SS WILSON ASSOCIATES
Consulting Engineers

REPORT NO. WA20-059

NOISE CONTROL FEASIBILITY STUDY
MIXED-USE HIGH-RISE DEVELOPMENT
3085 HURONTARIO STREET
CITY OF MISSISSAUGA

SUBMITTED TO:

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1.0 INTRODUCTION

1.1 The services of SS Wilson Associates (SSWA) were retained by Doracin Terra Strategies Ltd. on behalf of Equity Three Holdings Inc. to prepare a Noise Control Feasibility Study for the proposed mixed-use high-rise development located at 3085 Hurontario Street in the City of Mississauga.

1.2 The objective of this report is to support an application for an amendment to the Official Plan containing the proposed development and rezoning of the land.

1.3 The site is bounded by the following land uses:

- to the north by Kirwin Avenue
- to the south by a commercial strip plaza
- to the east by residential apartment buildings
- to the west by Hurontario Street, and furthermore, by a secondary school, a commercial strip plaza and residential apartment buildings

The location of the site is shown in Figure 1. Project North is illustrated in Figures 2 and 3.

1.2 Major features of the development are defined by the Preliminary Design Package set of drawings prepared by Diamond Schmitt, dated April 14, 2021 and the Site Plan Drawing dated June 2021.

The Site Plan in Figure 2 illustrates the general layout of the proposed development.

1.3 Major surface transportation noise sources (current and future) of concern to the development are:

1. Hurontario Street/Highway 10
2. Future Light Rail Transit (LRT) rapid transit line on Highway 10

1.4 Major stationary noise sources (current and future) of concern to the development are:

1. The mechanical equipment penthouses serving the residential buildings themselves, and the associated intake and exhaust openings
2. The parking garage exhaust ventilation systems
3. The commercial HVAC equipment serving the ground-floor commercial uses
4. The truck delivery/loading dock located on the west side of Building 1 of the proposed development
5. The rooftop mechanical equipment of the surrounding residential and commercial buildings.

1.5 The proposed development is located outside the 25 NEF/NEP contour lines prepared by Transport Canada; therefore, aircraft noise is not considered a problem.

1.6 The scope of this report is to define the minimum noise attenuation requirements for the control of outdoor and indoor environmental sound levels.

1.7 There are no nearby potential sources of vibration, with the exception of the proposed LRT line on Highway 10; however, it is our understanding from the Noise and Vibration Impact Assessment Report, prepared by J.E. Coulter and Associates, dated June 4, 2014, that the vibration impact of the LRT has been considered throughout the proposed corridor, and that the Level 1 isolation proposed therein will be suitable to maintain vibration levels within acceptable limits at receptors in the vicinity of the proposed development. Therefore, no further vibration analysis has been undertaken.

2.0 SUMMARY AND RECOMMENDATIONS

2.1 SUMMARY

Based on the analysis conducted in this investigation it is concluded that:

1. The unattenuated daytime sound levels at the elevated Common Outdoor Living Areas (Common OLAs)[1] within the proposed development will exceed the recommended objective sound level. For these areas, outdoor noise control measures are required along with relevant warning clauses. The ground-floor Common OLA (i.e., Courtyard) will have acceptable outdoor sound levels, therefore, no outdoor noise control measures need be considered for this area.

2. As advised by the Proponent, the following are the locations of the proposed Common OLAs within the development:
   - Building 1: 8th floor (North and South sides of the building)
   - Building 2: 10th floor (North and South sides of the building)
   - Building 3: 10th floor (North side of the building)
   - Central Courtyard (i.e., Referred to on drawings as 'Exterior Amenity Courtyard', located on the ground floor)

   The above-noted outdoor amenity area locations were considered in this assessment and are outlined with red dashes in Figure 2. All other terraces/balconies within the development will be <4m in depth.

3. The unattenuated sound levels at the outside walls of all of the buildings will exceed the recommended objective sound levels. Indoor noise controls are required for these dwellings along with relevant warning clauses.

4. Although the projected sound levels are predicted to be above the sound level criteria outlined in Section 3, it is feasible to control sound levels within the outdoor and indoor areas of the proposed development to meet the stated criteria.

5. Detailed sound level calculations and analysis were performed in this study to assess the potential noise impact from the nearby and proposed stationary sources at all noise-sensitive receptors adjacent to and within the proposed development. In accordance with City of Mississauga Policies, noise studies must evaluate:

[1] At times, it may also be referred to as Outdoor Amenity Areas. The size of an OLA is subject to municipal standards and other project requirements (except when classified as a balcony along with other applicable MECP rules).

- The impact of noise from the surrounding environment on the proposed development;
- The impact of noise generated by a proposed development on the surrounding environment; and,
- The impact of noise from the proposed development on itself.

Based on the analysis conducted in this investigation it is concluded that:

I. The unattenuated sound levels at the worst-case Points of Reception within the future residential buildings **will exceed** the recommended objective sound level, therefore noise controls are required.

II. Although the projected sound levels are predicted to be above the sound level criteria outlined in Section 3, it is feasible to control the high sound levels emitted by the identified stationary sources and to control the resulting sound levels within the proposed development to meet the stated criteria. Additionally, since external receptors are all located at further setbacks from the sources of noise, control of sound levels at all receptors within the proposed development will necessarily control sound levels at external receptors.

III. The results of the investigation of the stationary noise sources of greatest concern (parking garage exhaust fans, and penthouse cooling tower intake/exhaust grilles) indicate that the unattenuated sound levels at the Points of Reception of concern (windows/building facades of residential suites and Common Outdoor Living Areas of the proposed development) are predicted to exceed the applicable sound level criteria for stationary sources. Accordingly, noise control measures are warranted for these Points of Reception. The following is a summary of the recommended mitigation measures/actions as per the MECP procedures:

    i. Implement an acoustic liner for the underground parking garage exhaust fan shafts;
        1. Alternatively, select suitably quiet equipment as identified herein to avoid high sound levels
    ii. Implement mechanical silencers for the rooftop cooling towers at the side intakes and the rooftop exhausts
        1. Alternatively, select suitably quiet equipment as identified herein to avoid high sound levels
    iii. Due to the reverberant fields present around the delivery/loading dock of Building 1, implement lining of the walls with acoustically absorbent materials.

    With implementation of the above noted recommendations, it is technically feasible to attenuate the stationary noise sources to meet the specified criteria. By meeting the specified criteria at the receptors within the development with the above-noted noise controls, external points of reception which are all located at further setbacks will also be in

compliance with the specified criteria. This issue should be addressed in further detail prior to the Building Permit stage, at which time more information will be available regarding the details of the proposed mechanical specifications to be used for the underground parking garage and rooftop mechanical equipment.

IV. The stationary noise assessment concluded that external stationary sources of noise emitted from the nearby residential buildings and the kitchen exhaust from the restaurants of the adjacent commercial strip plaza will not exceed the minimum sound level criteria, and therefore noise mitigation measures are not required for external stationary sources of noise.

2.2 RECOMMENDATIONS

A summary of the minimum noise attenuation requirements is presented in Table 1. Detailed description is as follows:

1. Outdoor Noise Control Measures

- **Building 1: 8th Floor (North, south and west sides of building)**
- **Building 2: 10th Floor (South side of building)**
- **Building 3: 10th Floor (North side of building)**

a. Acoustical barriers/parapet walls should be constructed to shield the Common Outdoor Living Areas for the above-noted locations with the following details:

(i) The parapet barrier walls should be constructed along the alignments shown schematically in Figures 3 and 4.
(ii) The required barrier heights as shown in Figures 3 and 4 could be as high as 1.4m.
(iii) The parapet barrier walls to be constructed of a durable material having approximately 10 kg/m^2 (Ξ 2 lb/ft^2) of surface area and be in a continuous line without openings or gaps.
(iv) The parapet barriers may consist of transparent material to OBC requirements and be in a continuous line without openings or gaps.
(v) The Builder/Contractor should be required to seek approval, including shop drawing approvals of the detailed construction of the proposed barriers prior to its installation and the approval of the Engineer shall cover: material/wood species, construction details, support details, arrangements of the panels and exact locations on a development/building plan.

Accordingly, a Detailed Noise Control Study should be undertaken prior to final approval of the specified locations requiring a barrier to define specific

barrier alignments and heights.

2. Air Conditioning

- **Buildings: 1, 2 and 3 (All Units Inclusive)**

The above noted properties should be equipped with central air conditioning. The air conditioning system may be central to the entire building or may be central to each dwelling unit (for example using packaged incremental units (PTAC), internal Heat Pump or Fan Coil Units (FCU) connected to a central cooling/heating system with suitable duct work to all rooms[2]). The *Ministry of the Environment*, *Conservation and Parks* does not accept window-type air conditioning units in lieu of a central system. In all cases, serious attention should be given by the proponent, the Mechanical Engineer, and the Contractor to the noise potential of the air conditioning system as it may affect the outdoor and indoor receivers within or outside of the proposed development. It is important that the Builder, the Mechanical Engineer, and the Contractor achieve the MECP objectives (the maximum sound level L_{AS} of 50 dBA[3] at the closest internal/external point(s) of reception, i.e., at their outdoor areas as well as at the closest window on any floor level) included in Publication NPC-300.

The following warning clause should be registered in all Development Agreement(s) and Offers of Sale and Purchase or Lease of these properties:

"*In order to achieve a suitable indoor noise environment, windows may have to remain closed; therefore, this dwelling unit has been equipped with a central air conditioning system*".

It is also our recommendation that the necessary detailed technical analysis be performed prior to the certification process for Building Permit to address the specific requirements for the control of the selected air conditioning system to meet the sound level criteria at the point(s) of reception and to include same in the applicable permit drawings/ specifications.

3. Warning Clause *[4]

- **Buildings: 1, 2 and 3 (All Units Inclusive)**

[2] The use of split system A/C units in apartment buildings is seldom used.

[3] Or the lowest hourly ambient Leq due to road traffic projected at the receptor location(s). It should be noted that L_{AS} of 55 dBA is acceptable only for cases where the A/C unit is placed in a high ambient location (i.e., with a direct line of sight to a major roadway).

*4 Reference should be made to Bulletin No. 91003, Environmental Warnings/Restrictions, Ontario Ministry of Consumer and Commercial Relations.

The following warning clause should be registered in all Development Agreement(s) and Offers of Sale and Purchase or Lease of these properties:

"*Purchasers/tenants are advised that despite the inclusion of noise control features within this development area and within the dwellings, sound levels from increasing road and/or (future) light rail transit traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the sound level exceeds the Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria."*

All Units with Balconies:

The following Warning Clause should be registered in all Development Agreements and Offers of Sale and Purchase or Lease of these properties having a balcony:

"*Purchasers/tenants are advised that despite the inclusion of noise control features within this development and within the dwellings, sound levels from increasing road and/or (future) light rail transit traffic will continue to be of concern as the levels in the balcony exceed the Ministry of the Environment, Conservation and Parks criteria*", and that protected Common Outdoor Living Areas meeting the Ministry sound level criteria have been provided within the development".

All Building 3 Podium Units facing South side:

The following Warning Clause should be registered in all Development Agreements and Offers of Sale and Purchase or Lease of those properties on the south side of Building 3 with exposure to the nearby restaurant exhausts:

"*Purchasers/tenants are advised that sound levels due to nearby kitchen exhaust equipment may continue to be audible, occasionally interfering with some activities of the dwelling occupants as the sound level may exceed the Municipality's and the Ministry of the Environment, Conservation and Parks sound level criteria."*

4. Building Acoustic Insulation

- **Buildings: 1, 2 and 3 (All Units Inclusive)**

All exterior building components (walls, windows and doors) should meet the minimum Acoustic Insulation Factors (AIF) shown in Tables 3 and 4. All windows should be well fitted and weather-stripped.

It is also the responsibility of the developer/builder responsible for final design and construction of the subject dwellings to ensure that the correct windows,

walls and doors acoustic specifications are secured from the Acoustical Engineer prior to planning and construction of the noted dwellings.

Typical Acoustic Insulation Factors (AIF) are shown in Tables 3 and 4. The Detailed Noise Control Study should provide complete and specific tabulations of AIFs for all properties affected.

It is also the responsibility of the developer/builder responsible for final design and construction of the subject dwellings to ensure that the correct windows, walls and doors acoustic specifications are secured from the Acoustical Engineer prior to planning and construction of the noted dwellings.

5. Implementation Procedures

The following is a summary of the generally recommended procedures for implementation as per the MECP requirements:

a) Prior to final approval of this development, a Detailed Noise Control Study, or an upgraded noise study should be required to take into consideration the following:
   - Final proposed building and amenity area locations
   - The exact distances to all sources of concern
   - All details related to building mechanical equipment/systems, including for the ground-floor commercial/mixed-use space
   - Final/approved sound barrier locations
   - Other relevant conditions to noise in the Development Agreement

b) The Development Agreement(s) should include the details of all the necessary noise control measures and procedures as outlined herein this noise study to the satisfaction of all concerned parties.

c) Prior to submission of the project plans for Building Permit, the Builder's plans, with respect to the units requiring noise control measures as referred to earlier, should be certified by an Acoustical Engineer as being in conformance with the recommendations of the Detailed Noise Control Study as approved and/or amended by the authorities having jurisdiction.

   The parapet barrier certification should include approval of the sound barrier shop drawings (showing the barrier material/wood species, construction details, support details, arrangements of the panels and exact locations on a development plan, height, and material composition) if applicable.

d) Prior to their final inspection and release for occupancy, these dwellings should be certified by an Acoustical Engineer as being in compliance with the recommendations of the Detailed Noise Control Study.

In view of the fact that municipal implementation procedures of the noise control measures recommended herein may differ, it is the responsibility of the developer/builder responsible for final design and construction of the subject structures/dwellings to ensure that the correct details related to the noise control measures referred in this report, such as sound barriers, building shell component specifications (windows, walls, doors, and others), air conditioning noise control technical requirements, etc. are secured from the Acoustical Engineer prior to planning and construction of the noted buildings.

3.0 SOUND AND VIBRATION LEVEL CRITERIA

3.1 SURFACE TRANSPORTATION CRITERIA[5]

The surface transportation noise is based on the objective sound levels recommended by the Ministry of the Environment, Conservation and Parks (Ref: MECP Publication NPC-300 "Environmental Noise Guideline, Noise Assessment Criteria for Stationary Sources and for Land Use Planning, 2013") and applicable Regional/Municipal sound level standards and procedures for different land uses and spaces.

The following is a summary of the applicable sound level criteria for surface transportation sources for the shown time periods (day=d & night=n):

Sound Level Limits for Outdoor Living Areas (OLAs)

AREA & TIME PERIOD	$L_{Aeq(day)}$ ROAD AND RAIL (dBA)
Designated (Individual or common) Outdoor Living Areas (16 hr day, 07:00 - 23:00)	$L_{Aeq(day)}$ 55

Indoor Sound Level Limits

Type of Space	L_{Aeq} (Time Period) (dBA)	
	Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc. (Time period-day: 16 hr, 07:00 - 23:00)	$L_{Aeq(day)}$ 45	$L_{Aeq(day)}$ 40
Living/dining, den areas of residences, hospitals. nursing homes, etc. (except schools or daycare centres) (Time period-night: 8 hr, 23:00 - 07:00)	$L_{Aeq(night)}$ 45	$L_{Aeq(night)}$ 40
Sleeping quarters (Time period-day: 16 hr, 07:00 - 23:00)	$L_{Aeq(day)}$ 45	$L_{Aeq(day)}$ 40
Sleeping quarters (Time period-night: 8 hr, 23:00 - 07:00)	$L_{Aeq(night)}$ 40	$L_{Aeq(night)}$ 35

[5] Road, rail and rolling stock traffic.

Additional Supplementary (Best Management Practices) Sound Level Criteria Recommended for Other Uses

Type of Space	L_{Aeq} (Time Period) (dBA)	
	Road	Rail
General offices, reception areas, retail stores, etc. (Time period-day: 16 hr, 07:00 - 23:00)	$L_{Aeq(day)}$ 50	$L_{Aeq(day)}$ 45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, places of worship, libraries, individual or semiprivate offices, conference rooms, reading rooms, etc. (Time period-day: 16 hr, 23:00 - 07:00)	$L_{Aeq(day)}$ 45	$L_{Aeq(day)}$ 40
Sleeping quarters of hotels/motels (Time period-night: 8 hr, 23:00 - 07:00)	$L_{Aeq(night)}$ 45	$L_{Aeq(night)}$ 40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc. (Time period-night: 8 hr, 23:00 - 07:00)	$L_{Aeq(night)}$ 40	$L_{Aeq(night)}$ 35

The criteria for acceptable outdoor and indoor sound levels are based on "free-field" predicted and/or measured sound levels at the applicable receiver locations, thus the effects of sound reflections and reverberant sound fields are not considered.

If the sound level is less than or equal to the sound level criteria, no control measures will be required.

The outdoor sound levels ***may*** exceed the outdoor sound level criterion by up to 5 decibels, provided that it can be demonstrated that it is not technically, economically or administratively feasible to achieve the criterion and that the occupants are informed of a potential disturbance due to the excess noise by means of a warning clause or cautionary note to be registered in all Development Agreement(s) and Offers of Sale and Purchase or Lease.

Central air conditioning is required when the daytime sound level at the outside wall of any habitable room containing windows exceeds an $L_{Aeq(day)}$ 16 hrs of 65 dBA or when the nighttime sound level at the outside wall of any habitable room containing windows exceeds an $L_{Aeq(night)}$ 8hrs of 60 dBA.

Forced air ventilation (with provision for future installation of a central air conditioning system) is required when the daytime sound level at the outside wall of any habitable room containing windows an exceeds $L_{Aeq(day)}$ 16 hrs of 55 dBA

but is less than or equal to 65 dBA or when the nighttime sound level at the outside wall of any habitable room containing windows exceeds an $L_{Aeq(night)}$ 8hrs of 50 dBA but is less than or equal to 60 dBA.

Notwithstanding the above, the Region of Peel requires that for those dwellings with a nighttime building façade sound level of 60dBA, air conditioning be installed, as opposed to the MECP's requirement for provision for air conditioning for these dwellings.

Application of Criteria

The following table summarizes the requirements for noise control measures for the various sound level ranges:

SOURCE OF NOISE	DAYTIME SOUND LEVEL $L_{Aeq(day)}$	NIGHTTIME SOUND LEVEL $L_{Aeq(night)}$	AIR CONDITIONING	FORCED AIR VENTILATION WITH PROVISION FOR FUTURE AIR COND.	WARNING CLAUSE	ACOUSTIC INSULATION
ROAD	<=55	<=50	-	-	-	-
	>55 & <=65	>50 & <=59	-	Yes	Yes "Type C"	
	>65	>59	Yes	-	Yes "Type D"	Yes
RAIL	<=55	<=50	-	-	-	-
	>55 & <=60	>50 & <=55	-	Yes	Yes "Type C"	-
	>60 & <=65	>55 & <=59	-	Yes	Yes "Type C"	Yes
	>65	>59	Yes	-	Yes "Type D"	Yes

3.2 CRITERIA FOR STATIONARY NOISE SOURCES

The following criteria apply to the impact of Stationary Sources of noise as defined by the MECP to include industrial and commercial facilities. The criteria apply to the impact of Stationary Sources external to the development on the proposed development or to the impact of any proposed Stationary Sources internal to the development on the development itself.

The criteria used in this study are based on the objective sound levels recommended by the Ministry of the Environment, Conservation and Parks (Ref.: MECP Publication NPC-300 "Environmental Noise Guideline, Noise Assessment Criteria for Stationary Sources and for Land Use Planning, 2013) and other relevant publications.

For sound from a stationary source, including Quasi-Steady Impulsive Sound but

not including other impulsive sound, the predicted and/or measured "predictable worst case" 1-hour equivalent sound levels (L_{Aeq1hr}) of the stationary source(s) at a point of reception is the higher of the applicable exclusion limit value (given in the following tables) or the background sound level for that point of reception. The outdoor sound level limits for stationary sources apply only to daytime and evening (07:00 – 23:00 hours).

Exclusion[6] Limit Values of One-Hour Equivalent Sound Level (L_{Aeq}, dBA) Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{Aeq}, dBA) Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

Impulse Noise

For impulsive sound, other than Quasi-Steady Impulsive Sound from a stationary source, the sound level limit at a point of reception expressed in terms of Logarithmic Mean Impulse Sound Level (L_{LM}) is the higher of the applicable exclusion limit value given in the following tables or the background sound level for that point of reception. The outdoor sound level limits for stationary sources apply only to daytime and evening (07:00 – 23:00 hours).

[6] or the minimum hourly background (ambient) sound level $LAeq_{1hr}$, whichever is higher

Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)
Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	**9 or more**	50	50	45	55
07:00 – 23:00	**7 to 8**	55	55	50	60
07:00 – 23:00	**5 to 6**	60	60	55	65
07:00 – 23:00	**4**	65	65	60	70
07:00 – 23:00	**3**	70	70	65	75
07:00 – 23:00	**2**	75	75	70	80
07:00 – 23:00	**1**	80	80	75	85

Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI) Plane of Window – Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00-23:00)/ (23:00-07:00)	Class 2 Area (07:00-23:00)/ (23:00-07:00)	Class 3 Area (07:00-19:00)/ (19:00-07:00)	Class 4 Area (07:00-23:00)/ (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

3.3 CRITERIA FOR TRUCK TRAFFIC NOISE IMPACT DUE TO A PROPOSED DEVELOPMENT ON AN EXISTING NEAR-BY NOISE-SENSITIVE LAND USE

The following criteria apply to the sound levels of vehicular truck traffic generated by a proposed development when traveling on public roadways in the vicinity of an existing noise-sensitive land use.

The following table shows the general acoustic criteria relating the significance of potential vehicular truck noise impact to the increase in sound levels due to the traffic associated with the proposed development:

IMPACT ASSESSMENT TABLE	
EXCESS/CHANGE	**IMPACT RATING**
0 to < 3	Insignificant
≥ 3 to < 5 dBA	Noticeable
≥ 5 to < 10 dBA	Significant
≥ 10	Very Significant

If the addition of the proposed development traffic increases the ambient noise at the receptors by more than 5 dB, then mitigation should be considered based on the Ministry of Environment, Conservation and Parks MOE/MTO Protocol (1986) criteria for traffic noise control.

4.0 ANALYSIS

4.1 TRANSPORTATION SOURCES OF NOISE

The relevant road traffic data was obtained from the City of Mississauga, and the future LRT volumes were extracted from the Noise and Vibration Impact Assessment report (Hurontario-Main Light Rail Transit) prepared by J.E. Coulter Associates Limited dated June 4, 2014 and are summarized below:

- Hurontario Street

Current No. of Lanes	6
Future No. of Lanes	4 + 2* (*2 lanes dedicated to LRT)
Posted Speed Limit	50 km/hr.
Future Speed Limit	50 km/hr.
Ultimate AADT	46,100 vpd
Total Truck Percentage – Medium Truck Split – Heavy Truck Split	5% 2.75% 2.25%
Day (16 hrs.)/Night (8 hrs.) Split	90%/10%
Directional Traffic Split (assumed)	50%/ 50%
Road Gradient	<2%
Future R.O.W.	35m

- Future Light Rail Transit (Highway 10/Hurontario St.)

Future No. of Lanes	2
Future Speed Limit	50 km/hr.
Daytime LRT Sets	280
Night-time LRT Sets	44
Directional Traffic Split (assumed)	50%/50%
Road Gradient	<2%

Appendix A contains the relevant road and LRT traffic data used in this study.

4.2 OUTDOOR NOISE ENVIRONMENT

Sound level predictions were carried out based on MECP's ORNAMENT sound level prediction modeling procedures[7] (Ontario Road Noise Analysis Method for

[7] The MECP's noise prediction models ORNAMENT and STEAM have a limitation as to the minimum AADT value for 24-hour traffic volume (calculated for the daytime and nighttime hourly volume). When the AADT value is less than 40 vph, there is a neutral mathematical manipulation that can be used as long as the hourly traffic volume is not very low. The manipulation is implemented by multiplying the traffic volume by any reasonable factor (for example a factor of 10) and then by deducting 10 x log "factor" from the results (in this case, 10 x log 10=10).

Environment and Transportation, Technical Document, 1989).

Overall sound levels at the Common OLAs are shown in Table 3. Sample sound level calculations at representative receptor locations are presented in Appendix B.

In consideration of the calculations, it is concluded that for the following Common Outdoor Amenity Areas, the unattenuated daytime sound levels will exceed 60 dBA, the maximum criteria levels allowed. Therefore, outdoor noise control measures are required:

- **Building 1: 8th Floor (West side of building)**
- **Building 2: 10th Floor (South side of building)**
- **Building 3: 10th Floor (North side of building)**

The conventional approach by which excess noise in Common OLAs may be mitigated is through construction of acoustical barriers. The parapet barrier height calculations for the receptors of concern are included in Appendix B and the schematic alignments are as shown in Figures 3 and 4.

If the sound levels at the Common OLAs for Buildings 1 and 3 are attenuated to 55dBA as per the MECP's sound level objective, barrier heights of up to 2.5m will be required. With the recommended sound barrier heights for these buildings, the unattenuated daytime sound levels will be below the MECP's maximum allowable sound level. Table 5 includes the details of the barrier heights required to achieve L_{Aeq} 55 dBA.

Based on the MECP guidelines, the balconies for the proposed development are not considered as OLAs due to fact that the depth of the balconies/terraces are less than 4m. Therefore, no physical mitigation measures are required and a warning clause registered in the Development Agreement(s) will suffice.

4.3 INDOOR NOISE ENVIRONMENT

The criteria for indoor L_{Aeq} sound levels are based on projected L_{Aeq} levels at the outside face of the dwellings with appropriate assumptions for the differences between the outdoor and indoor sound levels. If the outside L_{Aeq} levels do not exceed the recommended objective sound levels, then the indoor L_{Aeq} levels will not be exceeded, assuming standard building construction and operable windows.

Overall daytime sound levels at the building facades are shown in Table 3 and the overall nighttime sound levels at the building facades are shown in Table 4.

In consideration of the estimated sound levels and by comparison to the acceptable indoor sound level criteria (Section 3) the following is concluded:

The sound levels at the outside walls of all of the buildings within the development (within any habitable room on any floor) are predicted to exceed $L_{Aeq(day)}$ 65 and/or $L_{Aeq(night)}$ 59 dBA. Therefore, central air conditioning is required. Typical Acoustic Insulation Factors (A.I.F.) are summarized in Tables 3 and 4.

Additional Notes Regarding Air Conditioning Systems in Apartment Buildings

Based on the Sound Level Criteria and the established future sound levels, it was concluded that some of the dwelling units in the apartment buildings within the proposed development may require air conditioning and/or provision for future installation of air conditioning.

There are several techniques available to air condition apartment units using either a system central to the entire building or alternatively each apartment unit would have its own central system including the indoor fan and the outdoor condensing unit.

As it is not the subject of this report to discuss the specifics of all systems that may be used, the following comments are offered, to assist the proponent, the Mechanical Engineer and the Contractor in appreciating the acoustical problems and concerns associated with some of the commonly available commercial air conditioning systems:

1. The location and the design of the central system (cooling tower, condensing unit, openings in mechanical rooms, etc.) are important elements that must be checked by the Mechanical Engineer in order to achieve the stated outdoor and indoor sound level criteria.
2. Air conditioning units central to each individual apartment unit must also be designed by the Mechanical Engineer to meet the objective sound levels. If split-systems are used, then the sound power level of the outdoor units should be selected to avoid impacting the outdoor living areas and the windows of habitable spaces. Other noise control measures available include quieter makes, the use of other forms of sound barriers, etc. If through the wall incremental units are used, then the selected incremental units should have the following features in order to reduce the transmission of high outside noise levels into the suites:
    a) The partition in the heating/cooling chassis should be of the acoustically sealed type (this partition separates the outdoor and indoor components).
    b) The unit should preferably be of the insulated “double casing design”.
    c) The interior of the unit should be acoustically lined.
    d) The perimeter of the sleeve should be caulked all around with acoustical sealant.
    e) The unit may be placed through the living room wall and acoustically lined ducts extended to the adjoining bedroom or dining room in accordance with manufacturers recommendations.

4.4 TYPICAL WINDOW / WALL CONSTRUCTION

As the detailed architectural plans for Building Permit submission are not available at this time, it is not possible to specify the window and wall details to meet the AIF requirements presented in Tables 3 and 4. Further detailed analysis should be undertaken based on the data presented in this Report to take into consideration the final room location, floor area, window type (operable or fixed), window size and orientation, etc. Such analysis is required by the MECP and the municipality prior to submission for building permits as part of their Certification process.

It must be pointed out that there are several factors affecting the final glass selection including:

1. Size of window.
2. Room dimensions.
3. Floor level and direction room faces.
4. Fixed or operable glass.
5. The number of building components.
6. Type of wall to be used.
7. Projected sound levels outside the window
8. The choice of “laminated” window glazing in one or two of the window panes.

For the calculation of type of windows required for each dwelling, a detailed description of each unit is required.

As an example, for a typical unit with daytime outdoor sound level of 70 dBA, the AIF value for the Living Room will be 34 assuming 3 components. If the window to floor ratio is 32%, then the window requirements in terms of glass thickness, mm (air space thickness, mm) glass thickness, mm are any of the following:

Double Glazed: 3mm (40mm) 3mm; 4mm (32mm) 4mm

As an example, for a typical unit with nighttime outdoor sound level of 63 dBA, the AIF value for the bedrooms will be 33 assuming 3 components. If the window to floor ratio is 20%, then the window requirements in terms of glass thickness, mm (air space thickness, mm) glass thickness, mm are any of the following:

Double Glazed: 3mm (20mm) 3mm; 4mm (16mm) 4mm

The above window glazing construction is typical examples only. It is recommended that prior to the submission of the building plans for Building Permit that the detailed architectural drawings of the units requiring noise control measures, as referred to earlier, be examined by an Acoustical Engineer in order to advise the design consultant on the ***specific*** building components for noise control to suite the actual window construction details.

As the detailed architectural plans are not available at this time, we have made certain assumptions based on typical building designs. Since the highest L_{Aeq} (day) and/or L_{Aeq} (night) are calculated to be equal to or lower than 65 dBA and/or 60 dBA respectively, it is expected that standard window glazing, doors and exterior walls meeting the requirements of the Ontario Building Code will be sufficient for this project. The worst-case analysis assumes maximum ratios of window area to floor area of 32% and 20% for living/dining room and bedrooms respectively which should not be exceeded in order for this analysis to remain valid.

It must be pointed out that there are several factors affecting the final glass selection including:

1. Size of window.
2. Room dimensions.
3. Floor level and direction room faces.
4. Fixed or operable glass.
5. The number of building components.
6. Type of wall to be used.
7. Projected sound levels outside the window.
8. The choice of “laminated” window glazing in one or two of the window panes.

As the information above are typical examples only, therefore, prior to submission of the building plans for building permit, we recommend that the detailed architectural drawings of the units requiring noise control measures, as referred to earlier, be examined by the Acoustical Engineer in order to advise the design consultant on the project specific building components for noise control.

IMPORTANT NOTES TO THE WINDOW SUPPLIER/CONTRACTOR:

The Contractor should use the window glazing dimensions specified in this report. If the Contractor chooses to use, instead the minimum specified STC values herein in this report, then the Contractor MUST observe the following rules:

(1) The **specific** windows MUST be tested by an “accredited” acoustic laboratory that is “NVLAP” accredited, and
(2) The full STC test results shall be submitted to SS Wilson Associates for prior approval before installation

4.5 CONTROL OF AIR CONDITIONING UNITS NOISE FOR THE CITY OF MISSISSAUGA

To control the environmental noise emitted by air conditioning or heat pump units it is essential that the following procedures and specifications be adhered to by the parties responsible for the selection, design and installation of the air conditioning systems:

1. Although the Ministry of the Environment, Conservation and Parks guidelines refer to residential air conditioners not exceeding 7.6 bels and that some municipalities specify other standards for residential air conditioner noise, we recommend that the sound emission level of residential air conditioners (power level) not exceed 6.8 bels when tested in accordance with ARI Standard 270-84 (Using the minimum sound rating specified by the MECP may result in sound levels exceeding the MECP NPC-216 criteria at the points of reception in some cases).

   The following is the City of Mississauga's views when dealing with the issue of air conditioning noise.

   a) The City will not accept placement of air conditioning condenser units in the front yards. They are permitted in the side yard under certain conditions. The building Division has indicated that the Zoning By-law was amended in 1991 (B/L 356-89) to the extent of allowing condenser units in side yards provided they are no closer than 0.61 metres from the side lot line.
   b) The MECP's Technical Publication NPC-216 criteria section 6 related to a sound emission standard for the condenser unit will be enforced by the City.
   c) The criteria for air conditioning noise impact, i.e., L_{Aeq} 55 dBA, apply to the impact on both the property itself and the adjoining properties. However, the City's view considers this criterion as a guideline only.
   d) To ensure these requirements are met, Schedule 'C' clauses in the Servicing Agreement will require builders plan certification and final certification by the Acoustic Engineer to ensure the air conditioning condenser units and locations are in compliance with the noise report.

2. The resulting sound levels due to residential air conditioners at the nearest points-of-reception should not exceed the levels in MECP Publication NPC-216.

3. The siting of the split-system central air conditioning units and other systems should follow good planning principles.

4. When placing the air condenser unit in the backyard or side yard areas the noise is likely to interfere with the outdoor and indoor activities of any occupant and/or neighbour then it is necessary to design and install noise control measures.

Noise control measures include any or a combination of the following:

a) Distance setback away from the receptor(s).
b) Sound barrier wall(s) or ultimately an acoustic enclosure.
c) Sealing selected windows, i.e., installation of non-operable windows.
d) Deleting selected windows.

Indoor Sound Levels

While the control of the indoor noise created by the air conditioning equipment is not the direct subject of this study, it is important that the selected and designed air conditioning systems achieve indoor sound levels that meet the OBC/ASHRAE criteria and be at least 5dB lower than the Ministry of the Environment, Conservation and Parks recommended indoor sound level criteria included in Section 3.0 of this study.

4.6 STATIONARY SOURCES OF NOISE INTERNAL TO THE PROPOSED DEVELOPMENT

1. Introduction

The preparation of this noise impact assessment is primarily concerned with the documentation and assessment of the changes in noise in accordance with the following main procedures:

1. Describe the existing and future noise environment;
2. Predict the future noise environment of the project; and
3. Assess the noise impact and recommend noise control measures, if required.

The standard practice for impact assessment of the stationary sources of noise such as those within the subject development is to consider the noise potential at the outside of the nearest noise-sensitive Points of Reception (POR) to assist in determining the degree of impact on the indoor noise-sensitive spaces.

A single number, the hourly Leq (equivalent sound level) has been used to arrive at an objective and quantitative definition of the noise impact.

2. Description of the Internal Sources of Stationary Noise

The stationary noise sources of concern within the proposed development are the garage exhaust shafts located facing Hurontario Street, and the penthouse mechanical rooms of the three (3) residential towers.

In addition, we foresee other potential sources of noise, such as the large makeup air units (MUA) on the roofs serving the building corridors, the emergency power generator serving each building, and other miscellaneous HVAC equipment to serve the building.

The most significant stationary source of noise are the cooling towers and therefore a cooling tower was assumed to be present in each mechanical penthouse, with the intakes and exhausts pointed towards the centre of the development to simulate the acoustic worst-case for the most significant pieces of equipment. The assumptions related to the sound emission levels of the subject equipment is discussed in Section 4.8.5 below.

The second most significant source of noise is the makeup air equipment associated with each building, where the MUA fans are located on the roofs. Such equipment has not been designed at this stage, and their locations are not indicated on the drawings provided. The air intake louvers for the MUA will be considered as a source of stationary noise prior to the building permit stage when more details of the mechanical equipment have been finalized.

The emergency power generator is also a potential source of stationary noise, however the drawings provided did not identify the exact location for the generator. Generators may be located on the rooftop or within an electrical room; the exact location of the generator must be confirmed prior to the building permit stage.

The delivery/loading dock which is part of Building 1 will be a source of stationary noise, potentially affecting the residential suites above. Since the details of the commercial space on the first floor are not known at this time, the nature of truck deliveries and the schedule are unknown. However, it is well-known that delivery dock openings are likely to be highly reverberant, and therefore it is recommended that the inside of the dock walls be lined with exterior grade absorbent panels at least 2" thick to reduce the noise emitted from the delivery dock and impinging upon the nearby receptors.

The details of all of the above potential sources of noise need to be addressed in more specific details prior to approval of the site plan drawings for the project being considered. The following is a complete list of the equipment/operations that will require detailed consideration in due course:

- **Cooling towers on the roofs**
- **MUA units on rooftops and on ground floor**
- **Garage exhaust fan discharge outlets (normally located at grade level)**
- **Parking garage entry/exit**
- **Garbage room exhaust fans (normally located on ground floor)**
- **Loading/delivery dock within Building 1 serving the complex**

With the availability of more detailed architectural drawings for the next phase of the planning process, equipment and site-specific recommendations for noise control measures will be prepared. It is, however, our opinion that for the subject development, such sources can be controlled.

3. Points of Reception

To determine the level of noise impact, the nearest and most exposed outdoor areas and building facades facing the sources of noise are selected to represent the worst-case scenarios.

The following is a brief description of the selected points of reception:

- POR-A: Building 1 Tower, 30th floor residential suite
- POR-B: Building 2, North Tower, 33rd floor residential suite
- POR-C: Building 2, South Tower, 35th floor residential suite
- POR-D: Building 1, 2nd floor residential suite, north side
- POR-E: Building 1, 2nd floor residential suite, south side

PORs A, B and C are the receptors most exposed to the penthouse cooling towers located within the mechanical penthouses above; PORs D and E are those receptors located nearest to the garage exhaust shafts.

Figure 5 illustrates the locations of the selected points of reception relative to the study area.

4. Sound Level Criteria

The land use and character of the areas near the subject site is essentially urban. This is due to its proximity to Hurontario Street and Dundas Street E, which qualify the area as a Class 1 Area (Urban) based on the MECP definition.

Point of Reception ID	Sound Level Limit Criteria $L_{eq(1hr)}$
POR-A	50 dBA Day 50 dBA Evening 45 dBA Night
POR-B	
POR-C	
POR-D	
POR-E	

The worst-case hourly ambient traffic sound levels (i.e., the time of the lowest sound levels, at nighttime) in the subject area are predicted to be in excess of the exclusion limits for the majority of receptors; however, due to shielding from the road provided to those receptors located away from the sources of transportation noise, the exclusion limits have been employed to ensure a conservative estimate and a suitable indoor environment for all occupants. Therefore, the MECP exclusion limits will be the applicable sound level criteria for this assessment for all points of reception.

5. Source Details and Assumptions

At this time, no mechanical drawings have been provided for the proposed development, and therefore the details related to the location, capacity, and sound power of the proposed equipment are unknown. Therefore, the assumed sound power levels for the garage exhaust shafts and colling tower were taken from the SS Wilson Associates emission data database, as these are typical sources.

Garage Exhaust Fan Equipment

The development is proposed to include four (4) levels of underground parking shared amongst all three buildings, with two (2) exhaust ventilation shafts shown on either side of Building 1 facing Hurontario Street. Each level of parking is assumed to contain two (2) fans per shaft (8 fans per shaft). Based on the floor area of the parking levels, each fan was assumed to provide a capacity of 8000 cfm, which is likely to produce a sound power of 93 dBA per fan. This value was used for the purposes of modeling each garage exhaust shaft.

It was assumed that the shafts located nearest to the sources of road noise will be used for exhaust, while the other shafts located towards the rear of the development will be used for intake. This is the best practice acoustically to ensure the garage shafts are in areas of high ambient noise, reducing the likelihood for a noise impact. Two (2) parking garage exhaust ventilation shafts were considered for the analysis of internal sources of stationary noise.

Mechanical Penthouse Cooling Towers

The sound power information for the cooling tower air intake and exhaust openings of the mechanical penthouse were assumed based on previous sound data stored within SSWA's project database for a similar high-rise project. The side air intake was assumed to emit a sound power level of 84 dBA; the overhead exhaust was assumed to emit a sound power level of 92 dBA.

6. Sound Level Prediction Model

All stationary source noise analysis was performed using an industry-standard 3-D computer software package. The modelling algorithms follow the ISO Standard 961302: *Acoustics – Attenuation of Sound during Propagation Outdoors*. Site-generated sound levels from the relevant noise sources were calculated for selected receptors as described by the noise descriptor, $L_{eq(1hour)}$.

The modeling takes into account:

- Reference sound levels and reference distances for the equipment working in each area of the subject development, i.e., sound emission levels.
- The Cartesian co-ordinates (x, y & z) of all sources and receivers.
- The number of events or occurrences of the noise in a given time period and the time period of each event.
- Spherical divergence factor.
- Sound reflection from building facades and sound barriers
- Additional attenuation due to sound barriers; natural or man-made types.
- Additional attenuation due to ground (as modified by sources/receiver elevations, the presence of intervening barriers and the type of ground).
- Atmospheric attenuation due to air molecular absorption.

Additional details regarding the sound level prediction calculations, including sample calculations, are included in Appendix B.

7. Impact Assessment

The following is a summary of the resulting sound level impact, with no mitigation, at each of the selected receptors:

Point of Reception ID	Point of Reception Description*	Sound Level at Point of Reception Leq(1h)	Applicable MECP Criteria	Compliance with MECP Criteria
POR-A	B1 Tower, 30th Floor	64 dBA Day 63 dBA Evening 61 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	No No No
POR-B	B2 North Tower, 33rd Floor	64 dBA Day 63 dBA Evening 61 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	No No No
POR-C	B2 South Tower, 35th Floor	65 dBA Day 63 dBA Evening 62 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	No No No
POR-D	B1, 2nd Floor, North Side	80 dBA Day 80 dBA Evening 79 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	No No No
POR-E	B1, 2nd Floor, South Side	80 dBA Day 80 dBA Evening 80 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	No No No

* For the purposes of receptor descriptions, “B” refers to Building

The established sound levels at all selected points of reception are predicted to exceed the MECP’s applicable sound level criteria during the daytime, evening and night; therefore, noise control measures are warranted. Figure 5 identifies the sound levels at each receptor as a result of internal stationary sources, prior to the application of noise control measures.

Appendix B includes sample calculation sheets of impact assessment.

8. Noise Control Measures

At this early stage of the planning process, this study identified the potential for several sources to be of concern for noise, including the following generalized sources of noise:

1. Garage ventilation shafts/fans
2. Cooling towers located in mechanical penthouse

Based on the sound power data utilized in the foregoing analysis, the garage ventilation shaft sound levels will need to be addressed through the implementation of garage shaft lining and/or baffles; alternatively, selecting garage

exhaust fans having a sound power level of 58 dBA or less (per fan) will result in sound levels in compliance with the MECP limits and will not require shaft lining noise control.

The cooling towers are likely to require silencers on the inlet and exhaust openings in order to control sound levels at the nearby residential receptors, based on the assumed orientation and sound power data. Alternatively, a cooling tower may be selected which produces a sound power level of 63 dBA at the inlet and 82 dBA at the outlet in order to produce sound levels at the nearby receptors which are in compliance with the MECP limits.

9. Resulting Sound Levels

The following is a summary of the resulting sound level impact, with mitigation, at the selected receptors:

Point of Reception ID	Point of Reception Description*	Sound Level at Point of Reception Leq(1h)	Applicable MECP Criteria	Compliance with MECP Criteria
POR-A	B1T, 30th Floor	46 dBA Day 44 dBA Evening 43 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	Yes Yes Yes
POR-B	B2NT, 33rd Floor	47 dBA Day 46 dBA Evening 44 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	Yes Yes Yes
POR-C	B2ST, 35th Floor	48 dBA Day 47 dBA Evening 45 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	Yes Yes Yes
POR-D	B1, 2nd Floor, North Side	45 dBA Day 45 dBA Evening 44 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	Yes Yes Yes
POR-E	B1, 2nd Floor, South Side	45 dBA Day 45 dBA Evening 44 dBA Night	50 dBA Day 50 dBA Evening 45 dBA Night	Yes Yes Yes

In summary, the impact due to the stationary source sound levels at all the receptors is predicted to meet the applicable sound level criteria with the implementation of the recommended noise control measures. Figure 6 identifies the sound levels at each noise-sensitive receptor after the application of noise control measures.

10. Recommendations

Based on the analysis provided, it is likely that the following noise controls will be required within the proposed development:

- Install garage exhaust shaft lining; alternatively, select garage exhaust fans with sound power of 58 dBA or less
- Install intake/outlet silencers on the cooling towers in the rooftop mechanical

penthouses; alternatively, select cooling tower equipment having a sound power level less than 63/82 dBA (inlet/exhaust).

It is recommended that a further detailed analysis of the building mechanical equipment be performed by an Acoustic Engineer when more details of these systems become available, with particular attention to the garage exhaust shaft and cooling tower equipment which have been confirmed to have the potential to create unacceptable sound levels.

4.7 STATIONARY SOURCES OF NOISE EXTERNAL TO THE PROPOSED DEVELOPMENT

1. Introduction

As referenced above when considering internal noise sources, the preparation of this noise impact assessment is primarily concerned with the documentation and assessment of the changes in noise in accordance with the following main procedures:

1. Describe the existing and future noise environment;
2. Predict the future noise environment of the project; and
3. Assess the noise impact and recommend noise control measures, if required.

The standard practice for impact assessment of the stationary sources of noise such as those external to the subject development is to consider the noise potential at the outside of the nearest noise-sensitive Points of Reception (POR) to assist in determining the degree of impact on the indoor noise-sensitive spaces.

A single number, the hourly Leq (equivalent sound level) has been used to arrive at an objective and quantitative definition of the noise impact.

2. Description of the External Sources of Stationary Noise

The stationary noise sources of concern external to the subject development are limited to the rooftop kitchen exhaust fan equipment of the commercial restaurant operations to the immediate south of the proposed development. These kitchen exhaust fans are assumed to operate during daytime and evening hours only, with the restaurants being closed during nighttime hours.

The surrounding residential buildings were examined through the use of satellite imagery to determine the likely presence of mechanical/HVAC equipment which could produce noise impacts on the proposed development. However, it was observed that all of the surrounding residential buildings are of sufficient age or distance setback, or of sufficiently small size, that the rooftop equipment is not likely to produce any impact on the proposed development, and that the most significant sources which will affect the development are the kitchen exhaust fans above, and the internal sources which have already been assessed.

3. Points of Reception

To determine the level of noise impact, the nearest and most exposed outdoor areas and building facades to the sources of noise are selected to represent the worst-case scenarios.

The following is a brief description of the selected points of reception:

- POR-1: Building 1, podium, 4/5th floor residential suite facing kitchen exhaust
- POR-2: Building 2, podium, 4/5th floor residential suite facing kitchen exhaust

Figure 7 illustrates the locations of the selected points of reception relative to the study area and the resulting sound levels from external sources of stationary noise.

4. Sound Level Criteria

The land use and character of the areas near the subject site is essentially urban. This is due to its proximity to Hurontario Street and Dundas Street E, which qualify the area as a Class 1 Area (Urban) based on the MECP definition.

Point of Reception ID	Sound Level Limit Criteria $L_{eq(1hr)}$
POR-1	50 dBA Day 50 dBA Evening 45 dBA Night
POR-2	

The worst-case hourly ambient traffic sound levels in the subject area are predicted to be in excess of the exclusion limits for the majority of receptors, especially due to the fact that this assessment is considering a restaurant which is only operational during daytime and evening hours; however, due to shielding from the road provided to those receptors located away from the sources of transportation noise (i.e. POR-2 on Building 2), the exclusion limits have been employed to ensure a conservative estimate and a suitable indoor environment for all occupants. Therefore, the MECP exclusion limits will be the applicable sound level criteria for this assessment for all points of reception.

5. Source Details and Assumptions

As mentioned previously, the kitchen exhaust fans are assumed to operate continuously for 60 minutes in every hour during the daytime and evening hours while the restaurant is open, and then to shut off during the nighttime period. Based on the observed size of the two (2) restaurants and knowledge of the typical equipment for such operations, each kitchen exhaust fan was assumed to produce 2000 cfm and a corresponding sound power level of 86 dBA.

6. Sound Level Prediction Model

All stationary source noise analysis was performed using an industry-standard 3-D computer software package. The modelling algorithms follow the ISO Standard 961302: *Acoustics – Attenuation of Sound during Propagation Outdoors*. Site-generated sound levels from the relevant noise sources were calculated for selected receptors as described by the noise descriptor, $L_{eq(1hour)}$.

The modeling takes into account:

- Reference sound levels and reference distances for the equipment working in each area of the subject development, i.e., sound emission levels.
- The Cartesian co-ordinates (x, y & z) of all sources and receivers.
- The number of events or occurrences of the noise in a given time period and the time period of each event.
- Spherical divergence factor.
- Sound reflection from building facades and sound barriers
- Additional attenuation due to sound barriers; natural or man-made types.
- Additional attenuation due to ground (as modified by sources/receiver elevations, the presence of intervening barriers and the type of ground).
- Atmospheric attenuation due to air molecular absorption.

Additional details regarding the sound level prediction calculations, including sample calculations, are included in Appendix B.

7. Impact Assessment

The following is a summary of the resulting sound level impact, with no mitigation, at each of the selected receptors:

Point of Reception ID	Point of Reception Description*	Sound Level at Point of Reception Leq(1h)	Applicable MECP Criteria	Compliance with MECP Criteria
POR-1	B1, 4/5th Floor	53 dBA Day 53 dBA Evening	50 dBA Day 50 dBA Evening	No No
POR-2	B2, 4/5th Floor	50 dBA Day 50 dBA Evening	50 dBA Day 50 dBA Evening	Yes Yes

* For the purposes of receptor descriptions, “B” refers to Building

The established sound levels at POR-2 are predicted to comply with the MECP’s applicable sound level criteria during the daytime and evening, and therefore no noise control measures are required.

While the table above indicates that the sound levels at POR-1 will exceed the MECP exclusion limits, the predicted sound level of 53 dBA will be significantly less than the ambient sound level due to traffic, particularly during daytime periods. Based on the short distance setback from Hurontario Street and the significant

traffic volume thereupon, the ambient sound level during daytime periods is expected be in excess of 60 dBA during all daytime and evening hours; therefore, the noise impact from the kitchen exhaust fans is not predicted to exceed the ambient sound level, and therefore no noise control measures are required.

Appendix B includes sample calculation sheets of impact assessment.

8. Noise Control Measures

Since the sound levels at the noise-sensitive receptors of the proposed development are in compliance with the MECP exclusion limits, or are below the ambient transportation sound level, control of external stationary sources of noise is not required. However, the study has determined that the potential exists for high sound levels to be perceived on the south side of Building 1 due to the kitchen exhaust equipment. Therefore, a warning clause should be registered in the Development Agreement(s) and Offers of Sale and Purchase or Lease of those units facing the strip plaza to the south to indicate the following:

"*Purchasers/tenants are advised that sound levels due to nearby kitchen exhaust equipment may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the sound level exceeds the Municipality's and the Ministry of the Environment, Conservation and Parks sound level criteria."*

9. Recommendations

Based on the analysis provided, it is concluded that external sources of stationary noise are not expected to exceed the applicable criteria or the ambient noise due to traffic, and therefore noise control measures are not required.

It is recommended to register a warning clause in the Development Agreements/Offers of Sale and Purchase or Lease to advise purchasers/tenants of the possibility of high sound levels due to kitchen exhaust equipment.

4.8 POTENTIAL IMPACT OF THE COMMERCIAL SPACE ON THE GROUND FLOOR

The project plans and drawings show the ground floor being planned for commercial land use, which is in close proximity to the proposed residential component of the project. The commercial space will require separate heating, ventilation and air conditioning equipment.

Such equipment will have the potential for creating additional environmental and interior noise impact on the residential component of the project and since the detailed mechanical drawings for the project are not available at this stage, it is important that this issue be addressed during the detailed design stage and in particular during the building permit submission stage.

Noise control measures may include one or a combination of the following measures with the intent of meeting the MECP and the OBC/ASHRAE requirements for noise as outlined in MECP Publication NPC-205 and the ASHRAE Guidelines. The guidelines in question deal with the transfer of the outdoor noise to the outside into the residential units as well as the potential for transfer of the indoor equipment vibration and sound levels through the structure itself.

Operating parameters of the commercial component may also require assessment of their potential impact on the residential component of the development and/or on to neighboring sensitive land uses.

4.9 IMPORTANT NOTES FOR THE RESIDENTIAL BUILDER REGARDING WINDOWS

The results in this report provide information on the calculated Acoustic Insulation Factors (AIF) for windows based on typical assumed window and room dimensions.

To assist the Builder in appreciating the fact of whether the results presented herein require typical commercially available residential type windows, or special type windows, the following table[8] provides reasonably accurate information on whether such window(s) are standard industry window or not:

Acoustic Insulation Factor (AIF) in this report	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**
Window to room floor area percentage NOT to be exceeded	**10%**	**13%**	**16%**	**20%**	**25%**	**32%**	**40%**	**50%**	**63%**	**80%**

If the above ratios are exceeded, several options are available to the builder including one or more of: reducing the size of the window, increasing the inter-pane air spacing, the use of thicker glazing, the use of "laminated" glazing (1 or 2 panes), etc.

WORKED EXAMPLE 1:

- AIF shown in this study: 31
- Actual room floor area: 250 sq.ft.
- You selected a window area of: 45 sq. ft
- Your window/floor ratio: (45 divided by 250, then times 100) =18%
- Your result is less than above table value 25%; i.e., standard glazing unit

WORKED EXAMPLE 2:

- AIF shown in this study: 34

[8] Based on a typical commercially available glazing: 3mm inside pane, 16mm inter-pane air space & 3mm exterior pane.

- Actual room floor area: 200 sq.ft.
- You selected a window area of: 50 sq. ft
- Your window/floor ratio: (50 divided by 200, then times 100) =25%
- Your result is more than above table value 13%; i.e., Non-standard (special) glazing unit

ABREVIATIONS:

Basic Descriptor	Measurement Weighting	Time Weighting Characteristics **F**(Fast)**. S**(Slow)**. I**(Impulse)**.**
L_p Sound pressure level	A-Weighted sound pressure level	L_{AF}, L_{AS}, L_{AI}
	C-Weighted sound pressure level	L_{CF}, L_{CS}, L_{CI}
	Z-Weighted sound pressure level (Flat)	L_{ZF}, L_{ZS}, L_{ZI}
L_{eq} Equivalent continuous sound level	Equivalent continuous A-weighted sound level	L_{Aeq}, L_{AIeq}
	Equivalent continuous C-weighted sound level	L_{Ceq}, L_{CIeq}
	Equivalent continuous Z-weighted (Flat) sound level	L_{Zeq}, L_{ZIeq}
L_E Sound Exposure Level	A-Weighted sound exposure Level	L_{AE}, L_{AIE}
	C-Weighted sound exposure Level	L_{CE}, L_{CIE}
	Z-Weighted sound exposure Level (Flat)	L_{ZE}, L_{ZIE}
L_{max}, L_{min} Maximum Sound Level	Maximum A-weighted sound level	L_{AFmax}, L_{ASmax}, L_{AImax}
	Maximum C-weighted sound level	L_{CFmax}, L_{CSmax}, L_{CImax}
	Maximum Z- weighted sound level (Flat)	L_{ZFmax}, L_{ZSmax}, L_{ZImax}
L_N Percentile Sound Level	Percentile A-weighted sound level	L_{AFNn}, L_{ASN}, L_{AIN}
	Percentile C-weighted sound level	L_{CFNn}, L_{CSN}, L_{CIN}
	Percentile Z-weighted sound level (Flat)	L_{ZFNn}, L_{ZSN}, L_{ZIN}
L_{peak} Peak Sound Level	A-Weighted peak sound level	L_{Apeak}
	C-Weighted peak sound level	L_{Cpeak}
	Z-Weighted peak sound level (Flat)	L_{Zpeak}

TABLES

TABLE 1
SUMMARY OF MINIMUM REQUIRED NOISE CONTROL MEASURES

RECEPTOR	PARAPET SOUND BARRIER/ SOUND BARRIER	CENTRAL AIR CONDITIONING	PROVISION FOR CENTRAL AIR CONDITIONING	WARNING CLAUSE
Building 1: 8th Floor Common OLA (West Side of Building)	Yes	--	--	--
Building 2: 10th Floor Common OLA (South Side of Building)	Yes	--	--	--
Building 2: 10th Floor Common OLA (North Side of Building)	No	--	--	--
Building 3: 10th Floor Common OLA (North Side of Building)	Yes	--	--	--
Buildings 1, 2 and 3: Exterior Amenity Courtyard (Common OLA on Ground Floor)	No	--	--	--
Buildings 1, 2 and 3: All units within the buildings	--	Yes	--	Yes

N6 Leq-AIF Master-January 2007 Proceed **SS WILSON ASSOCIATES**

2021-05-25 9:57 **Leq- AIF CALCULATIONS AND TYPICAL WINDOW GLAZING REQUIREMENTS** (Using NRC/MOE Pocedure

File Number : WA20-059 **OUTDOORS**

Project Name : 3085 Hurontario St., Mississauga **Table 2**

Description : Mississauga

Any Heavy Rail Line ? Yes

Description : Condo Building

Appropriate adjustment will be applied to the Acoustic Insulation Factor to account for their

Record Number	1	2	3	4	5	6	7	8	9	10	11	12
Consider Record	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
RECEPTOR	Bldg 1-8th floor	Bldg 2-10th floor South Side	Bldg 2-10th floor North Side	Bldg 3-8th floor North Side	Courtyard							
FACE/DIRECTION	South	South	North	North	South							
LOCATION	Common COLA	Common COLA	Common COLA	Common COLA	Common COLA							
Source 1: Hurontario St	Road Traffic		OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			
Leq Outdoors	57.00	56.00	53.00	60.00	54.00							
Partial angle of exposure, degrees	180	180	180	180	180							
Partial exposure adjust., dB												
Barrier Adjustment, dB	-3.00	-4.00		-7.00								
Additional Adjustment, dB												
Sub-Total Leq, dBA	54.00	52.00	53.00	53.00	54.00							
Source 2: LRT	Rail Traffic		OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			
Leq Daytime	54.00	58.00	50.00	56.00	50.00							
Partial angle of exposure, degrees	180	180	180	180	180							
Partial exposure adjust., dB												
Barrierl Adjustment, dB	-2.00	-6.00	-3.00	-5.00								
Additional Adjustment, dB												
Sub-Total Leq, dBA	52.00	52.00	47.00	51.00	50.00							
Source 3:	Road Traffic		OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			
Leq Daytime												
Partial angle of exposure, degrees	180	180	180	180	180							
Partial exposure adjust., dB												
Additional Adjustment, dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA												
Source 4:	Road Traffic		OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			OUTDOOR DAYTIME LEVELS			
Leq Daytime												
Partial angle of exposure, degrees	180	180	180	180	180							
Partial exposure adjust., dB												
Additional Adjustment, dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA												
Sub-Tot. 4 Sources Leq, dBA	**56.12**	**55.01**	**53.97**	**55.12**	**55.46**							
Aircraft noise NEF/NEP												
Adjust.1												
Adjust.2												
Adjusted NEF/NEP												
Approx. Overall Combined Leq	*56*	*55*	*54*	*55*	*55*							
Overall Road and/or Rail and/or Stationary Sources, Leq (dBA)	***56***	***55***	***54***	***55***	***55***							
Aircraft Noise Only, NEF												
NOTES	1.2m High Sound Barrier/ Parapet	1.4m High Sound Barrier/ Parapet	No Barrier Required	1.3m High Sound Barrier/ Parapet	No Barrier Required							

N6 Leq-AIF Master-January 2007 Proceed

SS WILSON ASSOCIATES

2021-05-25 9:57

Leq- AIF CALCULATIONS AND TYPICAL WINDOW GLAZING REQUIREMENTS

File Number : WA20-059

Project Name : 3085 Hurontario Street, Mississauga

DAYTIME

Table 3

(Using NRC/MOE Pocedures)

Description : Mississauga

Description : Condo Building

Caution: , the AIF Reported for heavy Rail Noise is the Higher of day and night

Record Number	1	2	3	4	5	6	7	8	9	10	11	12
Consider Record	Y	Y	N	N	N	N	N	N	N	N	N	N
RECEPTOR	BUILDING 1	BUILDING 2										
FACE/DIRECTION	West	West										
LOCATION	BUILDING FACADE	BUILDING FACADE										
ROOM CLASSIFICATION	Living /Dining	Living /Dining										
Adjustm. to Criterion, dBA												
MOE Transportation Sources Daytime Leq Indoor Criteria, dBA	45	45										
Aircraft Indoor Criteria, NEF	5	5										
Source 1: Hurontario St	Road Traffic		**DAYTIME LEVELS**			DAYTIME LEVELS			DAYTIME LEVELS			
Leq Daytime	70.00	64.00										
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA	70.00	64.00										
Angular range of incidence (0,1,2,3)												
Adjusted AIF	32	26	-38	-38	-38	-38	29	18	9	-38	-38	-38
Source 2: LRT	Rail Traffic		**DAYTIME LEVELS**			DAYTIME LEVELS			DAYTIME LEVELS			
Leq Daytime	64.00	57.00										
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA	64.00	57.00										
Angular range of incidence (0,1,2,3)												
Adjusted AIF	31	24	34	-28	-28	-28	-28	-28	-28	-28	-28	-28
Source 3:	Road Traffic		**DAYTIME LEVELS**			DAYTIME LEVELS			DAYTIME LEVELS			
Leq Daytime												
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA												
Angular range of incidence (0,1,2,3)												
Adjusted AIF	-38	-38	-38	-38	-38	-38	-38	-38	-38	-38	-38	-38
Source 4:	Road Traffic		**DAYTIME LEVELS**			DAYTIME LEVELS			DAYTIME LEVELS			
Leq Daytime												
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA												
Angular range of incidence (0,1,2,3)												
Adjusted AIF	-38	-38	-38	-38	-38	-38	-38	-38	-38	-38	-38	-38
Sub-Tot. 4 Sources Leq, dBA	**70.97**	**64.79**										
Aircraft noise NEF/NEP												
Adjust.1												
Adjust.2												
Adjusted NEF/NEP												
Approx. Overall Combined Leq	*71*	*65*										
Assumed Window/ Floor Area %	32.0	32.0										
Assumed Total # of Components (Road, Rail, and Other Sources)	3	3										
Assumed Total # of Components Aircraft ONLY	3	3										
AIF of 4 Sources	*34*	*28*										
Aircraft AIF												
Combined AIF	34	28										
Openable or Fixed windows ?	Openable	Openable										
Regular or Laminated Glass	Regular	Regular										
Other Adjustment												
Final Adjusted AIF	34	28										
Minimum STC (Approx)	*35*	*29*										
Typical Minimum Double Glazing Alternatives	3(40)3 4(32)4 3(25)6 6(24)6	3(6)3										
NOTES	A/C Required	A/C Required										

SS WILSON ASSOCIATES

SUMMARY TABLE OF **Leq- AIF CALCULATIONS AND TYPICAL WINDOW GLAZING REQUIREMENTS**

WA20-059

3085 Hurontario Street, Mississauga

Mississauga

Condo Building

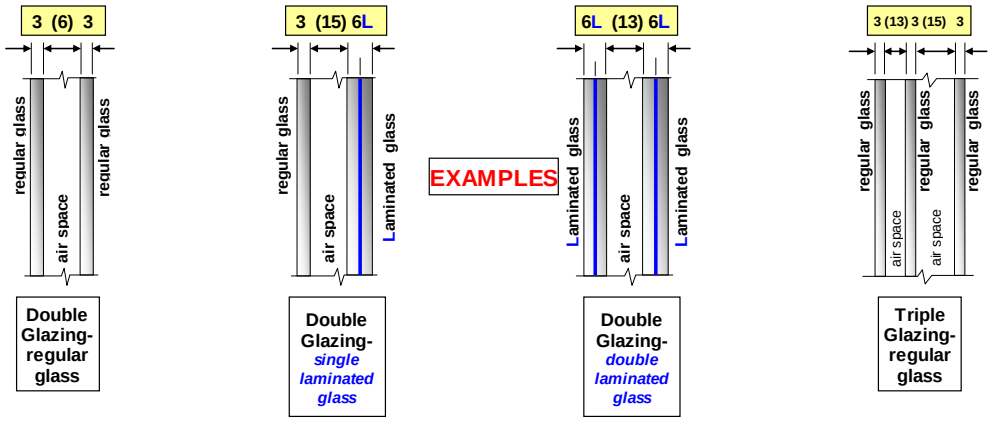
DAYTIME

Table 3

- Windows must be well-fitted weatherstripped units.
- The interpane spacing shown in the tables are the minimum acceptable.
- Larger spacing for a given glazing thickness normally improves the performance.

RECEPTOR	FACE/DIRECTION	ROOM CLASSIFICATION	LOCATION	Openable or Fixed Window	Regular Strength or Laminated Glass	Combined AIF	Approx. Overall Combined Leq	Double Glazing Alternatives , mm	Triple Glazing Alternatives , mm	*Minimum STC (Approx)*
BUILDING 1	West	Living /Dining	BUILDING FA	Openable	Regular	34	71	3(40)3 4(32)4 3(25)6 6(24)6		*35*
BUILDING 2	West	Living /Dining	BUILDING FA	Openable	Regular	28	65	3(6)3		*29*

ABBREVIATIONS SPECIFIC TO THIS PROJECT : FF(Front Face), RF(Rear Face), RS(Right Side face), LS(Left Side face)



N6 Leq-AIF Master-January 2007 Proceed

SS WILSON ASSOCIATES

2021-05-25 9:57

Leq- AIF CALCULATIONS AND TYPICAL WINDOW GLAZING REQUIREMENTS (Using NRC/MOE Poc

File Number : WA20-059

Project Name : 3085 Hurontario Street

Description : Mississauga

NIGHT TIME

Table 4

Description : Condo Building

Caution: , the AIF Reported for heavy Rail Noise is the Higher of day and night

Record Number	1	2	3	4	5	6	7	8	9	10	11	12
Consider Record	Y	Y	N	N	N	N	N	N	N	N	N	N
TOWNHOUSE/UNIT NO.	BUILDING 1	BUILDING 2										
FACE/DIRECTION	West	West										
LOCATION	BUILDING FACADE	BUILDING FACADE										
ROOM CLASSIFICATION	Bedroom	Bedroom										
Adjustm. to Criterion, dBA												
MOE Transportation Sources Night Leq Indoor Criteria, dBA	40	40										
Aircraft Indoor Criteria, NEF												
Source 1: Hurontario St	Road Traffic		**NIGHT TIME LEVELS**			NIGHT TIME LEVELS			NIGHT TIME LEVELS			
Leq Night Time	63.00	58.00										
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA	63.00	58.00										
Angular range of incidence (0,1,2,3)												
Adjusted AIF	30	25	25	19	25	13	26	15	6	-33	-33	-33
Source 2: LRT	Rail Traffic		**NIGHT TIME LEVELS**			NIGHT TIME LEVELS			NIGHT TIME LEVELS			
Leq Night Time	57.00	51.00										
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA	57.00	51.00										
Angular range of incidence (0,1,2,3)												
Adjusted AIF	31	24	34	-28	-28	-28	-28	-28	-28	-28	-28	-28
Source 3:	Road Traffic		**NIGHT TIME LEVELS**			NIGHT TIME LEVELS			NIGHT TIME LEVELS			
Leq Night Time												
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA												
Angular range of incidence (0,1,2,3)												
Adjusted AIF	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33
Source 4:	Road Traffic		**NIGHT TIME LEVELS**			NIGHT TIME LEVELS			NIGHT TIME LEVELS			
Leq Night Time												
Partial angle of exposure, degrees	180	180										
Partial exposure adjust., dB												
Additional Adjustment, dB												
Sub-Total Leq, dBA												
Angular range of incidence (0,1,2,3)												
Adjusted AIF	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33
Sub-Tot. 4 Sources Leq, dBA	**63.97**	**58.79**										
Aircraft noise NEF/NEP												
Adjust.1												
Adjust.2												
Adjusted NEF/NEP												
Approx. Overall Combined Leq	*64*	*59*										
Assumed Window/ Floor Area %	20.0	20.0										
Assumed Total # of Components (Road, Rail, and Other Sources)	3	3										
Assumed Total # of Components Aircraft ONLY	3	3										
AIF of 4 Sources	*33*	*27*										
Aircraft AIF												
Combined AIF	33	27										
Openable or Fixed windows ?	Openable	Openable										
Regular or Laminated Glass	Regular	Regular										
Other Adjustment												
Final Adjusted AIF	33	27										
Minimum STC (Approx)	*32*	*26*										
Typical Minimum Double Glazing Alternatives	3(20)3 4(16)4 3(13)6 6(13)6	3(6)3										
NOTES	A/C Required	A/C Required										

SS WILSON ASSOCIATES

SUMMARY TABLE OF **Leq- AIF CALCULATIONS AND TYPICAL WINDOW GLAZING REQUIREMENTS**

WA20-059

3085 Hurontario Street

Mississauga

Condo Building

NIGHT TIME

Table 4

- Windows must be well-fitted weatherstripped units. - The interpane spacing shown in the tables are the minimum acceptable.
- Larger spacing for a given glazing thickness normally improves the performance.

TOWNHOUSE/UNIT NO.	FACE/DIRECTION	ROOM CLASSIFICATION	LOCATION	Openable or Fixed Window	Regular Strength or Laminated Glass	Combined AIF	Approx. Overall Combined Leq	Double Glazing Alternatives , mm	Triple Glazing Alternatives , mm	*Minimum STC (Approx)*
BUILDING 1	West	Bedroom	BUILDING FA	Openable	Regular	33	64	3(20)3 4(16)4 3(13)6 6(13)6		*32*
BUILDING 2	West	Bedroom	BUILDING FA	Openable	Regular	27	59	3(6)3		*26*

ABBREVIATIONS SPECIFIC TO THIS PROJECT : FF(Front Face), RF(Rear Face), RS(Right Side face), LS(Left Side face)

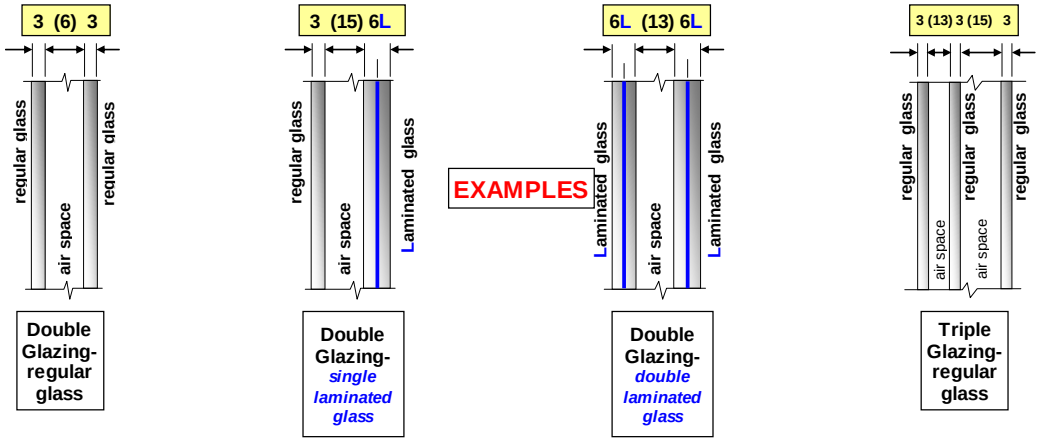


TABLE 5
BARRIER HEIGHTS TO ACHIEVE L_{Aeq} 55 dBA IN OLAs

RECEPTOR	OLA Sound Level Without Barrier, $L_{Aeq(day)}$, dBA	BARRIER HEIGHT, m TO ACHIEVE THE FOLLOWING, $L_{Aeq(day)}$, dBA					
		60	59	58	57	56	55
Building 1: 8th Floor Common OLA (West side of Building)	59	--	--	--	1.1	1.2	2.5
Building 2: 10th Floor Common OLA (South side of Building)	60	--	--	--	--	1.1	1.4
Building 3: 10th Floor Common OLA (North Side of Building)	62	--	--	--	--	1.1	1.3

FIGURES

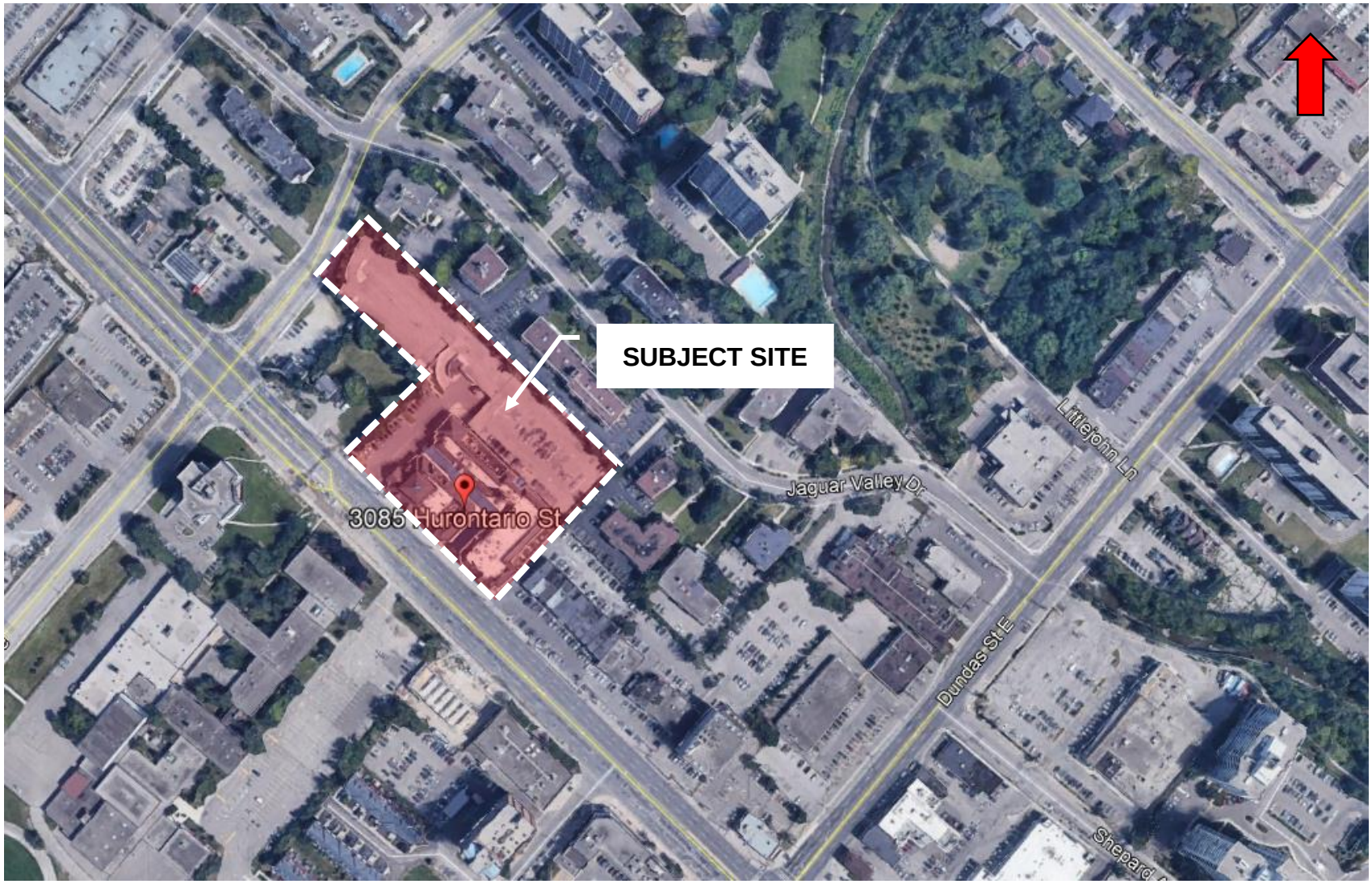


FIGURE 1
KEY PLAN

SS Wilson Associates Consulting Engineers

Project No.: WA20-059

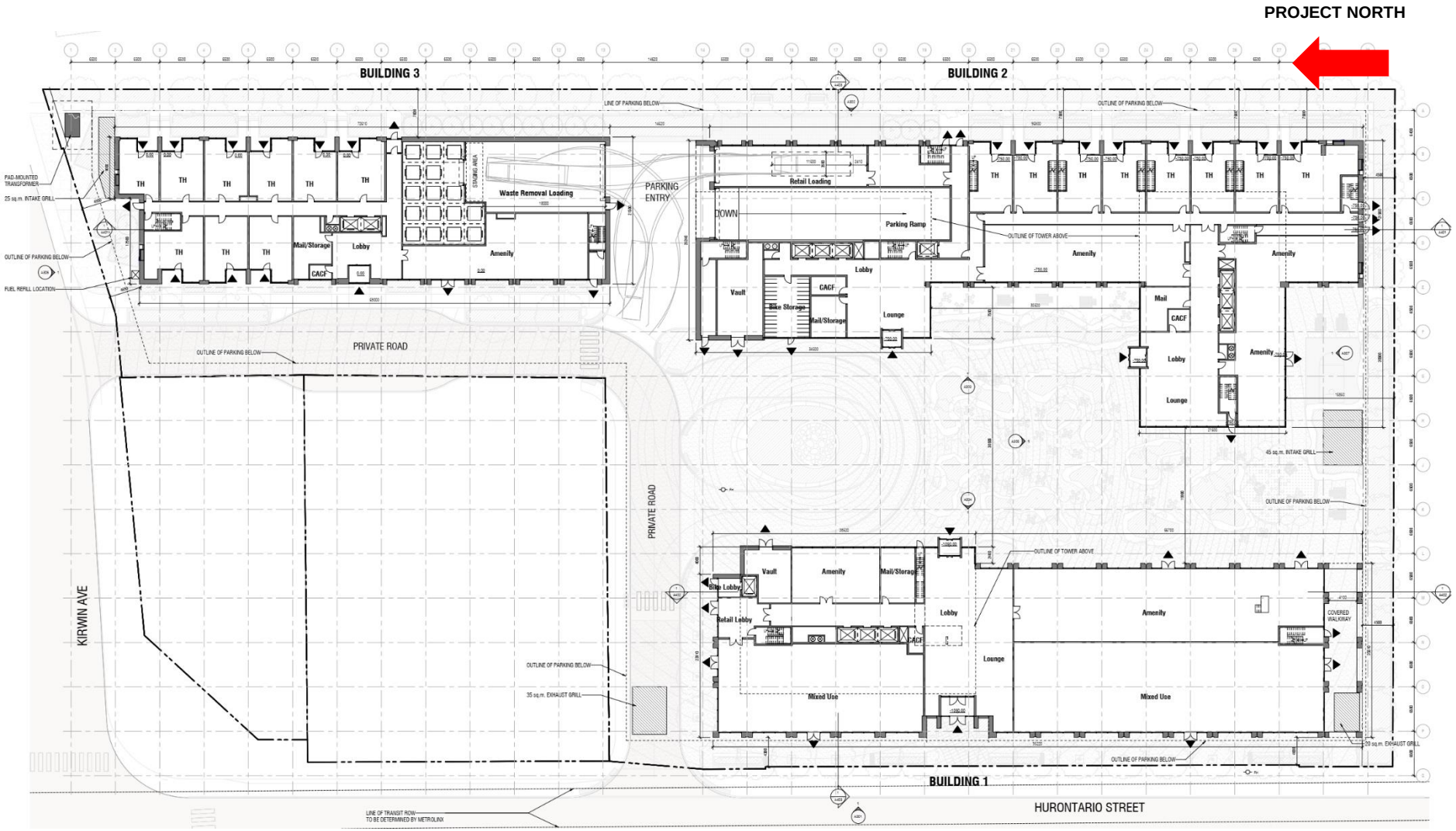


FIGURE 2
GROUND FLOOR/SITE PLAN

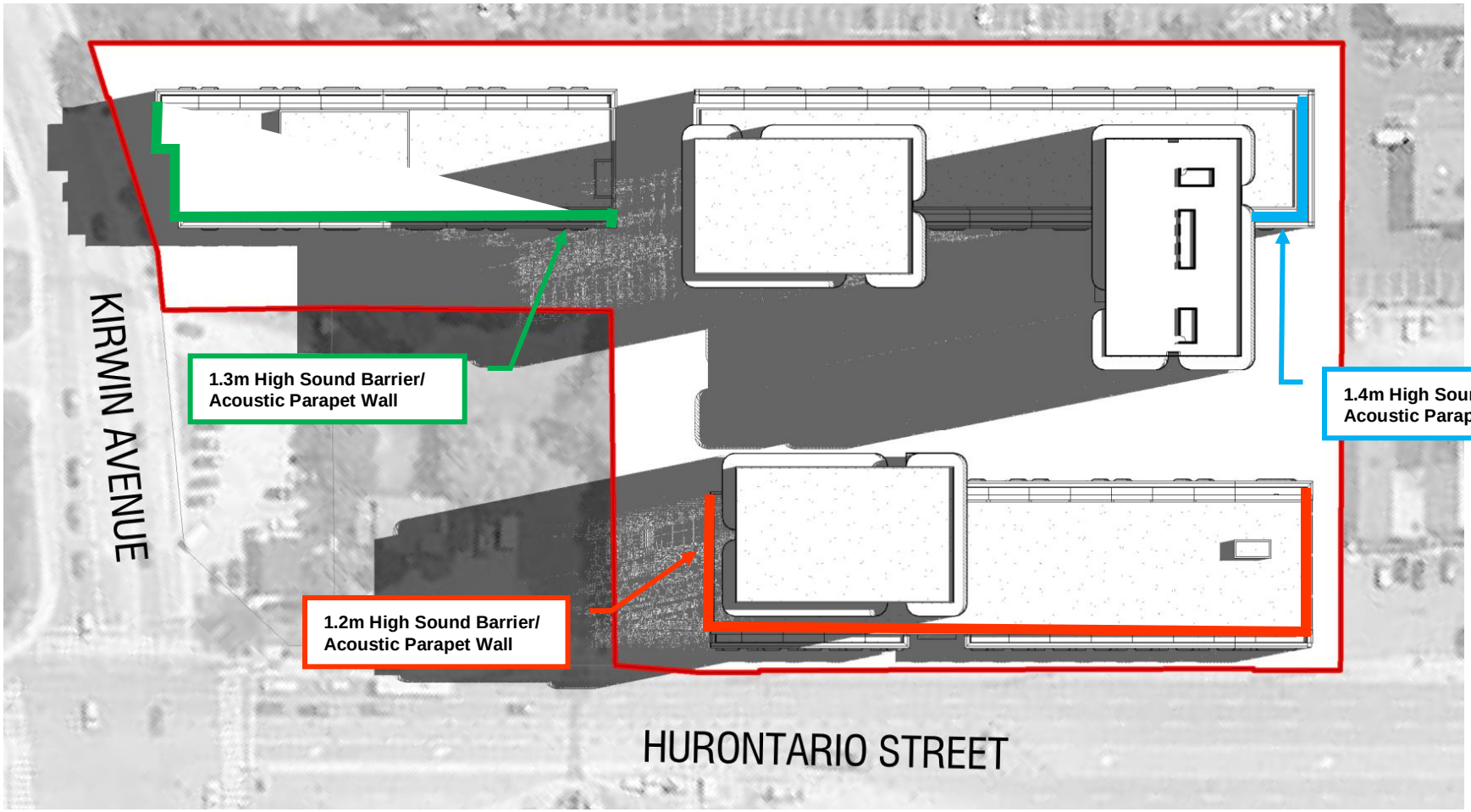


FIGURE 3
BUILDINGS 1, 2, AND 3:
SCHEMATIC BARRIER ALIGNMENTS

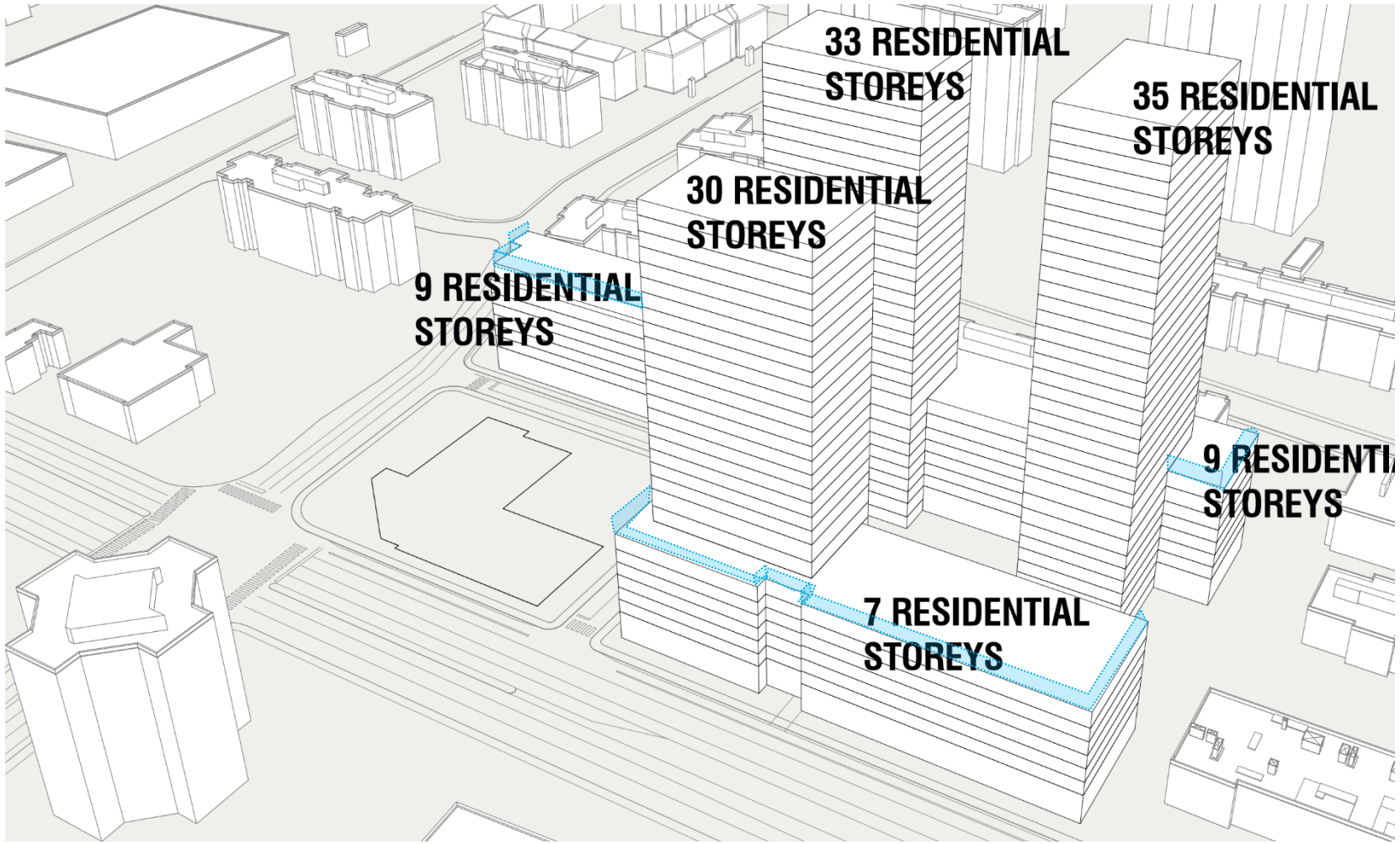


FIGURE 4
BUILDINGS 1, 2, AND 3:
SCHEMATIC BARRIER ALIGNMENTS-3D VIEW

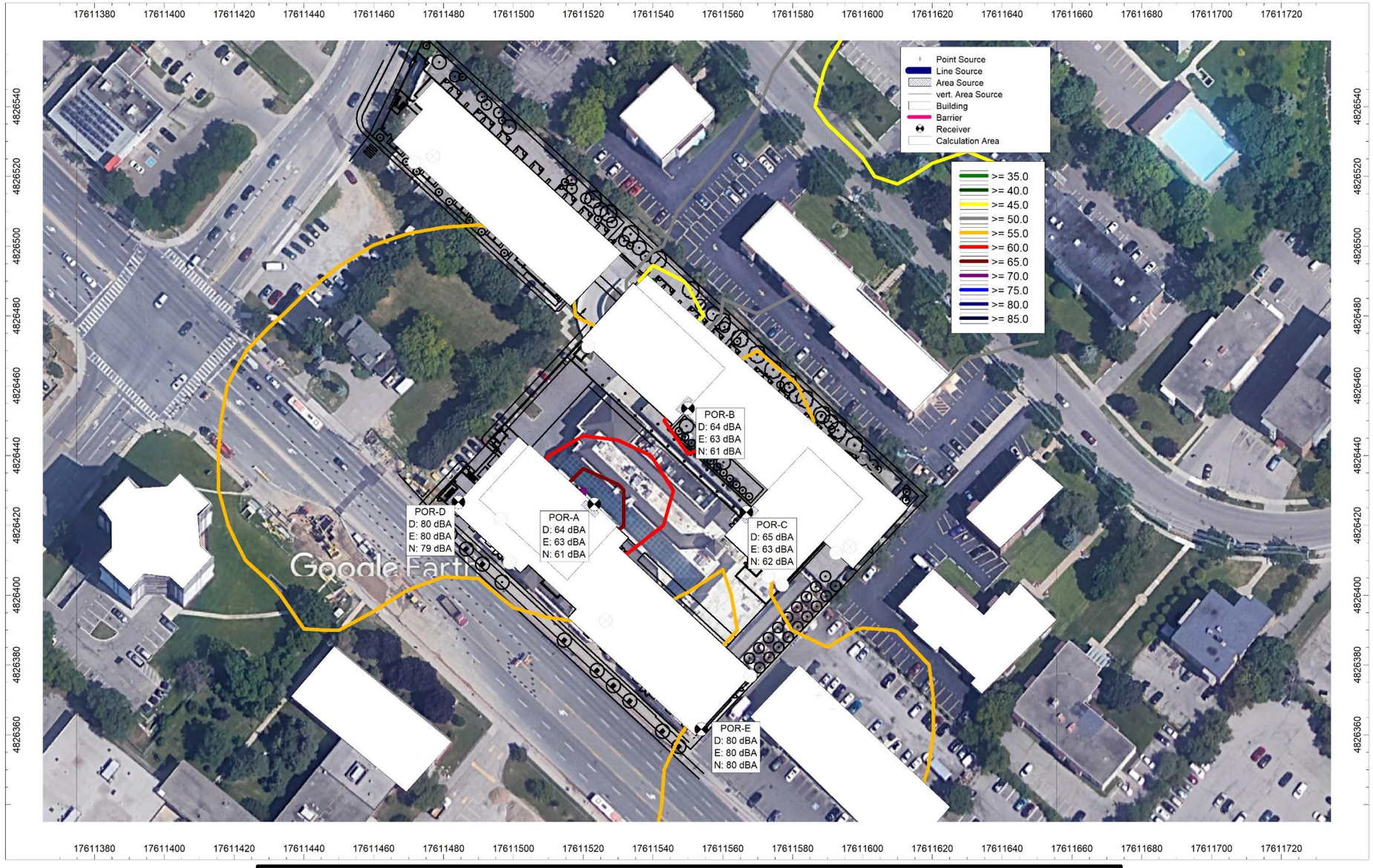


FIGURE 5
STATIONARY SOURCES OF NOISE INTERNAL TO PROPOSED DEVELOPMENT – UNMITIGATED IMPACT SOUND LEVEL CONTOURS (100 m ELEV)

FIGURE 6
STATIONARY SOURCES OF NOISE INTERNAL TO PROPOSED DEVELOPMENT –MITIGATED IMPACT SOUND LEVEL CONTOURS (100 m ELEV)

FIGURE 7
STATIONARY SOURCES OF NOISE EXTERNAL TO PROPOSED DEVELOPMENT – UNMITIGATED IMPACT SOUND LEVEL CONTOURS (12m ELEV)

APPENDIX A

ROAD TRAFFIC DATA

Date:	03-Dec-20

REQUESTED BY:

Name:	Cheryl McMurter
Company:	SS Wilson Associates

PREPARED BY:

Name:	Bertuen Mickle
Tel#:	(905) 615-3200

NOISE REPORT FOR PROPOSED DEVELOPMENT

MISSISSAUGA

Location:	Hurontario Street between Hillcrest Avenue and Dundas street West
ID#:	495

ON SITE TRAFFIC DATA

Specific	Street Names				
[redacted]	Hurontarion Street				
AADT:	46,100				
# of Lanes:	4 Lanes				
% Trucks:	5%				
Medium/Heavy Trucks Ratio:	55/45				
Day/Night Traffic Split:	90/10				
Posted Speed Limit:	50 km/h				
Gradient of Road:	<2%				
Ultimate R O W:	35m				

Comments:

- Ultimate Traffic Data Only (2041 ADT)
- Ultimate Data is based on the proposed LRT project along Hurontario Street with existing lanes converted from 6 to 4 lanes with 2 LRT lanes in middle/both sides
-Please contact Farhad Shala @(905)-616-2300 ext. 3377 of farhad.shala@mississauga.ca

Classification Details Report

Location: LAKESHORE RD E btwn DETA RD & LAKESHORE RD E

Municipality: Mississauga

Eastbound

	1	2	3	4	5	6	7	8	Grand Total
StartTime	0-4.8	4.9-9	9.1-10	10.1-13	13.1-15.8	15.9-18.8	18.9-22.5	22.6-40	
5/3/2018 12:00 AM	29	37	2	3	3	0	0	0	74
5/3/2018 1:00 AM	8	24	0	2	2	0	2	0	38
5/3/2018 2:00 AM	5	18	2	0	0	1	0	0	26
5/3/2018 3:00 AM	8	8	0	4	0	0	0	0	20
5/3/2018 4:00 AM	10	15	0	1	1	0	0	1	28
5/3/2018 5:00 AM	29	83	0	7	5	0	3	1	128
5/3/2018 6:00 AM	136	274	11	20	10	6	0	4	461
5/3/2018 7:00 AM	184	413	13	31	12	2	4	9	668
5/3/2018 8:00 AM	256	515	8	32	15	8	7	6	847
5/3/2018 9:00 AM	144	367	9	17	11	3	7	3	561
5/3/2018 10:00 AM	123	285	3	27	8	8	3	2	459
5/3/2018 11:00 AM	118	241	8	12	10	1	3	2	395
5/3/2018 12:00 PM	128	295	10	22	7	4	2	5	473
5/3/2018 1:00 PM	104	246	4	20	10	3	2	6	395
5/3/2018 2:00 PM	135	323	11	21	14	2	6	1	513

5/3/2018 3:00 PM	159	359	5	21	11	6	8	3	572
5/3/2018 4:00 PM	198	486	11	31	28	2	5	12	773
5/3/2018 5:00 PM	228	461	14	19	10	4	8	7	751
5/3/2018 6:00 PM	202	464	5	21	4	2	6	4	708
5/3/2018 7:00 PM	172	440	7	13	5	1	4	3	645
5/3/2018 8:00 PM	105	258	7	6	5	0	2	1	384
5/3/2018 9:00 PM	108	203	2	10	4	0	0	1	328
5/3/2018 10:00 PM	65	141	2	5	2	0	0	0	215
5/3/2018 11:00 PM	61	121	4	7	3	2	0	3	201
Grand Total	2715	6077	138	352	180	55	72	74	9663
	1	2	3	4	5	6	7	8	Grand Total
Total %	28.10%	62.89%	1.43%	3.64%	1.86%	0.57%	0.75%	0.77%	100.00%

Classification Details Report

Location: LAKESHORE RD E btwn DETA RD & LAKESHORE RD E

Municipality: Mississauga

Westbound

	1	2	3	4	5	6	7	8	Grand Total
StartTime	0-4.8	4.9-9	9.1-10	10.1-13	13.1-15.8	15.9-18.8	18.9-22.5	22.6-40	
5/3/2018 12:00 AM	40	46	1	2	2	0	0	0	91
5/3/2018 1:00 AM	23	27	0	4	3	0	1	0	58
5/3/2018 2:00 AM	18	11	0	0	1	0	0	0	30
5/3/2018 3:00 AM	15	17	0	1	0	0	0	0	33
5/3/2018 4:00 AM	16	12	2	0	1	1	2	0	34
5/3/2018 5:00 AM	25	50	1	4	2	3	3	0	88
5/3/2018 6:00 AM	99	137	0	7	3	2	4	2	254
5/3/2018 7:00 AM	212	249	5	11	10	5	4	0	496
5/3/2018 8:00 AM	280	395	6	21	6	5	3	0	716
5/3/2018 9:00 AM	224	277	3	15	8	3	3	1	534
5/3/2018 10:00 AM	191	252	8	13	8	2	3	1	478
5/3/2018 11:00 AM	189	244	6	16	4	4	2	0	465
5/3/2018 12:00 PM	256	325	7	18	2	1	3	2	614
5/3/2018 1:00 PM	245	280	4	10	6	4	3	2	554
5/3/2018 2:00 PM	345	351	6	7	7	4	3	2	725

5/3/2018 3:00 PM	474	610	8	13	2	5	7	1	1120
5/3/2018 4:00 PM	586	677	9	31	12	7	10	4	1336
5/3/2018 5:00 PM	560	667	11	11	7	6	4	0	1266
5/3/2018 6:00 PM	412	506	5	17	4	1	3	0	948
5/3/2018 7:00 PM	309	375	4	11	3	3	1	1	707
5/3/2018 8:00 PM	259	242	1	9	0	1	1	0	513
5/3/2018 9:00 PM	158	183	3	5	3	1	0	0	353
5/3/2018 10:00 PM	125	173	3	9	1	0	0	0	311
5/3/2018 11:00 PM	102	127	3	5	1	1	0	1	240
Grand Total	5163	6233	96	240	96	59	60	17	11964
	1	2	3	4	5	6	7	8	Grand Total
Total %	43.15%	52.10%	0.80%	2.01%	0.80%	0.49%	0.50%	0.14%	100.00%

Table 4: Future 2031 "With Project" Traffic Volumes

Roadway	Intersection		Daytime Traffic				Night-time Traffic			
		POR	Cars	Medium	Heavy	LRT Sets	Cars	Medium	Heavy	LRT Sets
Hurontario St.	Park St.	1	18,717	597	518	280	2,080	66	58	44
Hurontario St.	Mineola Rd.	2	21,845	574	557	280	2,427	64	62	44
Hurontario St.	Paisley Ave.	3	15,570	371	353	280	1,730	41	39	44
Hurontario St.	Fairview Rd.	4	20,734	417	372	280	2,304	46	41	44
Hurontario St.	Matthew's Gate	5	22,830	445	418	280	2,537	49	46	44
Burnhamthorpe Rd.	Duke of York Blvd.	6	26,181	893	667	280	2,909	99	74	44
Hurontario St.	Elia Ave.	7	20,637	518	482	280	2,293	58	54	44
Hurontario St.	Bristol Rd.	8	21,218	679	521	280	2,358	75	58	44
Hurontario St.	Superior Blvd.	9	29,817	738	702	280	3,313	82	78	44
Hurontario St.	County Court Blvd.	10	15,648	422	377	280	1,739	47	42	44
Main St.	Elgin Dr.	11	9,780	254	209	280	1,087	28	23	44
Main St.	Clarence St.	12	4,058	94	94	280	451	10	10	44
Main St.	Queen St.	13	12,414	689	231	280	1,379	77	26	44
Main St.	Church St.	14	21,168	322	322	280	2,352	36	36	44

APPENDIX B

SAMPLE SOUND LEVEL CALCULATIONS

```
STAMSON 5.0        SUMMARY REPORT        Date: 25-05-2021 09:41:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rb3ncola.te          Time Period: Day/Night 16/8 hours
Description: Building 3-Sound Level at Common OLA

Road data, segment # 1: Hurontario N (day/night)
-----------------------------------------------
Car traffic volume  : 19708/2190  veh/TimePeriod  *
Medium truck volume :   570/63    veh/TimePeriod  *
Heavy truck volume  :   467/52    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  23050
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Hurontario N (day/night)
-----------------------------------------------
Angle1   Angle2           : -60.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  82.00 / 82.00  m
Receiver height           :   1.50 / 75.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :  28.50 m
Barrier elevation         :  28.50 m
Reference angle           :   0.00

Road data, segment # 2: Hurontario S (day/night)
-----------------------------------------------
Car traffic volume  : 19708/2190  veh/TimePeriod  *
Medium truck volume :   570/63    veh/TimePeriod  *
Heavy truck volume  :   467/52    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  23050
    Percentage of Annual Growth        :   0.00
```

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Hurontario S (day/night)
-----------------------------------------------
Angle1   Angle2           : -60.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  98.00 / 98.00  m
Receiver height           :   1.50 / 75.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :  28.50 m
Barrier elevation         :  28.50 m
Reference angle           :   0.00

Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Hurontario N     !     1.22 !    54.26 !    54.26
 2.Hurontario S     !     1.22 !    58.70 !    58.70 *
--------------------+---------+---------+---------
                      Total                  60.03 dBA

  * Bright Zone  !

Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Hurontario N     !     1.23 !    52.94 !    52.94 *
 2.Hurontario S     !     1.23 !    52.17 !    52.17 *
--------------------+---------+---------+---------
                      Total                  55.58 dBA

  * Bright Zone  !
TOTAL Leq FROM ALL SOURCES (DAY): 60.03
                           (NIGHT): 55.58
```

STAMSON 5.0 SUMMARY REPORT Date: 25-05-2021 09:41:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rb3ncolb.te Time Period: Day/Night 16/8 hours
Description: Building 3-Sound Level at Common OLA with Barrier

```
Road data, segment # 1: Hurontario N (day/night)
-----------------------------------------------
Car traffic volume  : 19708/2190  veh/TimePeriod  *
Medium truck volume :   570/63    veh/TimePeriod  *
Heavy truck volume  :   467/52    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  23050
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Hurontario N (day/night)
-----------------------------------------------
Angle1   Angle2           : -60.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  82.00 / 82.00  m
Receiver height           :   1.50 / 75.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.30 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :  28.50 m
Barrier elevation         :  28.50 m
Reference angle           :   0.00

Road data, segment # 2: Hurontario S (day/night)
-----------------------------------------------
Car traffic volume  : 19708/2190  veh/TimePeriod  *
Medium truck volume :   570/63    veh/TimePeriod  *
Heavy truck volume  :   467/52    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  23050
```

```
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Hurontario S (day/night)
-----------------------------------------------
Angle1   Angle2           : -60.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  98.00 / 98.00  m
Receiver height           :   1.50 / 75.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.30 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :  28.50 m
Barrier elevation         :  28.50 m
Reference angle           :   0.00

Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Hurontario N     !     1.22 !    49.67 !    49.67
 2.Hurontario S     !     1.22 !    49.93 !    49.93
--------------------+---------+---------+---------
                      Total                  52.81 dBA

Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Hurontario N     !     1.23 !    52.94 !    52.94 *
 2.Hurontario S     !     1.23 !    52.17 !    52.17 *
--------------------+---------+---------+---------
                      Total                  55.58 dBA

  * Bright Zone  !

TOTAL Leq FROM ALL SOURCES (DAY): 52.81
                           (NIGHT): 55.58
```

STAMSON 5.0 SUMMARY REPORT Date: 25-05-2021 09:43:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rb3west.te Time Period: Day/Night 16/8 hours
Description: Building 3-Sound Levels at Building Facade

```
Road data, segment # 1: Hurontario N (day/night)
-----------------------------------------------
Car traffic volume  : 19708/2190  veh/TimePeriod  *
Medium truck volume :   570/63    veh/TimePeriod  *
Heavy truck volume  :   467/52    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  23050
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Hurontario N (day/night)
-----------------------------------------------
Angle1   Angle2           : -70.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  77.00 / 77.00  m
Receiver height           : 106.00 / 106.00 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Hurontario S (day/night)
-----------------------------------------------
Car traffic volume  : 19708/2190  veh/TimePeriod  *
Medium truck volume :   570/63    veh/TimePeriod  *
Heavy truck volume  :   467/52    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  23050
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Hurontario S (day/night)
------------------------------------------------
Angle1   Angle2           : -70.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  93.00 / 93.00  m
Receiver height           :  96.00 / 96.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Result summary (day)
--------------------

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Hurontario N      !     1.22 !    60.03 !    60.03
 2.Hurontario S      !     1.22 !    59.21 !    59.21
--------------------+---------+---------+---------
                       Total                 62.65 dBA

Result summary (night)
----------------------

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Hurontario N      !     1.23 !    53.50 !    53.50
 2.Hurontario S      !     1.23 !    52.68 !    52.68
--------------------+---------+---------+---------
                       Total                 56.12 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 62.65
                           (NIGHT): 56.12
```

SAMPLE CADNA OUTPUT FOR EXTERNAL STATIONARY SOURCES

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (m)	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°C)	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (m/s)	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver
Name: B1P_12m_extsrc
ID: !00!R_1
X: 17611567.85
Y: 4826376.85
Z: 11.00

Point Source, ISO 9613, Name: "Kitchen Exhaust 1", ID: "Kitchen_Ex1"																			
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	17611587.53	4826371.22	12.00	0	D	A	85.7	0.0	0.0	0.0	37.2	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	51.3
2	17611587.53	4826371.22	12.00	1	D	A	85.7	0.0	0.0	0.0	53.5	0.7	-3.0	0.0	0.0	14.4	0.0	1.0	19.1

Point Source, ISO 9613, Name: "Kitchen Exhaust 2", ID: "Kitchen_Ex2"																			
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
4	17611591.50	4826367.38	12.00	0	D	A	85.7	0.0	0.0	0.0	39.1	0.2	-3.0	0.0	0.0	0.0	0.0	0.0	49.4
6	17611591.50	4826367.38	12.00	1	D	A	85.7	0.0	0.0	0.0	53.8	0.8	-3.0	0.0	0.0	14.4	0.0	1.0	18.7

Receiver
Name: B2ST_12m_extsrc
ID: !00!R_1
X: 17611577.04
Y: 4826402.95
Z: 12.00

Point Source, ISO 9613, Name: "Kitchen Exhaust 1", ID: "Kitchen_Ex1"																			
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
3	17611587.53	4826371.22	12.00	0	D	A	85.7	0.0	0.0	0.0	41.5	0.2	-3.0	0.0	0.0	0.0	0.0	0.0	47.0
5	17611587.53	4826371.22	12.00	1	D	A	85.7	0.0	0.0	0.0	46.3	0.4	-3.0	0.0	0.0	0.0	0.0	1.0	41.0

Point Source, ISO 9613, Name: "Kitchen Exhaust 2", ID: "Kitchen_Ex2"																			
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
7	17611591.50	4826367.38	12.00	0	D	A	85.7	0.0	0.0	0.0	42.7	0.2	-3.0	0.0	0.0	0.0	0.0	0.0	45.8