Noise Feasibility Study for Ottawa Community Housing

Branch Street and Jockvale Road/Longfields Drive, Ottawa, ON

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August 19, 2025
Reference: 24-05-23-R
Version: 02

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Revision Log

Version	Date	Prepared by	Reviewed by	Description
00	11/10/2024	Srinivasa-Rao Ippili	Pascal Everton	Noise Feasibility Study Report - DRAFT
01	25/07/2025	Srinivasa-Rao Ippili	Pascal Everton	Noise Feasibility Study Report (updated post-SPCA feedback)
02	19/08/2025	Srinivasa-Rao Ippili	Roderick Mackenzie	Noise Feasibility Study Report - FINAL (updated post-response from City regarding AC system equivalencies)

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1 Introduction

Lemay Michaud (the Client) retained Soft dB to complete a noise feasibility study for the proposed Ottawa Community Housing (OCH) development. As part of the current Design Development (DD) phase, the site plan dated April 30, 2025, includes a 9-storey condominium building with 99 residential units and a 3-storey townhouse building comprising 18 units. The development is situated fronting Branch Street and bounded by Jockvale Road and Longfields Drive to the north and east, respectively (see Figure 1).

The client is currently in the process of submitting documentation for Site Plan Control Approval (SPCA). As part of the pre-consultation process, the City of Ottawa has requested that a noise study be completed in accordance with Ottawa's Environmental Noise Control Guidelines (ENCG) document based on Ministry of the Environment, Conservation and Parks (MECP) Environmental Noise Guideline NPC-300. This noise study has been conducted due to the site's proximity to significant transportation noise sources—specifically adjacent roadways—with the objective of identifying any required noise mitigation measures. Additionally, this study also evaluates potential noise impacts from proposed mechanical equipment on nearby noise-sensitive receptor locations, based on the DD drawings provided by the client. The following noise feasibility study has been carried out in accordance with Ottawa's ENCG and MECP's NPC-300 guidelines. Refer to Appendix A for the associated site plan documentation.

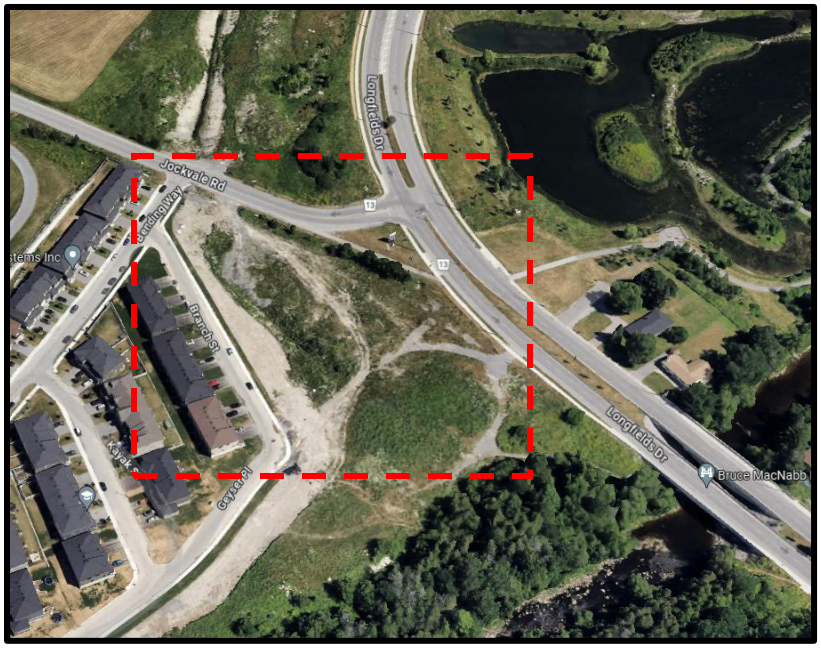


Figure 1: General site location (source: Google Earth)

The objectives of the noise impact study are:

- To assess the noise impact on the proposed development due to the transportation noise sources (road); and
- To assess the noise impact due to the proposed stationary noise sources from the building on the surrounding environment and on the project itself.
- To provide recommendations, if needed, to reduce any negative noise impact to comply with the municipal and provincial guidelines.

2 Methodology

The following methodology was used to conduct the noise assessment for the proposed residential development:

- Identification of all potential transportation (major roads) noise sources based on the aerial imagery analysis;
- Identification of the noise sensitive points of reception (POR) on the proposed developments and within the surrounding environment;
- Incorporate the relevant road traffic volumes from "Appendix B: Table of traffic and Road Parameters" of the City of Ottawa's ENCG document into a STAMSON model to predict transportation-related sound levels at the PORs associated with the proposed development, and to assess whether the predicted sound levels comply with the limits established in NPC-300;
- Evaluate and determine the maximum allowable sound levels from the assumed mechanical equipment within the condominium building to ensure compliance with the applicable noise limits at the POR locations as per NPC-300;
- If required, provide noise control recommendations to achieve compliance with applicable sound level limits.

3 Assessment Criteria

3.1 MECP – Environmental noise guidelines (NPC-300)

Part C of NPC-300 contains guidelines for addressing and controlling noise emissions for land use planning purposes. It also includes sound level limits for proposed noise sensitive land and specifies procedures for evaluating the sound level on the site of the proposed development due to transportation sources.

For a noise sensitive area, compliance with the sound level limits is typically established at the following points of reception (POR) depending on the type of noise sources affecting the proposed development:

- **Plane of Window (POW):** Represents the point in the space corresponding with the location of the centre of a window in a noise sensitive space. The noise impact assessment excludes the effect of sound reflection from the noise sensitive window under assessment. For transportation noise sources, the sound level at POW determines the requirements for ventilation and air-conditioning. Based on the POW sound levels; indoor noise levels are predicted which may dictate the requirements for any building element upgrades.

- **Outdoor Living Area (OLA):** Corresponds to the part of a noise-sensitive land use that is intended and designed for the quiet enjoyment of the outdoor environment and readily accessible from the building environment, such as backyards, balconies, parks, etc. If the noise-sensitive area is affected by transportation and/or stationary sources, a point of reception is placed at the OLA. To qualify as an OLA,

    - The point of assessment must be at least 3 metres from the building façade;
    - 1.5 metres above grade, aligned with midpoint of subject façade.

    If no at-grade points satisfy these requirements, balconies and elevated terraces (e.g., rooftop, etc.) can be considered as an OLA, provided they are not enclosed and have a minimum depth of 4 metres. Receptor points along the façade are assumed based on provided plans.

3.1.1 Transportation Noise Sources (Road)

According to Part C of the NPC-300 guidelines[1], when predicting sound levels from transportation sources, consideration should be given to future sound levels. For road traffic, a minimum 10-year projection is typically used, or 'ultimate' road traffic data may be used if provided by the city, region, or province.

Further, as mentioned in Part C of NPC-300, the sound levels should be assessed in an Outdoor Living Area (OLA) representing a patio, backyard or common outdoor amenity area, and at the plane of window (POW) corresponding to the noise sensitive indoor space. Compliance with the sound levels inside the proposed development is calculated from the predicted sound level at the façade of the respective spaces. The sound level limits for transportation noise sources as mentioned in the NPC-300 are summarized in Table 1.

Table 1:Sound level limits according to NPC-300

Location	Type of space	Time Period	Road Sound Level (dBA)
OLA (outdoor play area, patio, etc.)	Outdoor	Day Time (07:00–23:00)	55

[1] https://www.ontario.ca/page/environmental-noise-guideline-stationary-and-transportation-sources-approval-and-planning

Living areas	Indoor	Day Time (07:00–23:00)	45
		Nighttime (23:00–07:00)	45
Sleeping Quarters	Indoor	Day Time (07:00–23:00)	45
		Nighttime (23:00–07:00)	40

In cases where there is an exceedance of these sound level limits; noise control measures may be required. Noise control measures may include warning clauses, improved architectural design, installing noise barriers, upgrading building envelope elements such as windows, exterior walls, doors, etc. with upgraded sound isolation performance, and/or the requirement for central air-conditioning system or equivalent which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within target criteria.

As per NPC-300, a "*warning clause means a notification of or obligation to notify a potential purchaser or tenant of a potential annoyance due to an existing source of environmental noise. When circumstances warrant, agreements that are registered on title to the lands in question should incorporate provisions for using warning clauses. Warning clauses would be included in agreements of offers of purchase and sale, lease/rental agreements and condominium declarations. Alternatively, easements in respect of noise may also be appropriate in some circumstances.*" Appendix B outlines all the potential warning clauses as defined in the environmental noise guidelines NPC-300.

Table 2 summarizes the noise control measures when an OLA's sound level limit is exceeded.

Table 2:Noise control measures for an OLA due to road traffic

Assessment Location	Time	Sound Level (dBA)	Noise control measures
OLA	Daytime (07:00–23:00)	≤ 55	• None
		> 55 ≤ 60	• Provide noise control measures to reduce sound levels to ≤55 dBA. • If noise control measures are not provided, **warning clause Type A** must be included in rental/purchase agreements.
		> 60	• Provide noise control measures to reduce the sound level to ≤55 dBA. • If noise control measures are not feasible for technical, economic or administrative reasons, an exceedance over the 55 dBA limit will be acceptable with **warning clause Type B**. • **Any such exceedance above 60 dBA is not acceptable.**

Table 3 summarizes the ventilation requirements when the sound level at a POW of a bedroom or living/dining spaces is exceeded.

Table 3:Ventilation requirements for road traffic

Assessment Location	Time	Sound Level (dBA)	Ventilation Requirement	Warning Clause
Exterior façade at the POW of a bedroom or living/dining room	Day Time (07:00–23:00)	≤ 55	None	None
		> 55 ≤ 65	Provision for central air-conditioning or equivalent system	Recommended–Type C
		> 65	Central air-conditioning or equivalent system **required**	Yes–Type D
	Nighttime (23:00–07:00)	≤ 50	None	None
		> 50 ≤ 60	Provision for central air-conditioning or equivalent system	Recommended–Type C
		> 60	Central air-conditioning or equivalent system **required**	Yes–Type D

Noise mitigation measures such as noise barriers, improved architectural design, and/or upgrading building envelope elements such as windows, exterior walls, doors, etc. are required if the sound levels at exterior façade (POW) due to road traffic exceeds 65 dBA during the daytime and/or 60 dBA during nighttime.

3.1.2 Stationary Noise Sources

The applicable sound level limits used in the study to assess the noise from stationary mechanical equipment—are the MECP "Stationary Noise Source" guidelines for Class 1, 2, and 3 areas, as set out in NPC-300. The guideline states that the one-hour sound exposures ($L_{Aeq,1\ hour}$) from stationary noise sources shall not exceed the higher of either the background sound level or the limits presented within Table 4.

Table 4:Applicable exclusion limits in terms of $L_{Aeq,\ 1h}$ (dBA) from the NPC-300

Outdoor Points of Receptions (OPOR)			
Time of Day	Class 1 Area	Class 2 Area	Class 3 Area
Daytime (07:00—19:00)	**50**	50	45
Evening (19:00—23:00)	**50**	45	40
Plane of Window (POW) of Noise Sensitive Spaces			
Time of Day	Class 1 Area	Class 2 Area	Class 3 Area
Daytime (07:00—19:00)	**50**	50	45
Evening (19:00—23:00)	**50**	50	40
Nighttime (23:00—07:00)	**45**	45	40

Based on the geographical location and perceived surrounding environment, **the site's location is considered to be Class 1,** which is dominated by the activities of people and road traffic. Therefore, during the critical nighttime period, the applicable $L_{Aeq,\ 1hr}$ noise limit for Class 1 areas is 45 dBA for POW locations.

According to NPC-300, for emergency equipment, the sound level limits are 5 dB higher than the limits established for steady state sources and are assessed independently (excluding the contribution of the steady state sources). Therefore, when emergency equipment is in operation, the permissible $L_{Aeq,\ 1hr}$ limit is 50 dBA during the nighttime period.

4 Supporting Information

4.1 Transportation Noise Sources

The transportation noise sources, as defined by NPC-300, comprise the noise generated by the road, railway and air traffic near the location of the site. The acoustical environment at the subject land is mainly dominated by the noise from road traffic from Jockvale Road and Longfields Drive, see Figure 2 for road descriptions.

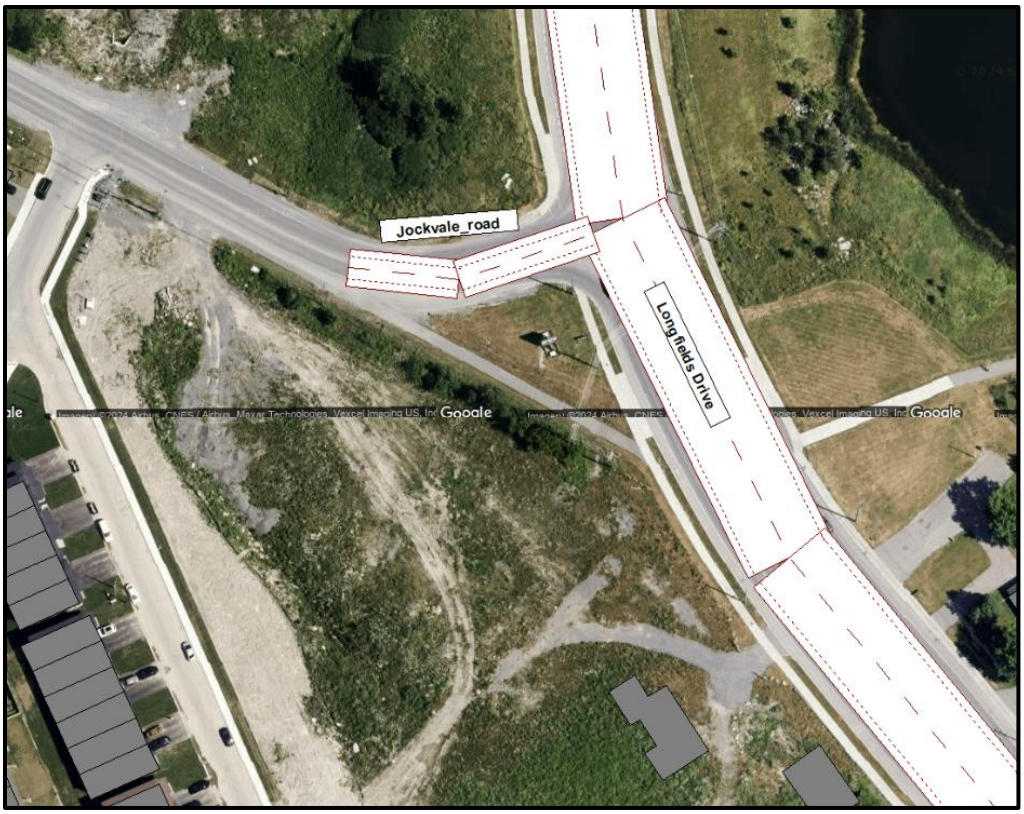


Figure 2: Transportation noise sources

Road Traffic Data

The road traffic data (vehicle count per hour, percentage of trucks (heavy and medium), etc.) for Jockvale Road and Longfields Drive were obtained from *Appendix B: Table of Traffic and Road Parameters of Ottawa's Environmental Noise Control Guidelines*. Part 4, Subsection 4 of the city's guidelines outlines the requirements for transportation noise studies, emphasizing that the traffic data used for sound level predictions must align with the table. See Appendix C in this report.

Based on correspondence with the City of Ottawa, Jockvale Road is classified as a 2-lane Rural Arterial Road and Longfields Drive is classified as a 4-lane Urban Arterial Divided Road. Appendix B of Ottawa's ENCG document was used to determine the road traffic inputs (e.g., AADT, day/night splits) for both roads. The implied roadway classifications and corresponding traffic data used in our analysis are shown in Table 5.

Table 5:Road traffic data

Description of road	Implied Roadway Class	AADT (Vehicles/Day)	Posted Speed (Km/Hr)	Day/Night Split %	Medium Trucks %	Heavy Trucks %
Jockvale Road	2-lane Rural Arterial (2-RAU)	15,000	60	92/8	7	5
Longfields Drive	4-lane Urban Arterial Divided (4-UAD)	35,000	60	92/8	7	5

4.2 Stationary Noise Sources

A stationary noise source, as defined by MECP Guideline NPC-300, refers to a sound source—or combination of sound sources—that is located and typically operates within the property boundaries of a facility. Examples of stationary sources include, but are not limited to—heating, ventilation, and air conditioning (HVAC) equipment as well as transformers, inverters and generators.

The proposed condominium building includes a mechanical equipment penthouse located on the roof, with an emergency generator positioned adjacent to the penthouse. Exhaust fans are also anticipated next to the west façade at Level 1. Figure 3 presents the expected sources around mechanical equipment penthouse, location of emergency genset and exhaust fans accordingly. Appendix D shows the current DD phase building plan drawing with locations of mechanical equipment in Level 1 and Level 10 of the condominium building.

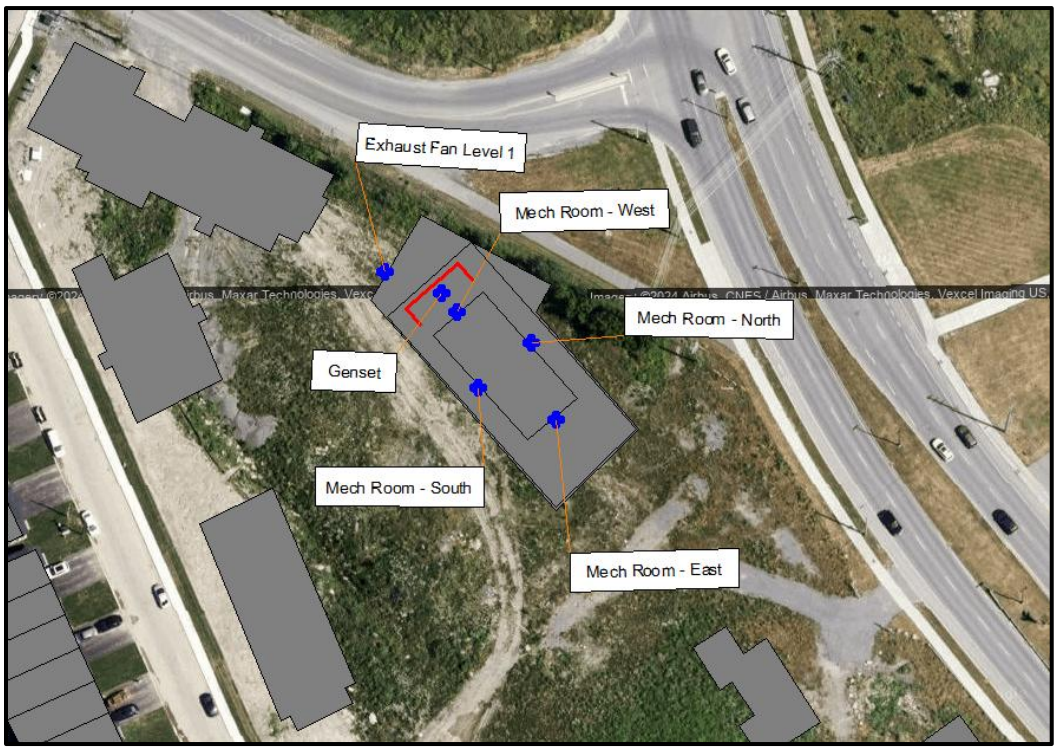


Figure 3: Assumed mechanical equipment on the proposed building

The modeling assumptions for noise sources are based on representative sound power levels derived from similar residential and mixed-use developments, informed by Soft dB's previous project experience and data library. These assumptions include:

- **Mechanical penthouse:** up to one louver or opening on each façade (north, south, east, and west);
- **Exhaust fans:** characteristics typical of parking garage exhaust systems;
- **Generator set:** a representative emergency generator.

Based on the proposed DD phase building plan drawings, an acoustic barrier has been assumed to enclose the generator set on three sides on the rooftop. A minimum surface density of 20 kg/m^2, consistent with standard noise control specifications, is assumed for any acoustic barrier designs discussed within this study.

4.3 Noise Sensitive Receptors

The sound levels at the proposed residential buildings due to transportation noise sources were assessed at three façades (East, West and North) for both the condominium and townhouse buildings, as well as at designated outdoor living areas (OLAs), such as patios and play areas.

The south façades of both buildings fall within the blind zones for road traffic noise assessment with respect to ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) methodology.

Based on a review of the DD phase drawings, two OLAs were identified within the site plan (OLA-2a and OLA-2b), which are situated within the central common yard area between the condominium and townhouse buildings.

Figure 4 illustrates all the PORs selected across the site, as referenced in the DD phase building plan.

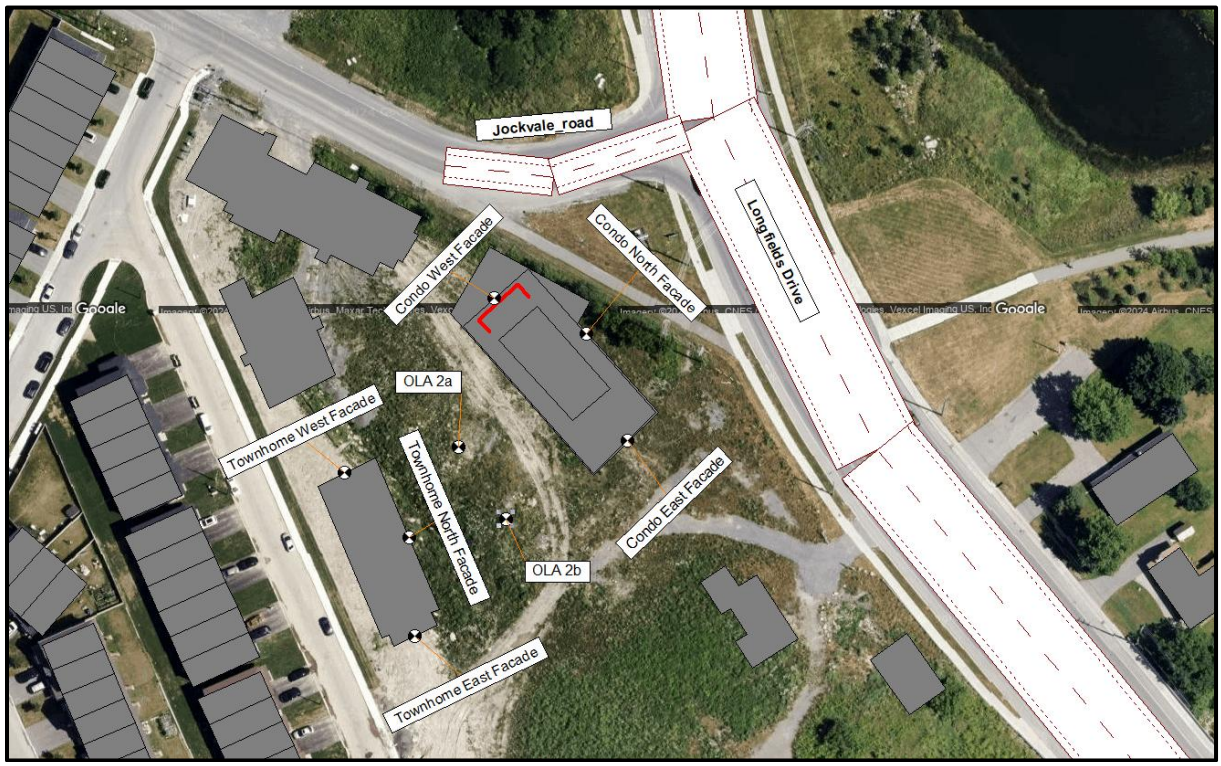


Figure 4: Location of the noise sensitive PORs for transportation noise sources

5 Acoustic Model

For this assessment, the computerized road traffic noise prediction model STAMSON V5 based on ORNAMENT methodology was used to determine the noise levels using the road traffic data.

All the applicable data (vehicle count per hour, percentage of trucks (heavy and medium), etc.) for the transportation noise sources (roads) were entered into the noise prediction model to predict the sound levels at the applicable POWs and OLAs.

CadnaA 2024 (developed by DataKustik GmbH) was used to calculate the sound levels at the identified receptor locations due to stationary noise sources.

The acoustical model parameters were set to consider two (2) orders of reflection from prominent surfaces such as buildings, barriers, etc. except any building(s) associated with the receptor location(s) and a ground factor of 0.2 was assumed.

All the applicable data for the stationary noise sources (representative sound power levels for assumed mechanical equipment) were entered into the CadnaA acoustic model to predict the sound levels at the identified receptor points.

6 Noise Level Predictions

6.1 Transportation Sources

Table 6 presents the details for the daytime period (07:00 – 23:00) noise compliance assessment for the identified PORs (OLAs and POWs) for the year 2035. Table 7 presents the details for the Nighttime period (23:00 – 07:00) noise compliance assessment for the identified PORs (POWs only). The predicted individual sound levels due to the road are evaluated for all building facades to assess the need for the design of the enhanced building components (*i.e.,* window glazing, walls, doors, etc.). Subsequently, the POW values presented in Table 6 and Table 7 represent the maximum noise levels estimated for each respective façade.

Table 6:Transportation noise compliance assessment for proposed building plan during **daytime** (07:00-23:00) - OLA and POW

Receptor location (POR)	Sound level limit	Compliance assessment		
	Road	Predicted sound levels, Leq, T (dBA)	Need for physical noise control/ventilation requirements	Comments
OLA – 2a	55	**51**	**NO**	-
OLA - 2b	55	**56**	YES	**See Note 1**
POW - 1 (North Façade of 9 Storey building)	55	**69**	YES	**See Note 3**
POW - 2 (East Façade of 9 Storey building)	55	**65**	YES	**See Note 2**
POW - 3 (West Façade of 9 Storey building)	55	**65**	YES	**See Note 2**
POW - 4 (North Façade of Townhome building)	55	**58**	YES	**See Note 2**
POW - 5 (East Façade of Townhome building)	55	**55**	**NO**	-
POW - 6 (West Façade of Townhome building)	55	**54**	**NO**	-

Table 7:Transportation noise compliance assessment for proposed building plan during **nighttime** (23:00-07:00) – POW

Receptor location (POR)	Sound level limit	Compliance assessment		
	Road	Predicted sound levels, Leq, T (dBA)	Need for physical noise control/ventilation requirements	Comments
POW - 1 (North Façade of 9 Storey building)	50	**61**	YES	See Note 3
POW - 2 (East Façade of 9 Storey building)	50	**58**	YES	See Note 2
POW - 3 (West Façade of 9 Storey building)	50	**58**	YES	See Note 2
POW - 4 (North Façade of Townhome building)	50	**50**	NO	-
POW - 5 (East Façade of Townhome building)	50	**47**	NO	-
POW - 6 (West Façade of Townhome building)	50	**46**	NO	-

Notes:

1. The predicted combined sound level at the respective OLA exceeds 55 dBA and is less than 60 dBA. Hence, physical noise control measures such as a berm, barrier, etc. may be applied to reduce the sound level to ≤55 dBA. If the measures are not provided, then the inclusion of warning clause Type A (see Appendix B) in the offers of purchase/sale/lease/rental agreements is required.

2. The maximum predicted sound levels at the façade of the building either (i) exceeds 55 dBA but not 65 dBA (road) during daytime, or (ii) exceeds 50 dBA but not 60 dBA (road) during nighttime. Hence, the building components including windows, walls and doors, air conditioning where applicable, should be designed so that the indoor sound levels comply with the sound level limits specified in Table 3, with the inclusion of warning clause Type C (see Appendix B) in the offers of purchase/sale/lease/rental agreements is required.

3. The maximum predicted sound levels at the façade of the building exceeds either (i) 65 dBA (road) during daytime, or (ii) exceeds 60 dBA (road) during nighttime. Hence, a **central air conditioning system or equivalent system that will allow windows and exterior doors to remain closed is required for apartments on this façade.** Further, the **façade building components including windows, walls and doors, are required to be designed so that the indoor sound levels comply with the sound level limits specified in Table 3**, with the inclusion of warning clause Type D (see Appendix B) in the offers of purchase/sale/lease/rental agreements is required.

6.2 Stationary Noise Sources Estimation

For the case of stationary noise sources, the most sensitive PORs are expected to be located within the proposed development itself, which includes:

- The Plane of Window (POW) on façades directly beneath the rooftop penthouse;

- The west façade at Level 1, in proximity to the anticipated exhaust fan discharge points.

Based on the applicable noise limits outlined in the previous section, maximum allowable overall sound power levels (LwA, in dBA) have been estimated to ensure compliance with the sound pressure level targets at the identified Points of Reception (PORs).

Table 8 below presents the calculated maximum allowable sound power levels for each of the modeled mechanical noise sources:

Table 8:Maximum allowable A-weighted sound power levels for stationary noise sources

Sound Source	Maximum Allowable Sound Power Level (dBA)
Mechanical Penthouse (per façade)	**82**
Exhaust Fans (West Façade, Level 1)	**56**
Emergency Generator Set	**98**

Note: The value shown for the mechanical penthouse applies to the combined output of all the louvres on each façade.

Per the Ministry of the Environment, Conservation and Parks (MECP) guidelines, emergency generator sets must be assessed independently from other stationary sources during acoustic evaluations. Accordingly, the allowable sound power level for the emergency generator (Row 3 of Table 8) has been determined and presented separately to comply with this regulatory requirement.

6.3 Noise Control Measures

6.3.1 Outdoor Areas - Barriers

Whilst a noise barrier is not required for OLA-2b, should the client prefer to only insert warning clause Type A, a scenario for a barrier required to bring the level below 55 dBA has been presented in Figure 5 that would enable removal of the warning clause. The sample noise barrier scenario illustrated in the Figure 5 for OLA-2b assumes the installation of a 2 m high noise barrier towards east of OLA-2b, effectively blocking the line of sight to traffic from the OLA.

In accordance with Ottawa's ENCG and NPC 300 Ontario standards, noise barriers must have a minimum surface density of 20 kg/m^2 and be tall enough to obstruct the line of sight between the noise source and the receiver. The barriers should be structurally sound and properly designed to withstand wind and snow loads. Installation must ensure there are no cracks or surface gaps that could compromise acoustical performance. Any openings required for drainage purposes should be minimal and localized to maintain the barrier's effectiveness in mitigating noise.

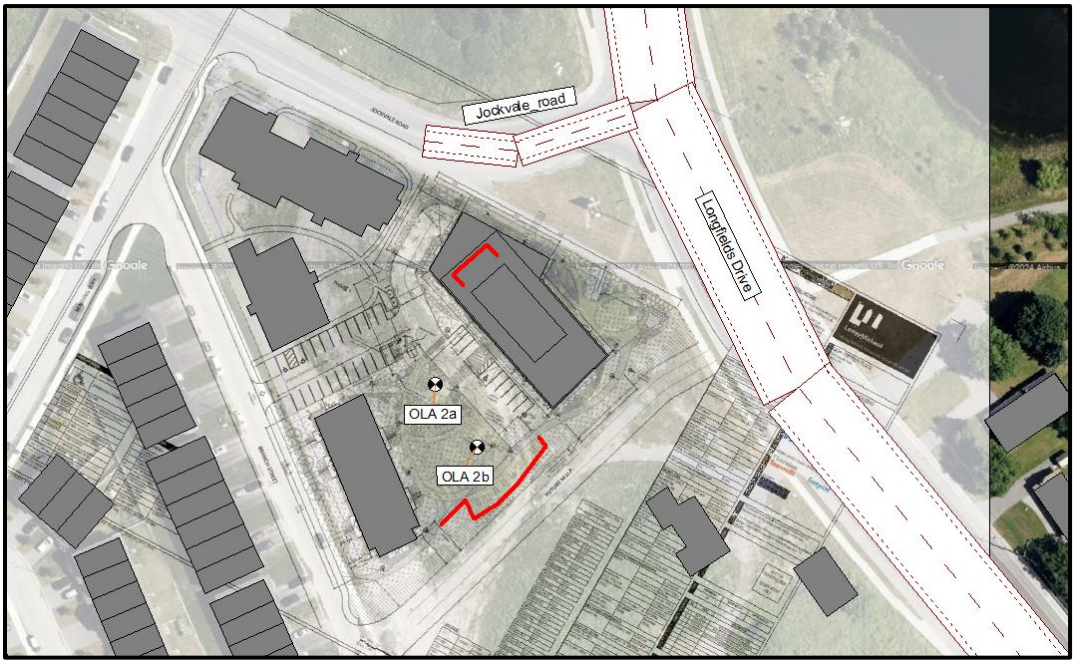


Figure 5: Barrier design example scenario for OLAs in current building plan

If noise barriers are incorporated in future phase development plans, it is recommended a qualified acoustical consultant should evaluate the anticipated noise levels based on the proposed barrier specifications. Such assessment should address all Outdoor Living Areas (OLAs) and Points of Reception (POWs). Furthermore, the acoustic consultant should also review any proposed façade components, including walls and glazing, as the design progresses to subsequent phases, to ensure continued compliance with NPC-300 guidelines.

6.3.2 Indoor Areas – Building Components

As sound levels along the North façade are predicted to be as high as 69 dBA (daytime) along the POW, it is required to verify the that the façade sound insulation is sufficient to achieve 45 dBA (daytime) with the windows closed. If this is achieved, the nighttime requirements will also be met. The use of a standard 6-12-6 sealed double glazing unit (STC 34) should permit this target to be achieved with a margin of safety (See Appendix E), but calculated level will be influenced by the window area and room volume. Whilst the wall assemblies are yet to be specified relative to their locations, the proposed wall assemblies W1 to W5 in the DD plans (A010) should also allow to achieve this. Again, verification should be made as design progresses.

7 Conclusions

Lemay Michaud (the *Client*) retained Soft dB to conduct a noise feasibility study for the proposed Ottawa Community Housing (OCH) development. The project, currently in the Design Development (DD) phase, consists of a 9-storey condominium building with 99 residential units and a 3-storey stacked townhouse building with 18 units. The site fronts Branch Street and Jockvale Road/Longfields Drive in Ottawa (refer to Appendix A).

This noise study was completed in accordance with the City of Ottawa's Environmental Noise Control Guidelines and the Ministry of the Environment, Conservation and Parks (MECP) noise control guideline NPC-300. The main objectives of this report were to assess the potential impact of future road traffic noise and to estimate the maximum allowable sound power levels for assumed stationary sources, such as mechanical equipment, on the proposed development site.

Noise-sensitive PORs have been identified that include both POW locations and OLAs, as detailed in Section 4. Section 6 of the report presents predicted noise levels at these PORs based on projected future road traffic conditions.

Based on the review of the available site plan information, it is concluded that the proposed development is acoustically feasible, if appropriate noise control measures are incorporated into the final building design.

These measures are necessary to address predicted exceedances at the identified POW and OLA locations, as outlined in Tables 6 and 7.

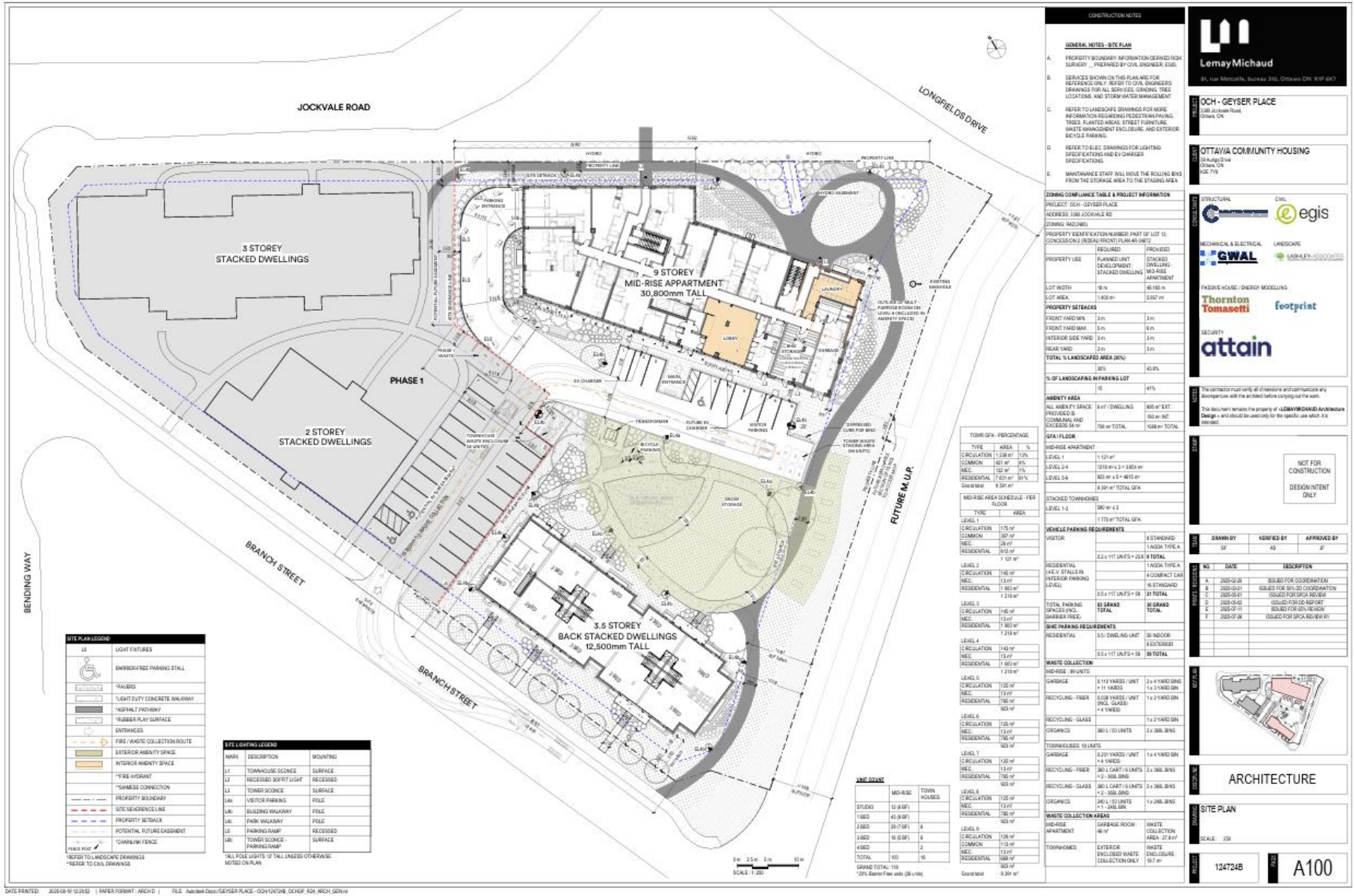
To summarise:

- OLA-2b would require a 2m high noise barrier, or a Type A warning clause;
- The provision to allow central air conditioning or an equivalent system is required for apartments along the west and east façades, that may allow for windows and exterior doors to remain closed in order to meet interior noise criteria;
- The installation of central air conditioning or equivalent system is required for apartments along the north façade, to permit windows and exterior doors to remain closed in order to meet interior noise criteria;
- Assuming the use of 6-12-6 sealed double glazing, and typical wall assemblies from the DD plans along the north façade, then the interior sound levels with windows closed are predicted to be below the required interior levels.

As the design evolves in future phases, including potential changes to site layout, inclusion of acoustic barriers, building construction specifications such as façade and glazing details, a future noise feasibility assessment should be conducted by a qualified acoustical consultant to confirm ongoing compliance with applicable noise criteria.

Appendix A Site plan

DD phase site plan (dated August 19, 2025)



Appendix B NPC-300 Warning Clauses

Type A

"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment. "

Type B

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment. "

Type C

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

Type D

"This dwelling unit has been supplied with a central air-conditioning system or equivalent system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment. "

Appendix C Road Traffic data

Ottawa

PLANNING AND GROWTH MANAGEMENT
URBANISME ET GESTION DE LA CROISSANCE

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

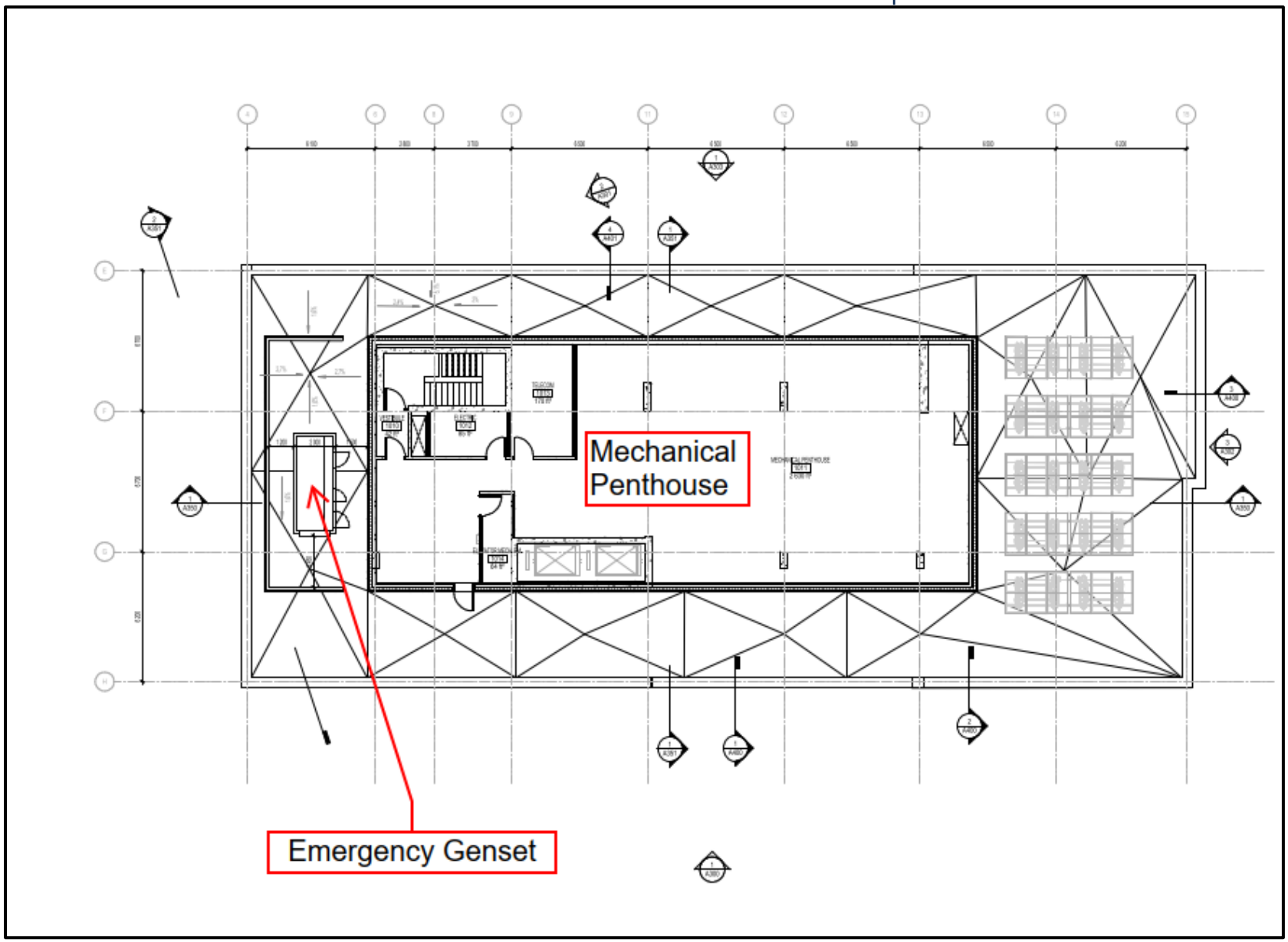
Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % [1]
NA [2]	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

[1] The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

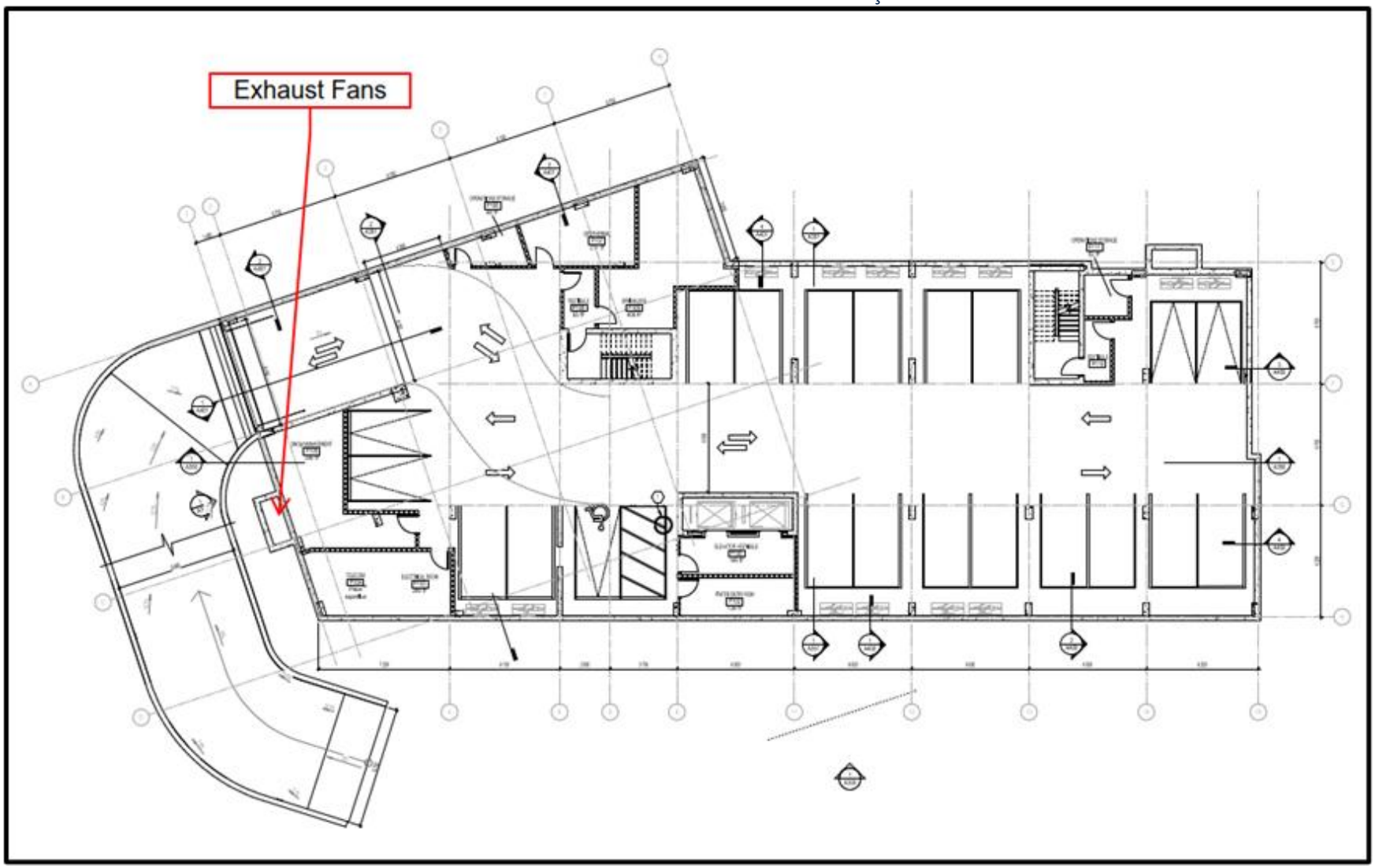
[2] The number of lanes is determined by the future mature state of the roadway.

Appendix D Stationary Noise Sources

Mechanical Penthouse Location – Level 10 Rooftop



Exhaust Fan Locations – Level 1 West Façade



Appendix E Sample Calculations

Example INSUL calculation of typical 25m³ bedroom, with:

- (Element 1) Wall Type W3 (lightweight façade wall, worst case), ~60% of façade area;
- (Element 2) 6-12-6 DGU forming ~40% of façade area.

INSUL calculations for both elements presented overleaf.

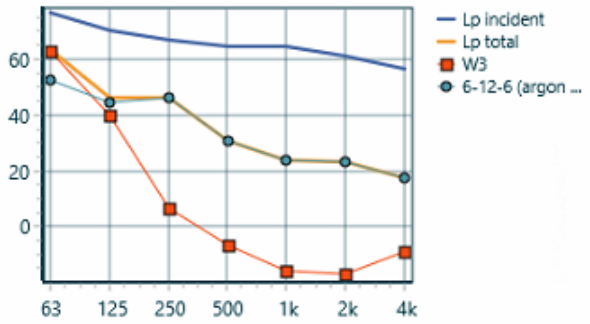
Façade is exposed to traffic noise of up to 69 dBA at POW (blue circle).

Resultant interior level calculated to be 41 dBA (red circle).

Outdoor to Indoor Calculator

Title

Comments



Source: Standard Sources

Exterior Sound Pressure Level	63	125	250	500	1k	2k	4k	Overall dBA
Traffic (ISO 717)	76,9	70,8	67,3	64,9	64,7	61,5	56,7	69,0

Path Element 1 | Element 2 | Element 3 | Element 4 | Element 5 | Element 6 | Element 7 | Element 8

Description W3 Area 6,96 m²

Path details		63	125	250	500	1k	2k	4k	-
-Sound Transmission Loss	Get R	-16	-33	-63	-74	-83	-81	-68	
-Facade Shape Level diff.	Facade	0	0	0	0	0	0	0	
Insertion Loss		0	0	0	0	0	0	0	
+10 Log(A)		8,4	8,4	8,4	8,4	8,4	8,4	8,4	

Receiving Room Volume 25,00 m³

Room details	63	125	250	500	1k	2k	4k	Overall dBA
-10 Log(V)+11	-3	-3	-3	-3	-3	-3	-3	
Reverberation Time (secs) ?	0,5	0,5	0,5	0,5	0,5	0,5	0,5	
+10 Log(T)	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0	
Element 1 sound level contribution	63	40	7	-7	-16	-17	-9	37,3
Room Sound Level	64	46	46	31	24	23	18	41,3

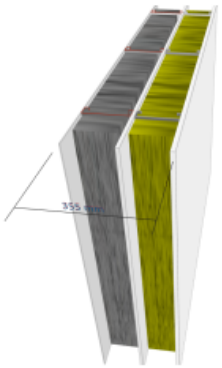
Element 2 sound level contribution	53	45	46	31	24	23	18	39,1
Room Sound Level	64	46	46	31	24	23	18	41,3

Sound Insulation Prediction (v10.0.2)

Date: 2025-07-25

Job Name:

INSUL

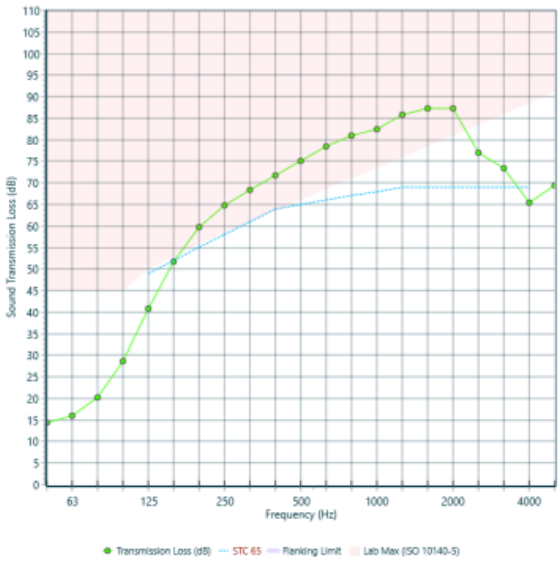


STC 65
OITC 39

System description

Panel 1	1 x 3 mm Aluminium
Frame	Steel Stud (0.50mm) (171 mm x 38 mm), Stud spacing 600 mm , Cavity Width 171 mm + 150 mm Rockwool (40kg/m3)
Panel 2	1 x 12,7 mm DensGlass® Sheathing Georgia Pa
Frame	Steel Stud (0.50mm) (152 mm x 38 mm), Stud spacing 600 mm , Cavity Width 152 mm + 150 mm Fibreglass (10kg/m3) 60mm
Panel 3	1 x 15,9 mm USG Sheetrock Firecode X Gypsum p...
Details	Panel Size 2,7 m x 4,0 m, Partition surface mass = 36,2 kg/m², Mass-air-mass resonant frequency = : 0 Hz , 0 Hz

freq.(Hz)	TL(dB)	Roct (dB)
50	14	
63	16	16
80	20	
100	29	
125	41	33
160	52	
200	60	
250	65	63
315	68	
400	72	
500	75	74
630	79	
800	81	
1000	82	83
1250	86	
1600	87	
2000	87	81
2500	77	
3150	73	
4000	65	68
5000	69	



- Key No. 2352 | Initials:Calcul | File Name:insul

Sound Insulation Prediction (v10.0.2)

Date: 2025-07-25

Job Name:

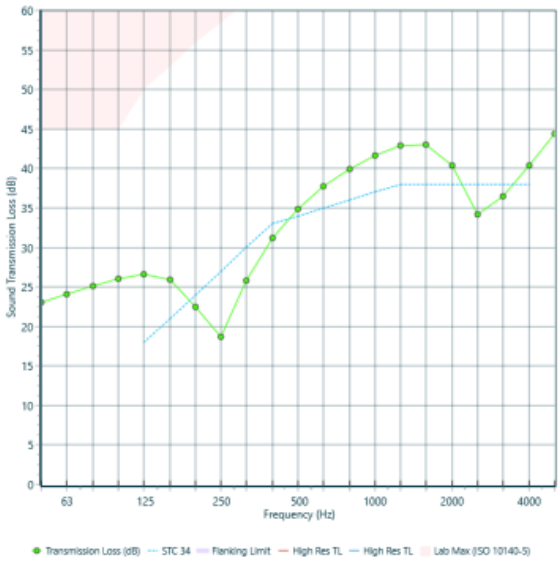
INSUL

STC 34
OITC 29

System description

Pane 1	1 x 6 mm Glass
Cavity	: 12 mm
Pane 2	1 x 6 mm Glass
Details	Panel Size 1,3 m x 1,5 m, Partition surface mass = 29,2 kg/m², Mass-air-mass resonant frequency = : 224 Hz

freq.(Hz)	TL(dB)	Roct (dB)
50	23	
63	24	24
80	25	
100	26	
125	27	26
160	26	
200	23	
250	19	21
315	26	
400	31	
500	35	34
630	38	
800	40	
1000	42	41
1250	43	
1600	43	
2000	40	38
2500	34	
3150	36	
4000	40	39
5000	44	



- Key No. 2352 | Initials:Calcul | File Name:insul

Example STAMSON calculation for Condo on North Façade, 9th Storey:

```
STAMSON 5.0        NORMAL REPORT        Date: 14-07-2025 18:54:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: N_FAC_C.te          Time Period: Day/Night 16/8 hours
Description: Condo_NFac_28.1m_9thStorey_5RoadSegments


Road data, segment # 1: LongFields01 (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    60 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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: LongFields01 (day/night)
-----------------------------------------------
Angle1   Angle2           : -40.00 deg   -18.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  36.00 / 36.00  m
Receiver height           :  28.10 / 28.10  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 2: LongFields02 (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    60 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):  35000
    Percentage of Annual Growth        :   0.00
```

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: LongFields02 (day/night)
-----------------------------------------------
Angle1   Angle2           : -18.00 deg   65.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  48.00 / 48.00  m
Receiver height           :  28.10 / 28.10  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 3: LongFields03 (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    60 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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: LongFields03 (day/night)
-----------------------------------------------
Angle1   Angle2           :  65.00 deg   88.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  34.00 / 34.00  m
Receiver height           :  28.10 / 28.10  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 4: Jockvale01 (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
```

```
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    60 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):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Jockvale01 (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   -61.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  28.10 / 28.10  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 5: Jockvale02 (day/night)
--------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    60 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):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 5: Jockvale02 (day/night)
--------------------------------------------
Angle1   Angle2           : -61.00 deg   -23.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
```

```
Surface                    :      1       (Absorptive ground surface)
Receiver source distance   :  37.00 / 37.00  m
Receiver height            :  28.10 / 28.10  m
Topography                 :      1       (Flat/gentle slope; no barrier)
Reference angle            :   0.00

Results segment # 1: LongFields01 (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.75 + 0.00) = 60.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -40    -18   0.00  73.68   0.00  -3.80  -9.13   0.00   0.00   0.00  60.75
-------------------------------------------------------------------------------

Segment Leq : 60.75 dBA

Results segment # 2: LongFields02 (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 65.26 + 0.00) = 65.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -18     65   0.00  73.68   0.00  -5.05  -3.36   0.00   0.00   0.00  65.26
-------------------------------------------------------------------------------

Segment Leq : 65.26 dBA

Results segment # 3: LongFields03 (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.19 + 0.00) = 61.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    65     88   0.00  73.68   0.00  -3.55  -8.94   0.00   0.00   0.00  61.19
-------------------------------------------------------------------------------

Segment Leq : 61.19 dBA

Results segment # 4: Jockvale01 (day)
```

```
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.39 + 0.00) = 58.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -61   0.00  70.00   0.00  -3.68  -7.93   0.00   0.00   0.00  58.39
-------------------------------------------------------------------------------

Segment Leq : 58.39 dBA

♠
Results segment # 5: Jockvale02 (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.32 + 0.00) = 59.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -61    -23   0.00  70.00   0.00  -3.92  -6.75   0.00   0.00   0.00  59.32
-------------------------------------------------------------------------------

Segment Leq : 59.32 dBA

Total Leq All Segments: 68.70 dBA

♠
Results segment # 1: LongFields01 (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.15 + 0.00) = 53.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -40    -18   0.00  66.08   0.00  -3.80  -9.13   0.00   0.00   0.00  53.15
-------------------------------------------------------------------------------

Segment Leq : 53.15 dBA

♠
Results segment # 2: LongFields02 (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.67 + 0.00) = 57.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
```

```
-------------------------------------------------------------------------------
   -18     65   0.00  66.08   0.00  -5.05  -3.36   0.00   0.00   0.00  57.67
-------------------------------------------------------------------------------

Segment Leq : 57.67 dBA

♠
Results segment # 3: LongFields03 (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.59 + 0.00) = 53.59 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    65     88   0.00  66.08   0.00  -3.55  -8.94   0.00   0.00   0.00  53.59
-------------------------------------------------------------------------------

Segment Leq : 53.59 dBA

♠
Results segment # 4: Jockvale01 (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.79 + 0.00) = 50.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -61   0.00  62.40   0.00  -3.68  -7.93   0.00   0.00   0.00  50.79
-------------------------------------------------------------------------------

Segment Leq : 50.79 dBA

♠
Results segment # 5: Jockvale02 (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.72 + 0.00) = 51.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -61    -23   0.00  62.40   0.00  -3.92  -6.75   0.00   0.00   0.00  51.72
-------------------------------------------------------------------------------

Segment Leq : 51.72 dBA

Total Leq All Segments: 61.10 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 68.70
(NIGHT): 61.10