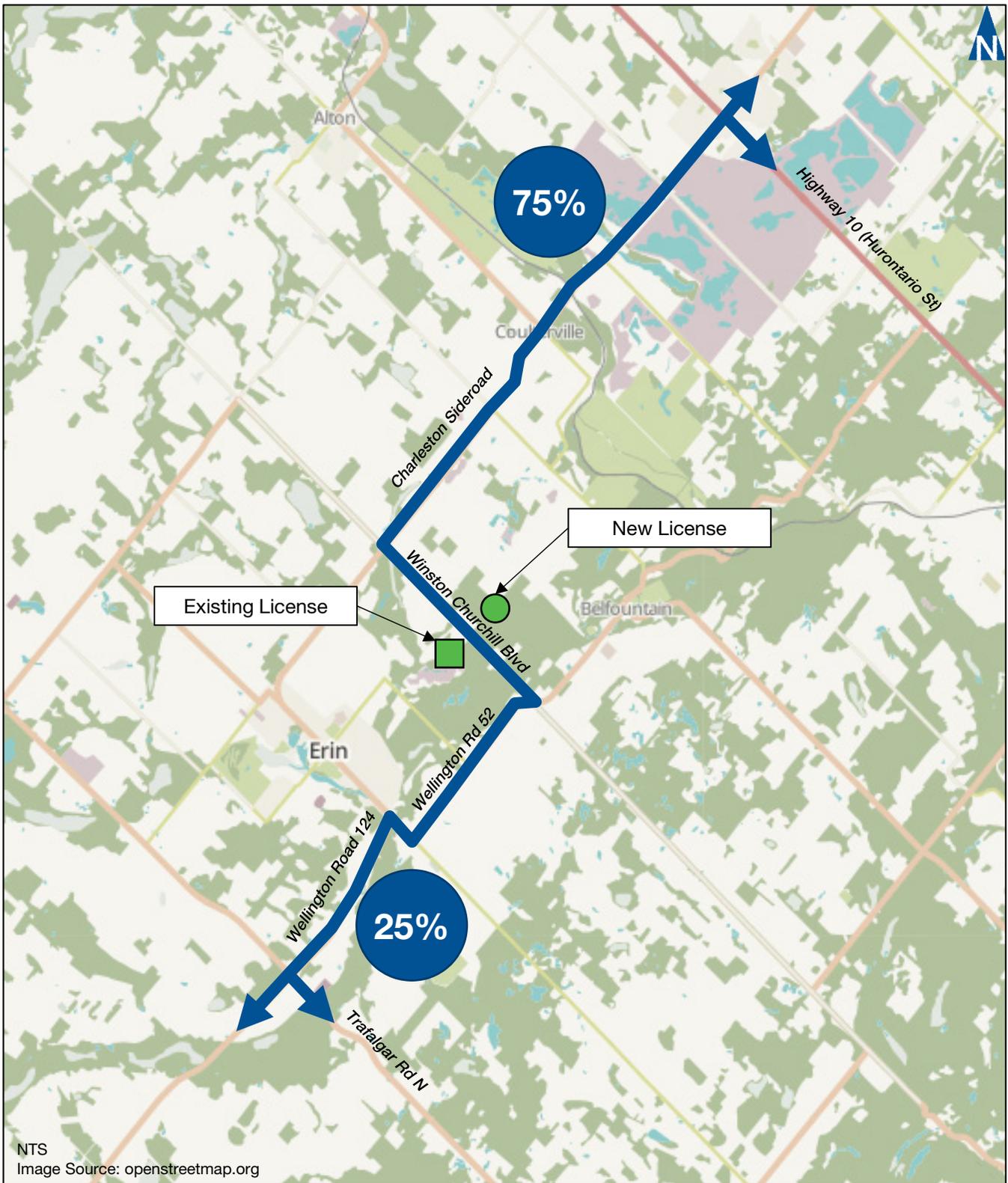


Figure 3 Haul Route

Figure 3.2



## Appendices

---

Manors of Belfountain  
SACL Project #SW17308A1  
April 23, 2019



## Appendix A: Traffic Data

---



Turning Movement Count (1 . SHAWS CREEK RD & BUSH ST)

Start Time	N Approach SHAWS CREEK RD						E Approach BUSH ST						S Approach SHAWS CREEK RD						W Approach BUSH ST						Int. Total (15 min)	Int. Total (1 hr)	
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total			
07:00:00	0	4	9	0	0	13	3	13	2	0	0	18	1	0	1	0	0	2	3	29	1	0	0	33	66		
07:15:00	2	1	12	0	0	15	0	15	2	0	0	17	2	1	0	0	0	3	1	35	0	0	0	36	71		
07:30:00	0	3	9	0	0	12	3	10	0	0	0	13	2	1	0	0	0	3	4	39	2	0	0	45	73		
07:45:00	1	6	13	0	0	20	4	16	2	0	0	22	0	1	1	0	0	2	3	33	1	0	0	37	81	291	
08:00:00	0	5	13	0	0	18	2	10	2	0	0	14	0	2	1	0	0	3	3	20	0	0	0	23	58	283	
08:15:00	1	4	6	0	0	11	3	14	7	0	0	24	9	4	4	0	0	17	4	22	1	0	0	27	79	291	
08:30:00	0	2	8	0	0	10	3	14	1	0	0	18	1	1	1	0	0	3	1	10	0	0	0	11	42	260	
08:45:00	1	0	9	0	0	10	2	7	1	0	0	10	1	0	1	0	0	2	1	14	2	0	0	17	39	218	
09:00:00	2	2	6	0	0	10	1	13	2	0	0	16	1	2	0	0	0	3	1	9	0	0	0	10	39	199	
09:15:00	0	1	3	0	0	4	3	9	0	0	0	12	0	0	1	0	0	1	1	16	3	0	0	20	37	157	
09:30:00	1	0	3	0	0	4	4	10	0	0	0	14	0	3	0	0	0	3	0	15	2	0	0	17	38	153	
09:45:00	0	2	4	0	0	6	2	3	0	0	0	5	0	0	1	0	0	1	1	6	1	0	0	8	20	134	
***BREAK***																											
16:00:00	0	3	3	0	1	6	15	39	3	0	0	57	5	2	2	0	0	9	1	11	5	0	0	17	89		
16:15:00	0	1	4	0	0	5	7	29	1	0	0	37	3	0	5	0	0	8	0	11	2	0	0	13	63		
16:30:00	1	1	3	0	0	5	14	39	1	0	0	54	0	1	1	0	0	2	0	11	1	0	0	12	73		
16:45:00	1	1	6	0	0	8	12	44	1	0	0	57	3	4	2	0	0	9	1	16	4	0	0	21	95	320	
17:00:00	0	0	3	0	0	3	10	31	2	0	0	43	1	1	0	0	0	2	0	20	4	0	0	24	72	303	
17:15:00	0	0	2	0	0	2	17	38	1	0	0	56	1	3	2	0	0	6	1	20	2	0	0	23	87	327	
17:30:00	0	3	6	0	0	9	14	29	0	0	0	43	3	1	0	0	0	4	0	21	2	0	0	23	79	333	
17:45:00	1	0	1	0	0	2	13	30	1	0	0	44	0	1	1	0	0	2	0	9	1	0	0	10	58	296	
18:00:00	2	0	5	0	0	7	7	17	1	0	0	25	1	2	1	0	0	4	0	12	0	0	0	12	48	272	
18:15:00	0	1	0	0	0	1	9	19	1	0	0	29	0	0	0	0	0	0	0	10	1	0	0	11	41	226	
18:30:00	3	1	3	0	0	7	10	8	0	0	0	18	0	1	1	0	0	2	0	15	3	0	0	18	45	192	
18:45:00	0	3	1	0	0	4	3	9	1	0	0	13	0	0	1	0	0	1	0	8	0	0	0	8	26	160	
<b>Grand Total</b>	<b>16</b>	<b>44</b>	<b>132</b>	<b>0</b>	<b>1</b>	<b>192</b>	<b>161</b>	<b>466</b>	<b>32</b>	<b>0</b>	<b>0</b>	<b>659</b>	<b>34</b>	<b>31</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>26</b>	<b>412</b>	<b>38</b>	<b>0</b>	<b>0</b>	<b>476</b>	<b>1419</b>	<b>-</b>	
<b>Approach %</b>	8.3%	22.9%	68.8%	0%	-	-	24.4%	70.7%	4.9%	0%	-	-	37%	33.7%	29.3%	0%	-	-	5.5%	86.6%	8%	0%	-	-	-	-	
<b>Totals %</b>	1.1%	3.1%	9.3%	0%	-	13.5%	11.3%	32.8%	2.3%	0%	-	46.4%	2.4%	2.2%	1.9%	0%	-	6.5%	1.8%	29%	2.7%	0%	-	33.5%	-	-	
<b>Heavy</b>	1	4	5	0	-	-	2	9	6	0	-	-	4	4	2	0	-	-	3	6	1	0	-	-	-	-	
<b>Heavy %</b>	6.3%	9.1%	3.8%	0%	-	-	1.2%	1.9%	18.8%	0%	-	-	11.8%	12.9%	7.4%	0%	-	-	11.5%	1.5%	2.6%	0%	-	-	-	-	
<b>Bicycles</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycle %</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Count  
Location Name: SHAWS CREEK RD & BUSH ST  
Date: Wed, Nov 15, 2017 Deployment Lead: Theo Daglis

NexTrans  
4261-A14 Highway 7 East  
Suite 489  
Markham ON, CANADA, L3R 9W6



Peak Hour: 07:30 AM - 08:30 AM Weather: Mostly Cloudy (1.6 °C)

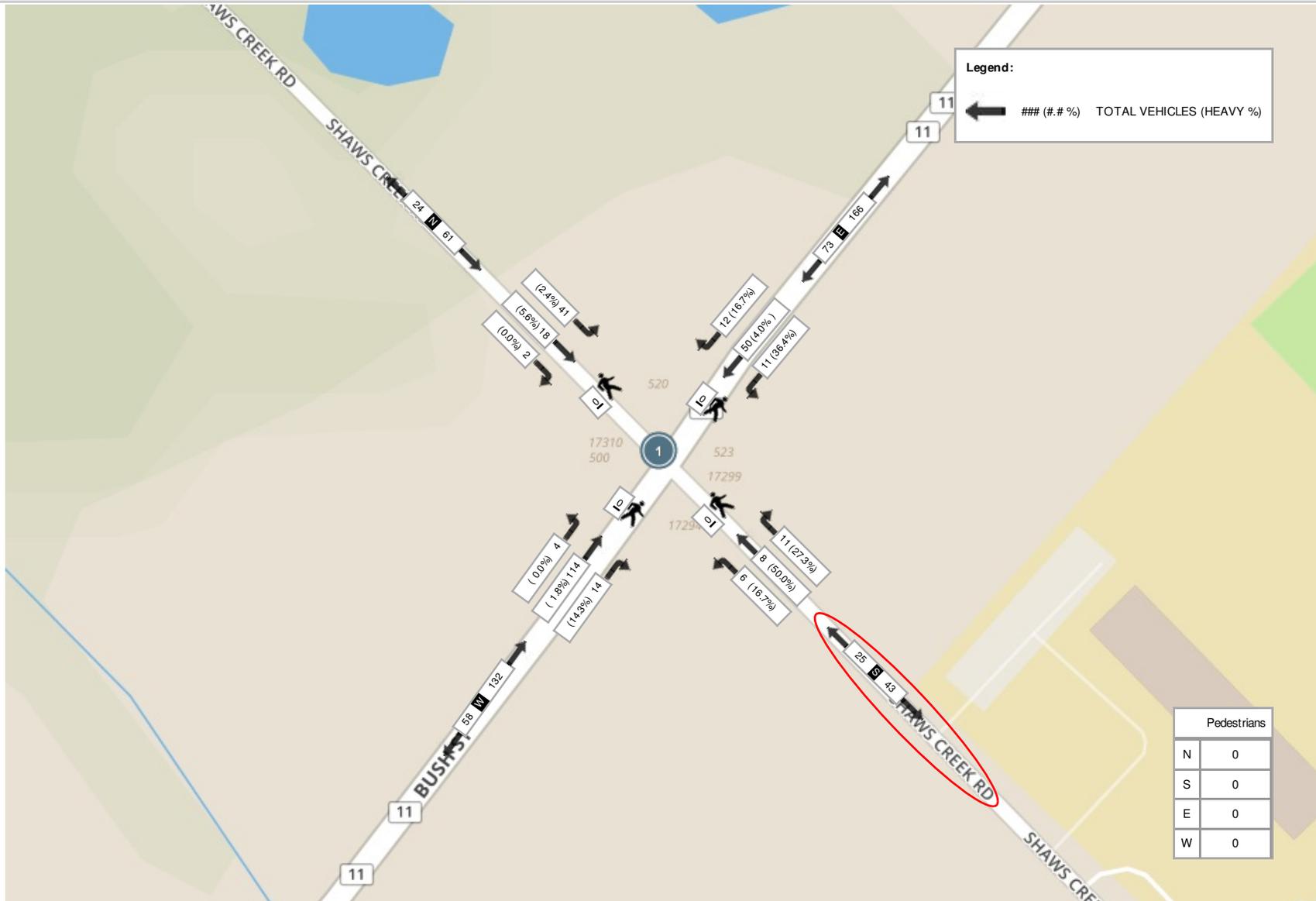
Start Time	N Approach SHAWS CREEK RD						E Approach BUSH ST						S Approach SHAWS CREEK RD <span style="border: 1px solid red; padding: 2px;">northbound</span>						W Approach BUSH ST						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	0	3	9	0	0	12	3	10	0	0	0	13	2	1	0	0	0	3	4	39	2	0	0	45	73
07:45:00	1	6	13	0	0	20	4	16	2	0	0	22	0	1	1	0	0	2	3	33	1	0	0	37	81
08:00:00	0	5	13	0	0	18	2	10	2	0	0	14	0	2	1	0	0	3	3	20	0	0	0	23	58
08:15:00	1	4	6	0	0	11	3	14	7	0	0	24	9	4	4	0	0	17	4	22	1	0	0	27	79
<b>Grand Total</b>	<b>2</b>	<b>18</b>	<b>41</b>	<b>0</b>	<b>0</b>	<b>61</b>	<b>12</b>	<b>50</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>73</b>	<b>11</b>	<b>8</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>14</b>	<b>114</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>132</b>	<b>291</b>
<b>Approach%</b>	3.3%	29.5%	67.2%	0%	-	-	16.4%	68.5%	15.1%	0%	-	-	44%	32%	24%	0%	-	10.6%	86.4%	3%	0%	-	-	-	-
<b>Totals %</b>	0.7%	6.2%	14.1%	0%	21%	21%	4.1%	17.2%	3.8%	0%	25.1%	25.1%	3.8%	2.7%	2.1%	0%	8.6%	4.8%	39.2%	1.4%	0%	45.4%	45.4%	-	
<b>PHF</b>	0.5	0.75	0.79	0	0.76	0.76	0.75	0.78	0.39	0	0.76	0.76	0.31	0.5	0.38	0	0.37	0.88	0.73	0.5	0	0.73	0.73	-	
<b>Heavy</b>	0	1	1	0	2	2	2	2	4	0	8	8	3	4	1	0	8	2	2	0	0	4	4	-	
<b>Heavy %</b>	0%	5.6%	2.4%	0%	3.3%	3.3%	16.7%	4%	36.4%	0%	11%	11%	27.3%	50%	16.7%	0%	32%	14.3%	1.8%	0%	0%	3%	3%	-	
<b>Lights</b>	2	17	40	0	59	59	10	48	7	0	65	65	8	4	5	0	17	12	112	4	0	128	128	-	
<b>Lights %</b>	100%	94.4%	97.6%	0%	96.7%	96.7%	83.3%	96%	63.6%	0%	89%	89%	72.7%	50%	83.3%	0%	68%	85.7%	98.2%	100%	0%	97%	97%	-	
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	1	1	0	0	0	1	1	-	
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	0%	0%	8.3%	0%	0%	0%	1.4%	1.4%	0%	0%	16.7%	0%	4%	7.1%	0%	0%	0%	0.8%	0.8%	-	
<b>Buses</b>	0	1	1	0	2	2	1	2	4	0	7	7	2	4	0	0	6	0	2	0	0	2	2	-	
<b>Buses %</b>	0%	5.6%	2.4%	0%	3.3%	3.3%	8.3%	4%	36.4%	0%	9.6%	9.6%	18.2%	50%	0%	0%	24%	0%	1.8%	0%	0%	1.5%	1.5%	-	
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	-	
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9.1%	0%	0%	0%	4%	7.1%	0%	0%	0%	0.8%	0.8%	-	
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	
<b>Pedestrians %</b>	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	0%	-	-	



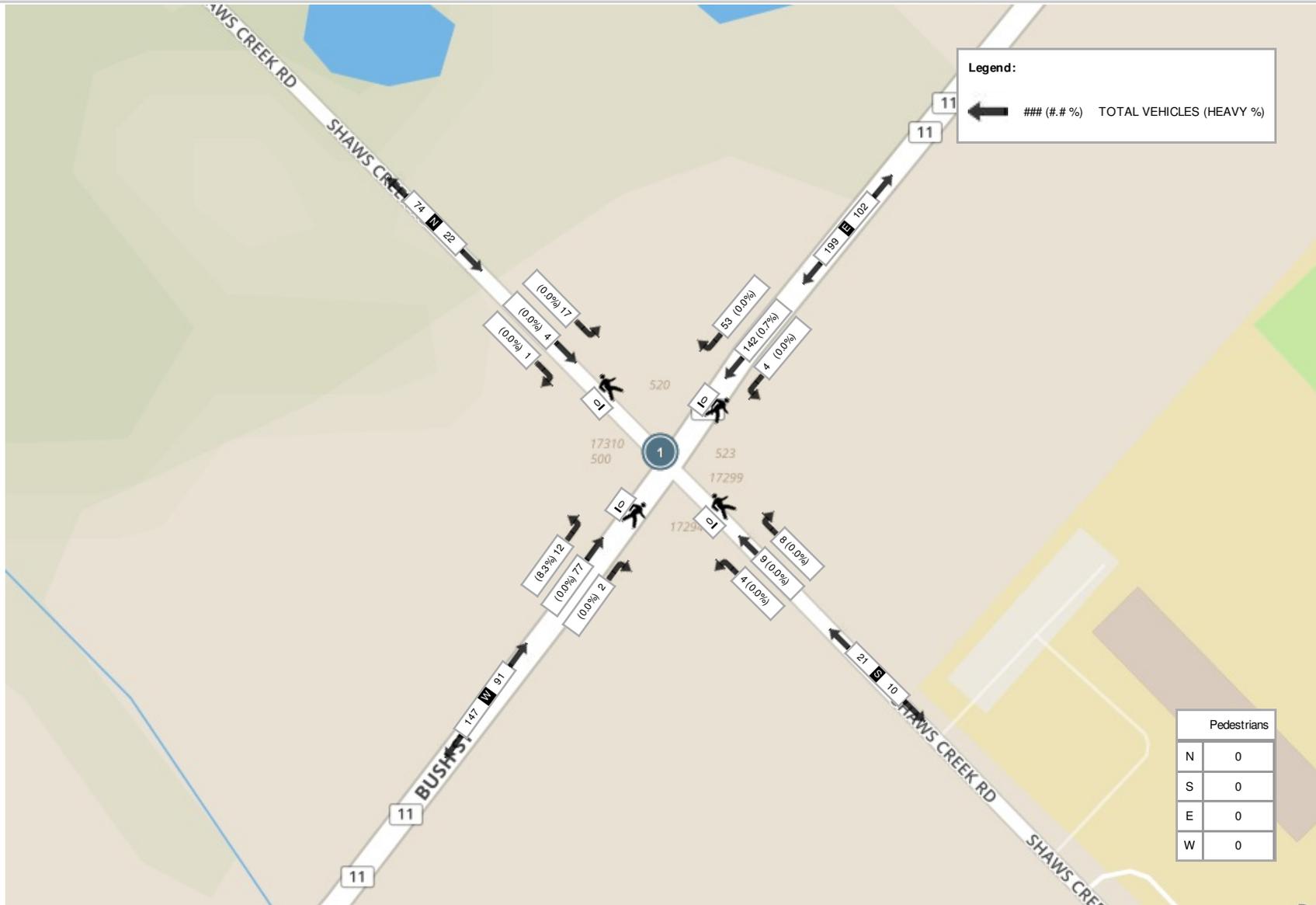
**Peak Hour: 04:45 PM - 05:45 PM Weather: Rain (2.8 °C)**

Start Time	N Approach SHAWS CREEK RD						E Approach BUSH ST						S Approach SHAWS CREEK RD						W Approach BUSH ST						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	1	1	6	0	0	8	12	44	1	0	0	57	3	4	2	0	0	9	1	16	4	0	0	21	95
17:00:00	0	0	3	0	0	3	10	31	2	0	0	43	1	1	0	0	0	2	0	20	4	0	0	24	72
17:15:00	0	0	2	0	0	2	17	38	1	0	0	56	1	3	2	0	0	6	1	20	2	0	0	23	87
17:30:00	0	3	6	0	0	9	14	29	0	0	0	43	3	1	0	0	0	4	0	21	2	0	0	23	79
<b>Grand Total</b>	<b>1</b>	<b>4</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>53</b>	<b>142</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>199</b>	<b>8</b>	<b>9</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>2</b>	<b>77</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>333</b>
<b>Approach%</b>	4.5%	18.2%	77.3%	0%	-	-	26.6%	71.4%	2%	0%	-	38.1%	42.9%	19%	0%	-	2.2%	84.6%	13.2%	0%	-	-	-	-	
<b>Totals %</b>	0.3%	1.2%	5.1%	0%	6.6%	15.9%	42.6%	1.2%	0%	59.8%	2.4%	2.7%	1.2%	0%	6.3%	0.6%	23.1%	3.6%	0%	27.3%	-	-	-	-	
<b>PHF</b>	0.25	0.33	0.71	0	0.61	0.78	0.81	0.5	0	0.87	0.67	0.56	0.5	0	0.58	0.5	0.92	0.75	0	0.95	-	-	-	-	
<b>Heavy</b>	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	
<b>Heavy %</b>	0%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.5%	0%	0%	0%	0%	0%	0%	8.3%	0%	1.1%	-	-	-	-	
<b>Lights</b>	1	4	17	0	22	53	141	4	0	198	8	9	4	0	21	2	77	11	0	90	-	-	-	-	
<b>Lights %</b>	100%	100%	100%	0%	100%	100%	99.3%	100%	0%	99.5%	100%	100%	100%	0%	100%	100%	100%	91.7%	0%	98.9%	-	-	-	-	
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
<b>Buses</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	-	-	-	-	
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8.3%	0%	1.1%	-	-	-	-	-	
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	
<b>Pedestrians%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	

Peak Hour: 07:30 AM - 08:30 AM Weather: Mostly Cloudy (1.6 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Rain (2.8 °C)



Manors of Belfountain  
SACL Project #SW17308A1  
April 23, 2019



## **Appendix B: STAMSON Calculations**

---

Filename: ola1.te                    Time Period: Day/Night 16/8 hours  
Description: Calculated Traffic Sound Level at OLA1

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

-----  
Car traffic volume : 9421/1047 veh/TimePeriod \*  
Medium truck volume : 2295/255 veh/TimePeriod \*  
Heavy truck volume : 362/40 veh/TimePeriod \*  
Posted speed limit : 70 km/h  
Road gradient : 4 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8190  
Percentage of Annual Growth : 2.50  
Number of Years of Growth : 20.00  
Medium Truck % of Total Volume : 19.00  
Heavy Truck % of Total Volume : 3.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: ShawCreek (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 : 36.00 / 36.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -45.00 deg Angle2 : 45.00 deg  
Barrier height : 6.00 m  
Barrier receiver distance : 3.00 / 3.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

Results segment # 1: ShawCreek (day)

Source height = 1.32 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.32	1.50	1.48	1.48

ROAD (56.34 + 43.58 + 56.34) = 59.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.66	71.70	0.00	-6.31	-9.05	0.00	0.00	0.00	56.34
-45	45	0.31	71.70	0.00	-4.96	-3.15	0.00	0.00	-20.00	43.58
45	90	0.66	71.70	0.00	-6.31	-9.05	0.00	0.00	0.00	56.34

Segment Leq : 59.46 dBA

Total Leq All Segments: 59.46 dBA

Results segment # 1: ShawCreek (night)

Source height = 1.31 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.31	1.50	1.48	1.48

ROAD (49.80 + 37.04 + 49.80) = 52.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.66	65.16	0.00	-6.31	-9.05	0.00	0.00	0.00	49.80
-45	45	0.31	65.16	0.00	-4.96	-3.15	0.00	0.00	-20.00	37.04
45	90	0.66	65.16	0.00	-6.31	-9.05	0.00	0.00	0.00	49.80

Segment Leq : 52.92 dBA

Total Leq All Segments: 52.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.46  
(NIGHT): 52.92

Filename: ola2.te                    Time Period: Day/Night 16/8 hours  
Description: Calculated Traffic Sound Level at OLA2

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

-----  
Car traffic volume : 9421/1047 veh/TimePeriod \*  
Medium truck volume : 2295/255 veh/TimePeriod \*  
Heavy truck volume : 362/40 veh/TimePeriod \*  
Posted speed limit : 70 km/h  
Road gradient : 4 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8190  
Percentage of Annual Growth : 2.50  
Number of Years of Growth : 20.00  
Medium Truck % of Total Volume : 19.00  
Heavy Truck % of Total Volume : 3.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: ShawCreek (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 : 37.07 / 49.60 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: ShawCreek (day)

-----  
Source height = 1.32 m

ROAD (0.00 + 63.72 + 0.00) = 63.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.70	0.00	-6.52	-1.46	0.00	0.00	0.00	63.72

-----

Segment Leq : 63.72 dBA

Total Leq All Segments: 63.72 dBA

Results segment # 1: ShawCreek (night)

-----  
Source height = 1.31 m

ROAD (0.00 + 55.08 + 0.00) = 55.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.16	0.00	-8.62	-1.46	0.00	0.00	0.00	55.08

-----

Segment Leq : 55.08 dBA

Total Leq All Segments: 55.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.72  
(NIGHT): 55.08

Filename: por1.te                    Time Period: Day/Night 16/8 hours  
 Description: Calculated Traffic Sound Level at POR1

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

```
-----
Car traffic volume   : 9421/1047 veh/TimePeriod *
Medium truck volume : 2295/255  veh/TimePeriod *
Heavy truck volume  : 362/40   veh/TimePeriod *
Posted speed limit  : 70 km/h
Road gradient       : 4 %
Road pavement      : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 8190
Percentage of Annual Growth       : 2.50
Number of Years of Growth         : 20.00
Medium Truck % of Total Volume    : 19.00
Heavy Truck % of Total Volume     : 3.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: ShawCreek (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 : 18.00 / 18.00 m
Receiver height  : 4.50 / 4.50 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

Results segment # 1: ShawCreek (day)

Source height = 1.32 m

```
ROAD (0.00 + 69.14 + 0.00) = 69.14 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90     90     0.58  71.70  0.00  -1.25  -1.31  0.00  0.00  0.00  69.14
-----
```

Segment Leq : 69.14 dBA

Total Leq All Segments: 69.14 dBA

Results segment # 1: ShawCreek (night)

-----  
Source height = 1.31 m

ROAD (0.00 + 62.60 + 0.00) = 62.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	65.16	0.00	-1.25	-1.31	0.00	0.00	0.00	62.60

-----

Segment Leq : 62.60 dBA

Total Leq All Segments: 62.60 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.14  
(NIGHT): 62.60

Filename: por2.te                    Time Period: Day/Night 16/8 hours  
 Description: Calculated Traffic Sound Level at POR2

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

```
-----
Car traffic volume   : 9421/1047 veh/TimePeriod *
Medium truck volume : 2295/255  veh/TimePeriod *
Heavy truck volume  : 362/40   veh/TimePeriod *
Posted speed limit  : 70 km/h
Road gradient       : 4 %
Road pavement      : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 8190
Percentage of Annual Growth       : 2.50
Number of Years of Growth         : 20.00
Medium Truck % of Total Volume    : 19.00
Heavy Truck % of Total Volume     : 3.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: ShawCreek (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 : 68.13 / 68.13 m
Receiver height : 4.50 / 4.50 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: ShawCreek (day)

Source height = 1.32 m

ROAD (0.00 + 60.03 + 0.00) = 60.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	71.70	0.00	-10.36	-1.31	0.00	0.00	0.00	60.03

Segment Leq : 60.03 dBA

Total Leq All Segments: 60.03 dBA

Results segment # 1: ShawCreek (night)

-----  
Source height = 1.31 m

ROAD (0.00 + 53.49 + 0.00) = 53.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	65.16	0.00	-10.36	-1.31	0.00	0.00	0.00	53.49

-----

Segment Leq : 53.49 dBA

Total Leq All Segments: 53.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.03  
(NIGHT): 53.49

Manors of Belfountain  
SACL Project #SW17308A1  
April 23, 2019



## Appendix C: Technical Information of Rooftop Units



# Product Submittal

## Project Information

Project Name: PDSB Belfountain 17247 Shaws Creek Rd

Project Number: 3000690456

Project Location: BELFOUNTAIN, ON L6S 6E1, CA

Project Altitude: 500

<input type="checkbox"/>	REVIEWED
<input checked="" type="checkbox"/>	REVIEWED AS MODIFIED
<input type="checkbox"/>	REVISE AND RESUBMIT

This review by JAIN is for sole purpose of ascertaining conformance with general design concept. This review shall not mean that JAIN approves details design inherent in Shop Drawings, responsibility for shall remain with Contractor and such review shall not relieve Contractor of his responsibility for errors and omissions in Shop Drawings or of his responsibility for meeting all requirements of contract documents. Contractor is responsible for dimensions to be confirmed and correlated at site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of work of all trades.

### NOTES:

#### 1. General Notes

- Units shall be complete with 600 mm (24") curb adaptor.

- Units shall be complete with BMS control, provide dry contacts for control.

By: A.G. / C.V.

Date: July 19, 2017

## Customer Information

Company Name:

- Units shall be belt drive.

Company Address:

- Provide Shop Drawings for vibro-acoustic type RTR continuous isolation base.

Company Location:

#### 2. Specific Notes

##### a) HVAC-1

- Unit shall be complete with 7.5 kw electric heat.  
- MOP required 40A.

Contact:

##### b) HVAC-2

- Unit shall be complete with 15 kw electric heat.  
- MOP required 70A.

Phone:

- Complete with power exhaust.

3. HVAC-1 shall be rated for 208v, 1Ph, 40A, 2P breaker.

4. HVAC-2 shall be rated for 208v, 3-Ph, 70A, 3P breaker.

## Engineering Information

Company Name: ~~Jain & Associates Limited~~

Jain Sustainability Consultants Inc.

Company Address: ~~2260 Argenta Rd 2nd Flr~~

7405 East Danbro Crescent, 2nd Floor

Company Location: ~~Mississauga, ON L5N 6H7~~

Mississauga, ON L5N 6P8

Contact:

Phone: ~~905-542-7211~~

905-285-9900

*We are pleased to provide the attached project submittal. If you have any questions or need additional information, please feel free to call our office.*

<b>CENTURY GROUP INC.</b>	
PROJECT	
THIS SHOP DRAWING IS	
<input checked="" type="checkbox"/>	REVIEWED
<input type="checkbox"/>	REVIEWED AS NOTED
<input type="checkbox"/>	REVISE & RE-SUBMIT
BY	DATE
Rob Piti	July 14, 2017
"This review shall not mean that CENTURY GROUP INC. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the SUB-CONTRACTOR submitting same, and such review shall not relieve the SUB-CONTRACTOR of his responsibility for errors or omissions in the Shop drawings or of his responsibility for meeting all requirements of the Contract documents. The SUB-CONTRACTOR is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades."	

# Table of Contents

System ID	Qty	Model	Description
HVAC - 1	1	KCB030S4D	PKGEE/2.5 TON/230-1
HVAC - 2	1	KCA090S4B	PKGEE/7.5 TON/230-3 ENV

# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 1

Package Model: KCB030S4D

Description: PKGEE/2.5 TON/230-1

## HEATING PERFORMANCE

Unit Type	Packaged Electric/Electri
-----------	------------------------------

## COOLING PERFORMANCE

Refrigerant	R-410A	Number Compressors	1
ARI EER	11.6	Number of Cooling Stages	1
ARI SEER	14.0	Condensate Drain Size	1.00 (in.)
ARI Total Power	2400 (W)	Cooling OutdoorDB	95.0 (°F)
ARI GrossTotalCool	31200 (Btuh)	Cooling CondenserDB	95.0 (°F)
ARI NetTotalCool	30200 (Btuh)	Cooling MixedDB	80.0 (°F)
Coil GrossTotalCool	31410 (Btuh)	Cooling MixedWB	67.0 (°F)
Unit NetTotalCool	30615 (Btuh)	Coil DischargeDB	58.3 (°F)
Coil GrossSensCool	24205 (Btuh)	Coil DischargeWB	57.5 (°F)
Unit NetSensCool	23411 (Btuh)	Unit DischargeDB	59.0 (°F)
		Unit DischargeWB	57.8 (°F)
		Coil MoistureRemoval	6.6 (lb/hr)
		System MoistRemoval	6.6 (lb/hr)

## SUPPLY FAN PERFORMANCE

Supply AirFlow	1069 (cfm)	TotalStaticPress	0.66 (in.WC)
ExtStaticPress Supply	0.60 (in.WC)	Wet Coil Static Press	0.02 (in.WC)
SupplyFan Req'dPower	0.25 (hp)	Economizer Static Press	0.04 (in.WC)
SupplyFan NomPower	0.25 (hp)	Air Filter Qty	4
Supply Fan Type	CAV Direct Drive	Air Filter Length	16.0 (in.)
SupplyDrive Speed	HIGH	Air Filter Width	20.0 (in.)
		Air Filter Thickness	2.0 (in.)

## ELECTRICAL

Voltage	208V 1Ph	SupplyFan FLA	1.7 (amp)
Frequency	60 (Hz)	CondensingUnit FLA	1.7 (amp)
System MCA	20.0 (amp)	CondenserFan Power	250 (W)
System MOCP	30 (amp)		
Compressors RLA	12.7 (amp)		
Cooling FLA Total	16.1 (amp)		
Unit Oper Range-Nom Voltage	+/- 10%		

## DIMENSIONS

Cabinet Width	47.0 (in.)	Downflow Supply Length	18.0 (in.)
Cabinet Length	83.3 (in.)	Downflow Supply Width	20.0 (in.)
Cabinet Height	36.4 (in.)	Downflow Return Length	11.0 (in.)
Total Weight	706 (lb)	Downflow Return Width	29.0 (in.)

## SOUND

Outdoor Sound Rating	75 (db)
----------------------	---------

# Lennox Industries Inc. - Product Submittal

**System ID:** HVAC - 1

**Package Model:** KCB030S4D

**Description:** PKGEE/2.5 TON/230-1

## SYSTEM FEATURES

Durable Outdoor Enamel Paint Finish  
Scroll Compressor  
High Capacity Driers  
Separate Compressor and Controls Compartment

Limited compressor warranty of 5 years  
Limited warranty on all other components of 1 year  
See Limited Warranty Certificate included with unit for details

## INCLUDED SYSTEM OPTIONS - FACTORY INSTALLED

2 IN MERV4 FILTER  
CONSTANT AIR VOLUME DIRECT DRIVE

## INCLUDED SYSTEM OPTIONS - FIELD INSTALLED

11F51	1	C1CURB71A-1 DNFLOW HYBRID CURB 14"
13H15	1	CS7500 COMM'L PROGRAMMABLE THERMOSTAT
14D90	1	K1ECON30A-3-LANDMARK ECONO STD SHORT
53W64	1	C1SNSR64FF1 SINGLE ENTHALPY
76W26	1	C1TRAP20AD2 PVC DRAIN TRAP KIT
79W87	1	C1PWRE10A-1P PEF 208/230V - SHORT



# Lennox Industries Inc. - Product Submittal

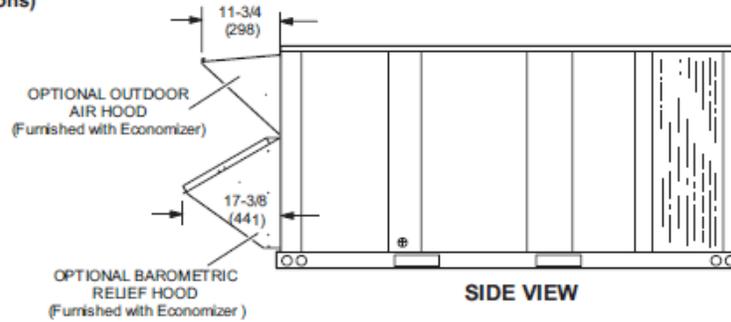
System ID: HVAC - 1

Package Model: KCB030S4D

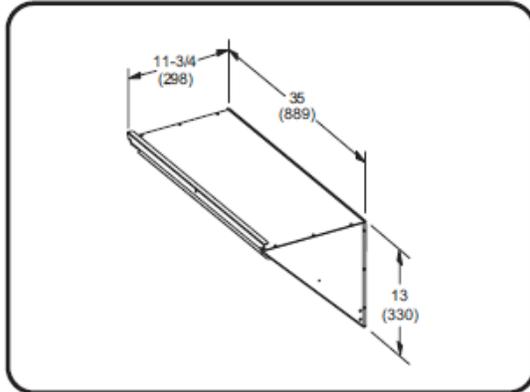
Description: PKGEE/2.5 TON/230-1

## DIMENSIONS - ACCESSORIES - INCHES (MM)

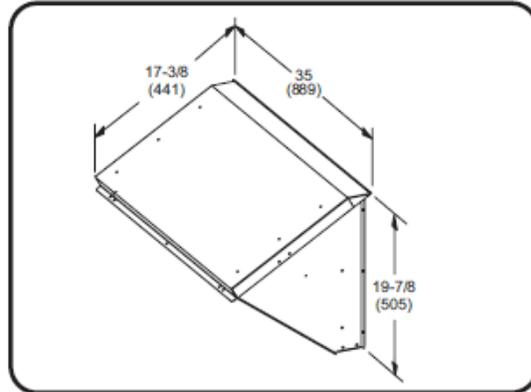
### OUTDOOR AIR HOOD DETAIL FOR OPTIONAL ECONOMIZER AND BAROMETRIC RELIEF DAMPERS (Downflow Applications)



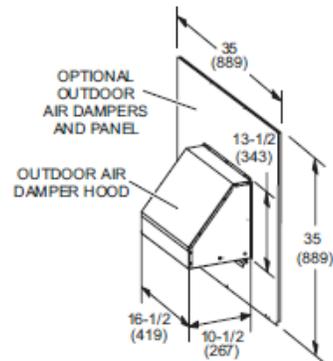
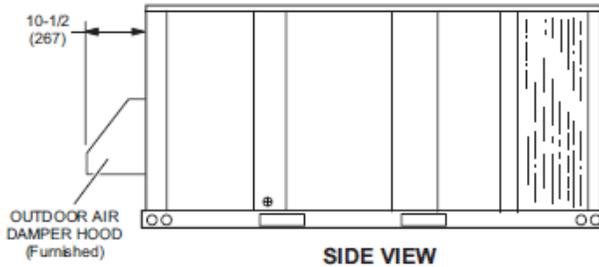
### OUTDOOR AIR HOOD FOR ECONOMIZER (Furnished)



### BAROMETRIC RELIEF HOOD FOR ECONOMIZER (Furnished)



### OUTDOOR AIR DAMPER HOOD DETAIL FOR OPTIONAL MANUAL OR MOTORIZED OUTDOOR AIR DAMPERS (Downflow or Horizontal Applications)



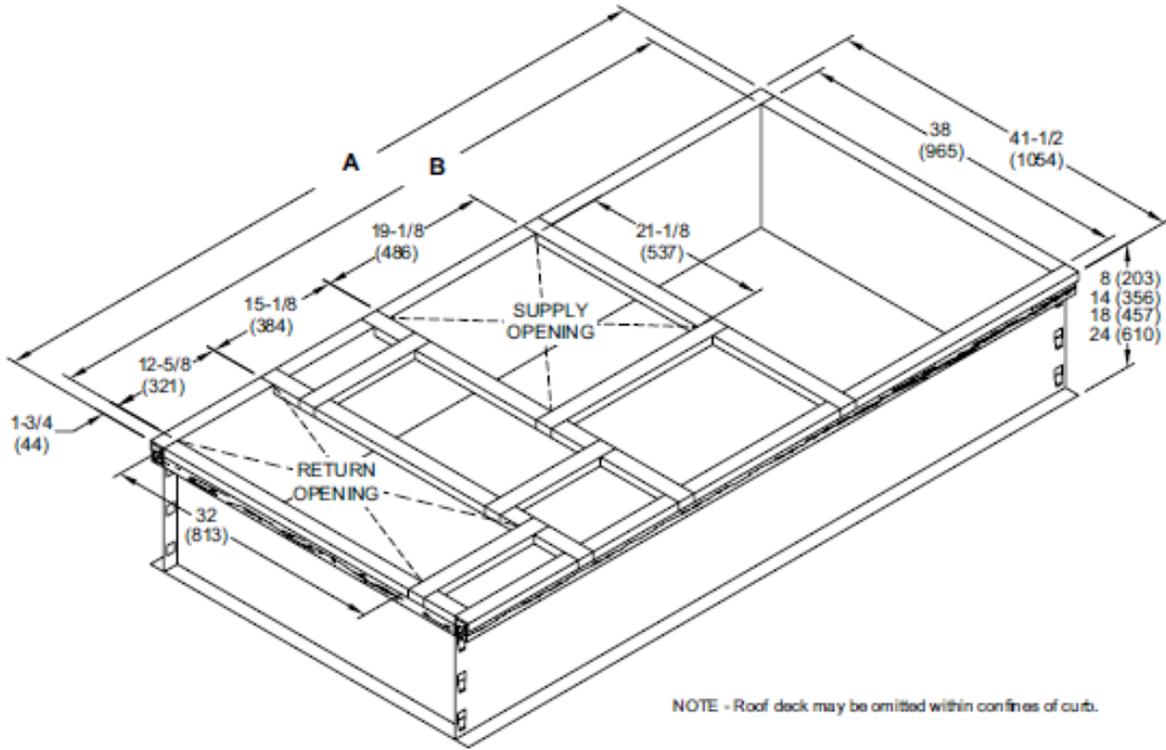
# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 1

Package Model: KCB030S4D

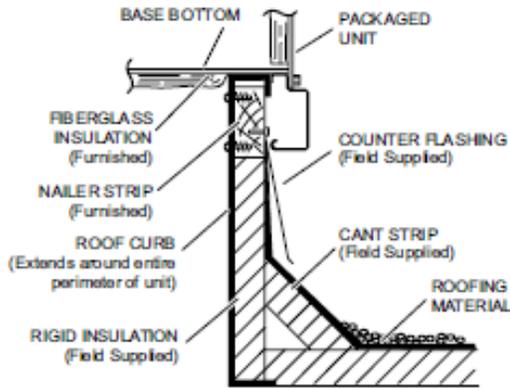
Description: PKGEE/2.5 TON/230-1

## HYBRID ROOF CURBS - DOUBLE DUCT OPENING - STANDARD AND FULL PERIMETER

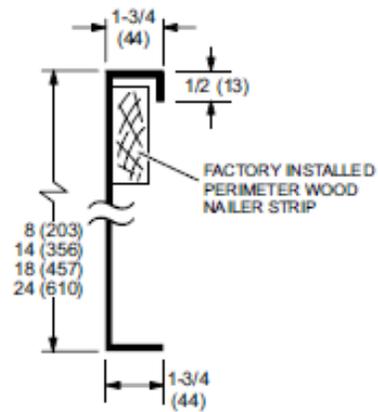


NOTE - Roof deck may be omitted within confines of curb.

TYPICAL FLASHING DETAIL FOR ROOF CURB



DETAIL ROOF CURB



Model No.	A		B	
	in.	mm	in.	mm
Standard - 024, 030, 036, 048, 060, 072, 1 090	79-3/4	2026	76-1/4	1937
Full Perimeter - 090	92-3/4	2356	89-1/4	2267

<sup>1</sup> 090 models can be used on smaller 79-3/4 in. (2026 mm) roof curbs (not full perimeter) with 15-3/4 in. (400 mm) overhang at condenser end of unit. See dimension drawing on page 54

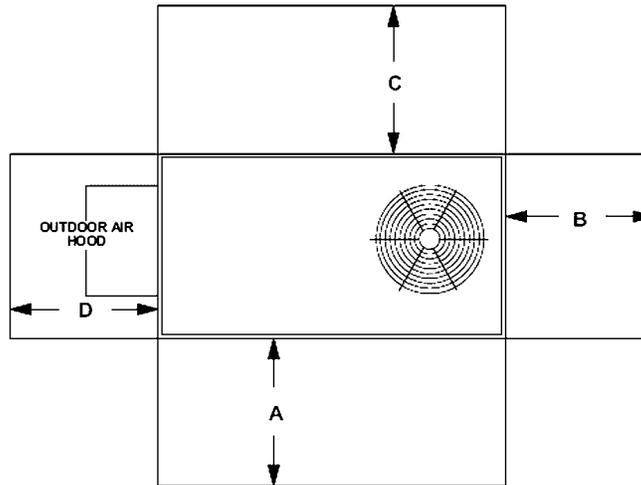
# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 1

Package Model: KCB030S4D

Description: PKGEE/2.5 TON/230-1

## UNIT CLEARANCES - INCHES (MM)



1 Unit Clearance	A		B		C		D		Top Clearance
	in.	mm	in.	mm	in.	mm	in.	mm	
Service Clearance	36	914	36	914	36	934	36	914	Unobstructed
Minimum Operation Clearance	36	914	36	914	36	914	36	914	

NOTE - Entire perimeter of unit base requires support when elevated above the mounting surface.

1 Service Clearance - Required for removal of serviceable parts.

Minimum Operation Clearance - Required clearance for proper unit operation.

# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 2

Package Model: KCA090S4B

Description: PKGEE/7.5 TON/230-3 ENV

## HEATING PERFORMANCE

Unit Type	Packaged Electric/Electri
-----------	------------------------------

## COOLING PERFORMANCE

Refrigerant	R-410A	Number Compressors	1
ARI EER	11.2	Number of Cooling Stages	1
ARI IEER	11.4	Condensate Drain Size	1.00 (in.)
ARI Total Power	8200 (W)	Cooling OutdoorDB	95.0 (°F)
ARI GrossTotalCool	92000 (Btuh)	Cooling CondenserDB	95.0 (°F)
ARI NetTotalCool	90000 (Btuh)	Cooling MixedDB	80.0 (°F)
Coil GrossTotalCool	78983 (Btuh)	Cooling MixedWB	67.0 (°F)
Unit NetTotalCool	75393 (Btuh)	Coil DischargeDB	58.2 (°F)
Coil GrossSensCool	56473 (Btuh)	Coil DischargeWB	56.5 (°F)
Unit NetSensCool	52883 (Btuh)	Unit DischargeDB	59.5 (°F)
		Unit DischargeWB	57.0 (°F)
		Coil MoistureRemoval	21.2 (lb/hr)
		System MoistRemoval	21.2 (lb/hr)

## SUPPLY FAN PERFORMANCE

Supply AirFlow	2500 (cfm)	TotalStaticPress	0.75 (in.WC)
ExtStaticPress Supply	0.60 (in.WC)	Wet Coil Static Press	0.09 (in.WC)
SupplyFan Req'dPower	1.13 (hp)	Economizer Static Press	0.06 (in.WC)
SupplyFan NomPower	2.00 (hp)	Air Filter Qty	4
Supply Fan Type	CAV Belt Drive	Air Filter Length	20.0 (in.)
SupplyDriveReq'd RPM	767 (rpm)	Air Filter Width	20.0 (in.)
SupplyDrive Min RPM	798 (rpm)	Air Filter Thickness	2.0 (in.)
SupplyDrive Max RPM	1105 (rpm)	Number Exhaust Fans	1

## ELECTRICAL

Voltage	208V 3Ph	SupplyFan FLA	7.5 (amp)
Frequency	60 (Hz)	CondensingUnit FLA	2.4 (amp)
System MCA	44.0 (amp)	CondenserFan Power	350 (W)
System MOCP	60 (amp)		
Compressors RLA	25.0 (amp)		
Cooling FLA Total	34.9 (amp)		
Unit Oper Range-Nom Voltage	+/- 10%		

## DIMENSIONS

Cabinet Width	47.0 (in.)	Downflow Supply Length	20.0 (in.)
Cabinet Length	98.3 (in.)	Downflow Supply Width	18.0 (in.)
Cabinet Height	46.9 (in.)	Downflow Return Length	29.0 (in.)
Total Weight	982 (lb)	Downflow Return Width	11.0 (in.)

## SOUND

Outdoor Sound Rating	79 (db)
----------------------	---------

# Lennox Industries Inc. - Product Submittal

**System ID:** HVAC - 2

**Package Model:** KCA090S4B

**Description:** PKGEE/7.5 TON/230-3 ENV

## SYSTEM FEATURES

Durable Outdoor Enamel Paint Finish  
Scroll Compressor  
High Capacity Driers  
Separate Compressor and Controls Compartment

Limited compressor warranty of 5 years  
Limited warranty on all other components of 1 year  
See Limited Warranty Certificate included with unit for details

## INCLUDED SYSTEM OPTIONS - FACTORY INSTALLED

2 IN MERV4 FILTER  
CONSTANT AIR VOLUME BELT DRIVE

## INCLUDED SYSTEM OPTIONS - FIELD INSTALLED

11S48	1	K1CURB71AP1 DNFLOW HYBRID CURB 14"
13H15	1	CS7500 COMM'L PROGRAMMABLE THERMOSTAT
14D90	1	K1ECON30A-3-LANDMARK ECONO STD SHORT
53W64	1	C1SNSR64FF1 SINGLE ENTHALPY
79W87	1	C1PWRE10A-1P PEF 208/230V - SHORT
76W26	1	C1TRAP20AD2 PVC DRAIN TRAP KIT

# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 2

Package Model: KCA090S4B

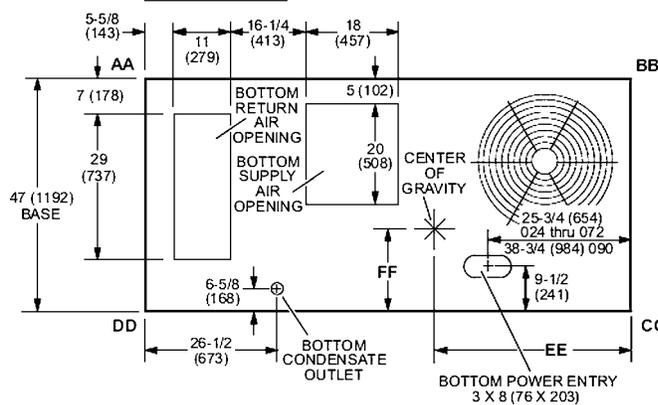
Description: PKGEE/7.5 TON/230-3 ENV

## DIMENSIONS - INCHES (MM)

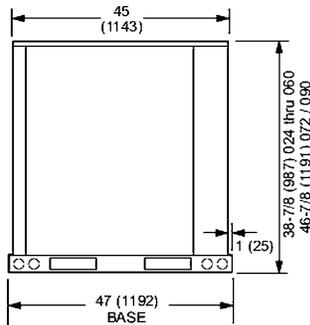
Model No.	CORNER WEIGHTS										CENTER OF GRAVITY													
	AA		BB		CC		DD		EE		FF													
	Base lbs.	Max. kg	Base lbs.	Max. kg	Base lbs.	Max. kg	Base lbs.	Max. kg	Base in.	Max. mm	Base in.	Max. mm	Base in.	Max. mm										
024	86	39	109	50	104	47	123	56	167	76	199	90	138	63	176	80	38-1/2	978	40	1016	18	457	18	457
030	86	39	109	50	104	47	124	56	168	76	199	91	138	63	176	80	38-1/2	978	40	1016	18	457	18	457
036	86	39	110	50	105	48	124	56	169	77	200	91	139	63	177	80	38-1/2	978	40	1016	18	457	18	457
048	93	42	116	53	112	51	132	60	181	82	212	96	149	68	187	85	38-1/2	978	40	1016	18	457	18	457
060	98	44	122	56	119	54	138	63	191	87	223	101	157	72	197	90	38-1/2	978	40	1016	18	457	18	457
072	115	52	138	63	139	63	156	71	225	102	251	114	185	84	222	101	38-1/2	978	40	1016	18	457	18	457
090	164	74	187	85	179	81	203	92	221	100	252	114	203	92	231	105	47	1194	47	1194	21	533	21	533

Base Unit - The unit with NO OPTIONS.

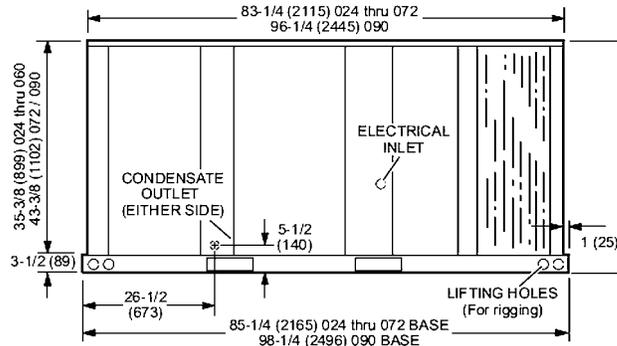
Max. Unit - The unit with ALL OPTIONS Installed. (Economizer, etc.)



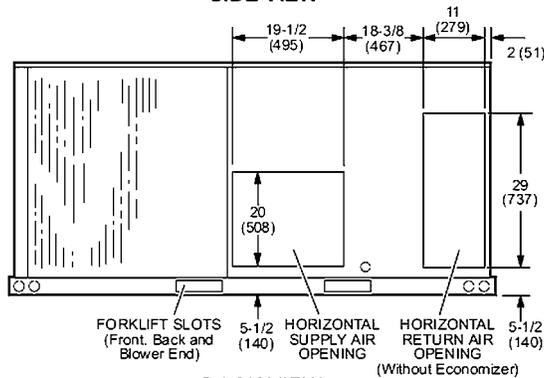
TOP VIEW (Base)



END VIEW



SIDE VIEW



BACK VIEW

# Lennox Industries Inc. - Product Submittal

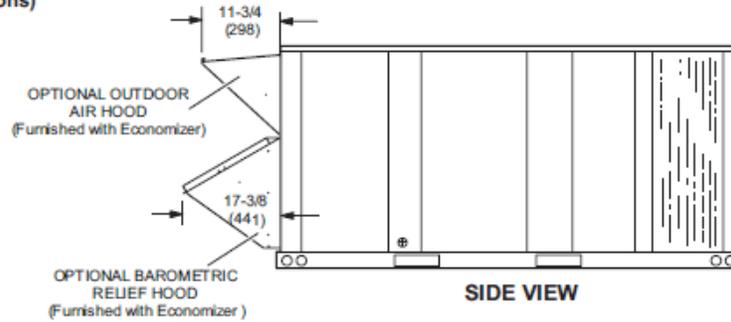
System ID: HVAC - 2

Package Model: KCA090S4B

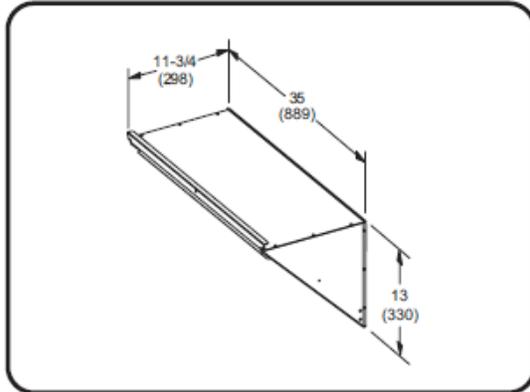
Description: PKGEE/7.5 TON/230-3 ENV

## DIMENSIONS - ACCESSORIES - INCHES (MM)

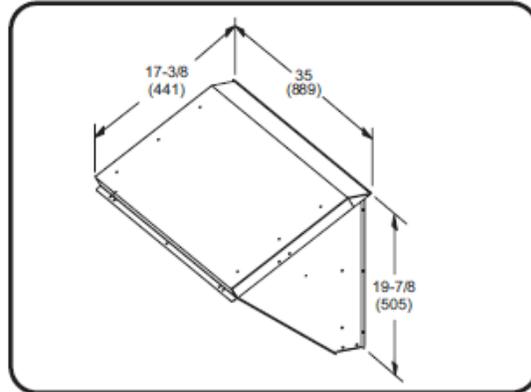
### OUTDOOR AIR HOOD DETAIL FOR OPTIONAL ECONOMIZER AND BAROMETRIC RELIEF DAMPERS (Downflow Applications)



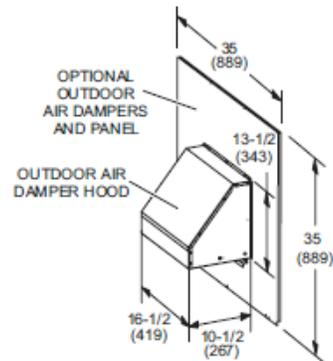
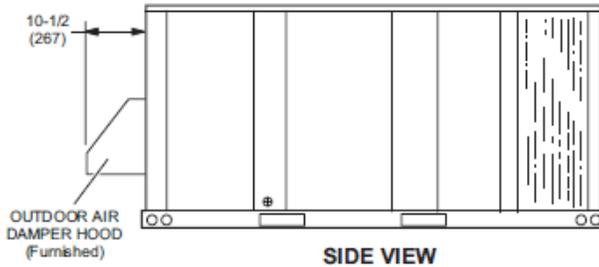
### OUTDOOR AIR HOOD FOR ECONOMIZER (Furnished)



### BAROMETRIC RELIEF HOOD FOR ECONOMIZER (Furnished)



### OUTDOOR AIR DAMPER HOOD DETAIL FOR OPTIONAL MANUAL OR MOTORIZED OUTDOOR AIR DAMPERS (Downflow or Horizontal Applications)



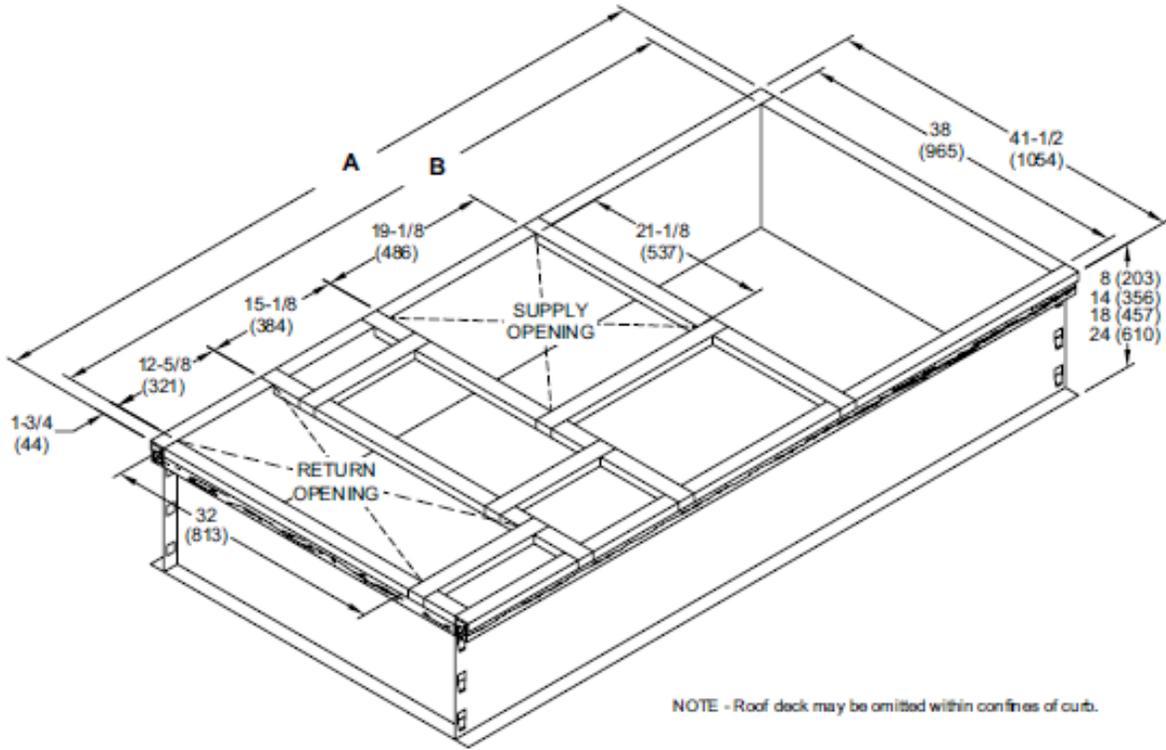
# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 2

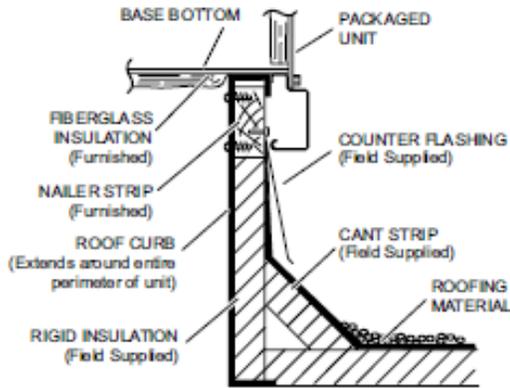
Package Model: KCA090S4B

Description: PKGEE/7.5 TON/230-3 ENV

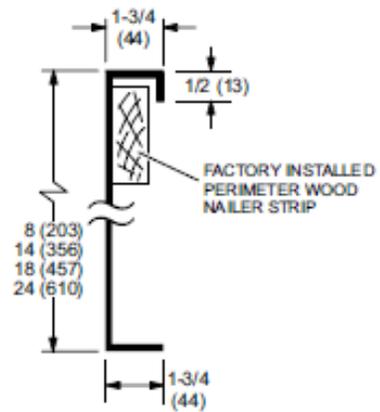
## HYBRID ROOF CURBS - DOUBLE DUCT OPENING - STANDARD AND FULL PERIMETER



### TYPICAL FLASHING DETAIL FOR ROOF CURB



### DETAIL ROOF CURB



Model No.	A		B	
	in.	mm	in.	mm
Standard - 024, 030, 036, 048, 060, 072, 1 090	79-3/4	2026	76-1/4	1937
Full Perimeter - 090	92-3/4	2356	89-1/4	2267

<sup>1</sup> 090 models can be used on smaller 79-3/4 in. (2026 mm) roof curbs (not full perimeter) with 15-3/4 in. (400 mm) overhang at condenser end of unit. See dimension drawing on page 54

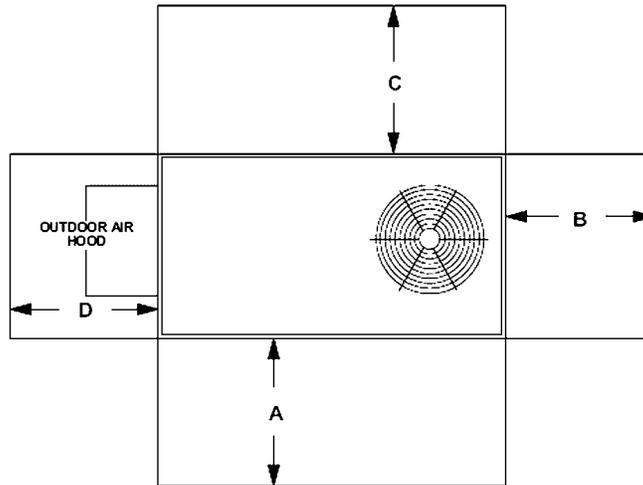
# Lennox Industries Inc. - Product Submittal

System ID: HVAC - 2

Package Model: KCA090S4B

Description: PKGEE/7.5 TON/230-3 ENV

## UNIT CLEARANCES - INCHES (MM)



1 Unit Clearance	A		B		C		D		Top Clearance
	in.	mm	in.	mm	in.	mm	in.	mm	
Service Clearance	36	914	36	914	36	934	36	914	Unobstructed
Minimum Operation Clearance	36	914	36	914	36	914	36	914	

NOTE - Entire perimeter of unit base requires support when elevated above the mounting surface.

1 Service Clearance - Required for removal of serviceable parts.

Minimum Operation Clearance - Required clearance for proper unit operation.