



AMICO PROPERTIES INC.

Noise Impact Assessment

Division & Road 2 Commercial Plaza, Town of Kingsville

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1.0 Introduction

1.1 Purpose and Objectives

Dillon Consulting Limited (Dillon) was retained by the Amico Properties Inc. (Amico) to prepare a Noise Impact Assessment for the proposed Tim Hortons (development) located at Division & Road 2 Commercial Plaza in the Town of Kingsville, Ontario. This study assesses the noise impacts of the proposed development on nearby noise-sensitive land uses.

The proposed development is located in an area zoned Rural Commercial. There are sensitive uses in close proximity of the proposed development, referred to herein as POR1, POR2, and POR3. The receptors are located approximately 130 m to the north, 20 m to the south, and 50 m west of the proposed commercial development's operations.

This study has been completed in accordance with the applicable noise guidelines and methodologies set by the Ontario Ministry of the Environment, Conservation and Parks (MECP) in their publication entitled *NPC-300 – Environmental Noise Guideline* (2013).

1.2 Overview of Proposed Development

The proposed development is to be located in the north end of the Town of Kingsville. The proposed development's lands are zoned for Rural Commercial while lands immediately surrounding the proposed development are zoned as Residential. The development is proposed to be a Tim Hortons fast food restaurant with a walk-in cooler and drive-thru services. The proposed development is 250 square metres (2,691 square feet) of building area on 0.97 acres of land. The Site Plan of the proposed development has been provided in **Appendix A**.

The primary noise sources of concern related to the development's operations include; rooftop HVAC and condenser, drive-thru service speakers, and vehicle traffic located in the drive-thru. The proposed development is assumed to operate 24 hours per day, 7 days per week.

The topography of the development and surrounding area has minor elevations changes in all directions, and is considered to be generally flat.

1.3 Summary of Acoustic Environment and Applicable Noise Limits

The background ambient noise of the surrounding lands can be characterized as having qualities of a Class 2 area, as described in NPC-300. The primary contributors to the background sound during the daytime and evening (07:00-23:00) include the activity of people and road traffic while background sound during the nighttime (23:00-07:00) is defined by the natural environment.

1.4 Statement of Compliance

This study confirms that the proposed development will comply with the daytime, evening, and nighttime noise exclusionary limits defined in the MECP's NPC-300, for all sources assessed in this report.

2.0

Noise Criteria

The MECP noise guideline publication NPC-300 – Environmental Noise Guidelines, Stationary and Transportation Sources – Approval and Planning (October 2013) defines four (4) area classification as follows:

- **Class 1 area** – an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as “urban hum.”
- **Class 2 area** – an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas: sound levels characteristic of Class 1 during daytime (07:00 to 19:00 or to 23:00 hours); and low evening and night background sound level defined by natural environment and infrequent human activity starting as early as 19:00 hours (19:00 or 23:00 to 07:00 hours).
- **Class 3 area** – means a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as, a small community, agricultural area, a rural recreational area such as a cottage or a resort area, or a wilderness area.
- **Class 4 area** – means an area or specific site that would otherwise be defined as Class 1 or 2 and which is an area intended for development with new noise sensitive land use(s) that are not yet built; is in proximity to existing, lawfully established stationary source(s); and has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.

For the purpose of this assessment, the subject site was considered to be a Class 2 area. The noise guideline criteria at sensitive receptors (such as residential dwellings) are given in terms of one-hour L_{eq} , the energy equivalent continuous sound level (in dBA). The limits for Class 2 areas are presented in **Table 1**.

Table 1: NPC-300 Class 2 Stationary Source Exclusion Limits

| Time of Day | Plane of Window One-Hour Leq (dBA) | Outdoor Point of Reception One-Hour Leq (dBA) |
|---------------------------|---------------------------------------|--|
| Daytime (07:00 – 19:00) | 50 | 50 |
| Evening (19:00 – 23:00) | 50 | 45 |
| Nighttime (23:00 – 07:00) | 45 | - |

3.0

Noise Sensitive Points of Reception

As per the MECP noise guideline a Point of Reception (POR) / receptor as “any point on the premises of a person where sound or vibration originating from other than those premises is received.” Noise sensitive receptors, as defined in MECP Publication NPC-300, include the following land uses:

- Permanent, seasonal, or rental residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes; and
- Churches and places of worship.

Three (3) sensitive points of reception were identified as the closest sensitive receptors to the development, as shown in **Figure 1**. Brief descriptions of the receptors is provided below and summarized in **Table 2**.

- **POR1** – A 1-storey long term care home approximately 10 m south of the proposed development’s property boundary operating as Chartwell Royal Oak Long Term Care Home Residence. A receptor height of 1.5 m, representing a receiver in the open plane of a first storey windows was assumed. This receptor was assessed for noise impacts during daytime, evening, and nighttime periods. A building evaluation was utilized for this receptor to assess the worst case impacted façade. Additionally a receptor height of 1.5 m, representing an outdoor living area was also assessed at the location of a patio for daytime and evening impacts only.
- **POR2** – A 1-storey residential dwelling located approximately 30 m west of the proposed development’s property boundary on Division Street North. A receptor height of 1.5 m, representing a receiver in the open plane of a first storey window was assumed. This receptor was assessed for noise impacts during daytime, evening, and nighttime periods. Additionally a receptor height of 1.5 m, representing an outdoor living area located at the backyard of the residence was assessed for daytime and evening impacts only.
- **POR3** – A 1-storey residential dwelling located approximately 35 m north of the proposed development’s property boundary on Road 2 East. A receptor height of 1.5 m, representing a receiver in the open plane of a first storey window was assumed. This receptor was assessed for noise impacts during daytime, evening, and nighttime periods. Additionally a receptor height of 1.5 m, representing an outdoor living area located at the backyard of the residence was assessed for daytime and evening impacts only.

Table 2: Noise Sensitive Receptors

| Receptor ID | Location | Comments |
|--------------------|----------------------------|---------------------------------|
| POR1 | 1750 Division Street North | One-storey long term care home |
| POR2 | 1771 Division Street North | One-storey residential dwelling |
| POR3 | 60 Road 2 East | One-storey residential dwelling |

4.0 Acoustic Analysis

The proposed development is a Tim Hortons fast food restaurant with indoor and drive-thru services assumed to operate 24 hours a day, 7 days a week. The Site Plan of the proposed development has been provided in **Appendix A**. The dominant noise generating sources and operations of the proposed development include rooftop HVAC and condensers associated with the building operation and refrigeration units, as well as vehicle traffic and speakers associated with the operation of the drive-thru service.

The following analysis was completed to determine the impact of dominant noise sources on noise sensitive points of reception identified in **Section 3.0**.

4.1 Noise Source Types

The significant noise sources / operations that were identified as part of this study are summarized in **Table 3**. Any additional noise sources associated with building services (e.g., exhaust fans) that were not included in this assessment are expected to be negligible.

Table 3: Summary of Significant Noise Sources

| Source ID | Description | Source Type | Sound Power Levels [Daytime / Nighttime] (dBA) | Number of Sources |
|-----------|---|--------------------------|--|-------------------|
| HVAC | One 10 ton rooftop HVAC unit assumed to operate continuously during daytime and evening periods and to operate at 30 minutes per hour during nighttime period. | Point Source | 84.2 | 1 |
| Condenser | Rooftop condenser operating continuously. | Point Source | 81.2 | 1 |
| Speaker | Drive-thru service speaker operating 30 minutes per hours. | Point Source | 82.5 | 2 |
| Idle | Vehicle traffic of drive-thru service at a speed of 1 km/h and an assumed daytime capacity of 100 vehicles serviced per hour and nighttime capacity of 60 vehicles serviced per hour. | Road Traffic Noise Model | 52.5/50.3 | 3 |

The sound power levels used in this analysis were determined from historic projects with similar noise sources.

It should be noted that parking lots for private vehicles at commercial facilities, such as retail stores, plazas, or shopping malls, are not considered as stationary sources as per MECP's NPC-300.

4.2 Site Plan Identifying All Significant Sources and Noise Control Equipment

The location of the proposed development and noise sensitive points of reception assessed in this study is illustrated in **Figure 1**. The location of the dominant noise sources of the proposed development are illustrated in **Figure 2**.

4.3 Acoustic Model Results

Sound power levels for dominant on-site noise sources were used as input to the predictive computer model CADNA/A noise prediction software developed by DataKustik GmbH. The outdoor noise propagation model is based on ISO Standard 9613, Part 1: Calculation of the absorption of sound by the atmosphere, 1993 and Part 2: General method of calculation (ISO-9613-2:1996). The model is capable of incorporating various site specific features, such as elevation, berms, absorptive grounds, and barriers to accurately predict noise levels at specific receptors, pertaining to noise emissions from a particular source / sources. The ISO based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures and topography. The model is considered conservative as it represents atmospheric conditions that promote propagation of sound from source to receiver.

4.3.1 Reflections

The noise sources were modelled assuming a single-order reflection. A building absorption coefficient of 0.37 was assumed to be representative of the brick façades present at the surrounding buildings, including the receptor buildings.

4.3.2 Ground Absorption & Topography

A global ground absorption coefficient of 0.5 was used to represent the mix between reflective (i.e., asphalt) and absorptive (i.e., grass) surfaces that exist between the proposed development and the surrounding sensitive receptors.

4.3.3 Sound Quality

Based on the assumed sources associated with the proposed development, no tonal or other annoyance characterizes are anticipated to be present, therefore, no penalties were applied.

The predicted receptor sound levels for daytime/evening and nighttime operating scenarios are presented in **Table 4**. Also presented in this table are the established performance limits for each time period / scenario.

Table 4: Acoustic Assessment Summary – Regular Operations

| Point of Reception ID | Point of Reception Description | Time of Day / Operating Scenario | Sound Level at Point of Reception (dBA) (Leq) | Performance Limit (dBA) (Leq) | Compliance with Performance Limit (Yes/No) |
|-----------------------|--------------------------------|----------------------------------|---|-------------------------------|--|
| POR1 | Façade | Daytime / Evening | 47 | 50 | Yes |
| | | Nighttime | 45 | 45 | Yes |
| | Patio | Daytime / Evening | 36 | 45 | Yes |
| POR2 | Façade | Daytime / Evening | 39 | 50 | Yes |
| | | Nighttime | 37 | 45 | Yes |
| | Backyard | Daytime / Evening | 26 | 45 | Yes |
| POR3 | Façade | Daytime / Evening | 37 | 50 | Yes |
| | | Nighttime | 35 | 45 | Yes |
| | Backyard | Daytime / Evening | 36 | 45 | Yes |

The predicted noise level contours and receptor noise levels for daytime/evening and nighttime scenarios are presented in **Figure 3** and **Figure 4**, respectively.

5.0

Recommendations

While the predicted receptors sound levels are below the established noise performance limits, it is still recommended to follow best operating practices to ensure that the proposed development minimizes its impact on the nearby noise sensitive points of reception.

It is Dillon's recommendation that the drive-thru speaker system be equipped with the Automatic Volume Control (AVC) technology so that the speaker volume can be adjusted based on the outdoor ambient noise levels. This ensures that the drive-thru speaker system will produce minimum noise emissions during nighttime periods while still servicing customers. A memo from HM Electronics detailing the use of AVC has been included in **Appendix B**.

6.0 Conclusion

This study confirms that proposed development's noise sources included in this assessment are in compliance with applicable daytime, evening, and nighttime noise performance limits specified in MECP's NPC-300.

7.0

Closure

This Noise Impact Assessment has been prepared based on the information provided and/or approved by Amico Properties Inc. (Amico). This report is intended to provide a reasonable review of available information within an agreed work scope, schedule, and budget. This report was prepared by Dillon for the sole benefit of Amico and to satisfy the reporting requirements for permitting purposes. The material in the report reflects Dillon's judgment in light of the information available to Dillon at the time of this report preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that the report is to your satisfaction. Please do not hesitate to contact the undersigned if you have any further questions on this report.

Respectfully Submitted:

DILLON CONSULTING LIMITED



Lucas Arnold, P.Eng.
Associate

A handwritten signature in black ink that reads 'Callum Heggart'.

Callum Heggart, EIT

AMICO PROPERTIES INC.

Noise Impact Assessment - Division & Road 2 Commercial Plaza, Town of Kingsville

January 2021 – 21-1034



Figures



Scale 1 : 2000

Figure 1

Project # 21-1034

January 22, 2021

Proposed Development and Surrounding Area

Division Street North and Road 2 East,
Kingsville, Ontario





Scale 1 : 1,000

| Legend | |
|---|---------------------------------|
|  | Drive-thru Traffic Noise Source |
|  | HVAC/Condenser Noise Source |
|  | Drive-thru Speaker Noise Source |
|  | Property Boundary |

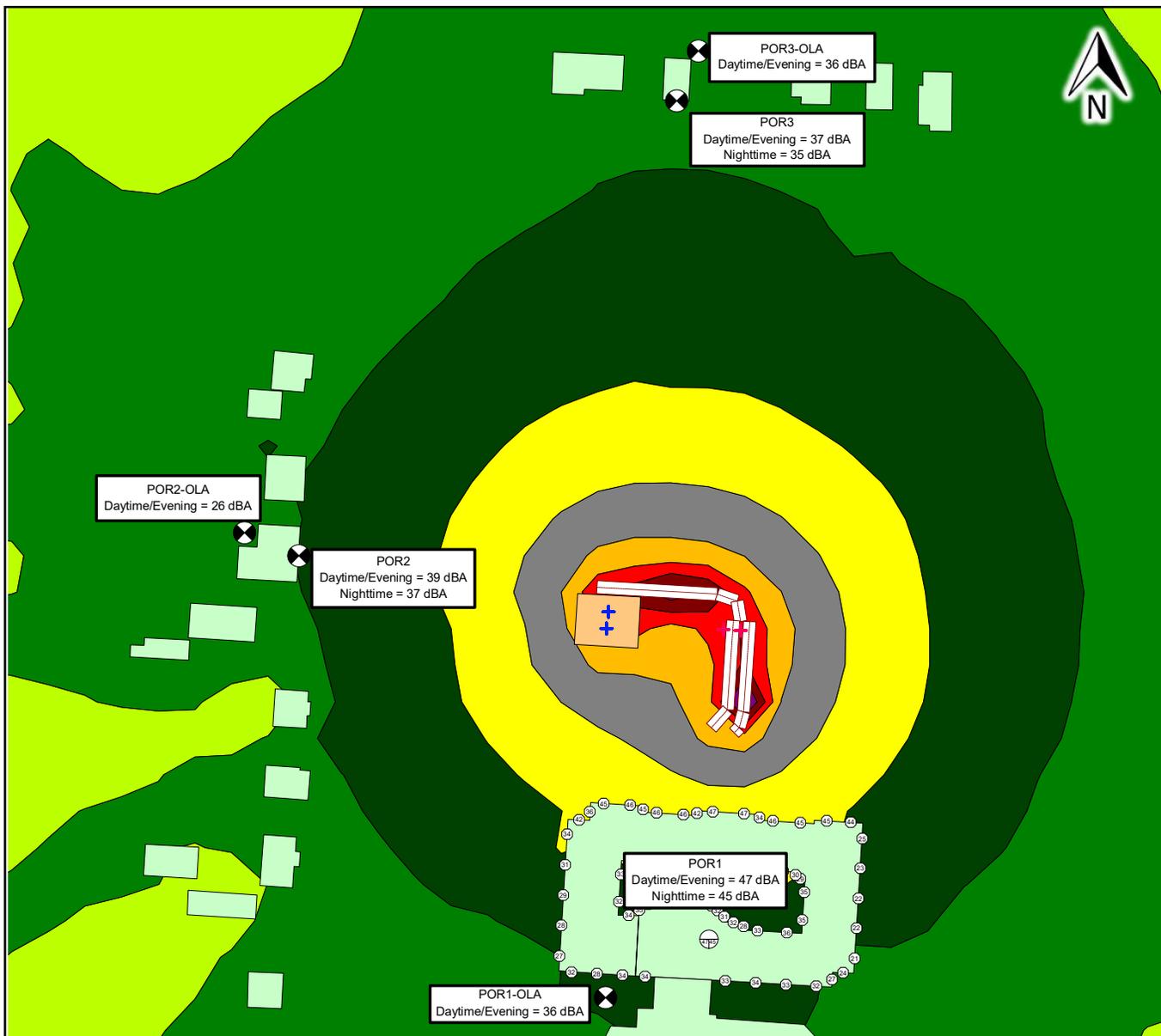
Figure 2

Project # 21-1034

January 22, 2021

Dominant Noise Sources of the Proposed Development
 Division Street North and Road 2 East,
 Kingsville, Ontario





Scale 1 : 1,500

Legend

-  Drive-thru Traffic Noise Source
-  HVAC/Condenser Noise Source
-  Drive-thru Speaker Noise Source

-  > 35.0 dB
-  > 40.0 dB
-  > 45.0 dB
-  > 50.0 dB
-  > 55.0 dB
-  > 60.0 dB
-  > 65.0 dB

Figure 3

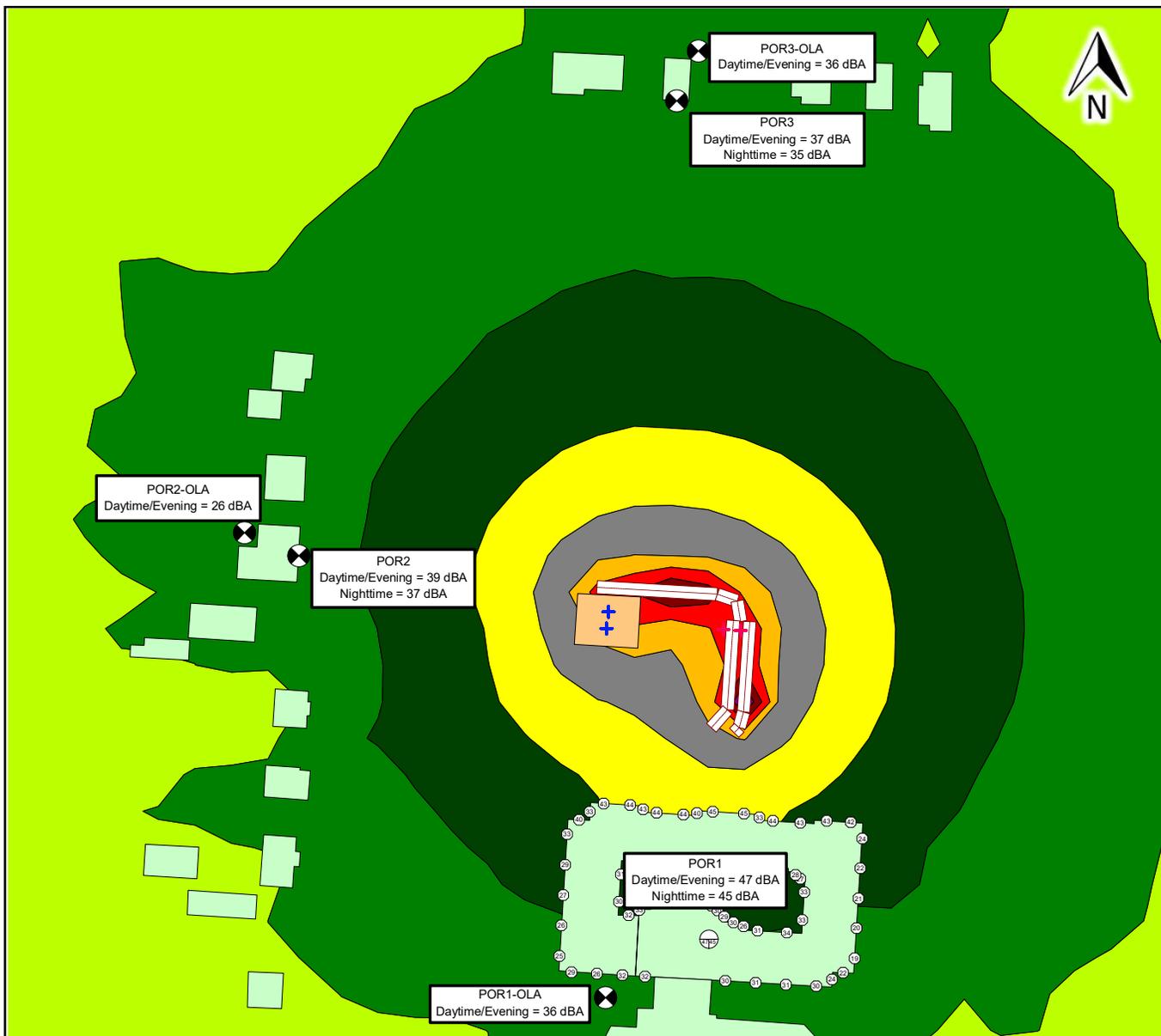
Daytime and Evening Impacts

Division Street North and Road 2 East,
Kingsville, Ontario



Project # 21-1034

January 22, 2021



Scale 1 : 1,500

| Legend | |
|---|---------------------------------|
|  | Drive-thru Traffic Noise Source |
|  | HVAC/Condenser Noise Source |
|  | Drive-thru Speaker Noise Source |
|  | > 35.0 dB |
|  | > 40.0 dB |
|  | > 45.0 dB |
|  | > 50.0 dB |
|  | > 55.0 dB |
|  | > 60.0 dB |
|  | > 65.0 dB |

Figure 4

Project # 21-1034

January 22, 2021

Nighttime Impacts

Division Street North and Road 2 East,
Kingsville, Ontario



Appendix A

Site Plan

Appendix B

Drive-Thru Sound Pressure Levels from the
Menu Board or Speaker Post with AVC

Memo**Re: Drive-Thru Sound Pressure Levels From the Menu Board or Speaker Post**

The sound pressure levels from the menu board or speaker post are as follows:

1. Sound pressure level (SPL) contours (A weighted) were measured on a typical HME SPP2 speaker post. The test condition was for pink noise set to 84 dBA at 1 foot in front of the speaker. All measurements were conducted outside with the speaker post placed 8 feet from a non-absorbing building wall and at an oblique angle to the wall. These measurements should not be construed to guarantee performance with any particular speaker post in any particular environment. They are typical results obtained under the conditions described above.
2. The SPL levels are presented for different distances from the speaker post:

| Distance from the Speaker (Feet) | SPL (dBA) |
|---|------------------|
| 1 foot | 84 dBA |
| 2 feet | 78 dBA |
| 4 feet | 72 dBA |
| 8 feet | 66 dBA |
| 16 feet | 60 dBA |
| 32 feet | 54 dBA |

3. The above levels are based on factory recommended operating levels, which are preset for HME components and represent the optimum level for drive-thru operations in the majority of the installations.

Also, HME incorporates automatic volume control (AVC) into many of our Systems. AVC will adjust the outbound volume based on the outdoor, ambient noise level. When ambient noise levels naturally decrease at night, AVC will reduce the outbound volume on the system. See below for example:

| Distance from Outside Speaker | Decibel Level of standard system with 45 dB of outside noise <u>without</u> AVC | Decibel level of standard system with 45 dB of outside noise <u>with</u> AVC active |
|--------------------------------------|--|--|
| 1 foot | 84 dBA | 60 dBA |
| 2 feet | 78 dBA | 54 dBA |
| 4 feet | 72 dBA | 48 dBA |
| 8 feet | 66 dBA | 42 dBA |
| 16 feet | 60 dBA | 36 dBA |

If there are any further questions regarding this issue please contact HME customer service at 1-800-848-4468.

Thank you for your interest in HME's products.