

Environmental Noise Assessment Proposed 10 Storey Student Residence 17 Ewen Road, Hamilton, Ontario

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FINAL

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1.0 INTRODUCTION

Novus Environmental Inc. (Novus) was retained by the GSP Group on behalf of Abode Varsity Living (hereinafter referred to as Rise) to conduct an environmental noise feasibility assessment for its proposed 10-storey (151-units, approximately 600 bed) student residence development, to be located at 17 Ewen Road, in Hamilton, Ontario. The proposed development is a privately owned student housing development and none of the units will be owned by students. All of the students will be tenants and the developer will be the landlord.

Noise impacts at this development have been previously examined by Novus Environmental in the following reports:

- Novus Report #10-0100, “Environmental Noise Assessment, Stationary Noise Impacts, Proposed 10 Storey Student Residence, 17 Ewen Road, Hamilton, Ontario” dated January 10, 2011;
- Novus letter, entitled “17 Ewen Road Development, Response to Peer Review Comments, Novus File No. 10-0100”, dated September 23, 2011; and
- Novus Report #13-0125, “Environmental Noise Assessment, Proposed 10 Storey Student Residence, 17 Ewen Road, Hamilton, Ontario” dated September 4, 2013.

Since the publication of the above, there has been significant noise abatement work in furtherance of an amended ECA by Mondelez Canada Inc., conducted at its adjacent industrial facility (45 Ewen Road). In addition, the MOE Publication NPC-300 “Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning” was officially released (on October 21, 2013) and is the current applicable guideline for both Land-use Planning assessments and ECA applications. The developer has approached the Ministry of the Environment (MOE) to discuss the applicability of the new guidelines. This report updates and replaces the previous assessment work, to include the effects of that work.

1.1 Focus of Report

This report examines the potential for:

- Impacts of the environment on the development;
- Impacts of the development on the environment; and
- Impacts of the development on itself.

1.2 Nature of the Subject Lands

The subject property, 17 Ewen Road, is currently improved with a 1-storey commercial storage facility. The proposal is to replace that storage facility with a new 11-storey (10 residential storeys plus 1 mechanical storey) privately-owned student residence on the property, to service students attending McMaster University. Information on the proposed development is provided in **Figure 1**, and a context plan showing the surrounding area is shown in **Figure 2**.

1.3 Nature of the Surroundings

The site is located between Ewen Road and Rifle Range Road, approximately 75 m south of Main Street. See **Figure 2**. The lots to the north contain commercial uses and restaurants.

To the west, on the far side of Ewen Road, there are a commercial and institutional uses including a physiotherapy clinic and funeral home, and warehouse space. Further west behind these uses is the open space of the hydro corridor.

To the east of the subject property along Rifle Range Road are a paint store and a Fortino's grocery store.

Directly to the south of the 17 Ewen Road property is the Mondelez Canada Inc. facility at 45 Ewen Road.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

In assessing the potential for the environment to impact the development, the focus of this report is to assess the potential for:

- 1) Transportation noise impacts from local roads;
- 2) Industrial “stationary” noise impacts from the Mondelez Canada Inc. facility.

2.0 Transportation Noise

The following transportation sources have the potential to produce noise levels at the development:

- Main Street;
- Rifle Range Road; and
- Ewen Road

The level of noise from these sources has been predicted, and this information has been used to identify façade, ventilation and warning clause requirements.

2.1 Surface Transportation Noise Criteria - Ministry of the Environment Publication NPC-300

Ministry of the Environment (MOE) Publication NPC-300 provides sound level criteria for new residential developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. The following tables summarize applicable surface transportation (road and rail) criteria.

As railway noise impacts are not anticipated on the development, only the roadway portion of the NPC-300 criteria is applicable for this assessment.

Table 1: MOE Publication NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Equivalent Sound Level (dBA)		Assessment Location
		Road	Rail ^[1]	
Outdoor Living Area	Daytime (0700-2300h)	55	55	Outdoors
Living / Dining Room ^[3]	Daytime (0700-2300h)	45	40	Indoors ^[2]
	Night-time (2300-0700h)	45	40	Indoors ^[2]
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors ^[2]
	Night-time (2300-0700h)	40	35	Indoors ^[2]

Notes: [1] Including whistle noise.

[2] An assessment of indoor noise levels is required only if the criteria in **Table 3** are exceeded.

[3] Residence area Dens, Hospitals, Nursing Homes, Schools, Daycares are also included. During the night-time period, Schools and Daycares are excluded.

Table 2: MOE Publication NPC-300 Ventilation and Warning Clause Requirements

Assessment Location	Time Period	Equivalent Sound Level (dBA)		Ventilation and Warning Clause Requirements ^[2]
		Road	Rail ^[1]	
Plane of Window	Daytime (0700-2300h)	≤ 55	≤ 55	None
		56 to 65 incl.	56 to 65 incl.	Forced Air Heating with provision to add air conditioning + Type C Warning Clause
		> 65	> 65	Central Air Conditioning + Type D Warning Clause
	Night-time (2300-0700h)	51 to 60 incl.	51 to 60 incl.	Forced Air Heating with provision to add air conditioning + Type C Warning Clause
		> 60	> 60	Central Air Conditioning + Type D Warning Clause

Notes: [1] Whistle noise is excluded.

[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Table 3: MOE Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Equivalent Sound Level (dBA)		Component Requirements
		Road	Rail ^[1]	
Plane of Window	Daytime (0700-2300h)	> 65	> 60	Designed/ Selected to Meet Indoor Requirements ^[2]
	Night-time (2300-0700h)	> 60	> 55	

Notes: [1] Including whistle noise.

[2] Building component requirements are assessed separately for Road and Railway noise. The resultant sound isolation parameter is required to be combined to determine an overall acoustic parameter.

In summary, Roadway noise impacts were predicted at the plane-of-window for the proposed development. Providing the plane-of-window sound levels exceed the daytime and night-time sound levels indicated in **Table 3**, the determination of the building façade components is required for meeting the indoor sound level criteria outlined in **Table 1**.

In addition, the ventilation requirements and warning clauses were determined, as outlined in **Table 2**, based on the plane-of-window noise levels.

As the proposed development does not have any outdoor amenity spaces, an assessment of OLA impacts was not completed.

2.2 Traffic Data and Future Projections

Road traffic data was obtained from the City of Hamilton Public Works, which provides intersection count data for major roadways. Copies of all traffic data used and calculations can be found in **Appendix A**. The traffic volume data were adjusted to a 2023 horizon year using a conservative traffic growth rate of 2.0% per annum. **Table 4** summarizes the road traffic volumes used in the analysis.

Table 4: Summary of Road Traffic Data Used in the Transportation Noise Analysis

Roadway Link	Year 2023 Traffic Levels (AADT)	Day/ Night Volume Split [1]		Commercial Traffic Breakdown		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
Main Street Westbound	14,033	92 %	8 %	1.8	1.1	60
Main Street Eastbound	13,600	92 %	8 %	1.8	1.1	60
Rifle Range Road	4,783	92 %	8 %	2.9	1.5	50
Ewen Road [2]	4,783	92 %	8 %	2.9	1.5	50

Notes: [1] Based on typical urban arterial road traffic distribution.

[2] Ewen Road counts not available, assumed to be equal to Rifle Range Road counts.

Future road traffic sound levels at the proposed development were predicted using the Cadna/A computer model. Roadways were modelled as line sources of sound. Noise emission levels for the roads were calculated using MOE ORNAMENT road traffic noise prediction algorithms. This information is then used as an input into the Cadna/A model, which models the roadways as line segments. The resulting predictions are equivalent to those made using the MOE STAMSON road traffic noise prediction model.

2.3 Projected Sound Levels

Sound levels were predicted at the façades of the development. Predicted façade sound levels at a number of heights above grade are presented in the following **Table 5**. The location of modelled receptors and graphical representation of results are shown in **Figures 3a and 3b**.

Table 5: Predicted Future Year 2023 Façade Sound Levels From Transportation Sources

Façade	Predicted Sound Level Due to 2023 Road Traffic (dBA)	
	Daytime (0700-2300h)	Night-time (2300-0700h)
North (Facing Main Street)	58	51
East (Facing Rifle Range Road)	60	52
South (Facing Mondelez Canada Inc.)	58	50
West (Facing Ewen Road)	61	54

2.4 Façade Recommendations

Based on the predicted façade sound levels, walls and windows meeting basic Ontario Building Code (OBC) requirements will be adequate to reduce transportation noise to acceptable levels indoors. Upgraded façade constructions are not required.

2.5 Ventilation and Warning Clause Requirements

Forced-air heating with the provision for installation of future central air conditioning and a warning clause is required for all units based on the traffic noise analysis. However, the building will be constructed with sealed windows and central air conditioning due to other considerations (see Section 3.4.6). Therefore the warning clause will indicate that central air conditioning is being provided. The following warning clause must be included in all lease/rental agreements to address traffic noise. An additional warning clause is also required to address stationary source noise (see Section 3.4.7).

"This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. 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 Municipality's and the Ministry of the Environment's noise criteria. "

Note that the proposed development is a privately owned student housing development and none of the units will be owned by students. All of the students will be tenants and the developer will be the landlord.

2.6 Outdoor Amenity Space Requirements

There are no communal outdoor amenity spaces associated with the development. Specifically, there are no ground level outdoor amenity areas and no rooftop amenity areas. The applicable zoning by-law does not require any such space and none is being provided. The space between the south wall of the building and the common property line with Mondelez Canada Inc. will be landscaped with a combination of turf, hedges, shrubs and trees, but will not be outdoor amenity space. Accordingly, no noise barriers, or warning clauses are required with respect to outdoor amenity spaces.

3.0 Stationary Source Impacts

3.1 Guideline D-6

The D-series of guidelines were developed by the Ontario Ministry of the Environment (MOE) in 1995 as a means to assess recommended separation distances and other control measures for land use planning proposals in an effort to prevent or minimize 'adverse effects' from the encroachment of incompatible land uses where a facility either exists or is proposed. The guideline specifically addresses issues of odour, dust, noise and litter.

Adverse effect is a term defined in the Environmental Protection Act and “means one or more of,

- impairment of the quality of the natural environment for any use that can be made of it,
- injury or damage to property or to plant or animal life,
- harm or material discomfort to any person,
- an adverse effect on the health of any person,
- impairment of the safety of any person,
- rendering any property or plant or animal life unfit for human use,
- loss of enjoyment of normal use of property, and
- interference with the normal conduct of business”

To minimize the potential to cause an adverse effect, areas of influence and recommended minimum setback distances were included within the guidelines. Guideline D-6 “Compatibility Between Industrial Facilities and Sensitive Land Uses” is specific to industrial uses in proximity to more sensitive land uses such as the proposed student residence development on the subject lands.

The areas of influence and recommended separation distances from the guidelines are provided in Table 6 below.

Table 6: Guideline D-6 Potential Influence Areas and Recommended Minimum Setback Distances for Industrial Land Uses

Industry Classification	Area of Influence	Recommended Minimum Setback Distance
Class I – Light Industrial	70 m	20 m
Class II – Medium Industrial	300 m	70 m
Class III – Heavy Industrial	1000 m	300 m

Industrial categorization criteria are supplied in Guideline D-6-2, and are shown in **Table 7** (following page).

Guideline D-6 requires that studies be conducted to assess impacts where sensitive land uses are proposed within the Area of Influence of an industrial facility. The proposed student residence is within the area of influence; therefore, a detailed study is required, and is provided in this report. For noise, Section 4.6.1 requires that the study address MOE Publication LU-131 guidelines.

Guideline D-6 also recommends that no sensitive land use be placed within the recommended minimum setback distance. However, it should be noted that this is a recommendation only. Section 4.10 of the Guideline allows for development within the separation distance, in cases of redevelopment, infilling, and transitions to mixed use, provided that the appropriate studies are conducted and that the relevant air quality and noise guidelines are met.

Table 7: Guideline D-6 – Industrial Categorization Criteria

Category	Outputs	Scale	Process	Operations / Intensity	Possible Examples
Class 1	<ul style="list-style-type: none"> Noise: Sound not audible off-property Dust: Infrequent and not intense Odour: Infrequent and not intense Vibration: No ground-borne vibration on plant property 	<ul style="list-style-type: none"> No outside storage Small-scale plant or scale is irrelevant in relation to all other criteria for this Class 	<ul style="list-style-type: none"> Self-contained plant or building which produces/ stores a packaged product Low probability of fugitive emissions 	<ul style="list-style-type: none"> Daytime operations only Infrequent movement of products and/ or heavy trucks 	<ul style="list-style-type: none"> Electronics manufacturing and repair Furniture repair and refinishing Beverage bottling Auto parts supply Packaging and crafting services Distribution of dairy products Landry and linen supply
Class 2	<ul style="list-style-type: none"> Noise: Sound occasionally heard off-property Dust: Frequent and occasionally intense Odour: Frequent and occasionally intense Vibration: Possible ground-borne vibration, but cannot be perceived off-property 	<ul style="list-style-type: none"> Outside storage permitted Medium level of production allowed 	<ul style="list-style-type: none"> Open process Periodic outputs of minor annoyance Low probability of fugitive emissions 	<ul style="list-style-type: none"> Shift operations permitted Frequent movements of products and/ or heavy trucks with the majority of movements during daytime hours 	<ul style="list-style-type: none"> Magazine printing Paint spray booths Metal command Electrical production Manufacturing of dairy products Dry cleaning services Feed packing plants
Class 3	<ul style="list-style-type: none"> Noise: Sound frequently audible off property Dust: Persistent and/ or intense Odour: Persistent and/ or intense Vibration: Ground-borne vibration can frequently be perceived off-property 	<ul style="list-style-type: none"> Outside storage of raw and finished products Large production levels 	<ul style="list-style-type: none"> Open process Frequent outputs of major annoyances High probability of fugitive emissions 	<ul style="list-style-type: none"> Continuous movement of products and employees Daily shift operations permitted 	<ul style="list-style-type: none"> Paint and varnish manufacturing Organic chemical manufacturing Breweries Solvent recovery plants Soaps and detergent manufacturing Metal refining and manufacturing

3.1.1 Local Surrounding Industries and Commercial Uses

Under the provisions of the Environmental Protection Act, all facilities which may emit a contaminant to the environment, including sound and vibration, must obtain an Environmental Compliance Approval (ECA) (formerly a Certificate of Approval (Air & Noise), or a “C of A”) to operate. A review of ECA’s / Cs of A for facilities within 300 m of the proposed 17 Ewen Road development was conducted.

The site is located between Ewen Road and Rifle Range Road, approximately 75 m south of Main Street. See **Figure 1**. The lots to the north contain commercial uses, including:

- | | |
|----------------------------|------------|
| • Westdale Car Service | Commercial |
| • Carstar Autoparts store | Commercial |
| • Money Mart | Commercial |
| • Pizza Hut | Restaurant |
| • Skyline Billiards Lounge | Commercial |
| • Burger King | Restaurant |

None of these uses have significant noise sources associated with them. Noise from these sources was not audible at the proposed development. None have, or would require ECAs from the MOE, based on their types and on the exemptions provided under O.Reg 524/98.

To the west, on the far side of Ewen Road, there are the following uses:

- | | |
|---|-------------------------------|
| • West End Physiotherapy Clinic | Clinic |
| • Union Gas valve station | Pipeline valve / Gate station |
| • United Hebrew Memorial Chapel | Funeral Home/ Chapel |
| • Clarke Productions Ltd. (5 Ofield Road) | Screen Printing Warehouse |
| • Advance Dental Ceramics | Dental laboratory |
| • FWP Wholesaling | Commercial / Warehousing |

Again, the majority of these uses would not require ECAs from the MOE, based on their types and on the exemptions provided under O.Reg. 524/98. Noise from these sources was not audible at the proposed development.

Operation of the Union Gas valve / gate station would be covered under Union Gas’ province-wide Environmental Compliance Approval (ECA) / Certificate of Approval 1949-7KRMC5. Noise from these sources was not audible at the proposed development.

Further west behind these uses is the open space of the hydro corridor.

To the east of the subject property along Rifle Range Road are the following uses:

- | | |
|--|------------|
| • Sherwin-Williams paint store (1603 Main Street West) | Commercial |
| • Canwest Editorial Services (1603 Main Street West) | Commercial |
| • Centre for String Playing (1603 Main Street West) | Commercial |

- AIM Medical Clinic Commercial
- Fortinos grocery store (1579 Main Street West) Commercial

None of these uses have significant noise sources associated with them. None have, or would require ECAs from the MOE, based on their types and on the exemptions provided under O.Reg 524/98. Noise from these sources was not audible at the proposed development.

Directly to the south of the 17 Ewen Road property is:

- the Mondelez Canada Inc. facility (45 Ewen Road) Industrial, Food(Candy)

The Mondelez Canada Inc. facility currently operates under Environmental Compliance Approval (ECA) No. 3308-8RYMAM. Noise from Mondelez Canada Inc. operations was audible at the proposed development.

In summary, only two facilities in the area have Environmental Compliance Approvals, as shown in **Table 8**.

Table 8: Environmental Compliance Approvals for Facilities Within 300 m of 17 Ewen Road

Company	Address	Ministry Approval and Issue Date	Distance To Subject Property (From Property Line To Property Line)
Union Gas	22 Ewen Road	1949-7KRMCS November 28, 2008	30 m
Mondelez Canada Inc.	45 Ewen Road	3308-8RYMAM September 27, 2013	Adjacent

Of the two, noise from the Union Gas gate station is insignificant. Noises from all other commercial and institutional sources in the area as discussed above are inaudible at the 17 Ewen Road site. Thus, the major potential source of “industrial” noise impacts in the area with the potential to adversely affect the proposed development is the Mondelez Canada Inc. facility.

The focus of the remainder of the assessment will be on Mondelez Canada Inc. operations. A copy of the ECA for the Mondelez Canada Inc. facility can be found in **Appendix B**.

3.1.2 Industrial Classification of Mondelez Canada Inc. Facility

Novus agrees with Pinchin, a consultant retained by Mondelez Canada Inc., in that the facility is a Class 2 “Medium” industry; and that under D-6 guidelines, the following setback distances apply:

- Area of Influence: 300 m
- Recommended Minimum Setback Distance 70 m

Figure 4 shows the proposed development and surrounding area, as well as the Guideline D-6 setback distances, measured from the property line of the Mondelez Canada Inc. facility.

3.1.3 Existing Sensitive Land Uses Surrounding the Mondelez Canada Inc. Facility

Figure 4 shows the area surrounding the Mondelez Canada Inc. facility. The 70 m recommended minimum setback distance and 300 m area of influence are shown. The Mondelez Canada Inc. plant is adjacent to noise-sensitive land uses, including existing residential uses and school to the south.

As can be seen in **Figure 4**, fifteen existing residences are located within the recommended minimum setback distance of 70 m. Some of these residences are directly adjacent to the rear property line of the Mondelez Canada Inc. plant.

3.1.4 Planning Classification of Surrounding Area

Based on discussions with GSP Group planners, and based on their review of the Hamilton Official Plan and the applicable area Secondary Plan, the subject property is an excellent candidate to be designated as a Class 4 Area pursuant to NPC-300. The remainder of the noise impact assessment and mitigation measures discussed in this report are based on the assumption that the subject property (but not any other lands in the vicinity of Mondelez Canada Inc.) will be classified as a Class 4 property by the City of Hamilton (being the land use planning authority). Given that the official plan designation of the subject property has been appealed to the Ontario Municipal Board (“OMB”), the final confirmation of the Class 4 classification may be achieved through the approval of an official plan policy and designation that identifies the Class 4 classification.

3.1.5 Assessment Requirements and Recommendations Under D-6

Guideline D-6 requires that studies be conducted to assess impacts where sensitive land uses are proposed within the Area of Influence of an industrial facility. The proposed student residence is within the area of influence; therefore, a detailed study is required, and is provided in this report. For noise, Section 4.6.1 requires that the study address MOE Publication LU-131 guidelines (now NPC-300, the successor guideline).

Guideline D-6 also recommends that no sensitive land use be placed within the recommended minimum setback distance. However, it should be noted that this is a recommendation only. Section 4.10 of the Guideline allows for development within the separation distance, in cases of redevelopment, infilling, and transitions to mixed use, provided that the appropriate studies are conducted and that the relevant air quality and noise guidelines are met.

Thus, provided MOE Publication NPC-300 noise guidelines are met based on the detailed assessment, the proposed development will meet Guideline D-6 requirements.

3.2 NPC-300 Guideline Limits

MOE noise guidelines for stationary source noise impacting residential and certain institutional and commercial developments are given in MOE publication NPC-300. The applicable portions of NPC-300 are Part B – Stationary Sources, Part C – Land Use Planning and the associated definitions outlined in Part A – Background.

Steady Sound

The sound level limit for steady sound sources are expressed as a 1-hr equivalent sound level (1-hr L_{eq}), and is the higher of the NPC-300 exclusionary limits and the existing background sound level. The NPC-300 stationary source noise requirements are summarized below for steady sound sources for outdoor and plane-of-window receptor locations.

Table 9: NPC-300 Steady Sound Noise Requirements

Receiver Category		Time Period	Exclusionary Sound Level Limits, L_{eq} (dBA) ^[1]
Outdoor	Class 1	0700-1900h	50
		1900-2300h	50
		2300-0700h	-
	Class 2	0700-1900h	50
		1900-2300h	45
		2300-0700h	-
	Class 4	0700-1900h	55
		1900-2300h	55
		2300-0700h	-
Plane of Window ^[2]	Class 1	0700-1900h	50
		1900-2300h	50
		2300-0700h	45
	Class 2	0700-1900h	50
		1900-2300h	50
		2300-0700h	45
	Class 4	0700-1900h	60
		1900-2300h	60
		2300-0700h	55

Notes: [1] or minimum hourly L_{eq} of background noise, whichever is higher

[2] Applicable for “Noise Sensitive Spaces”, as defined in NPC-300.

Impulsive Sound

Impulsive noise is evaluated by comparing the log-average noise levels (dBAI values) of several distinct impulses against limits defined by the actual number of impulses per hour. The Publication NPC-300 limits are provided in the following table:

Table 10: NPC-300 Impulsive Noise Guideline Limits – Outdoor Living Area

No. of Impulses per Hour	Time Period	Impulsive Noise Limits (dBAI) ^{[1] [2]}		
		Class 1	Class 2	Class 4
9 or more	0700-2300h	50	50	55
7 or 8		55	55	60
5 or 6		60	60	65
4		65	65	70
3		70	70	75
2		75	75	80
1		80	80	85

Notes: [1] expressed in terms of the Logarithmic Mean Impulsive Sound Level (L_{LM})
[2] or minimum hourly L_{eq} of background noise, whichever is higher

Table 11: NPC-300 Impulsive Noise Guideline Limits – Noise Sensitive Space

No. of Impulses per Hour	Time Period	Impulsive Noise Limits (dBAI) ^{[1] [2] [3]}		
		Class 1	Class 2	Class 4
9 or more	0700-2300h	50	50	60
	2300-0700h	45	45	55
7 or 8	0700-2300h	55	55	65
	2300-0700h	50	50	60
5 or 6	0700-2300h	60	60	70
	2300-0700h	55	55	65
4	0700-2300h	65	65	75
	2300-0700h	60	60	70
3	0700-2300h	70	70	80
	2300-0700h	65	65	75
2	0700-2300h	75	75	85
	2300-0700h	70	70	80
1	0700-2300h	80	80	90
	2300-0700h	75	75	85

Notes: [1] expressed in terms of the Logarithmic Mean Impulsive Sound Level (L_{LM})
[2] or minimum hourly L_{eq} of background noise, whichever is higher
[3] applied at the plane-of-window

Existing and Proposed Area Classifications

The acoustic environment surrounding the proposed development is dominated by the roadway noise and a general urban hum during all periods of the day. Therefore, the proposed development is considered to be located in a Class 1 area. Therefore, the Class 1 guideline limits are considered applicable for the existing noise sensitive receptors in the area.

In NPC-300, an area (otherwise classified as Class 1 or Class 2) can be designated as Class 4 based on the following:

- Intended for development with new noise sensitive land use(s) that are not yet built;
- In proximity to existing, lawfully established stationary source(s); and
- Has formal conformation from the City of Hamilton as a Class 4 area classification, determined during the land use planning process.

For the purposes of this assessment, the proposed development is assumed to be located in a Class 4 area. Any required designation of such by the City of Hamilton and any required legal agreements (between the developer, the City and Mondelez Canada Inc.) are also assumed to be in place for the purpose of this report.

3.3 City of Hamilton Noise Bylaw

The City of Hamilton Noise By-law No. 11-285 also regulates noise within the City. The following provisions would apply to the Mondelez Canada Inc. operations:

- ...
3. (1) No person shall make or permit to be made:
- (a) an unreasonable noise; or
 - (b) a noise that is likely to disturb the inhabitants of the City.
- (2) Without limiting the generality of section 3, noise from the sources listed in paragraphs 3(2)(a) to 3(2)(h) is deemed to be an unreasonable noise or a noise that is likely to disturb the inhabitants of the City:
- ...
- (h) construction or loading that is clearly audible at a point of reception between 10 p.m. of one day and 7 a.m. of the next day.
- ...
4. No person shall make or permit to be made noise that contravenes:
- (a) an applicable Noise Pollution Control Publication of Ontario's Ministry of the Environment; or
 - (b) a permission, such as a certificate of approval, under federal or provincial legislation.
- ...

Thus, loading and unloading activities from Mondelez Canada Inc.’s operations are constrained by the Noise By-law to being inaudible at existing residential receptors in the area. Compliance with the current NPC-300 is also required by the by-law. Mondelez Canada Inc. has requested, and Rise supports, a technical amendment to the by-law which would make it clear that compliance with a valid ECA is deemed compliance with the by-law. Such a clear statement would be consistent with the proper application of the by-law and would avoid any unintended inconsistency between the by-law and NPC-300.

3.4 Industrial “Stationary Source” Noise Modelling

An environmental noise assessment was conducted to investigate the potential for noise impacts on the proposed development from the Mondelez Canada Inc. facility. All other stationary sources in the surrounding area were considered to be insignificant for the proposed development. Stationary noise impact modelling was completed using “Cadna/A” noise prediction software produced by DataKustik GmbH.

3.4.1 Facility Noise Model

Noise modelling information was obtained from an Acoustic Assessment Report (AAR) and associated Cadna/A electronic modeling files, prepared for the Mondelez Canada Inc. Facility by Conestoga-Rovers & Associates Ltd. (CRA), in September 2013.

This model was used to assess stationary noise impacts at the proposed development. Modelled noise source locations are shown in **Figure 5**.

3.4.2 Determination of Applicable Guideline Limits

The NPC-300 Class 4 area guideline limits are assumed to apply to the proposed development. The ambient sound levels are not expected to exceed the Class 4 exclusionary limits, based on the ambient sound level data included in the CRA AAR. Therefore, the exclusionary NPC-300 limits of 60 dBA/dBAI during the daytime; and 55 dBA/ dBAI during the night-time periods were applied in this assessment.

3.4.3 Noise Modeling Data and Settings

Noise modelling data and settings used were provided by CRA and are consistent with the AAR and NAAP reports supplied by CRA to the MOE.

3.4.4 Modelling Results – Proposed Development

The noise impacts at the proposed development were modelled using “building evaluations” for both steady and impulsive noise. The “building evaluations” modelling approach allows for impacts to be examined over the entire building surface, where the maximum noise levels are identified. The predicted impacts include all noise mitigation measures listed in the updated Mondelez Canada Inc. AAR and associated Noise Abatement Action Plan (NAAP).

Steady Sound

The results of the modelling are shown in the following table for steady noise. The results of the building evaluations are shown graphically in **Figure 6** and **Figure 7** for daytime and night-time impacts, respectively.

Table 12: Modelling Results – Steady Sound

Receptor Location	Time Period	Predicted Level ^[1] (dBA)	Default Class 4 Guideline Limits (dBA)	Meets Guideline? (Yes/No)
Southern Face of Building, Near Eastern Edge	0700-2300h	61	60	No
	2300-0700h	57	55	No

Notes: [1] The predicted levels are the worst-case impacts for all facades of the development.

The Class 4 exclusionary guideline limits are exceeded by 1 dBA during the daytime and 2 dBA night-time periods for steady sound at the worst-case locations on the building facade. Therefore, the consideration for noise control measures is required for steady sound.

Impulsive Sound

The predicted impulsive sound levels are shown in the following table. The results of the building evaluations are shown graphically in **Figure 8**.

Table 13: Modelling Results – Impulsive Sound

Receptor Location	Time Period	Predicted Level (dBAI)	Default Class 4 Guideline Limits (dBAI)	Meets Guideline? (Yes/No)
Southern Face of Building, Near Eastern Edge	0700-2300h	75	60	No
	2300-0700h	-	55	-
Eastern Face of Building, Near Southern Edge	0700-2300h	75	60	No
	2300-0700h	-	55	-

Notes: [1] The predicted levels are the worst-case impacts for all facades of the development.

Impulsive sound levels exceed the daytime guideline limits by 15 dBAI at the worst-case locations on the building facade. Therefore, the consideration for noise control measures is required.

An assessment of night-time impulsive sound levels was not completed, since the CRA AAR identifies impulse noise is to be associated with daytime unloading only as a component of the updated NAAP.

3.4.5 Receptor-Based Noise Mitigation Measures

Section C4.4.2 of Publication NPC-300 identifies that where the guideline limits are exceeded in a Class 4 Area, receptor-based noise control measures are applicable, and can be used to achieve compliance.

Receptor based noise mitigation measures can include building designs, sealed windows, noise barriers, and enclosed noise buffers. Where the combination of sealed windows and enclosed noise buffers are used, mandatory air conditioning is required, and walls and windows must be selected to ensure that an acceptable indoor noise environment is maintained.

The NPC-300 guideline allows for the use of additional mitigation in the form of “Enclosed Noise Buffers” (ENBs) on high-rise, multi-unit buildings in a Class 4 area. ENBs overlap sensitive windows and essentially act as a “secondary skin facade”, providing an initial reduction in noise prior to impacting the window on the sensitive space, thus ensuring that the noise guidelines are met at the exterior plane of windows next to noise sensitive spaces. The exterior plane of the window next to the noise sensitive space is defined as a sensitive point of reception (POR) in NPC-300.

Mitigation requirements for the proposed development were reviewed with the MOE. An ENB design for the proposed development was reviewed by MOE which acknowledged that it would be acceptable for consideration in the context of a receptor based “on building” noise control measure in a Class 4 Area, as defined in NPC-300.

The ENB in this case consists of a sealed (not openable) window, on the exterior of the building, with steel sides (minimum 20 ga.), 4 inches (100 mm) deep. The ENB would be “in front of” and completely overlap any windows leading on to noise sensitive spaces (including but not limited to bedrooms, living rooms, eat-in kitchens, dens, and offices) on the south, east and portions of the north facades. The façade window within the ENB, next to the noise sensitive space, would need to be of exterior grade and meet the minimum requirements of the Ontario Building Code.

The ENBs will be installed on all units on the south facade of the building (facing Mondelez Canada Inc.), all units on the east facade (facing Rifle Range Road) and on selected units on the north facade of the building (units on floors 7,8,9 and 10) on the east end of the north façade as shown on **Figure 10**.

For the majority of the ENBs, the exterior window pane will be constructed out of minimum ¼” thick (6 mm) glass.

As indicated in **Figure 10**, for specific ENBs on the east façade of the building located on floors 6, 7, 8, 9 and 10, the exterior window pane will be constructed out of either:

- 1/2" (13 mm) glass, or
- Laminated glass, 3/16" glass / 0.030" laminate / 3/16" glass; or
- Laminated glass, 1/4" glass / 0.030" laminate / 1/8" glass.

The vast majority of the “interior” windows within the ENBs would be sealed. Some of the interior windows may be “operable” (or designed to be made temporarily operable) to allow for noise measurement to address MOE acoustic audit requirements. This is the only reason for these limited number of interior windows to be operable. The windows to be used for acoustic audit purposes will be reviewed and agreed to with Mondelez Canada Inc. and identified in an updated AAR.

A concept sketch is illustrated in **Figure 9**. A copy of the correspondence with the Ministry of the Environment can be found in **Appendix C**.

An ENB would not be required on bathrooms, laundry rooms, corridors or other “noise insensitive” spaces. Instead, normal sealed windows would be used for these spaces. It should also be noted that “regular” (non-ENB) sealed windows will be used on the west facade and the remainder of the north façade of the development. The north façade faces away from Mondelez Canada Inc. and is generally shielded from that facility by the proposed building itself. The use of sealed windows on the west and north façades (with the exception of those required on floors 7, 8, 9 and 10) is a safety feature for the student residents and is not an acoustical requirement.

Table 14: Modelling Results – Impulsive Sound, Mitigated

Receptor Location	Time Period	Predicted Level at Inner Window of ENB (dBAI)	Default Class 4 Guideline Limits (dBAI)	Meets Guideline? (Yes/No)
Southern Face of Building, Near Eastern Edge	0700-2300h	55	60	No
	2300-0700h	-	55	-
Eastern Face of Building, Near Southern Edge	0700-2300h	55	60	No
	2300-0700h	-	55	-

Notes: [1] The predicted levels are the worst-case impacts for all facades of the development.

3.4.6 Ventilation Requirements

The ventilation requirements, based on the roadway traffic noise assessment (see Section 2.5), are for units to be fitted with forced air heating and the provision for central air conditioning. However, as sealed windows and ENBs are to be used within the development, mandatory air-conditioning is required.

3.4.7 Noise Warning Clause

It is recommended that the following warning clauses should be included in all Occupancy Agreements to address stationary noise (in addition to the transportation noise-related warning clauses discussed in Section 2.5):

Tenants are advised that this development is in close proximity to an industrial manufacturing facility located at 45 Ewen Road, Hamilton (the “Hamilton Manufacturing Facility”) which operates 24 hours a day, 7 days a week. Various processes, including shipping and receiving, either operate continuously or at any time of day or night. Activities may include loading, unloading and repair of large tractor trailers and operation of various manufacturing processes. In addition, there may be industrial emissions, including noise, dust, light or odour emanating from the Hamilton Manufacturing Facility from time to time that may be detectable within this development.

Tenants and other occupants are advised that sound levels due to the Hamilton Manufacturing Facility are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. These dwelling units have been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed.

Notwithstanding the inclusion of certain mitigation features within this development to lessen potential noise from the Hamilton Manufacturing Facility, from time to time, noise from the Hamilton Manufacturing Facility is likely to be audible and such noise may impact the enjoyment of indoor areas of this development.

An application may be made to alter or expand the Hamilton Manufacturing Facility in the future.

Tenants are advised that the owner of the Hamilton Manufacturing Facility will not be responsible for any complaints or claims arising from any of the activities at or relating to the Hamilton Manufacturing Facility, property or operations thereon and that a Restrictive Covenant and an agreement under the Industrial and Mining Lands Compensation Act have been registered on title to the lands for the development and the Hamilton Manufacturing Facility in this regard.”

PART 2: IMPACTS OF THE DEVELOPMENT ON ITSELF

4.0 Outdoor Noise Impacts From Ventilation Sources

The building ventilation and potential emergency systems associated with the development have not been designed at this time. Such equipment has the potential to result in noise impacts on noise sensitive spaces within the development itself.

4.1 Applicable Guideline Limits

On- and off-site noise impacts from all mechanical equipment, including but not limited to any required chillers, cooling towers, exhaust fans, and make up air handling units, should comply with the guideline limits contained in:

- The City of Hamilton Noise Bylaw; and
- MOE Publication NPC-300.

These criteria generally limit noise from stationary sources relative to the ambient sound exposures.

As discussed above, the proposed development is presumed to be in a Class 4 area. The following is a summary of the Class 4 area exclusionary guideline limits.

Table 15: NPC-300 Noise Guideline Limits for Stationary Noise (Non-Impulsive Noise Sources)

Type of Space	Sound Level Limit (L_{eq} 1-hr, dBA), During Time Period ^{[1] [2]}	
	Daytime (0700-2300h)	Night-time (2300-0700h)
Outdoor Living Area	55	-
Living / Dining Room	60	55
Sleeping Quarters	60	55

Notes: [1] Or the minimum hourly background sound level $L_{eq}(1)$, whichever is higher.
 [2] L_{eq} measured in A-weighted decibels (dBA), is the value of the constant sound level which would result in exposure to the same total sound energy as would the specified time-varying sound, if constant sound level persisted over an equal time interval.

Impacts for living and sleeping areas are evaluated at the outside plane of the window next to the sensitive space.

4.2 Building Equipment

The proposed development will require mechanical ventilation, and may require emergency power systems. Based on our experience, the type and size of the units which will likely be required, and their probable location (tower rooftops well removed from on-site and off-site noise sensitive receptors) adverse noise impacts are not anticipated.

Regardless, potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design.

An Environmental Compliance Approval (ECA) should be applied for with the Ministry of the Environment at the site plan approval stage, once building mechanical systems are fully designed. Alternatively, the equipment should be designed to meet the requirements of the applicable Environmental Activity and Sector Registry (EASR), and be registered with the MOE.

5.0 Interior Noise Sources

Building rooms or spaces next to mechanical equipment areas may be adversely affected by sound transmitted through ducts, opening, or noise induced by the vibrations of adjoining walls. The isolation of sound from mechanical equipment can be readily achieved by good design.

All supply, return and miscellaneous fans should be provided with adequate vibration isolation to ensure that vibration is not transferred to the building structure and become a source of noise. Duct silencers can be used to ensure that high fan noise levels are not carried by the duct work to residential

and other noise sensitive rooms throughout the building. Fans should be connected to ducting with flexible connectors. Duct work should be hung on vibration isolating hangers.

All chillers, compressor and similar items of equipment should be provided with adequate vibration isolation and mounted on concrete inertia bases. The chiller room may need a floating floor or other alternate acoustically equivalent "room to room" construction to ensure that the high sound levels associated with a chiller are not transmitted to the noise sensitive units.

All piping runs within the building are potential sources of noise. For example, plumbing can be a source of noise particularly if the source is not in the same suite as the listener. Pipes that pass through walls, floors and ceiling should be treated to reduce potential noise and vibration impacts. For example, pipes should be hung on vibration isolating hangers, and risers should not be rigidly connected to the floors or other supporting members at anchor locations.

Pumps should be provided with adequate vibration isolation and mounted on concrete inertia bases where required. Transformers and other vibration noise producing electrical components should be provided with adequate vibration isolation.

The following Table indicates accepted guidelines to limit interior sound levels from continuous building services (i.e., pumps, air handling units, etc.). These guidelines are in the form of Noise Criteria (NC) curves, which indicate the maximum desirable sound level at the receptor in different frequency bands depending on the use of the space.

Table 16: Typical Indoor Noise Control Design Criteria

Type of Space	Range of Sound Levels (dBA)	Range of NC Criteria
Residence	25-35	20-30
Apartments	30-40	30-35
Private / Executive Office	30-40	25-35
General/Open Office	40-50	35-45
Conference Room	30-40	25-35
Restaurants / Lounges	35-50	35-45

5.1 Interior Walls and Floors

Walls and floors separating mechanical rooms, fan rooms, electrical rooms, elevators shafts and rooms, garbage chutes, retail spaces etc. from residential spaces in the building should have adequate sound transmission loss. The Building Code requires a minimum Sound Transmission Class (STC) of 55 for such floors and walls.

Interior walls between adjacent units should have a sufficient sound transmission loss. A minimum STC of 50 to 55 is recommended between adjacent units, STC-50 being specified by the Ontario Building Code. Adequate sound isolation can only be achieved if pertinent details to design and construction are followed. For example, closure of all cracks by caulking or equivalent, and the sealing

of all wall penetrations, including electrical outlets. Electrical outlets serving different suites should not be within the same stud space or masonry cavity.

Attention should also be paid to the effect of party rooms and other recreational and utility areas located adjacent to, or in close proximity to, units and office spaces. Noise and vibration impacts due to these areas should be investigated, and noise and/or vibration control measures included as necessary.

An important aspect not addressed by the Building Code is impact sound. The floor/ceiling systems can be designed to minimize the transmission of impact sounds. The use of carpet or resilient underlayments to meet Impact Insulation Class (IIC) ratings of IIC 55-60 would be appropriate for stacking units.

PART 3: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

6.0 Impacts of the Development on Surrounding Properties

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties.

6.1 Road Traffic Noise

The traffic related to the proposed development will be small relative to the existing traffic volumes within the area, and is not of concern with respect to noise impact.

6.2 Ventilation System Noise

Other possible sources of noise associated with the proposed development which may affect the surrounding neighbourhood are emergency generators and mechanical roof-top equipment. This equipment must meet the following requirements at the closest off-site noise sensitive receptors:

- The City of Hamilton Noise Bylaw; and
- MOE Publication NPC-300.

Off-site impacts are not anticipated given the high ambient sound levels in the area, the large separation distances to off-site noise sensitive receptors, and the fact that the systems will be designed to ensure that the applicable noise guidelines are met at on-site receptors.

Regardless, potential impacts will be assessed as part of the final building design to ensure compliance. The criteria can be met at all surrounding and on-site receptors through the use of routine mitigation measures, including the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design. An Environmental Compliance Approval (ECA) should be

applied for with the Ministry of the Environment at the site plan approval stage, once building mechanical systems are fully designed. Alternatively, the equipment should be designed to meet the requirements of the applicable Environmental Activity and Sector Registry (EASR), and be registered with the MOE.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The potential for noise and vibration impacts on and from the proposed 17 Ewen Road development have been assessed. Impacts of the environment on the development, the development on itself, and the development on the surrounding area have been considered. Based on the results of our studies, the following conclusions have been reached:

7.1 Transportation Noise

- An assessment of transportation noise impacts has been completed.
- Facade walls and windows meeting minimum Ontario Building Code requirements will be adequate to address transportation noise. See **Section 2.4**.
- Forced air heating suitable for installation of future air conditioning and a warning clause is required for all units based on road traffic noise estimates, however central air conditioning will be installed for other reasons. See **Sections 2.5 and 3.4.6**.
- As there is no planned communal outdoor amenity area, noise barriers or warning clauses are not required. See **Section 2.6**.

7.2 Industrial “Stationary” Noise

- Noise impacts from the nearby Mondelez Canada Inc. facility have been modelled based on information received from Mondelez Canada Inc. The Mondelez Canada Inc. facility noise levels, with mitigation measures included in the current Mondelez Acoustic Assessment Report and Noise Abatement Action Plans, may exceed the noise guideline limits at the proposed development.
- Feasible noise mitigation measures for a Class 4 area include Receptor Based “on building” noise controls. An enclosed noise buffer is proposed. See **Section 3.4.5**. The application of sealed windows and the ENB enclosures will be secured and maintained through the site plan approval process and an agreement between Rise, Mondelez Canada Inc. and the City of Hamilton as required by NPC-300. ENBs will be installed on the entire south and east facades and a portion of the north facade for sensitive living spaces.
- Mandatory air conditioning is required for all units. See **Section 3.4.6**.
- A noise warning clause is recommended for industrial noise, and an additional noise warning clause regarding air conditioning is also recommended. See **Section 3.4.7**.

7.3 Overall

- Impacts of the environment on the development can be adequately controlled through the feasible mitigation measures, façade designs, and warning clauses detailed in this report.
- Impacts of the development on itself are anticipated to be negligible, and can be adequately controlled by following the design guidance outlined in Part 2 of this report.
- Impacts of the development on the surrounding area are anticipated to be negligible, and can be adequately controlled by following the design guidance outlined in Part 3 of this report.
- The acoustical requirements above should be refined by an Acoustical Consultant as the design progresses.

Should you have any questions or concerns, please do not hesitate to contact the undersigned.

Sincerely,

Novus Environmental Inc.



R. L. Scott Penton, P.Eng.,
Principal



Marcus Li, B.Sc., B.Eng.Sc.,
Specialist

8.0 REFERENCES

- Aercoustics Ltd., Report #07120.01, “Acoustic Assessment Report, Kraft Canada Inc., 45 Ewen Road Facility, Hamilton, Ontario”, dated May 1, 2012, and signed by David Grant and Payam Ashtiani, P.Eng. (the Acoustic Assessment (AAR) Report)
- Conestoga Rovers & Associates, Report #074775, “Noise Abatement Recommendations, Kraft Foods Canada Inc., Hamilton Ontario”, dated August 30, 2012, and signed by Gordon Reusing, P.Eng. (the Noise Abatement Action Plan (NAAP))
- Ontario Ministry of the Environment, Amended Environmental Compliance Approval Number 3308-8RYMAM, Issue Date: December 19, 2012
- City of Hamilton Bylaw No. 11-285, Noise Control By-Law
- Ontario Ministry of the Environment (MOE 1995c), Publication NPC-205: Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)
- Ontario Ministry of the Environment (MOE 1997a), Publication LU-131: Noise Assessment Criteria In Land Use Planning
- Ontario Ministry of the Environment (MOE 1997b), Annex to Publication LU-131: Noise Assessment Criteria In Land Use Planning
- Ontario Ministry of the Environment (MOE 1997b), Noise Assessment Criteria In Land Use Planning: Requirements, Procedures and Implementation
- Ontario Ministry of the Environment (MOE, 2013), Publication NPC-300: Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning

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Figures

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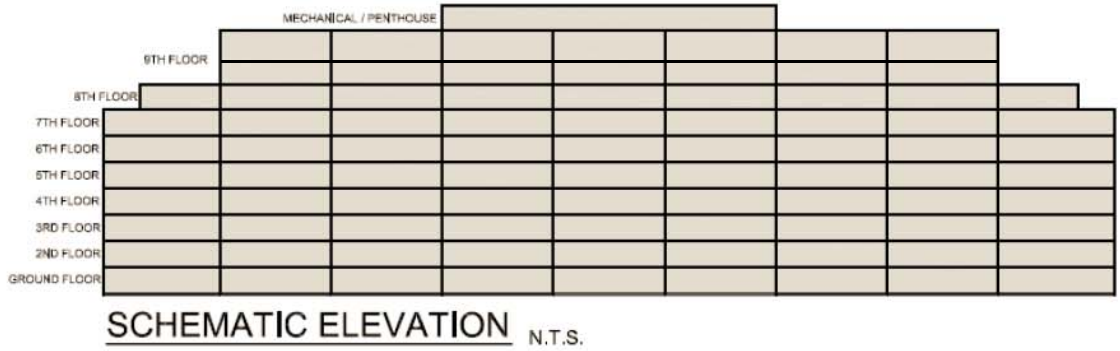
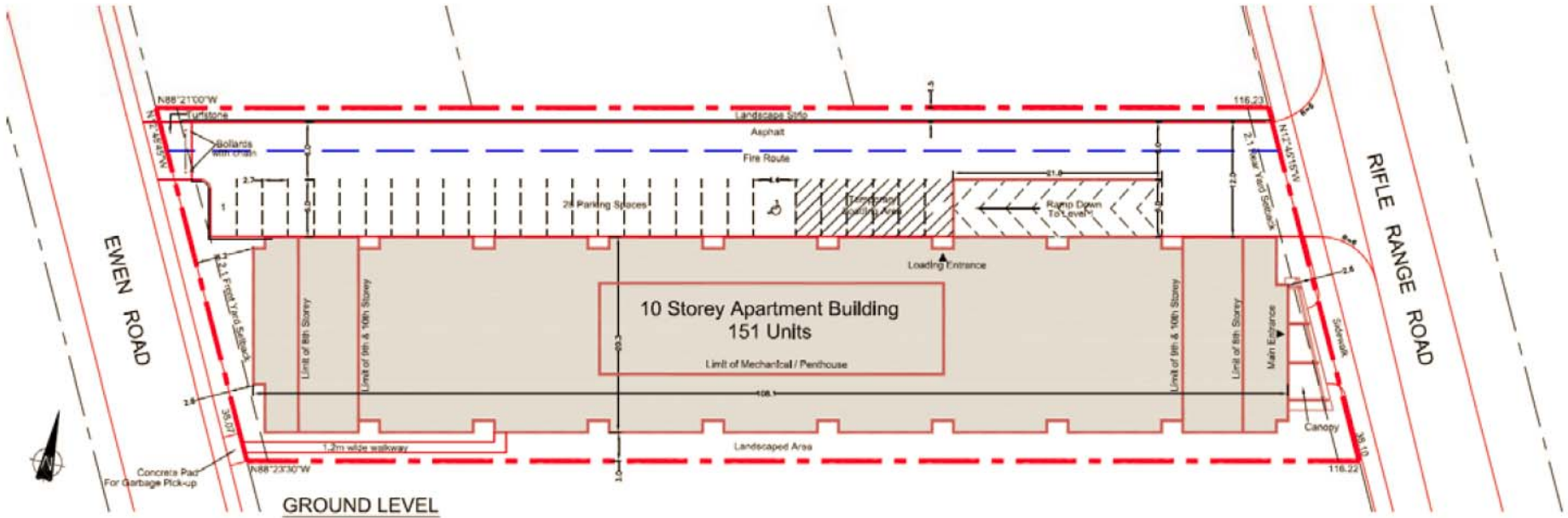



Figure No. 1	Scale: n.t.s.	 150 Research Lane, Suite 105 Guelph, ON, Canada, N1G 4T2 t. 226.706.8080 f.226.706.8081 www.novusenv.com
17 Ewen Road Proposed Development	Date: 14/08/01	
	File No.: 13-0125	
Abode Varsity Living 17 Ewen Road Development	Drawn By: MTL	



True North

Scale: 1: 2,000

Date: 14/08/07

File No.: 13-0125

Drawn By: SLP

**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **2**

**17 Ewen Road Proposal
Context Plan**



True North

LEGEND

- > 45 dBA
- > 50 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA
- > 70 dBA
- > 75 dBA

Scale: n/a

Date: 13/08/19

File No.: 13-0125

Drawn By: SLP

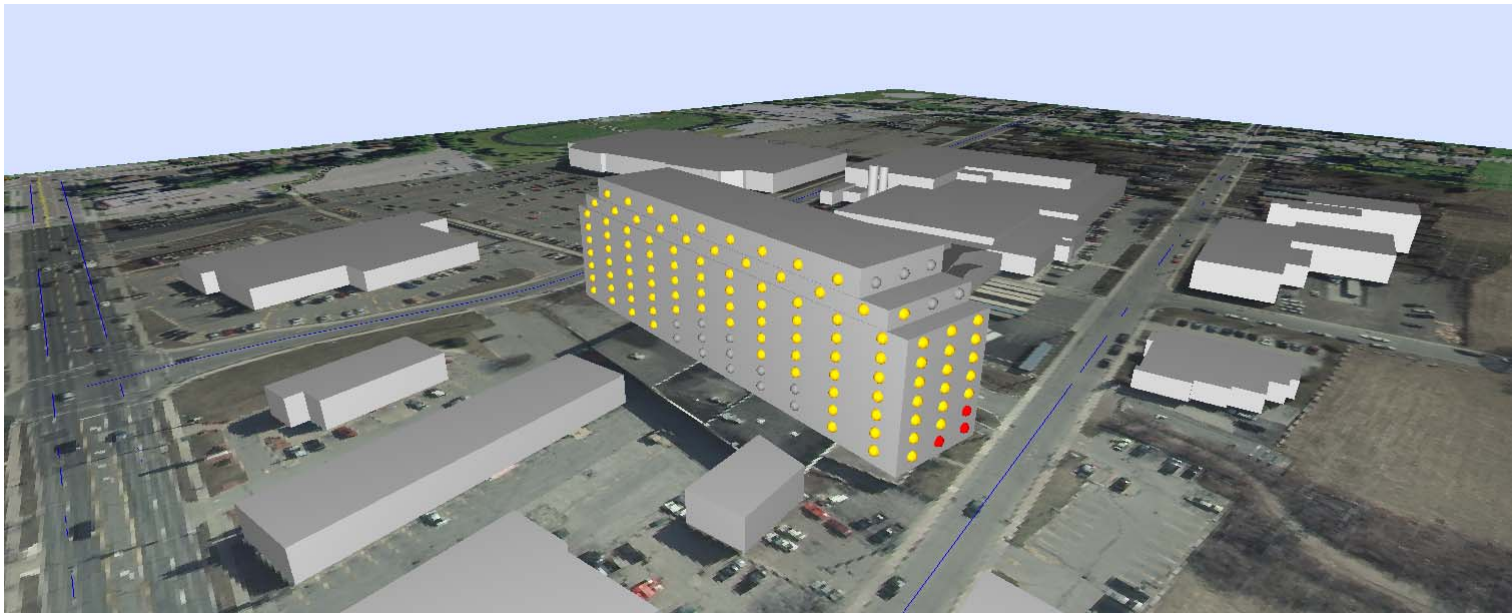
**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **3a**

**Future Year 2023
Transportation Noise
Modelling Results –
Daytime**



Daytime (0700-2300h) (1: 750)





True North

LEGEND

- > 45 dBA
- > 50 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA
- > 70 dBA
- > 75 dBA

Scale: n/a

Date: 13/08/19

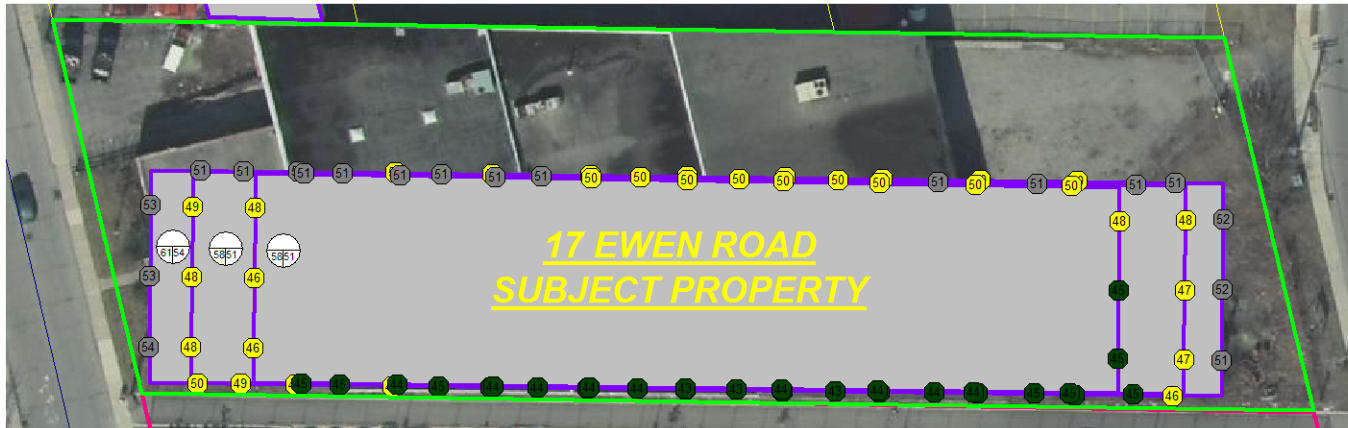
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Drawn By: SLP

**Abode Varsity Living
17 Ewen Road
Development**

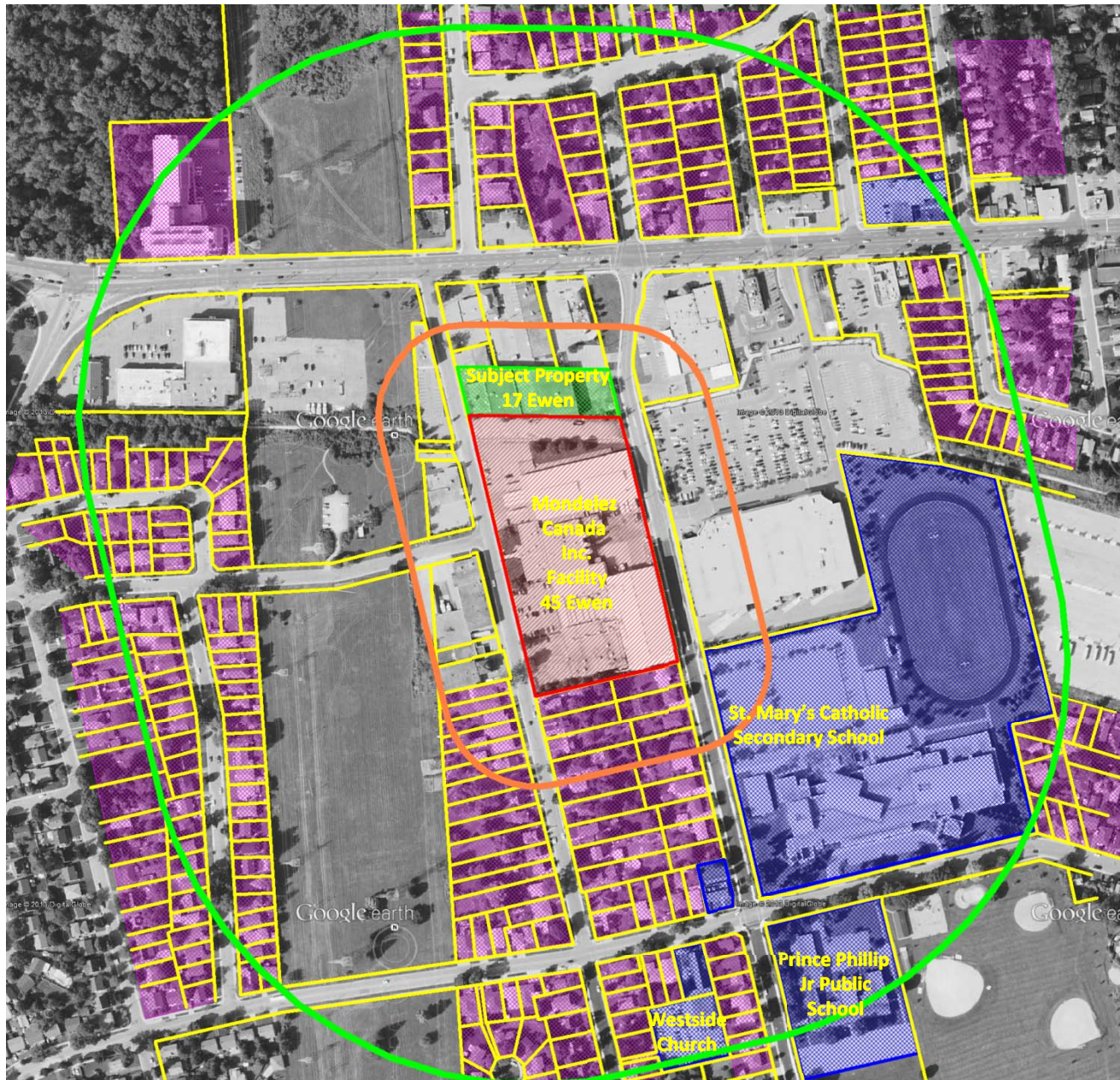
Figure No: **3b**

**Future Year 2023
Transportation Noise
Modelling Results –
Night-time**



Night-time (2300-0700h) (1: 750)





- Subject Property
 - Noise Sensitive Residential Use
 - Noise Sensitive Institutional Use
- Mondelez Canada Inc. Property
 - Guideline D-6: 70 m Recommended Minimum Setback
 - Guideline D-6: 300 m Area of Influence



True North

Scale: 1: 5,000

Date: 14/08/07

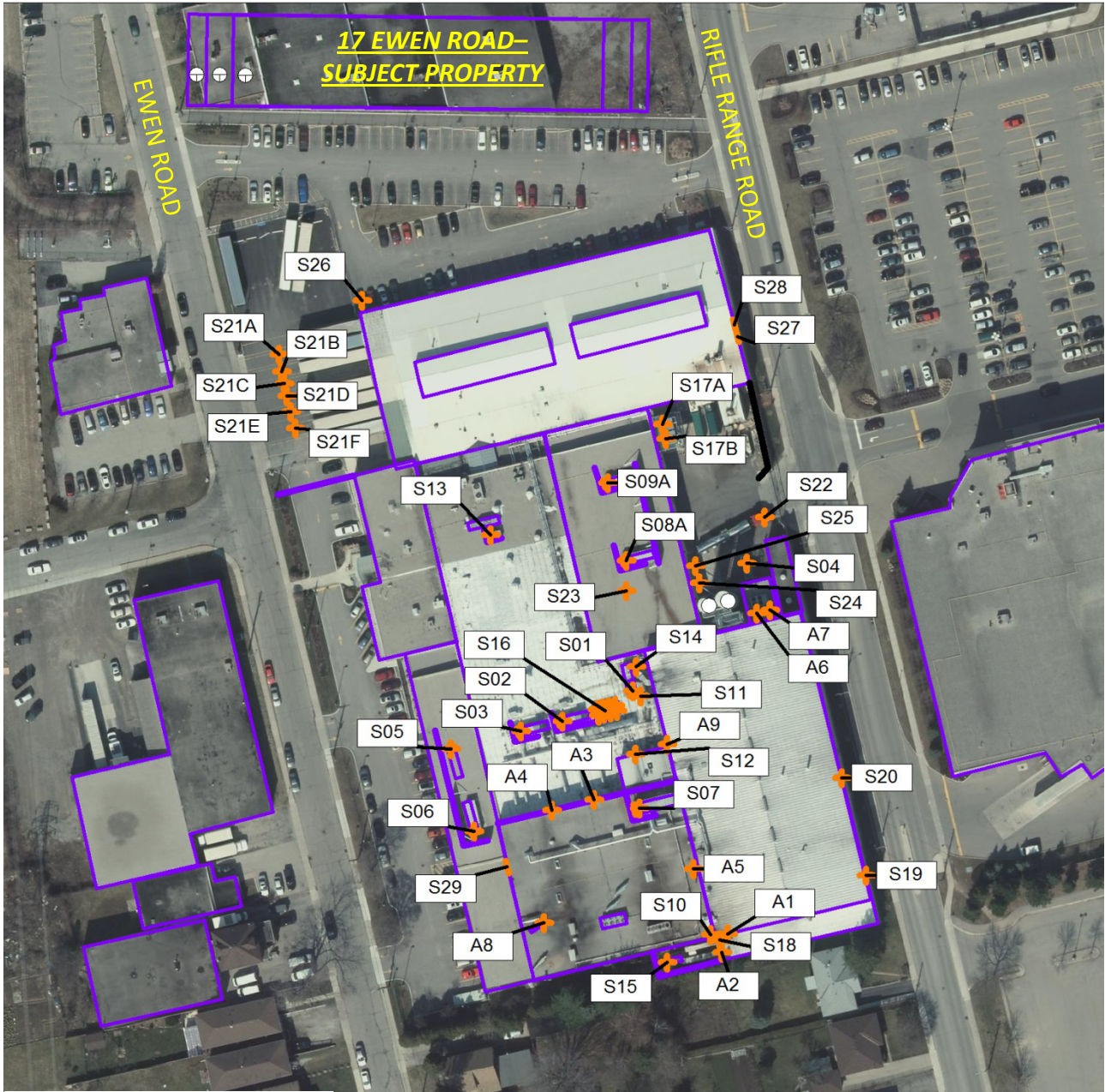
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Drawn By: SLP

**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **4**

**Guideline D-6 Setback
Distances Measured
From Mondelez Canada
Inc. Facility**



Aerial image from First Base Solutions



True North

Scale: 1: 1,500

Date: 13/10/31

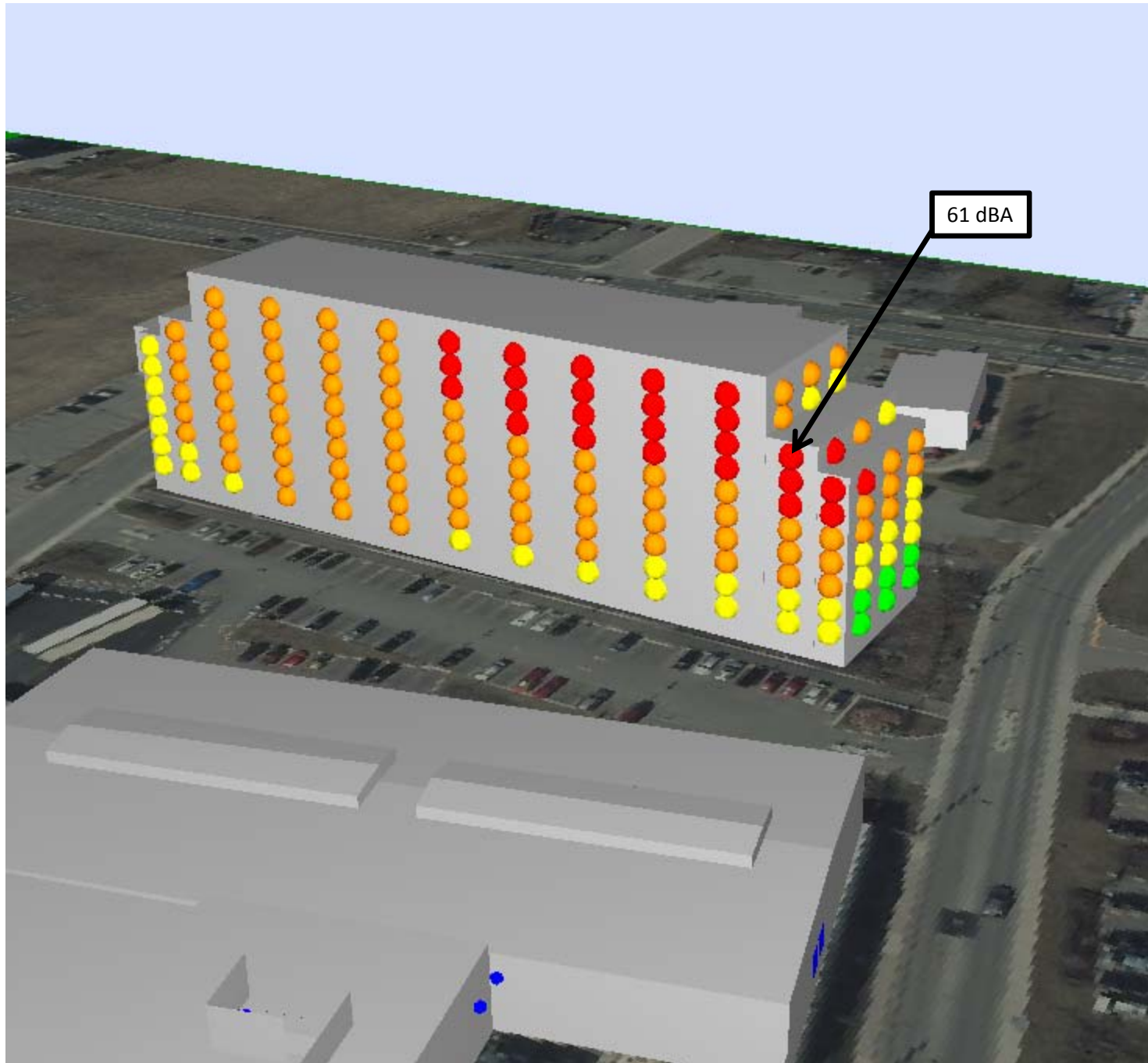
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**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **5**

**Mondelez Canada Inc.
Facility Noise Source
Locations**



True North

LEGEND

- > 45 dBA
- > 50 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA
- > 70 dBA
- > 75 dBA

Scale: N/A

Date: 13/10/31

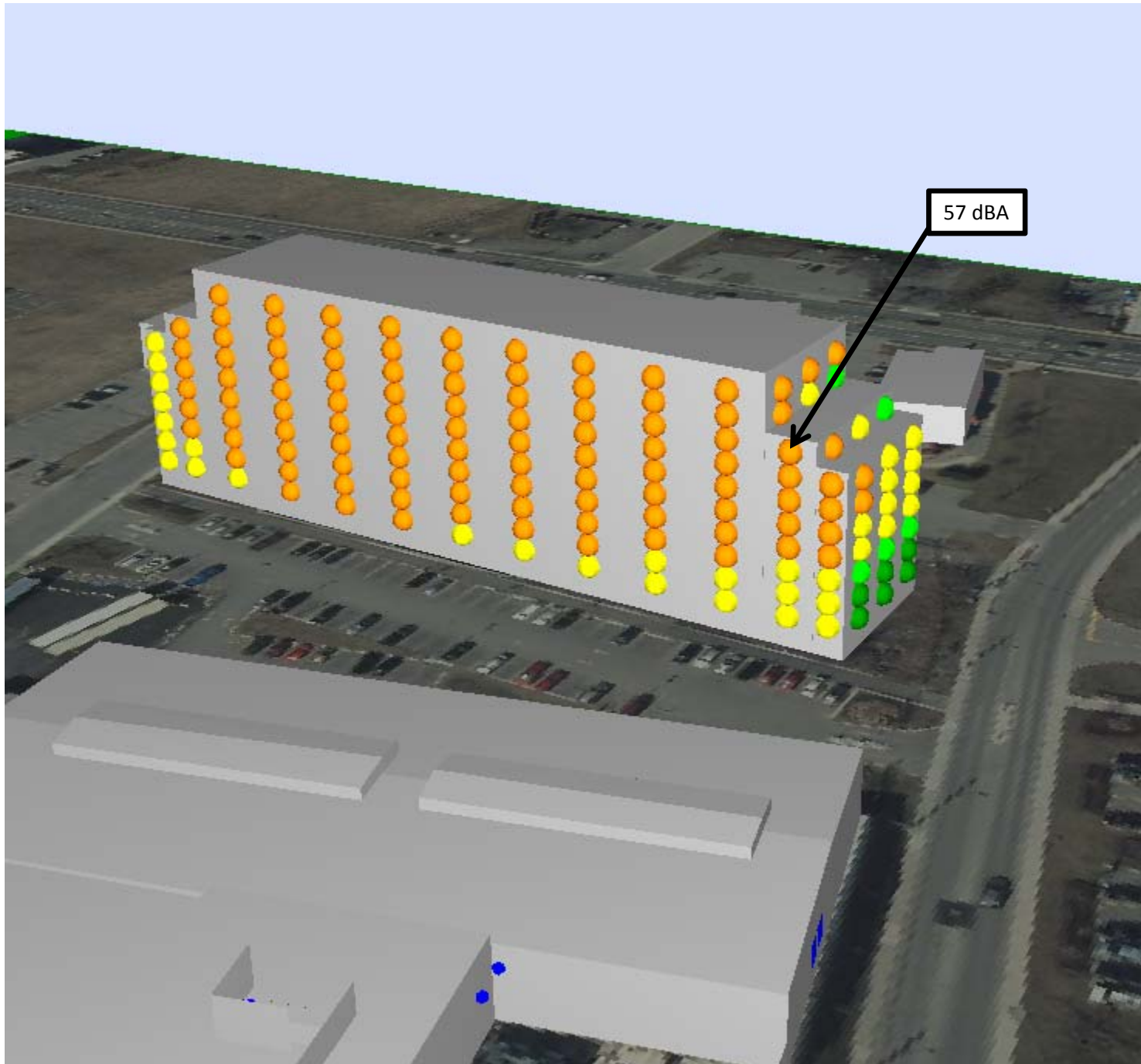
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**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **6**

**Mondelez Canada Inc.
Noise Modelling
Results, Steady -
Daytime**



True North

LEGEND

- > 45 dBA
- > 50 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA
- > 70 dBA
- > 75 dBA

Scale: N/A

Date: 13/10/31

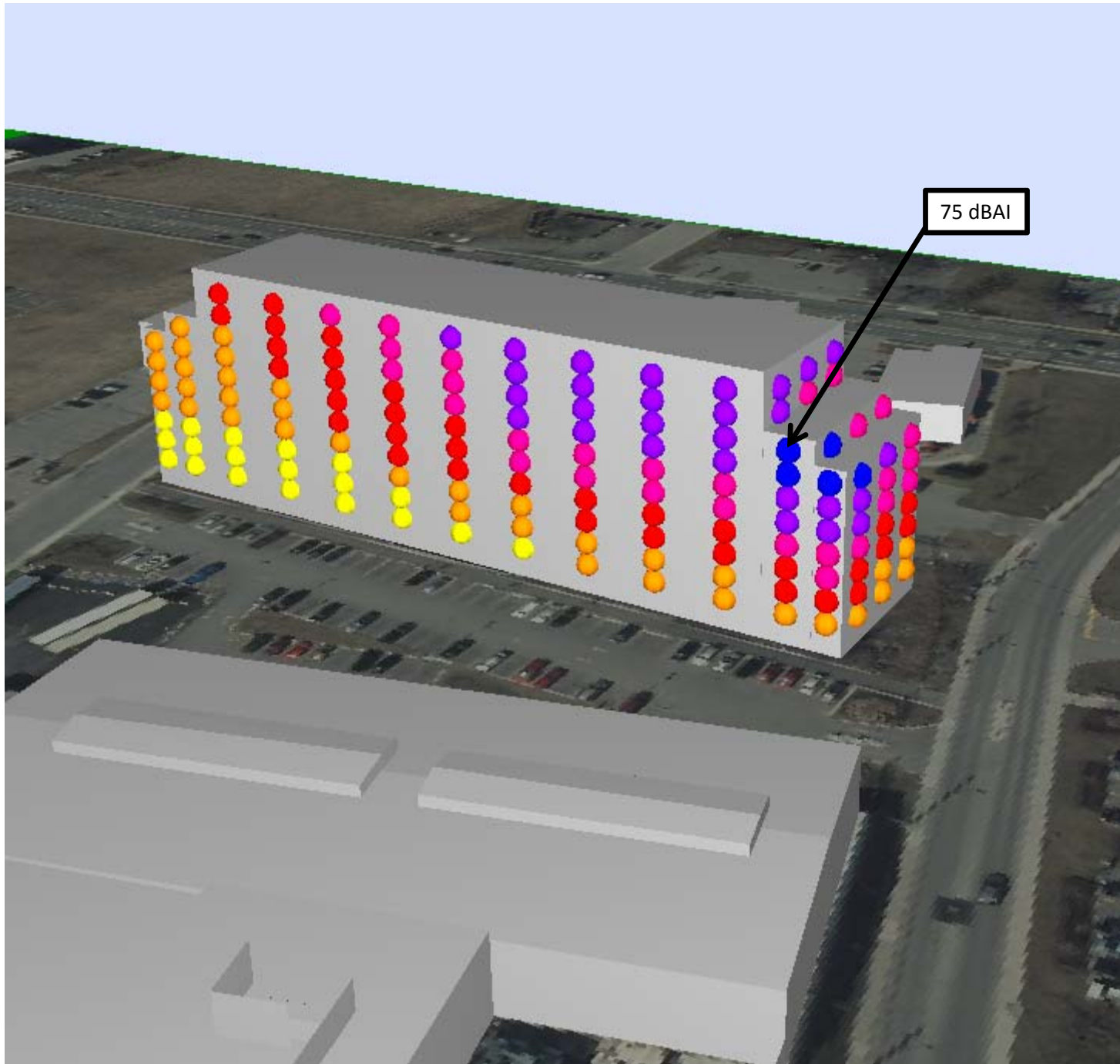
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**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **7**

**Mondelez Canada Inc.
Noise Modelling
Results, Steady –
Night-time**



True North

LEGEND

- > 45 dBAI
- > 50 dBAI
- > 55 dBAI
- > 60 dBAI
- > 65 dBAI
- > 70 dBAI
- > 75 dBAI

Scale: N/A

Date: 13/10/31

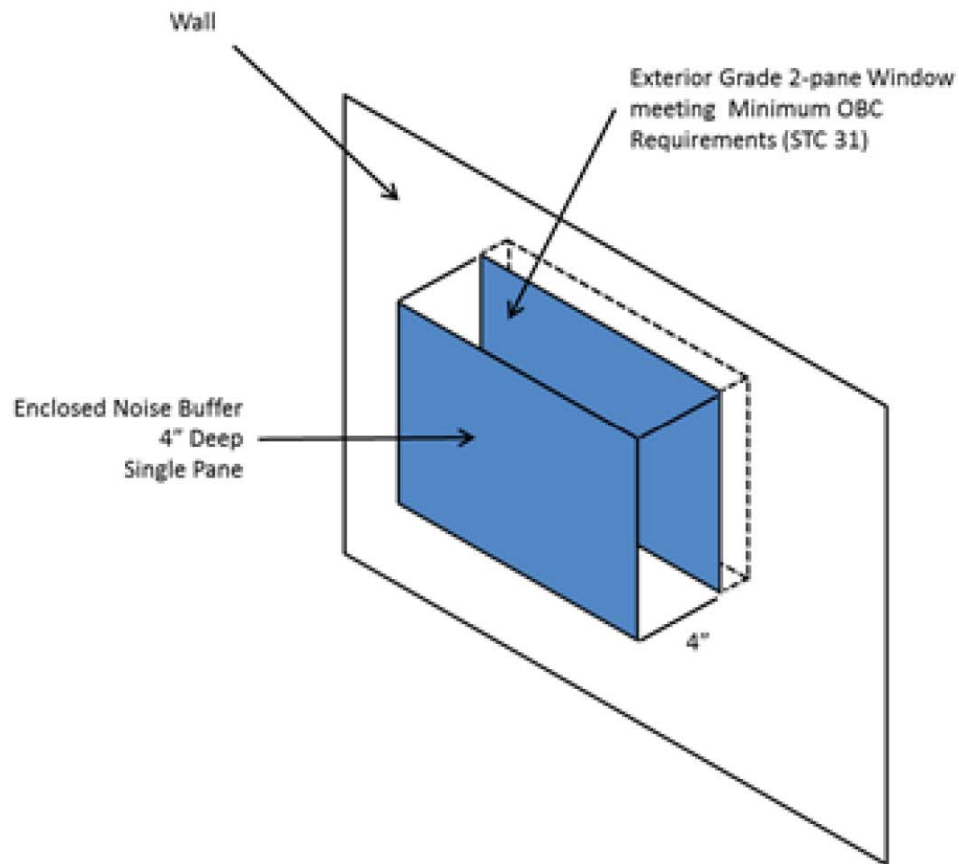
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**Abode Varsity Living
17 Ewen Road
Development**

Figure No: **8**

**Mondelez Canada Inc.
Noise Modelling
Results, Impulsive -
Daytime**



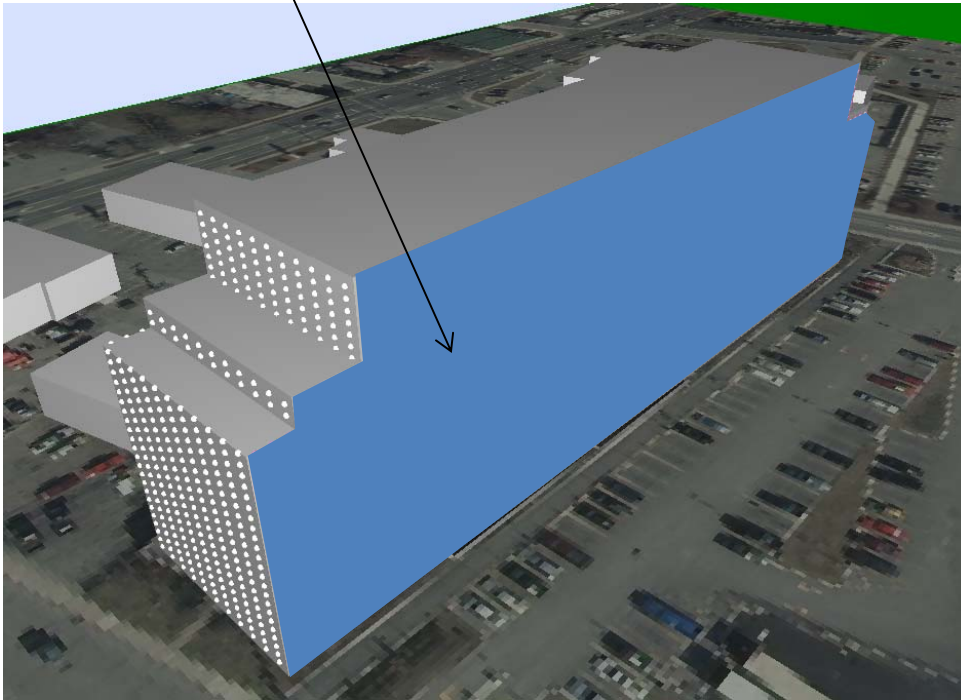
Enclosed Noise Buffer Design for Development

Figure No. 9	Scale: n/a	 150 Research Lane, Suite 105 Guelph, ON, Canada, N1G 4T2 t. 226.706.8080 f.226.706.8081 www.novusenv.com
Enclosed Noise Buffer Concept	Date: 14/06/25	
	File No.: 13-0125	
Abode Varsity Living 17 Ewen Road Development	Drawn By: SLP	

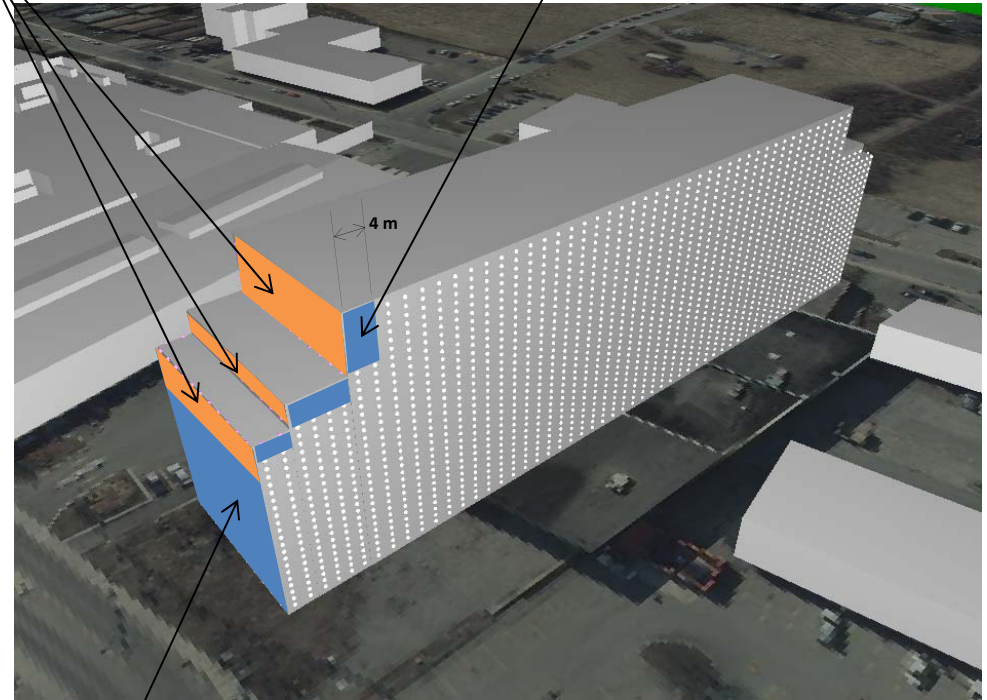
ENB Windows On South Façade
 Exterior Window 1/4" Glazing
 All Noise Sensitive Windows

ENB Windows On East Façade
 Floors 6,7,8,9, and 10
 Upgraded Exterior Window
 1/2" glazing or laminated glass (see report text)
 All Noise Sensitive Windows

ENB Windows On North Façade
 Limited Locations, 7th, 8th, 9th and 10th Storeys
 Exterior Window 1/4" Glazing
 All Noise Sensitive Windows




West and South Facades



East and North Facades

ENB Windows On East Façade
 Floors 1 through 5
 Exterior Window 1/4" glazing
 All Noise Sensitive Windows

Figure No. 10	Scale: n/a	 150 Research Lane, Suite 105 Guelph, ON, Canada, N1G 4T2 t. 226.706.8080 f.226.706.8081 www.novusenv.com
Required Locations of Enclosed Noise Buffers	Date: 14/08/07	
	File No.: 13-0125	
Abode Varsity Living 17 Ewen Road Development	Drawn By: SLP	

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Appendix A

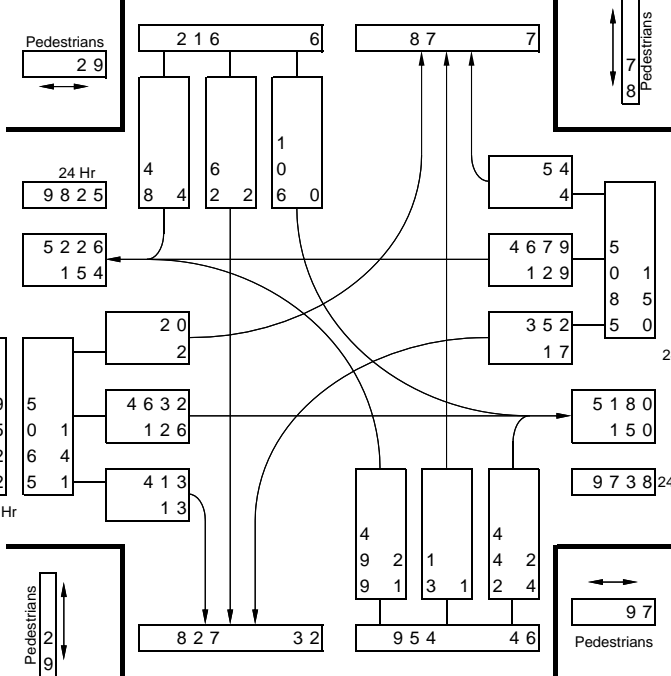
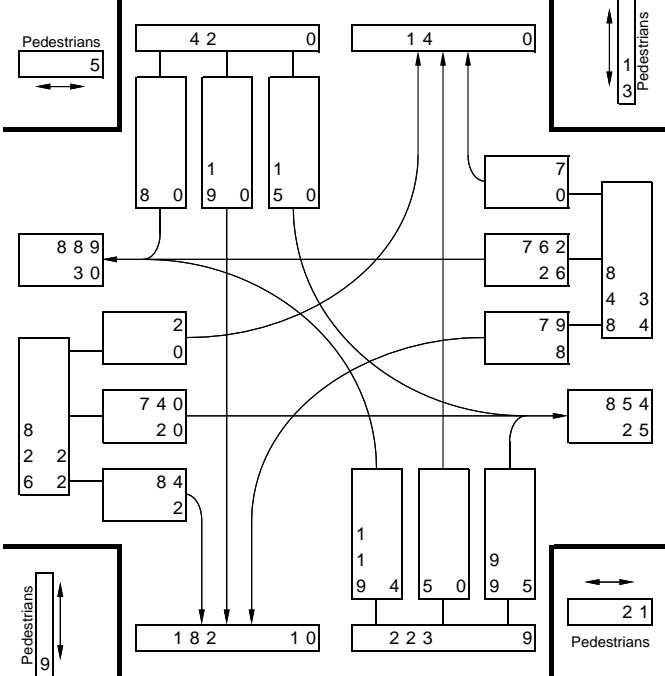
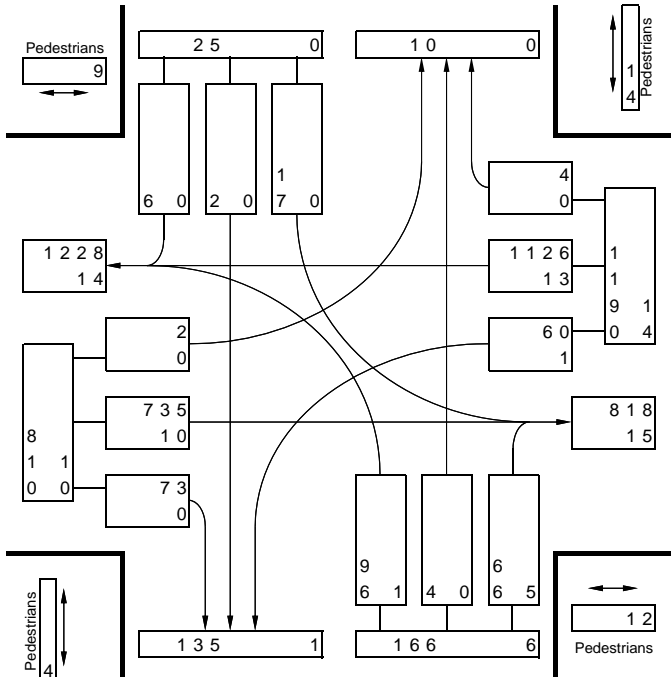
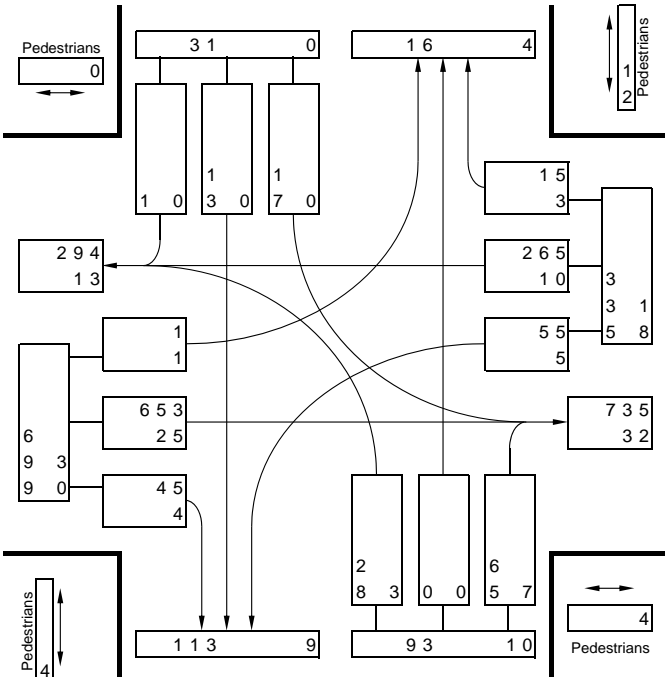
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Intersection: Main St. W. (East/West)
Direction: (East/West)
Road Condition: Dry
Comments:

at Rifle Range Rd. (North/South)
Weather: Clear

Total Vehicles: 11,320
M.V.E./Year: 7,236
AWDT Factor: 1.88

Date: Friday
Dec 2, 2005
Period: 7 hours



7 Hr & 24 Hr TOTAL VOLUMES

	2005 Growth	2013	2023	
Main Street WB Total	9825	2.0%	11512	14033
Main Street EB Total	9522	2.0%	11157	13600
Rifle Range Total	3349	2.0%	3924	4783

Typical Urban Distribution

				Hour of the Day																								
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	100.0%
				1.4%	0.8%	0.5%	0.4%	0.4%	0.6%	2.0%	4.3%	6.5%	6.2%	5.4%	5.5%	5.8%	6.0%	6.2%	6.6%	7.2%	7.7%	7.1%	5.9%	4.5%	3.8%	3.1%	2.2%	
	TOTAL	Day	Night																									
MINIMUM EXISTING																												
Main Street WB	11512	10563	949	162	97	60	44	42	73	225	496	747	716	621	628	668	694	714	763	834	884	815	675	520	434	354	249	11515
Main Street EB	11157	10235	922	157	94	58	42	40	71	218	480	724	694	602	608	647	672	692	739	808	857	790	654	504	421	343	241	11156
Rifle Range	3924	3601	323	55	33	20	15	14	25	77	169	255	244	212	214	228	237	243	260	284	301	278	230	177	148	121	85	3925
FUTURE																												
Main Street WB	14033	12874	1159	197	119	73	53	51	89	274	604	911	873	757	765	814	846	870	930	1017	1078	993	822	633	529	432	303	14033
Main Street EB	13600	12475	1125	191	115	71	52	49	86	266	585	883	846	734	741	789	820	843	901	985	1044	962	797	614	513	418	294	13599
Rifle Range	4783	4387	396	67	40	25	18	17	30	93	206	311	297	258	261	278	288	297	317	346	367	338	280	216	180	147	103	4780

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Appendix B

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AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3308-8RYMAM

Notice No. 1

Issue Date: September 27, 2013

Mondelez Canada Inc.
45 Ewen Road
Hamilton, Ontario
L8S 3C3

Site Location: 45 Ewen Road
45 Ewen Road
Hamilton City,
L8S 3C3

You are hereby notified that I have amended Approval No. 3308-8RYMAM issued on December 19, 2012 for a confectionary manufacturing facility , as follows:

The following Definition is revoked:

- (2) "*Acoustic Assessment Report*" means the report, prepared in accordance with *Publication NPC-233* and Appendix A of the *Basic Comprehensive User Guide*, prepared by Aercoustics Engineering Limited, dated May 1, 2012 and signed by Payam Ashtiani, submitted in support of the application, that documents all sources of noise emissions and *Noise Control Measures* present at the *Facility* and includes all up-dated *Acoustic Assessment Reports* as required by the Documentation Requirements conditions of this *Approval* to demonstrate continued compliance with the *Performance Limits* following the implementation of any Modification.

and replaced by the following:

- (2) "*Acoustic Assessment Report*" means the report, prepared in accordance with *Publication NPC-233* and Appendix A of the *Basic Comprehensive User Guide*, prepared by Conestoga-Rovers & Associates, dated September 25, 2013 and signed by Gordon Reusing, P.Eng., submitted in support of the application, that documents all sources of noise emissions and *Noise Control Measures* present at the *Facility* and includes all up-dated *Acoustic Assessment Reports* as required by the Documentation Requirements conditions of this *Approval* to demonstrate continued compliance with the *Performance Limits* following the implementation of any Modification.

The following Definition is revoked:

- (30) "*Noise Abatement Action Plan*" means the noise abatement program developed by the *Company* , submitted to the *Director* and *District Manager* and approved by the *Director* , designed to achieve compliance with the sound level limits set in *Publications NPC-205* or *NPC-232*, as applicable. It also means the *Noise Abatement Action Plan* prepared by Conestoga-Rovers & Associates, dated August 30, 2012 and signed by Gordon Reusing;

The following Condition is revoked:

3.2.3 The *Company* shall:

- (a) implement by not later than eighteen (18) months from the date of this *Approval*, the *Noise Control Measures* as outlined in the *Acoustic Assessment Report* prepared by Aercoustics Engineering Limited, dated May 1, 2012 and signed by Payam Ashtiani, and in the *Noise Abatement Action Plan* prepared by Conestoga-Rovers & Associates, dated August 30, 2012 and signed by Gordon Reusing;
- (b) ensure, subsequent to the implementation of the proposed *Noise Control Measures* that the noise emissions from the *Facility* comply with the limits set in *Ministry Publication NPC-205*; and
- (c) ensure that the *Noise Control Measures* are properly maintained and continue to provide the acoustical performance outlined in the *Acoustic Assessment Report*.

and replaced by the following:

3.2.3 The *Company* shall:

- (a) implement by not later than June 19, 2014, the *Noise Control Measures* as outlined in the *Acoustic Assessment Report* prepared by Conestoga-Rovers & Associates, dated September 25, 2013 and signed by Gordon Reusing, P.Eng.;
- (b) ensure, subsequent to the implementation of the proposed *Noise Control Measures* that the noise emissions from the *Facility* comply with the limits set in *Ministry Publication NPC-205*; and
- (c) ensure that the *Noise Control Measures* are properly maintained and continue to provide the acoustical performance outlined in the *Acoustic Assessment Report*.

The following Schedule is revoked:

SCHEDULE A

Supporting Documentation

- (a) Application for Approval (Air & Noise), dated December 20, 2010, signed by Jack Robertson, Manager and submitted by the *Company*;
- (b) Emission Summary and Dispersion Modelling Report, prepared by Thomas W. Davis (Green-Tech Environmental Engineering Ltd.) and dated December 20, 2010;
- (c) Acoustic Assessment Report, prepared by Aercoustics Engineering Limited and dated May 1, 2012;
- (d) The letter from Green-Tech Environmental Engineering Ltd. dated January 26, 2011 and signed by Thomas W. Davis, P.Eng.;
- (e) The letter from Green-Tech Environmental Engineering Ltd. dated January 24, 2012 and signed by Thomas W. Davis, P.Eng.; and
- (f) Noise Abatement Action Plan, prepared by Conestoga-Rovers & Associates and dated August 30, 2012

and replaced by the following:

SCHEDULE A

Supporting Documentation

- (a) Application for Approval (Air & Noise), dated December 20, 2010, signed by Jack Robertson, Manager and submitted by the *Company*;
- (b) Emission Summary and Dispersion Modelling Report, prepared by Thomas W. Davis (Green-Tech Environmental Engineering Ltd.) and dated December 20, 2010;
- (c) Acoustic Assessment Report, prepared by Aercoustics Engineering Limited and dated May 1, 2012;
- (d) The letter from Green-Tech Environmental Engineering Ltd. dated January 26, 2011 and signed by Thomas W. Davis, P.Eng.;
- (e) The letter from Green-Tech Environmental Engineering Ltd. dated January 24, 2012 and signed by Thomas W. Davis, P.Eng.;
- (f) Noise Abatement Action Plan, prepared by Conestoga-Rovers & Associates and dated August 30, 2012; and
- (g) Acoustic Assessment Report, prepared by Conestoga-Rovers & Associates and dated September 25, 2013.

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address information provided in the Acoustic Assessment Report prepared by Conestoga-Rovers & Associates, dated September 25, 2013 and signed by Gordon Reusing, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 3308-8RYMAM dated December 19, 2012

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 27th day of September, 2013



Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

PG/

c: District Manager, MOE Hamilton - District
Gordon Reusing, Conestoga-Rovers & Associates


AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3308-8RYMAM

Issue Date: December 19, 2012

Mondelez Canada Inc.
 2660 Mathenson Blvd East
 Mississauga, Ontario
 L4W 5M2

Site Location: Hamilton Confectionary Plant
 45 Ewen Road
 Hamilton City,
 L8S 3C3

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Description Section

A confectionary manufacturing facility, consisting of the following processes and support units including:

- bulk raw materials receiving and handling operations;
- blending and cooking operations;
- starch moulding and drying;
- starch separation and packaging operations;
- three (3) natural gas fired boilers, each having a maximum heat input of 18.67 Gigajoules per hour;

including the *Equipment* and any other ancillary and support processes and activities, operating at a *Facility Production Limit* of up to **60,000 metric tonnes of confectionary products per year**, exhausting to the atmosphere as described in the *ESDM Report*.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "*Acceptable Maximum Ground Level Concentration*" means a concentration accepted by the *Ministry*, as described in the *Guide to Applying for Approval (Air & Noise)*, for a *Compound of Concern* listed in the *Original ESDM Report* that has no *Ministry Point of Impingement Limit* and no *Jurisdictional Screening Level*, or the concentration at a *Point of Impingement* exceeds the *Jurisdictional Screening Level*.
2. "*Acoustic Assessment Report*" means the report, prepared in accordance with *Publication NPC-233* and Appendix A of the *Basic Comprehensive User Guide*, prepared by Aercoustics Engineering Limited, dated May 1, 2012 and signed by Payam Ashtiani, submitted in support of the application, that documents all sources of noise emissions and *Noise Control Measures* present at the *Facility* and includes all up-dated *Acoustic Assessment Reports* as required by the Documentation Requirements conditions of this *Approval* to demonstrate continued compliance with the *Performance Limits* following the implementation of any Modification.
3. "*Acoustic Assessment Summary Table*" means a table prepared in accordance with the *Basic Comprehensive User Guide* summarising the results of the *Acoustic Assessment Report*, up-dated as required by the Documentation Requirements conditions of this *Approval*.
4. "*Acoustic Audit*" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources

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of noise emissions due to the operation of the *Facility*, assessed to determine compliance with the Performance Limits for the *Facility* regarding noise emissions, completed in accordance with the procedures set in *Publication NPC-103* and reported in accordance with *Publication NPC-233*;

5. "*Acoustic Audit Report*" means a report presenting the results of an *Acoustic Audit*, prepared in accordance with *Publication NPC-233*;

6. "*Acoustical Consultant*" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with *Ministry* noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a *Facility*;

7. "*Air Standards Manager*" means the Manager, Human Toxicology and Air Standards Section, Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Human Toxicology and Air Standards Section, Standards Development Branch, as those duties relate to the conditions of this *Approval*.

8. "*Approval*" means this entire *Approval* document and any Schedules to it, including the application and *Supporting Documentation*.

9. "*Basic Comprehensive User Guide*" means the *Ministry* document titled "Basic Comprehensive Certificates of Approval (Air) User Guide" dated March 2011, as amended.

10. "*Company*" means Mondelez Canada Inc. operating as Mondelez Canada Inc. that is responsible for the construction or operation of the *Facility* and includes any successors and assigns in accordance with section 19 of the *EPA*.

11. "*Compound of Concern*" means a contaminant that, based on generally available information, may be emitted to the atmosphere in a quantity from the *Facility* that is non-negligible in accordance with section 8 of *O. Reg. 419/05* either in comparison to the relevant *Ministry Point of Impingement Limit* or if a *Ministry Point of Impingement Limit* is not available for the compound then, based on generally available toxicological information, the compound may cause an adverse effect as defined by the *EPA* at a *Point of Impingement*.

12. "*Description Section*" means the section on page one of this *Approval* describing the *Company's* operations and the *Equipment* located at the *Facility* and specifying the *Facility Production Limit* for the *Facility*.

13. "*Director*" means a person appointed by the Minister pursuant to section 5 of the *EPA*.

14. "*District Manager*" means the District Manager of the appropriate local district office of the *Ministry*, where the *Facility* is geographically located.

15. "*Emission Summary Table*" means the most updated table contained in the *ESDM Report*, which is prepared in accordance with section 26 of *O. Reg. 419/05* and the *Procedure Document* listing the appropriate *Point of Impingement* concentration for each *Compound of Concern* from the *Facility* and providing comparison to the corresponding *Ministry Point of Impingement Limit* or *Maximum Concentration Level Assessment*, or *Jurisdictional Screening Level*.

16. "*Environmental Assessment Act*" means the Environmental Assessment Act, R.S.O. 1990, c.E.18, as amended.

17. "*EPA*" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended.

18. "*Equipment*" means equipment or processes described in the *ESDM Report*, this *Approval* and in the *Supporting Documentation* referred to herein and any other equipment or processes.

19. "*Equipment with Specific Operational Limits*" means three (3) boilers or any *Equipment* related to the thermal oxidation of waste or waste derived fuels, fume incinerators or any other *Equipment* that is specifically referenced in any published *Ministry* document that outlines specific operational guidance that must be considered by the *Director* in issuing an *Approval*.

20. "*ESDM Report*" means the most current Emission Summary and Dispersion Modelling Report that describes the *Facility*. The *ESDM Report* is based on the *Original ESDM Report*, is prepared after the issuance of this *Approval* in accordance with section 26 of *O. Reg. 419/05* and the *Procedure Document* by the *Company* or its consultant, and is periodically updated to incorporate all *Modifications* to and changes on discharge from the *Facility*, as required by the

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Documentation Requirements conditions of this *Approval*.

21. "*Facility*" means the entire operation located on the property where the *Equipment* is located.
22. "*Facility Production Limit*" means the production limit placed on the main product(s) or raw materials used by the *Facility* that represents the design capacity of the *Facility* and assists in the definition of the operations approved by the *Director*.
23. "*Independent Acoustical Consultant*" means an *Acoustical Consultant* who is not representing the *Company* and was not involved in preparing the *Acoustic Assessment Report* or the design/implementation of *Noise Control Measures* for the *Facility* and/or *Equipment*. The *Independent Acoustical Consultant* shall not be retained by the *Acoustical Consultant* involved in the noise impact assessment or the design/implementation of *Noise Control Measures* for the *Facility* and/or *Equipment*;
24. "*Jurisdictional Screening Level*" means a screening level for a *Compound of Concern* that is listed in the Ministry publication titled "Jurisdictional Screening Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution - Local Air Quality", dated February 2008, as amended.
25. "*Log*" means the up-to-date log that is used to track all *Modifications* to the *Facility* since the date of this *Approval* as required by the Documentation Requirements conditions of this *Approval*.
26. "*Maximum Concentration Level Assessment*" means the Maximum Concentration Level Assessment for the purposes of an *Approval*, described in the *Basic Comprehensive User Guide*, prepared by a *Toxicologist* using currently available toxicological information, that demonstrates that the concentration at any *Point of Impingement* for a *Compound of Concern* that does not have a *Ministry Point of Impingement Limit* is not likely to cause an adverse effect as defined by the *EPA*. The concentration at *Point of Impingement* for a *Compound of Concern* must be calculated in accordance with *O. Reg. 419/05*.
27. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and includes all officials, employees or other persons acting on its behalf.
28. "*Ministry Point of Impingement Limit*" means the applicable Standard listed in Schedule 2 or 3 of *O. Reg. 419/05* or a limit listed in the *Ministry* publication titled "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution - Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)", dated February 2008, as amended.
29. "*Modification*" means any construction, alteration, extension or replacement of any plant, structure, equipment, apparatus, mechanism or thing, or alteration of a process or rate of production at the *Facility* that may discharge or alter the rate or manner of discharge of a *Compound of Concern* to the atmosphere or discharge or alter noise or vibration emissions from the *Facility*.
30. "*Noise Abatement Action Plan*" means the noise abatement program developed by the *Company*, submitted to the *Director* and *District Manager* and approved by the *Director*, designed to achieve compliance with the sound level limits set in *Publications NPC-205* or *NPC-232*, as applicable. It also means the *Noise Abatement Action Plan* prepared by Conestoga-Rovers & Associates, dated August 30, 2012 and signed by Gordon Reusing;
31. "*Noise Control Measures*" means measures to reduce the noise emissions from the *Facility* and/or *Equipment* including, but not limited to, silencers, acoustic louvres, enclosures, absorptive treatment, plenums and barriers.
32. "*O. Reg. 419/05*" means the Ontario Regulation 419/05, Air Pollution – Local Air Quality, as amended.
33. "*Original ESDM Report*" means the Emission Summary and Dispersion Modelling Report which was prepared in accordance with section 26 of *O. Reg. 419/05* and the *Procedure Document* by Thomas W. Davis (Green-Tech Environmental Engineering Ltd.) and dated December 20, 2010 submitted in support of the application, and includes any changes to the report made up to the date of issuance of this *Approval*.
34. "*Performance Limits*" means the performance limits specified in Condition 3.2 of this *Approval* titled Performance Limits.

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35. "*Point of Impingement*" has the same meaning as in section 2 of *O. Reg. 419/05*.

36. "*Point of Reception*" means Point of Reception as defined by *Publication NPC-205* and/or *Publication NPC-232*, as applicable.

37. "*Procedure Document*" means *Ministry* guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009, as amended.

38. "*Processes with Significant Environmental Aspects*" means the *Equipment* which, during regular operation, would discharge a contaminant or contaminants into the atmosphere at an amount which is not considered as negligible in accordance with section 8 of *O. Reg. 419/05* and the *Procedure Document*.

39. "*Publication NPC-103*" means the *Ministry* Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, August 1978, published by the *Ministry* as amended;

40. "*Publication NPC-205*" means the *Ministry* Publication NPC-205, "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)", October, 1995, as amended.

41. "*Publication NPC-207*" means the *Ministry* draft technical publication "Impulse Vibration in Residential Buildings", November 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, published by the *Ministry*, August 1978, as amended.

42. "*Publication NPC-232*" means the *Ministry* Publication NPC-232, "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)", October, 1995, as amended.

43. "*Publication NPC-233*" means the *Ministry* Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995, as amended.

44. "*Schedules*" means the following schedules attached to this *Approval* and forming part of this *Approval* namely:

Schedule A - *Supporting Documentation*;

45. "*Supporting Documentation*" means the documents listed in Schedule A of this *Approval* which forms part of this *Approval*.

46. "*Toxicologist*" means a qualified professional currently active in the field of risk assessment and toxicology that has a combination of formal university education, training and experience necessary to assess the *Compound of Concern* in question.

47. "*Written Summary Form*" means the electronic questionnaire form, available on the *Ministry* website, and supporting documentation, that documents the activities undertaken at the *Facility* in the previous calendar year that must be submitted annually to the *Ministry* as required by the section of this *Approval* titled Reporting Requirements.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

1.1 Except as otherwise provided by this *Approval*, the *Facility* shall be designed, developed, built, operated and maintained in accordance with the terms and conditions of this *Approval* and in accordance with the following *Schedules* attached hereto:

Schedule A - *Supporting Documentation*

2. LIMITED OPERATIONAL FLEXIBILITY

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2.1 Pursuant to section 20.6(1) of the *EPA* and subject to Conditions 2.2 and 2.3 of this *Approval*, future alterations, extensions or replacements are approved in this *Approval* if the future alterations, extensions or replacements are *Modifications* to the *Facility* that:

- (a) are within the scope of the intended operations of the *Facility* as described in the *Description Section* of this *Approval*;
- (b) do not result in an increase of the *Facility Production Limit* above the level specified in the *Description Section* of this *Approval*; and
- (c) result in compliance with the *Performance Limits*.

2.2 Condition 2.1 does not apply to:

- (a) the addition of any new *Equipment with Specific Operational Limits* or to the *Modification* of any existing *Equipment with Specific Operational Limits* at the *Facility*. The *Company* shall operate any *Equipment with Specific Operational Limits* approved by this *Approval* in accordance with the *Original ESDM Report* and Conditions in this *Approval*; or
- (b) *Modifications* to the *Facility* that would be subject to the *Environmental Assessment Act*.

2.3 Condition 2.1 of this *Approval* shall expire on February 1, 2020, unless this *Approval* is revoked prior to the expiry date. The *Company* may apply for renewal of Condition 2.1 of this *Approval* by including an *ESDM Report* and an *Acoustic Assessment Report* that incorporate all *Modifications* made to the *Facility* as of the date of the renewal application in the application as supporting information.

3. REQUEST FOR MAXIMUM CONCENTRATION LEVEL ASSESSMENT AND PERFORMANCE LIMITS

3.1 REQUEST FOR MAXIMUM CONCENTRATION LEVEL ASSESSMENT

3.1.1 If the *Company* proposes to make a *Modification* to the *Facility*, the *Company* shall determine if the proposed *Modification* will result in:

- (a) a discharge of a *Compound of Concern* that was not previously discharged; or
- (b) an increase in the concentration at a *Point of Impingement* of a *Compound of Concern*.

3.1.2 If a proposed *Modification* mentioned in Condition 3.1.1 will result in the discharge of a *Compound of Concern* that was not previously discharged, the *Company* shall submit a *Maximum Concentration Level Assessment* to the *Director* for review by the *Air Standards Manager* in the following circumstances:

- (a) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit* or a *Jurisdictional Screening Level*.
- (b) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit* and the concentration at a *Point of Impingement* will exceed the *Jurisdictional Screening Level*.
- (c) Prior to the proposed *Modification*, a contaminant was discharged in a negligible amount and the proposed *Modification* will result in the discharge of the contaminant being considered a *Compound of Concern* and the *Compound of Concern* does not have a *Ministry Point of Impingement Limit* or a *Jurisdictional Screening Level*.
- (d) Prior to the proposed *Modification*, a contaminant was discharged in a negligible amount and the proposed *Modification* will result in the discharge of the contaminant being considered a *Compound of Concern*. Additionally, the *Compound of Concern* does not have a *Ministry Point of Impingement Limit* and the concentration at a *Point of Impingement* will exceed the *Jurisdictional Screening Level*.

3.1.3 If a proposed *Modification* mentioned in Condition 3.1.1 will result in an increase in the concentration at a *Point of Impingement* of a *Compound of Concern*, the *Company* shall submit a *Maximum Concentration Level Assessment* to the *Director* for review by the *Air Standards Manager* in the following circumstances:

- (a) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit* or a *Jurisdictional Screening Level* and the concentration at a *Point of Impingement* will exceed the *Acceptable Maximum Ground Level Concentration*.

(b) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit* or a *Jurisdictional Screening Level* and the concentration at a *Point of Impingement* will exceed the most recently accepted *Maximum Concentration Level Assessment* submitted under Condition 3.1.2 or this Condition.

(c) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit* and the concentration at a *Point of Impingement* will exceed the *Jurisdictional Screening Level* and the *Acceptable Maximum Ground Level Concentration*.

(d) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit* and the concentration at a *Point of Impingement* will exceed the *Jurisdictional Screening Level* and the most recently accepted *Maximum Concentration Level Assessment* submitted under Condition 3.1.2 or this Condition.

(e) The *Compound of Concern* does not have a *Ministry Point of Impingement Limit*, *Acceptable Maximum Ground Level Concentration* or a *Maximum Concentration Level Assessment* and the concentration at a *Point of Impingement* will exceed the *Jurisdictional Screening Level*.

3.1.4 Subject to the Operational Flexibility set out in Condition 2 of this *Approval*, the *Company* may make the *Modification* if the submission of a *Maximum Concentration Level Assessment* under Condition 3.1.2 or 3.1.3 is not required.

3.1.5 A *Company* that is required to submit an assessment under Condition 3.1.2 or 3.1.3 shall submit the assessment at least thirty (30) days before the proposed *Modification* occurs.

3.1.6 The *Ministry* shall provide to the *Company* written confirmation of the receipt of the assessment under Condition 3.1.2 or 3.1.3.

3.1.7 If the *Ministry* notifies the *Company* that it does not accept the assessment submitted under Condition 3.1.2 or 3.1.3, the *Company* shall:

(a) revise and resubmit the assessment; or

(b) notify the *Ministry* that the *Company* will not be modifying the *Facility*.

3.1.8 The re-submission under Condition 3.1.7(a) is considered by the *Ministry* as a new submission.

3.1.9 If an assessment is submitted under Condition 3.1.2, the *Company* shall not modify the *Facility* unless the *Ministry* accepts the assessment.

3.1.10 If an assessment is submitted under Condition 3.1.3, the *Company* shall not modify the *Facility* unless the *Ministry*:

(a) accepts the assessment; or

(b) does not respond to the *Company* with respect to the assessment within thirty (30) days from the date of the written confirmation mentioned in Condition 3.1.6.

3.2. **PERFORMANCE LIMITS**

3.2.1 Subject to Condition 3.2.2, the *Company* shall, at all times, ensure that all *Equipment* that is a source of a *Compound of Concern* is operated to comply with the following *Performance Limits*:

(a) for a *Compound of Concern* that has a *Ministry Point of Impingement Limit*, the maximum concentration of that *Compound of Concern* at any *Point of Impingement* shall not exceed the corresponding *Ministry Point of Impingement Limit*;

(b) for a *Compound of Concern* that has an *Acceptable Maximum Ground Level Concentration* and no *Maximum Concentration Level Assessment*, the maximum concentration of that *Compound of Concern* at any *Point of Impingement* shall not exceed the corresponding *Acceptable Maximum Ground Level Concentration*; and

(c) for a *Compound of Concern* that has a *Maximum Concentration Level Assessment*, the maximum concentration of that *Compound of Concern* at any *Point of Impingement* shall not exceed the most recently accepted corresponding *Maximum Concentration Level Assessment*.

3.2.2 If the *Company* has modified the *Facility* and was not required to submit a *Maximum Concentration Level Assessment* with respect to a *Compound of Concern* under Condition 3.1.2 or 3.1.3, the *Company* shall, at all times, ensure that all *Equipment* that is a source of the *Compound of Concern* is operated such that the maximum concentration of the *Compound of Concern* shall not exceed the concentration listed for the *Compound of Concern* in the most recent version of the *ESDM Report*. *ESDM Reports* are required to be updated to reflect all *Modifications* under Condition 4.1(a).

3.2.3 The *Company* shall:

(a) implement by not later than eighteen (18) months from the date of this *Approval*, the *Noise Control Measures* as outlined in the *Acoustic Assessment Report* prepared by Aercoustics Engineering Limited, dated May 1, 2012 and signed by Payam Ashtiani, and in the *Noise Abatement Action Plan* prepared by Conestoga-Rovers & Associates, dated August 30, 2012 and signed by Gordon Reusing;

(b) ensure, subsequent to the implementation of the proposed *Noise Control Measures* that the noise emissions from the *Facility* comply with the limits set in *Ministry Publication NPC-205*; and

(c) ensure that the *Noise Control Measures* are properly maintained and continue to provide the acoustical performance outlined in the *Acoustic Assessment Report*.

3.2.4 The *Company* shall, at all times, ensure that the vibration emissions from the *Facility* comply with the limits set out in *Ministry Publication NPC-207*.

4. DOCUMENTATION REQUIREMENTS

4.1 The *Company* shall, at all times, maintain documentation that describes the current operations of the *Facility*, including but not limited to:

(a) a current *ESDM Report* that demonstrates compliance with the *Performance Limits* for the *Facility* regarding all *Compounds of Concern* and reflects all *Modifications* made at the *Facility*;

(b) a current *Acoustic Assessment Report* that demonstrates compliance with the *Performance Limits* for the *Facility* regarding noise emissions;

(c) an up-to-date *Log* that describes each *Modification* to the *Facility*; and

(d) a record of the changes to the *ESDM Report* and *Acoustic Assessment Report* that documents how each *Modification* is in compliance with the *Performance Limits*.

4.2 The *Company* shall, during regular business hours, make the current *Emission Summary Table* and *Acoustic Assessment Summary Table* available for inspection at the *Facility* by any interested member of the public.

4.3 Subject to Condition 4.5, the *Company* shall prepare and complete no later than April 15 of each year documentation that describes the activities undertaken at the *Facility* in the previous calendar year, including but not limited to:

(a) a list of all *Compounds of Concern* for which a *Maximum Concentration Level Assessment* was submitted to the *Director* for review by the *Air Standards Manager* pursuant to Condition 3.1.2 or 3.1.3 of this *Approval*;

(b) if the *Company* has modified the *Facility* and was not required to submit a *Maximum Concentration Level Assessment* with respect to a *Compound of Concern* under Condition 3.1.2 or 3.1.3, a list and concentration level of all such *Compounds of Concern*:

(c) a review of any changes to *Ministry Point of Impingement Limits* that affect any *Compounds of Concern* emitted from the *Facility*; and

(d) a table of the changes in the emission rate of any *Compound of Concern* and the resultant increase or decrease in the *Point of Impingement* concentration reported in the *ESDM Report*.

4.4 Subject to Condition 4.5, the *Company* shall, at all times, maintain the documentation described in Condition 4.3.

4.5 Conditions 4.3 and 4.4 do not apply if Condition 2.1 has expired.

4.6 The *Company* shall, within three (3) months after the expiry of Condition 2.1 of this *Approval*, update the *ESDM Report* and the *Acoustic Assessment Report* such that they describe the *Facility* as it was at the time that Condition 2.1 of this *Approval* expired.

5. REPORTING REQUIREMENTS

5.1 Subject to Condition 5.2, the *Company* shall provide the *Ministry* and the *Director* no later than April 15 of each year, a *Written Summary Form* that shall include the following:

- (a) a declaration that the *Facility* was in compliance with section 9 of the *EPA, O.Reg. 419/05* and the conditions of this *Approval*;
- (b) a summary of each *Modification* that took place in the previous calendar year that resulted in a change in the previously calculated concentration at the *Point of Impingement* for any *Compound of Concern* or resulted in a change in the sound levels reported in the *Acoustic Assessment Summary Table* at any *Point of Reception*.

5.2 Condition 5.1 does not apply if Condition 2.1 has expired.

6. OPERATION AND MAINTENANCE

6.1 The *Company* shall prepare and implement, not later than three (3) months from the date of this *Approval*, operating procedures and maintenance programs for all *Processes with Significant Environmental Aspects*, which shall specify as a minimum:

- (a) frequency of inspections and scheduled preventative maintenance;
- (b) procedures to prevent upset conditions;
- (c) procedures to minimize all fugitive emissions;
- (d) procedures to prevent and/or minimize odorous emissions;
- (e) procedures to prevent and/or minimize noise emission; and
- (f) procedures for record keeping activities relating to the operation and maintenance programs.

6.2 The *Company* shall ensure that all *Processes with Significant Environmental Aspects* are operated and maintained at all times in accordance with this *Approval*, the operating procedures and maintenance programs.

7. COMPLAINTS RECORDING PROCEDURE

7.1 If at any time, the *Company* receives any environmental complaints from the public regarding the operation of the *Equipment* approved by this *Approval*, the *Company* shall respond to these complaints according to the following procedure:

- (a) the *Company* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the time and date of the complaint and incident to which the complaint relates, the nature of the complaint, wind direction at the time and date of the incident to which the complaint relates and, if known, the address of the complainant;
- (b) the *Company*, upon notification of a complaint, shall initiate appropriate steps to determine all possible causes of the complaint, and shall proceed to take the necessary actions to appropriately deal with the cause of the subject matter of the complaint; and
- (c) the *Company* shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to appropriately deal with the cause of the subject matter of the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

8. RECORD KEEPING REQUIREMENTS

8.1 Any information requested by any employee in or agent of the *Ministry* concerning the *Facility* and its operation under this *Approval*, including, but not limited to, any records required to be kept by this *Approval*, shall be provided to the employee in or agent of the *Ministry*, upon request, in a timely manner.

8.2 The *Company* shall retain, for a minimum of seven (7) years from the date of their creation, except as noted below, all reports, records and information described in this *Approval* and shall include but not be limited to:

- (a) If the *Company* has updated the *ESDM Report* in order to comply with Condition 4.1(a) of this *Approval*, a copy of each new version of the *ESDM Report*;
- (b) If the *Company* has updated the *Acoustic Assessment Report*, in order to comply with Condition 4.1(b) of this *Approval*, a copy of each new version of the *Acoustic Assessment Report*;
- (c) supporting information used in the emission rate calculations performed in the *ESDM Reports* and *Acoustic Assessment Reports* to document compliance with the *Performance Limits* (superseded information must be retained for a period of three (3) years after *Modification*);
- (d) the *Log* that describes each *Modification* to the *Facility*;
- (e) all documentation prepared in accordance with Condition 4.3 of this *Approval*;
- (f) copies of any *Written Summary Forms* provided to the *Ministry* under Condition 5.1 of this *Approval*;
- (g) the operating procedures and maintenance programs, including records on the maintenance, repair and inspection of the *Equipment* related to all *Processes with Significant Environmental Aspects*; and
- (h) the complaints recording procedure, including records related to all environmental complaints made by the public as required by Condition 7.1 of this *Approval*.

9. REVOCATION OF PREVIOUS APPROVALS

9.1 This *Approval* replaces and revokes all Certificates of Approval (Air) issued under section 9 EPA and Environmental Compliance Approvals issued under Part II.1 EPA to the *Facility* and dated prior to the date of this *Approval*.

10. ACOUSTIC AUDIT

10.1 The *Company* shall carry out *Acoustic Audit* measurements on the actual noise emissions due to the operation of the *Facility*. The *Company*:

- (a) shall carry out *Acoustic Audit* measurements in accordance with the procedures in *Publication NPC-103*;
- (b) shall submit an *Acoustic Audit Report* on the results of the *Acoustic Audit*, prepared by an *Independent Acoustical Consultant*, in accordance with the requirements of *Publication NPC-233*, to the *District Manager* and the *Director*, not later than three (3) months after the full implementation of the *Noise Control Measures*.

10.2 The *Director*:

- (a) may not accept the results of the *Acoustic Audit* if the requirements of *Publication NPC-233* were not followed;
- (b) may require the *Company* to repeat the *Acoustic Audit* if the results of the *Acoustic Audit* are found unacceptable to the *Director*.

SCHEDULE A

Supporting Documentation

CONTENT COPY OF ORIGINAL

- (a) Application for Approval (Air & Noise), dated December 20, 2010, signed by Jack Robertson, Manager and submitted by the *Company*;
- (b) Emission Summary and Dispersion Modelling Report, prepared by Thomas W. Davis (Green-Tech Environmental Engineering Ltd.) and dated December 20, 2010;
- (c) Acoustic Assessment Report, prepared by Aercoustics Engineering Limited and dated May 1, 2012;
- (d) The letter from Green-Tech Environmental Engineering Ltd. dated January 26, 2011 and signed by Thomas W. Davis, P.Eng.;
- (e) The letter from Green-Tech Environmental Engineering Ltd. dated January 24, 2012 and signed by Thomas W. Davis, P.Eng.; and
- (f) Noise Abatement Action Plan, prepared by Conestoga-Rovers & Associates and dated August 30, 2012.

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

Condition No. 1 is included to require the *Approval* holder to build, operate and maintain the *Facility* in accordance with the *Supporting Documentation* considered by the *Director* in issuing this *Approval*.

LIMITED OPERATIONAL FLEXIBILITY, REQUEST FOR MAXIMUM CONCENTRATION LEVEL ASSESSMENT AND PERFORMANCE LIMITS

Conditions No. 2 and 3 are included to limit and define the *Modifications* permitted by this *Approval*, and to set out the circumstances in which the *Company* shall submit a *Maximum Concentration Level Assessment* prior to making *Modifications*. The holder of the *Approval* is approved for operational flexibility for the *Facility* that is consistent with the description of the operations included with the application up to the *Facility Production Limit*. In return for the operational flexibility the *Approval* places performance based limits that cannot be exceeded under the terms of this *Approval*. *Approval* holders will still have to obtain other relevant approvals required to operate the *Facility*, including requirements under other environmental legislation such as the *Environmental Assessment Act*.

DOCUMENTATION REQUIREMENTS

Condition No. 4 is included to require the *Company* to maintain ongoing documentation that demonstrates compliance with the *Performance Limits* of this *Approval* and allows the *Ministry* to monitor on-going compliance with these *Performance Limits*. The *Company* is required to have an up to date *ESDM Report* and *Acoustic Assessment Report* that describe the *Facility* at all times and make the *Emission Summary Table* and *Acoustic Assessment Summary Table* from these reports available to the public on an ongoing basis in order to maintain public communication with regard to the emissions from the *Facility*.

REPORTING REQUIREMENTS

Condition No. 5 is included to require the *Company* to provide a yearly *Written Summary Form* to the *Ministry* to assist the *Ministry* with the review of the site's compliance with the *EPA*, the regulations and this *Approval*.

OPERATION AND MAINTENANCE

Condition No. 6 is included to require the *Company* to properly operate and maintain the *Processes with Significant Environmental Aspects* to minimize the impact to the environment from these processes.

COMPLAINTS RECORDING PROCEDURE

Condition No. 7 is included to require the *Company* to respond to any environmental complaints regarding the operation of the *Equipment*, according to a procedure that includes methods for preventing recurrence of similar incidents and a

requirement to prepare and retain a written report.

RECORD KEEPING REQUIREMENTS

Condition No. 8 is included to require the *Company* to retain all documentation related to this *Approval* and provide access to employees in or agents of the *Ministry*, upon request, so that the *Ministry* can determine if a more detailed review of compliance with the *Performance Limits* is necessary.

REVOCAION OF PREVIOUS APPROVALS

Condition No. 9 is included to identify that this *Approval* replaces all Section 9 Certificate(s) of Approval and Part II.1 Approvals that have been previously issued for this *Facility*.

ACOUSTIC AUDIT

Condition No. 10 is included to require the *Company* to gather accurate information and submit an *Acoustic Audit Report* in accordance with procedures set in the *Ministry's* noise guidelines, so that the environmental impact and subsequent compliance with this *Approval* can be verified.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 7305-5WHJK3 issued on February 25, 2004.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me, the Environmental Review Tribunal and in accordance with Section 47 of the Environmental Bill of Rights, 1993, S.O. 1993, c. 28 (Environmental Bill of Rights), the Environmental Commissioner, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Environmental Commissioner
1075 Bay Street, Suite 605
Toronto, Ontario
M5S 2B1

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

CONTENT COPY OF ORIGINAL

This instrument is subject to Section 38 of the Environmental Bill of Rights, 1993, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at www.ebr.gov.on.ca, you can determine when the leave to appeal period ends.

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 19th day of December, 2012

Rudolf Wan, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

JK/
c: District Manager, MOE Hamilton - District
Thomas Davis, Green-Tech Environmental

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Appendix C

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for 2-sided printing purposes

From: "Greason, Ian (ENE)" <Ian.Greason@ontario.ca>
Date: April 4, 2014 at 1:36:27 PM EDT
To: "brianm@riserealestate.ca" <brianm@riserealestate.ca>
Cc: "Merza, Header (ENE)" <Header.Merza@ontario.ca>, "Verbaas, Alice (ENE)" <Alice.Verbaas@ontario.ca>, "Parrott, Ian (ENE)" <ian.parrott@ontario.ca>, "IssuesManager_EAASIB_EAB (ENE)" <IssuesManager_EAASIB_EAB@ontario.ca>
Subject: **Re: Request for MOE clarification (March 18, 2014).pdf**

Mr. McMullan:

Thank you for returning my call this morning. As you requested, I am providing a brief summary of our discussion.

The proposed use of an additional layer of fixed glass spaced at 10 centimetres from the exterior windows, as described in your March 18, 2014 Request for Clarification (attached), would be acceptable for consideration in the context of a receptor based "on building" noise control measure in a Class 4 Area, as defined by NPC-300. Receptor based "on building" noise control measures are defined in NPC-300 as "noise control measures implemented on the property of the receptor, directly on the building, for example, inoperable windows, enclosed noise buffers, parapets, acoustic barriers, etc. attached to the receptor building." Receptor based "on building" noise control measures may be considered for new noise sensitive land uses proposed in a Class 4 area.

Please note that the Ministry's Environmental Approvals Branch has not conducted a detailed review of the Mondelez facility noise emissions to confirm that Mondelez would be able to operate in compliance with NPC-300 sound level limits following the construction of the proposed residential building. Your next steps would be to continue discussions with Mondelez and the municipality to confirm that the site could be assessed as a Class 4 Area and that the proposed receptor based "on building" noise control measures would allow the Mondelez facility to continue to operate in compliance with NPC-300 sound level limits.

Regards,
Ian

Ian D. Greason, P.Eng.
Supervisor, Approval Services (Team 4)
Environmental Approvals Branch
Ministry of the Environment

Tel: (416) 212-3417
1-800-461-6290
Fax: (416) 314-8452

Request for Clarification
17 Ewen Road, Hamilton, Ontario
March 18, 2014

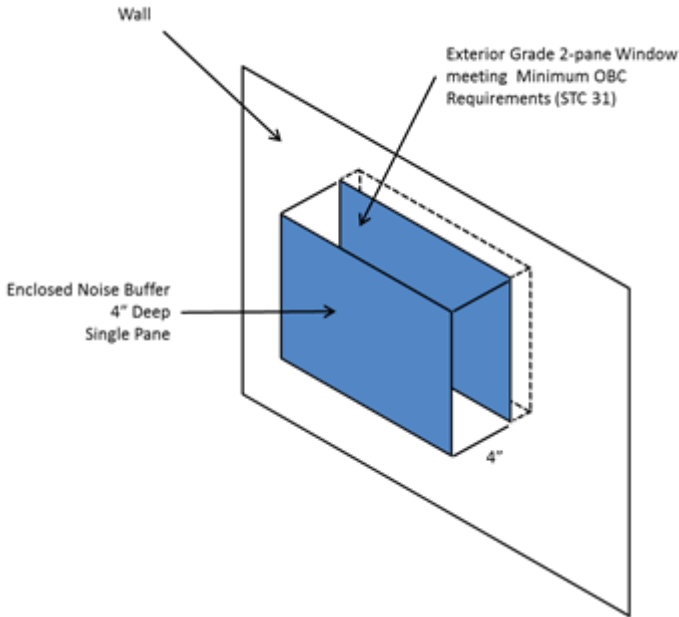
Following a meeting between representatives of the owner of 17 Ewen Road ("Rise") and staff from the Ministry of the Environment, Rise carefully considered the discussions and requests clarification on one item. This clarification will assist in focusing the discussions between itself, Mondelez Canada Inc. and the City of Hamilton.

By way of brief background Rise proposes to build a privately owned student residence at 17 Ewen Road to serve students at McMaster University. The site is north of and adjacent to the Mondelez Canada Inc. candy factory at 45 Ewen Road in Hamilton. Mondelez Canada Inc. has expressed concerns with the impact of the student residence on their current and future operations vis-à-vis compliance with NPC-205 (now NPC-300). Rise and Mondelez Canada Inc. are engaged in without prejudice settlement discussions to explore how NPC-300 could be utilized (together with noise mitigation already being implemented by Mondelez on its own site pursuant to an ECA) to permit the proposed student residence without adversely affecting Mondelez's current and future operations. The City of Hamilton is also involved in these discussions. NPC-300 requires a legally binding agreement between Rise, Mondelez and the City of Hamilton.

Rise previously requested that MOE advise if the proposed privately owned student residence could properly be considered as a commercial or institutional use under NPC-300 so that sealed windows (instead of enclosed balconies) could be used on the south facing façade (the one facing Mondelez) to properly address noise. This would not require the Rise property to be identified by the City of Hamilton as a Class 4 site. Moreover, the sealed windows would not be considered sensitive receptors (under NPC-300) and thus there would be no impact on Mondelez's current or future operations. A noise study was prepared by Novus Environmental which studied the predicted noise levels within the privately owned student residence and found them to be below the maximum noise guidelines and thus acceptable.

Ministry staff advised that they could not support treating the privately owned student residence as a commercial or institutional use. They advised that the privately owned student residence was properly considered a residential use. MOE staff further advised that NPC-300 provided a process by which this residential use could be permitted. It required the identification of the site by the City as a Class 4 property, a legally binding agreement between Rise, Mondelez and the City of Hamilton, and a form of noise mitigation on the privately owned student residence which is recognized in NPC-300. Rise has carefully considered this position and requests clarification on the specifics of the noise mitigation for the residential building. Rise would like to find a way to implement the position of MOE staff.

Following the recent meeting Rise understands that an acceptable form of noise mitigation for the privately owned student residence (treated as a residential building) would be to have a second glass window ten (10) centimetres out from each window. An illustration of this is shown below.



Novus Environmental has studied the worst-case (highest) sound levels from the Mondelez operations (which are due to impulsive noise from tanker truck unloading) and determined that the highest predicted facade sound levels on the eastern corner of the southern façade are 78.3 dBAI.

Under NPC-300 noise guidelines this noise mitigation must ensure that the applicable guideline limits are met outside of the enclosed façade window (i.e., at the exterior grade 2-pane window shown in the figure). As unloading activity is restricted to daytime hours, the applicable guideline limit is 60 dBA assuming a Class 4 designation.

There are two scenarios which can then be examined.

1. Scenario 1: The enclosed buffer glazing would be operable (openable) to the extent allowed under the Building Code. That is to say, it could open up to 4" wide.
2. Scenario 2: The enclosed buffer glazing would be inoperable (closed).

Based on composite transmission loss calculation Scenario 2 would be required in order to ensure that the sound level at the enclosed buffer facade meets the applicable 60 dBA guideline limit. The required configuration would be:

- A sealed 1/4" in thick single pane glazing element
- Steel sides 4" deep

The sound level at the enclosed buffer is predicted to be 58.2 dBA, and would therefore meet the 60 dBA applicable guideline limit. The calculations by Novus Environmental are attached.

Rise seeks confirmation this proposed mitigation is acceptable to MOE. Rise understands that all other relevant requirements of NPC-300 will also have to be met.

Enclosed Noise Buffer - 4" deep Sealed

Receiving Room

10 ft x 10 ft bedroom

Width	1.0	m wide	Length	Length	Vertical Height	Wall Area	Floor Area	Ceiling Area	Room Volume
Height	1.0	m high	()	()	()	(^2)	(^2)	(^2)	(^3)
Depth	0.1	m deep	1.0	0.1	1.0	2.2	0.1	0.1	0.1

	Description Comment	Material Selection	Area (^2)	NRC	Sound Absorption							
					63 Hz (sabins)	125 Hz (sabins)	250 Hz (sabins)	500 Hz (sabins)	1000 Hz (sabins)	2000 Hz (sabins)	4000 Hz (sabins)	8000 Hz (sabins)
Walls:	W1 Interior Window	151. REF. Glass, 3/32" ordinary window	1.0	0.16	0.25	0.35	0.25	0.18	0.12	0.07	0.04	0.03
	W2 Sides	156. REF. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	W3											
	W4											
	W5											
	W6											
Floors:	F1 Floor	209. Steel	0.1	0.48	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	F2											
Ceilings:	C1 Ceiling	323. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	C2											
	C3											
				a	0.26	0.37	0.28	0.21	0.15	0.09	0.05	0.05
				R2	0.29	0.43	0.32	0.23	0.16	0.09	0.05	0.05

Façade Source Data

Mondelez Operations

Size of Exposed Façade

Width	1.0	m wide	Area (^2)
Height	1.0	m high	1.0

FREE FIELD SOUND LEVEL

Scenario	Name	5 63 Hz	6 125 Hz	7 250 Hz	8 500 Hz	9 1000 Hz	10 2000 Hz	11 4000 Hz	12 8000 Hz	dB	dBA
1	W-C Continuous Noise - Day	69.3	64.9	63	62.7	59.4	54.3	47.2	33.3	72.2	64.1
2	W-C Continuous Noise - Night	68.2	64.2	60.3	59.7	54.5	50	43	31.5	70.7	60.5
3	Impulsive Noise - east corner	66.3	67.9	74.8	79.6	70.1	67.5	59.9	50.3	81.7	78.3
4	Impulsive Noise - west corner	59.3	58.8	64.5	67.1	55.1	49.8	38.6	23.2	70.0	65.2
5										9.0	7.0
6										9.0	7.0
7										9.0	7.0
8										9.0	7.0

Calculation

Composite?

N

Use Outdoor Sound Level Scenario:

3

Impulsive Noise - east corner

TL	Material	Select	Area	STC
Material 1	609	GLASS Saflex 1a: 1 pane 1/4" (RAL-TL85-169)	1.0	31
Material 2	Disabled		0	
Material 3	Disabled			
Material 4	Disabled			

Transmission Loss (dB)

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Material 1	17	24	26	31	34	29	35	39
Disabled								
Disabled								
Disabled								

Sound Pressure Level (dB)

Summary	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dBA
	66.3	67.9	74.8	79.6	70.1	67.5	59.9	50.3	81.7	78.3
Lp1	3	3	3	3	3	3	3	3	84.7	81.3
TL	17.0	24.0	26.0	31.0	34.0	29.0	35.0	39.0		
Lp2	58.0	51.0	57.1	58.2	47.2	51.8	41.2	27.0	63.3	58.2

Free Field Sound Level at window
 Façade Correction (per BPN-56)
 Resulting sound level at façade

1
2
3
4

Resulting sound level at Enclosed Window

Additional ENB Calculations

**Enclosed Noise Buffer - 4" deep
Sealed**

Receiving Room

10 ft x 10 ft bedroom

Width	1.0	m wide	Length	Length	Vertical Height	Wall Area	Floor Area	Ceiling Area	Room Volume
Height	1.0	m high	()	()	()	(^2)	(^2)	(^2)	(^3)
Depth	0.1	m deep	1.0	0.1	1.0	2.2	0.1	0.1	0.1

	Description Comment	Material Selection	Area (^2)	NRC	Sound Absorption								
					63 Hz (sabins)	125 Hz (sabins)	250 Hz (sabins)	500 Hz (sabins)	1000 Hz (sabins)	2000 Hz (sabins)	4000 Hz (sabins)	8000 Hz (sabins)	
Walls:	W1 Interior Window	Remaining 151. REF. Glass, 3/32" ordinary window	1.0	0.16	0.25	0.35	0.25	0.18	0.12	0.07	0.04	0.03	
	W2 Sides	156. REF. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	W3												
	W4												
	W5												
	W6												
Floors:	F1 Floor	209. Steel	0.1	0.48	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	F2	0											
Ceilings:	C1 Ceiling	323. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	
	C2	0											
	C3												
					a	0.26	0.37	0.28	0.21	0.15	0.09	0.05	0.05
					R2	0.29	0.43	0.32	0.23	0.16	0.09	0.05	0.05

Façade Source Data

Mondelez Operations

Size of Exposed Façade

Width	1.0	m wide	Area
Height	1.0	m high	(^2)
			1.0

FREE FIELD SOUND LEVEL

Scenario	Name	Frequency (Hz)										dB	dBAl	Incidence Angle
		63	125	250	500	1000	2000	4000	8000	13	14			
1	Continuous Noise - Day	66.3	61.9	60	59.7	56.4	51.3	44.2	30.3	69.2	61.1	0 to 90		
2	Continuous Noise - Night	65.2	61.2	57.3	56.7	51.5	47	40	28.5	67.7	57.5	0 to 90		
3	Imp - South Face, East crnr	63.3	64.9	71.8	76.6	67.1	64.5	56.9	47.3	78.7	75.3	0 to 90		
4	Imp - South Face, West crnr	56.3	55.8	61.5	64.1	52.1	46.8	35.6	20.2	67.0	62.2	0 to 90		
5	Imp - East Face, South crnr	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2	60 to 90		
6										9.0	7.0			
7										9.0	7.0			
8										9.0	7.0			

Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Added 140714

Calculation

Composite? N
 Use Outdoor Sound Level Scenario: 1 3

**Imp - South Face, East crnr
GLASS Saflex 1a: 1 pane 1/4" (RAL-TL85-169)**

Material	TL	Select	Material	Remaining	Area	STC
Material 1	609	Select:	GLASS Saflex 1a: 1 pane 1/4" (RAL-TL85-169)	1.0	31	
Material 2		Disabled		0		610
Material 3		Disabled				614
Material 4		Disabled				615

Material	Transmission Loss (dB)							
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Material 1	17	24	26	31	34	29	35	39
Disabled								
Disabled								
Disabled								
Disabled								

	Sound Pressure Level (dB)									
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dBAl
Summary	63.3	64.9	71.8	76.6	67.1	64.5	56.9	47.3	78.7	75.3
	3	3	3	3	3	3	3	3	<-----	Free Field Sound Level at window
	0	0	0	0	0	0	0	0	<-----	Façade Correction per BPN-56
	0	0	0	0	0	0	0	0	<-----	Angle of incidence correction per BPN-56
Lp1	66.3	67.9	74.8	79.6	70.1	67.5	59.9	50.3	81.7	78.3
TL	17.0	24.0	26.0	31.0	34.0	29.0	35.0	39.0	<-----	Resulting sound level at façade
Lp2	55.0	48.0	54.1	55.2	44.2	48.8	38.2	24.0	60.3	55.2
	<----- Resulting sound level at Enclosed Window									

Enclosed Noise Buffer - 4" deep
Sealed

Receiving Room

10 ft x 10 ft bedroom

Width	1.0	m wide	Length	Length	Vertical	Wall	Floor	Ceiling	Room
Height	1.0	m high	()	()	Height	Area	Area	Area	Volume
Depth	0.1	m deep	()	()	()	(^2)	(^2)	(^2)	(^3)
			1.0	0.1	1.0	2.2	0.1	0.1	0.1

	Description Comment	Material Selection	Area (^2)	NRC	Sound Absorption								
					63 Hz (sabins)	125 Hz (sabins)	250 Hz (sabins)	500 Hz (sabins)	1000 Hz (sabins)	2000 Hz (sabins)	4000 Hz (sabins)	8000 Hz (sabins)	
Walls:	W1 Interior Window	Remaining 151: REF. Glass, 3/32" ordinary window	1.0	0.16	0.25	0.35	0.25	0.18	0.12	0.07	0.04	0.03	
	W2 Sides	156: REF. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	W3												
	W4												
	W5												
	W6												
Floors:	F1 Floor	209: Steel	0.1	0.48	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	F2												
Ceilings:	C1 Ceiling	Remaining 323: Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	
	C2												
	C3												
					a	0.26	0.37	0.28	0.21	0.15	0.09	0.05	0.05
					R2	0.29	0.43	0.32	0.23	0.16	0.09	0.05	0.05

Façade Source Data

Mondelez Operations

Size of Exposed Façade

Width	1.0	m wide	Area
Height	1.0	m high	(^2)
			1.0

FREE FIELD SOUND LEVEL

Scenario	Name	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dB(A)	Incidence Angle
1	Continuous Noise - Day	66.3	61.9	60	59.7	56.4	51.3	44.2	30.3	69.2	61.1	0 to 90
2	Continuous Noise - Night	65.2	61.2	57.3	56.7	51.5	47	40	28.5	67.7	57.5	0 to 90
3	Imp - South Face, East crnr	63.3	64.9	71.8	76.6	67.1	64.5	56.9	47.3	78.7	75.3	0 to 90
4	Imp - South Face, West crnr	56.3	55.8	61.5	64.1	52.1	46.8	35.6	20.2	67.0	62.2	0 to 90
5	Imp - East Face, South crnr	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2	60 to 90
6										9.0	7.0	
7										9.0	7.0	
8										9.0	7.0	

Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Added 140714

Calculation

Composite?

N

Use Outdoor Sound Level Scenario: 5

Imp - East Face, South crnr
GLASS Saflex 1b: 1 pane 1/2" (RAL-TL85-198)

Material	TL	Select:	Area	STC
Material 1	610	GLASS Saflex 1b: 1 pane 1/2" (RAL-TL85-198)	Remaining 1.0	36
Material 2	Disabled		0	
Material 3	Disabled			
Material 4	Disabled			

610
614
615

Transmission Loss (dB)

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Material 1	22	27	32	35	33	39	48	45
Disabled								
Disabled								
Disabled								
Disabled								

Sound Pressure Level (dB)

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dB(A)
Summary	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2
	3	3	3	3	3	3	3	3	<-----	Free Field Sound Level at window
	3	3	3	3	3	3	3	3	<-----	Façade Correction per BPN-56
	3	3	3	3	3	3	3	3	<-----	Angle of incidence correction per BPN-56
Lp1	69.3	70.8	77.8	82.5	73.0	70.5	62.8	53.2	84.7	81.2
TL	22.0	27.0	32.0	35.0	33.0	39.0	48.0	45.0	<-----	Resulting sound level at façade
Lp2	53.0	47.9	51.1	54.1	48.1	41.8	28.1	20.9	58.6	53.6

Resulting sound level at Enclosed Window

Enclosed Noise Buffer - 4" deep

Sealed

Receiving Room

10 ft x 10 ft bedroom

Width	1.0	m wide	Length	Length	Vertical	Wall	Floor	Ceiling	Room
Height	1.0	m high	(^l)	(^l)	Height	Area	Area	Area	Volume
Depth	0.1	m deep	(^l)	(^l)	(^l)	(^{^2})	(^{^2})	(^{^2})	(^{^3})
	1.0		0.1		1.0	2.2	0.1	0.1	0.1

	Description Comment	Material Selection	Area (^{^2})	NRC	Sound Absorption								
					63 Hz (sabins)	125 Hz (sabins)	250 Hz (sabins)	500 Hz (sabins)	1000 Hz (sabins)	2000 Hz (sabins)	4000 Hz (sabins)	8000 Hz (sabins)	
Walls:	W1 Interior Window	Remaining	1.0	0.16	0.25	0.35	0.25	0.18	0.12	0.07	0.04	0.03	
	W2 Sides	1	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	W3												
	W4												
	W5												
	W6												
Floors:	F1 Floor	Remaining	0.1	0.48	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	F2	0											
Ceilings:	C1 Ceiling	Remaining	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	
	C2	0											
	C3												
					a	0.26	0.37	0.28	0.21	0.15	0.09	0.05	0.05
					R2	0.29	0.43	0.32	0.23	0.16	0.09	0.05	0.05

Façade Source Data

Mondelez Operations

Size of Exposed Façade

Width	1.0	m wide	Area
Height	1.0	m high	(^{^2})
			1.0

FREE FIELD SOUND LEVEL

Scenario	Name	Frequency (Hz)										dB / dBAI		Incidence Angle
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dBAI			
1	Continuous Noise - Day	66.3	61.9	60	59.7	56.4	51.3	44.2	30.3	69.2	61.1	0 to 90	Changed, values previously "double counted" façade corr. Changed, values previously "double counted" façade corr. Changed, values previously "double counted" façade corr. Changed, values previously "double counted" façade corr. Changed, values previously "double counted" façade corr. Added 140714	
2	Continuous Noise - Night	65.2	61.2	57.3	56.7	51.5	47	40	28.5	67.7	57.5	0 to 90		
3	Imp - South Face, East crnr	63.3	64.9	71.8	76.6	67.1	64.5	56.9	47.3	78.7	75.3	0 to 90		
4	Imp - South Face, West crnr	56.3	55.8	61.5	64.1	52.1	46.8	35.6	20.2	67.0	62.2	0 to 90		
5	Imp - East Face, South crnr	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2	60 to 90		
6										9.0	7.0			
7										9.0	7.0			
8										9.0	7.0			

Calculation

Composite?

N

Use Outdoor Sound Level Scenario: 5

Imp - East Face, South crnr
GLASS Saflex 1f: Lam. 1 pane (G-L-G) 3/16" - 0.030" - 3/16" (RAL - TL85-200)

TL	Material 1	Material 2	Material 3	Material 4	Area	STC
614	Select: GLASS Saflex 1f: Lam. 1 pane (G-L-G) 3/16" - 0.030" - 3/16" (RAL - TL85-200)	Remaining	1.0	36		
	Disabled	0				
	Disabled					610
	Disabled					614
	Disabled					615

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Material 1	22	27	31	34	36	36	48	53
Disabled								
Disabled								
Disabled								
Disabled								

Summary	Sound Pressure Level (dB)									dB	dBA
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB		
	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2	<----- Free Field Sound Level at window
	3	3	3	3	3	3	3	3	<-----	<-----	Façade Correction per BPN-56
	3	3	3	3	3	3	3	3	<-----	<-----	Angle of incidence correction per BPN-56
Lp1	69.3	70.8	77.8	82.5	73.0	70.5	62.8	53.2	84.7	81.2	<----- Resulting sound level at façade
TL	22.0	27.0	31.0	34.0	36.0	36.0	48.0	53.0			
Lp2	53.0	47.9	52.1	55.1	45.1	44.8	28.1	12.9	59.1	54.0	<----- Resulting sound level at Enclosed Window

Enclosed Noise Buffer - 4" deep

Sealed

Receiving Room

10 ft x 10 ft bedroom

Width	1.0	m wide	Length	Length	Vertical Height	Wall Area	Floor Area	Ceiling Area	Room Volume
Height	1.0	m high	()	()	()	(^2)	(^2)	(^2)	(^3)
Depth	0.1	m deep	1.0	0.1	1.0	2.2	0.1	0.1	0.1

	Description Comment	Material Selection	Area (^2)	NRC	Sound Absorption								
					63 Hz (sabins)	125 Hz (sabins)	250 Hz (sabins)	500 Hz (sabins)	1000 Hz (sabins)	2000 Hz (sabins)	4000 Hz (sabins)	8000 Hz (sabins)	
Walls:	W1 Interior Window	Remaining 151. REF. Glass, 3/32" ordinary window	1.0	0.16	0.25	0.35	0.25	0.18	0.12	0.07	0.04	0.03	
	W2 Sides	156. REF. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	W3												
	W4												
	W5												
	W6												
Floors:	F1 Floor	209. Steel	0.1	0.48	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	F2	0											
Ceilings:	C1 Ceiling	Remaining 323. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	
	C2	0											
	C3												
					a	0.26	0.37	0.28	0.21	0.15	0.09	0.05	0.05
					R2	0.29	0.43	0.32	0.23	0.16	0.09	0.05	0.05

Façade Source Data

Mondelez Operations

Size of Exposed Façade

Width	1.0	m wide	Area
Height	1.0	m high	(^2)
			1.0

FREE FIELD SOUND LEVEL

Scenario	Name	Frequency (Hz)										dB	dBAl	Incidence Angle
		63	125	250	500	1000	2000	4000	8000	13	14			
1	Continuous Noise - Day	66.3	61.9	60	59.7	56.4	51.3	44.2	30.3	69.2	61.1	0 to 90		
2	Continuous Noise - Night	65.2	61.2	57.3	56.7	51.5	47	40	28.5	67.7	57.5	0 to 90		
3	Imp - South Face, East crnr	63.3	64.9	71.8	76.6	67.1	64.5	56.9	47.3	78.7	75.3	0 to 90		
4	Imp - South Face, West crnr	56.3	55.8	61.5	64.1	52.1	46.8	35.6	20.2	67.0	62.2	0 to 90		
5	Imp - East Face, South crnr	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2	60 to 90		
6										9.0	7.0			
7										9.0	7.0			
8										9.0	7.0			

Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Added 140714

Calculation

Composite?

N

Use Outdoor Sound Level Scenario: 5

Imp - East Face, South crnr
 GLASS Saflex 1g: Lam. 1 pane (G-L-G) 1/4" - 0.030" - 1/8" (RAL-TL85-229)

TL	Material	Select	Material	Remaining	Area	STC
Material 1	615	Select:	GLASS Saflex 1g: Lam. 1 pane (G-L-G) 1/4" - 0.030" - 1/8" (RAL-TL85-229)	1.0	36	
Material 2		Disabled		0		610
Material 3		Disabled				614
Material 4		Disabled				615

Transmission Loss (dB)

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Material 1	22	27	31	33	36	37	47	52
Disabled								
Disabled								
Disabled								
Disabled								

Sound Pressure Level (dB)

Summary	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dBAl
	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2
	3	3	3	3	3	3	3	3	<-----	Free Field Sound Level at window
	3	3	3	3	3	3	3	3	<-----	Façade Correction per BPN-56
	3	3	3	3	3	3	3	3	<-----	Angle of incidence correction per BPN-56
Lp1	69.3	70.8	77.8	82.5	73.0	70.5	62.8	53.2	84.7	81.2
TL	22.0	27.0	31.0	33.0	36.0	37.0	47.0	52.0	<-----	Resulting sound level at façade
Lp2	53.0	47.9	52.1	56.1	45.1	43.8	29.1	13.9	59.5	54.6

Resulting sound level at Enclosed Window

**Enclosed Noise Buffer - 4" deep
Sealed**

Receiving Room

10 ft x 10 ft bedroom

Width	1.0	m wide	Length	Length	Vertical Height	Wall Area	Floor Area	Ceiling Area	Room Volume
Height	1.0	m high	()	()	()	(^2)	(^2)	(^2)	(^3)
Depth	0.1	m deep	1.0	0.1	1.0	2.2	0.1	0.1	0.1

	Description Comment	Material Selection	Area (^2)	NRC	Sound Absorption							
					63 Hz (sabins)	125 Hz (sabins)	250 Hz (sabins)	500 Hz (sabins)	1000 Hz (sabins)	2000 Hz (sabins)	4000 Hz (sabins)	8000 Hz (sabins)
Walls:	W1 Interior Window	Remaining 151. REF. Glass, 3/32" ordinary window	1.0	0.16	0.25	0.35	0.25	0.18	0.12	0.07	0.04	0.03
	W2 Sides	156. REF. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	W3											
	W4											
	W5											
	W6											
Floors:	F1 Floor	209. Steel	0.1	0.48	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01
	F2	0										
Ceilings:	C1 Ceiling	323. Steel	0.1	0.09	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	C2	0										
	C3											
				a	0.26	0.37	0.28	0.21	0.15	0.09	0.05	0.05
				R2	0.29	0.43	0.32	0.23	0.16	0.09	0.05	0.05

Façade Source Data

Mondelez Operations

Size of Exposed Façade

Width	1.0	m wide	Area
Height	1.0	m high	(^2)
			1.0

FREE FIELD SOUND LEVEL

Scenario	Name	5 6 7 8 9 10 11 12 13 14 15 16										Incidence Angle
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dBA / dBAI	
1	Continuous Noise - Day	66.3	61.9	60	59.7	56.4	51.3	44.2	30.3	69.2	61.1	0 to 90
2	Continuous Noise - Night	65.2	61.2	57.3	56.7	51.5	47	40	28.5	67.7	57.5	0 to 90
3	Imp - South Face, East crnr	63.3	64.9	71.8	76.6	67.1	64.5	56.9	47.3	78.7	75.3	0 to 90
4	Imp - South Face, West crnr	56.3	55.8	61.5	64.1	52.1	46.8	35.6	20.2	67.0	62.2	0 to 90
5	Imp - East Face, South crnr	63.3	64.8	71.8	76.5	67	64.5	56.8	47.2	78.7	75.2	60 to 90
6	Impl north	56.5	56.5	63.7	67.2	55.3	49.3	37.2	22.9	69.5	65.2	60 to 90
7										9.0	7.0	
8										9.0	7.0	

Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Changed, values previously "double counted" façade corr.
 Added 140714

Calculation

Composite?

N

Use Outdoor Sound Level Scenario: 6

**Impl north
GLASS Saflex 1a: 1 pane 1/4" (RAL-TL85-169)**

TL	Material 1	Material 2	Material 3	Material 4	Area	STC
609	Select: GLASS Saflex 1a: 1 pane 1/4" (RAL-TL85-169)				1.0	31
	Disabled				0	
	Disabled					
	Disabled					

610
614
615

Transmission Loss (dB)

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Material 1	17	24	26	31	34	29	35	39
Disabled								
Disabled								
Disabled								
Disabled								

Sound Pressure Level (dB)

Summary	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB	dBA
	56.5	56.5	63.7	67.2	55.3	49.3	37.2	22.9	69.5	65.2
	3	3	3	3	3	3	3	3		
	3	3	3	3	3	3	3	3		
Lp1	62.5	62.5	69.7	73.2	61.3	55.3	43.2	28.9	75.5	71.2
TL	17.0	24.0	26.0	31.0	34.0	29.0	35.0	39.0		
Lp2	51.2	42.6	49.0	48.8	35.4	36.6	21.5	2.6	55.0	47.6

Free Field Sound Level at window
 Façade Correction per BPN-56
 Angle of incidence correction per BPN-56
 Resulting sound level at façade

Resulting sound level at Enclosed Window