NOISE IMPACT ASSESSMENT STUDY

370 Cambridge Development - Update 1

Development Address:
370 Cambridge Development
370 Cambridge Street North
Ottawa, Ontario
City of Ottawa File Number: D07-12-23-0036

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EXECUTIVE SUMMARY

In accordance with the City of Ottawa Environmental Noise Control Guidelines, this Report and associated study present an assessment of the environmental noise impacting the proposed noise-sensitive development identified as the 370 Cambridge Development, located at 370 Cambridge Street North in Ottawa, Ontario. This development proposal is made by Miroca Design on behalf of 2250276 Ontario Inc. This Report has been updated from the original version dated 09 January 2023, in response to comments received from the City of Ottawa.

The assessment indicates that the following noise control measures are required to meet the applicable indoor sound level limits due to transportation noise sources.

- Air conditioning is required for all units. This will provide occupants with the option of keeping windows closed to reduce indoor noise from transportation sources.
- Building envelope components (exterior walls, windows, and balcony doors) must be evaluated to ensure that they provide the sound insulation required to meet indoor sound level limits. The evaluation is included in this Report. It is concluded that the proposed window specifications exceed the minimum requirements for insulation of transportation noise.

A Stationary Source of environmental noise has been identified proximate to the proposed development: the Embassy of Madagascar building at 3 Raymond Street. This Report includes an assessment of Stationary Source noise impacts upon the proposed development. It is concluded that the proposed development will not be subjected to Stationary Source noise in excess of the applicable limits.

It is concluded that the project can be developed in a manner which meets all requirements of the City of Ottawa Environmental Noise Control Guidelines.

1.0 INTRODUCTION

In accordance with the City of Ottawa Environmental Noise Control Guidelines (ENCG) and Ontario Ministry of the Environment publication NPC-300 (NPC-300), this Report presents a detailed study of the environmental noise impact upon the development proposed by Miroca Design and located at 370 Cambridge Street North in Ottawa, Ontario. This Report has been updated from the original version dated 09 January 2023, in response to comments 1.3, 1.4, 1.5 and 1.6 received from the City of Ottawa in a letter dated 23 November 2023. The updates have not changed the results of the analysis or recommendations.

The proposed development consists of a new four-storey multi-unit residential building. A total of 20 residential units are proposed, with parking provided on-grade at the rear (west side) of the building. The project will involve the demolition and removal of the existing building at 370 Cambridge Street North.

This Report assesses impacts from multiple sources of environmental noise upon the noise-sensitive portions of the proposed development, in accordance with City and Provincial Guidelines. This Report is organized by type of environmental noise source.

- Section 2.0 assesses noise impacts from surface transportation sources (roadways)
- Section 3.0 assess noise impacts from off-site Stationary Sources of noise

No other environmental noise source meets the proximity requirements for inclusion in this Noise Study.

This Report further includes an assessment of the potential Stationary Source noise impacts of the proposed development upon adjacent noise-sensitive land uses. The assessment is included as Section 3.3.

Site plans including the assessment locations and noise sources are included in the Figures section.

1.1 REFERENCES

This Report makes reference to the following documents.

1 City of Ottawa Environmental Noise Control Guidelines updated January 2016 (ENCG)

2 City of Ottawa Transportation Master Plan, November 2013 (TMP)

3 Ontario Ministry of the Environment, Conservation and Parks publication NPC-300: Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning, updated 24 August 2017

4 City of Ottawa Noise By-law No. 2017-255

5 Ontario Ministry of the Environment, Conservation and Parks (MECP) modelling tool STAMSON, version 5.04

6 BR/NRC Building Research Note BRN148: Acoustic Insulation Factor, dated June 1980 (BRN148)

7 Queensway Expansion East Design and Construction Report and Appendices WP 4088-07-01. Available for download at the following URL. http://queenswayexpansioneast.com/

8 Highway 417 Bridge Replacements and Operational Improvements Detail Design and Environmental Assessment Study GWP 4173-15-00. Available for download at the following URL. https://www.highway417-midtownbridgesandimprovements.com/

9 Architectural plans prepared by Miroca Design and dated January 2023. Received as file name “370 Cambridge – Architectural Package – January 4 2023.pdf”

10 Site Plan prepared by Miroca Design and dated January 2023. Received as file name “370 Cambridge – Site Plan – January 4 2023.pdf”

11 Survey Plan for the development property prepared by Annis O'Sullivan, Vollebekk Ltd. and dated 19 April 2021.

12 City of Ottawa GeoOttawa map, at URL maps.ottawa.ca/geoottawa

13 Aerial imagery from Google, using Google Earth Pro software

14 ISO Standard 9613: Acoustics – Attenuation of Sound During Propagation Outdoors

1. Part 1: Calculation of the Absorption of Sound by the Atmosphere, First Edition dated 1 June 1993
2. Part 2: General Method of Calculation, First Edition dated 15 December 1996

15 City of Ottawa 2nd Review Comment Letter for 370 Cambridge St N, dated 23 November 2023

In this Report:

- noise levels are reported in terms of sound pressure levels (SPL), in decibels (dB), with the reference sound pressure equal to $2x10^{-5}$ pascals; and
- sound levels described as dBA Leq represent the equivalent (average) A-weighted sound pressure level over a specified time period.

1.2 PURPOSE

The purpose of this Report is to demonstrate that the 370 Cambridge Development can be developed in a manner that meets all applicable requirements with respect to environmental noise.

1.3 SCOPE

This Noise Impact Assessment Study presents a detailed study of the issues, as defined by the ENCG and NPC-300. No further study to assess environmental noise impacts upon the proposed development is required or proposed. The City of Ottawa has requested a noise study to assess the Stationary Source noise impact of the proposed development upon nearby noise-sensitive land uses. This noise study will need to be completed when the mechanical design has matured.

This Report considers only the objective criteria as defined in the ENCG and NPC-300, and does not consider subjective responses to environmental noise.

2.0 SURFACE TRANSPORTATION NOISE

2.1 CRITERIA

ENCG and NPC-300 define sound level requirements from surface transportation noise sources separately for outdoor and indoor noise-sensitive spaces. The requirements applicable to the 370 Cambridge Development are summarized in the sub-sections that follow.

While additional requirements apply to noise from rail traffic, there are no significant sources of rail traffic in the vicinity of the proposed development.

2.1.1 Outdoor Spaces

Outdoor Living Areas (OLA) are outdoor amenity spaces meeting specific criteria as defined in the ENCG. As indicated on the Site Plan (Reference 10), no OLAs are required for the proposed development due to its zoning. No qualifying OLAs are proposed. Therefore, there are no sound level limits applicable to the outdoor areas of the development.

Of note, because the proposed balconies are less than 4 metres deep, they do not qualify as OLAs per the ENCG. No sound level limits apply at the balconies.

2.1.2 Indoor Spaces

The applicable indoor sound level limits are summarized in Table 1.

Table 1: Sound Level Limits for Indoor Living Areas

Type of Space	Time Period	Indoor Road Noise Level Leq dBA
Living/dining, den areas of residences	16 hours between 07:00-23:00	45
Living/dining, den areas of residences	8 hours between 23:00-07:00	45
Sleeping quarters	16 hours between 07:00-23:00	45
	8 hours between 23:00-07:00	40

For the purposes of assessing compliance with these limits, sound levels are predicted at the Plane Of Window (POW) of noise sensitive spaces. The predicted

POW sound levels determine the measures required to ensure that indoor limits are met. Specifically:

1. Ventilation measures may be required to allow occupants to keep windows closed (reducing noise transmission to the indoor space). The ventilation requirements per NPC-300 are summarized in Table 2.
2. An analysis of building components (exterior walls, windows, and doors as applicable) may be required to ensure that the building facade provides sound attenuation sufficient to meet the indoor sound level limits. The building component requirements per ENCG are summarized in Table 3.

Table 2: Ventilation Requirements

Assessment Location	**Noise Source**	**Daytime Noise Level (L_{eq} 16 hr, 07:00-23:00)**	**Nighttime Noise Level (L_{eq} 8 hr, 23:00-07:00)**	**Ventilation Requirements**
Plane of a bedroom or living/dining room window	Combined Road and Rail noise, excluding whistles	Up to 55 dBA	Up to 50 dBA	None
		Up to 65 dBA	Up to 60 dBA	Provision for the installation of central air conditioning* in the future, at occupant's discretion
		Above 65 dBA	Above 60 dBA	Central air conditioning

*Per NPC-300 (C7.8.1), forms of mechanical ventilation other than ducted central air may be available which satisfy the requirements.

Table 3: Building Component Requirements

Assessment Location	Noise Source	Daytime Noise Level (L_{eq} 16 hr)	Nighttime Noise Level (L_{eq} 8 hr)	Building Component Requirements
Plane of a bedroom or living/dining room window	Road	Up to 65 dBA	Up to 60 dBA	Per the Ontario Building Code
		Above 65 dBA	Above 60 dBA	Must be designed to ensure indoor criteria are met*

* Per the ENCG (Section 5.2, page 14), the preferred assessment method is the Acoustic Insulation Factor (AIF) method.

2.2 ROAD TRAFFIC INFORMATION

The Area Plan (Figure 1 in the Figures section) shows the roadways in the vicinity of the development. The City of Ottawa Transportation Master Plan (Reference 2) has been used to identify the roadways that must be included in noise level calculations: Highway 417; and Raymond Street between Bronson Avenue and the Highway 417 on-ramp. To ensure a conservative analysis, the Highway 417 westbound on-ramp on Raymond Street was also included.

Other nearby roadways do not qualify for inclusion per the ENCG: Raymond Street west of the on-ramp (local road), Bronson Avenue and Catherine Street (arterial roadways more than 100 m from the site); and local roadways Cambridge Street North, Arlington Avenue, and Arthur Lane North.

Average Annual Daily Traffic (AADT) volumes have been assigned and divided by time-of-day and vehicle categories per ENCG requirements (Reference 1, Part 4, Appendix B). The traffic data used for noise level calculations are summarized in Table 4. Highway 417 has been divided into eastbound and westbound lanes (4 lanes each direction). Each direction of travel was further divided into east and west segments, to account for the curvature of the roadway near the proposed development. The Highway 417 westbound on-ramp from Raymond Street was conservatively assessed as a single highway lane. Raymond Street is a one-way street, three lanes wide between Bronson Avenue and the Highway on-ramp. Its AADT was set at half the ENCG value of a 6-Lane Urban Arterial Divided roadway.

Table 4: Roadway Traffic Flow Data

Roadway Segment	Roadway Class	Speed Limit	Total AADT	AADT by Vehicle Type and Time of Day (Daytime / Nighttime)		
				Cars	Medium Trucks	Heavy Trucks
Highway 417 Eastbound	4-Lane Highway Segment	100 km/h	73332	59370/5163	4723/411	3373/293
Highway 417 Westbound	4-Lane Highway Segment	100 km/h	73332	59370/5163	4723/411	3373/293
Raymond Street	3-Lane Urban Arterial	50 km/h	25000	20240/1760	1610/140	1150/100
Highway 417 on-ramp	1-Lane Highway Segment	100 km/h	18333	14842/1291	1181/103	843/73

Traffic flow was presumed to be at the centre of each roadway segment, as is normal practice.

Highway 417 construction projects are currently underway, which will result in new 5 metre tall highway noise barrier being installed along the north edge of the highway near the site, including the highway on-ramp on Raymond Street (per References 7 and 8). These new noise barrier segments will connect to existing 5 m tall noise barrier to the east and west. Two existing buildings near the proposed development significantly obstruct exposure to roadways near the site and were factored into the analysis: the Embassy of Madagascar to the south (at 3 Raymond Street), and the Capital Endodontics building to the east (at 375 Cambridge Street North). Both buildings are approximately 11 metres tall.

2.3 POINTS OF ASSESSMENT

The following Points of Assessment (POA) form part of this Noise Study. These locations have been selected due to their potential to be worst-case locations in terms of surface transportation noise levels or building component requirements. The assessment locations are shown on the Site Plan included as Figure 2 in the Figures section.

- POA 'E4' is located on the east façade of the building, 4th floor bedroom window of the southeast unit. The assessment height is 12.41 m above ground, corresponding to the centre height of the fourth floor. The

calculated sound level is representative of the worst-case POW noise level on the east façade.

- POA 'E3' is located on the east façade of the building, 3rd floor den window of the northeast unit. The assessment height is 9.31 m above ground, corresponding to the centre height of the third floor.
- POA 'E1' is located on the east façade of the building, ground floor bedroom window. The assessment height is 2.96 m above grade, corresponding to the centre height of the ground floor. The calculated sound level is the worst-case east façade POW level for the basement and ground floor.
- POA 'S4' is located on the south façade of the building, 4th floor bedroom window. The assessment height is 12.41 m above grade. The calculated sound level is the worst-case south façade POW level.
- POA 'S3' is located on the south façade of the building, 3rd floor den window (assessment height 9.31 m). The calculated sound level is representative of the worst-case POW for the south façade up to and including level 3.
- POA 'W4' is located on the west façade of the building, 4th floor bedroom window of the southwest unit (assessment height 12.41 m above grade). The calculated sound level is representative of the worst-case POW level on the west façade of the building
- POA 'W3' is located on the west façade of the building, 3rd floor balcony door of the southwest unit (assessment height 9.31 m). The calculated sound level is representative of the worst-case POW level for the west façade up to and including level 3.

The grade height at each POA was set at 72.14 m above sea level, corresponding to the current average grade height indicated on the architectural plans (Reference 7). Highway 417 and the base of the highway noise barrier were set at a height of 75 m above sea level.

2.4 ANALYSIS AND RESULTS

Noise level calculations were made at each POA using the MECP tool STAMSON, version 5.04. The following table summarizes the inputs used for each STAMSON POA sound level calculation. Detailed drawings showing POA distances to roadway and barrier segments are included as Figures 3 through 8.

Table 5: STAMSON Calculation Inputs

POA			Roadway Segments				Barrier Segments				
ID	H	Gnd H	Name	Exp	D	Gnd H	ID*	Exp	D	H	Gnd H
E4	12.41	72.14	417WBE	-90 to 0	69.7	75	417 Barrier	-90 to 0	61.3	5	75
			417EBE	-90 to 0	86.5	75	417 Barrier	-90 to 0	61.7	5	75
			Raymond	-78 to -69	25.9	72.14	CE Building	-78 to -75	6.9	11	72.14
			417WBRamp	-54 to 13	42.1	72.14	EM Building	2 to 13	4.4	11	72.14
E3	9.31	72.14	417WBE	-90 to -48	79.7	75	417 Barrier	-90 to -48	71.4	5	75
			417EBE	-90 to -48	96.6	75	417 Barrier	-90 to -48	71.8	5	75
			Raymond	-74 to -62	35.9	72.14	CE Building	-74 to -62	17	11	72.14
			417WBRamp	-47 to -35	51.8	72.14	CE Building	-47 to -42	27.7	11	72.14
E1	2.96	72.14	417WBE	-90 to 0	72.6	75	417 Barrier	-90 to 0	64.3	5	75
			417EBE	-90 to 0	89.5	75	417 Barrier	-90 to 0	64.6	5	75
			Raymond	-77 to -66	28.9	72.14	CE Building	-77 to -66	9.9	11	72.14
			417WBRamp	-51 to 14	44.5	72.14	None				
S4	12.41	72.14	417WBW	-12 to 87	67.1	75	417 Barrier	-12 to 87	56.9	5	75
			417WBE	-88 to -6	68.2	75	417 Barrier	-88 to -6	59.8	5	75
			417EBW	-12 to 87	83.8	75	417 Barrier	-12 to 87	56.9	5	75
			417EBE	-88 to -6	85.1	75	417 Barrier	-88 to -6	60.2	5	75
			Raymond	-80 to 74	24.1	72.14	None				
			417WBRamp	-59 to 51	44.1	72.14	EM Building	-59 to 28	6.4	11	72.14
S3	9.31	72.14	417WBW	-5 to 84	68	75	417 Barrier	-5 to 84	57.8	5	75
			417WBE	-90 to 1	68.2	75	417 Barrier	-90 to 1	59.9	5	75
			417EBW	-6 to 84	84.6	75	417 Barrier	-6 to 84	57.8	5	75
			417EBE	-90 to -1	85.1	75	417 Barrier	-90 to -1	60.3	5	75
			Raymond	-79 to -72	24.3	72.14	None				
			417WBRamp	-57 to 56	42.1	72.14	EM Building	-42 to 56	4.4	11	72.14
W4	12.41	72.14	417WBW	-6 to 90	67.7	75	417 Barrier	-6 to 90	57.5	5	75
			417EBW	-6 to 90	84.3	75	417 Barrier	-6 to 90	57.5	5	75
			417WBRamp	13 to 44	47.7	72.14	Ramp Barrier	13 to 44	37.8	5	72.14
W3	9.31	72.14	417WBW	-6 to 90	67.7	75	417 Barrier	-6 to 90	57.5	5	75
			417EBW	-6 to 90	84.3	75	417 Barrier	-6 to 90	57.5	5	75
			417WBRamp	13 to 44	47.7	72.14	Ramp Barrier	13 to 44	37.8	5	72.14

Table 5 Notes:

H = height above grade, in metres

Gnd H = Absolute ground height relative to sea level, in metres

Exp = Exposure angles, in degrees

*Barrier segments:

- "417 Barrier" and "Ramp Barrier" are 5 m tall sound-absorptive barriers along Highway 417 and westbound on-ramp
- "CE Building" is the Capital Endodontics building (identified on Figure 1)
- "EM Building" is the Embassy of Madagascar building (identified on Figure 1)

2.4.1 POA Sound Level Calculation Results

The detailed STAMSON calculation results are included as Appendix A. The resulting daytime and nighttime sound levels at each POA are summarized below.

Table 6: Summary of Traffic Noise Level Calculation Results

Location	Calculated Noise Level Daytime (OLA or plane of window)	Calculated Noise Level Nighttime (plane of bedroom window)
POA 'E4'	70 dBA Leq	62 dBA Leq
POA 'E3'	63 dBA Leq	56 dBA Leq
POA 'E1'	68 dBA Leq	60 dBA Leq
POA 'S4'	71 dBA Leq	63 dBA Leq
POA 'S3'	69 dBA Leq	61 dBA Leq
POA 'W4'	67 dBA Leq	60 dBA Leq
POA 'W3'	66 dBA Leq	58 dBA Leq

2.4.2 Requirements for Indoor Residential Spaces

The POW noise level calculation results show that the following noise control is required for surface transportation noise for all units:

- central air conditioning (or other suitable mechanical ventilation meeting NPC-300 requirements) must be provided for all units; and
- east, south, and west façade components must be designed to meet indoor noise limits (the analysis is included in Section 2.5).

Notices-on-Title are also required for all units. Recommended wording is included in Section 4.0.

2.5 ACOUSTIC INSULATION FACTOR ANALYSIS

An Acoustic Insulation Factor (AIF) analysis was performed according to BRN148 (Reference 6) in order to confirm building façade component construction requirements that will ensure indoor sound level limits are met. The façade components include the exterior walls, windows that are fixed and sealed to the frame, and operable windows. Glass balcony doors are assessed as operable windows.

Detailed calculation results specific to individual rooms and portions of the building envelope are provided in Appendix B. The assumptions and requirements specific to individual types of façade components at presented in the following sections.

2.5.1 Exterior Wall Construction

Exterior wall construction details have not been developed at the time of preparation of this Report. The AIF analysis is based on an exterior wall design providing sound attenuation equal to exterior wall type EW1 in BRN148. The EW1 wall construction details are summarized below.

- 12.7 mm gypsum board
- vapour barrier
- 38 x 89 mm studs
- 50 mm (or thicker) mineral wool or glass fibre batts
- sheathing and wood siding, or metal siding and fibre backer board

Exterior wall designs with greater thickness and/or greater mass will tend to provide higher sound attenuation performance. No performance upgrades compared to EW1 are required.

2.5.2 Fixed Windows, Operable Windows, and Balcony Doors

Table 7 describes the minimum window construction requirements in order to meet indoor sound level limits within residential units. The noise isolation requirements can be met with double-glazed units at all locations. Window units which include thicker glass panes, greater interpane spaces, and/or additional panes (triple glazing) compared to the requirement listed in Table 7 will also meet noise isolation requirements.

Miroca Design has confirmed that the intended window specification for the project consists of double glazing, each pane 6 mm thick, and 13.4 mm interpane spacing. The proposed window specification exceeds the minimum requirements listed in Table 7. No further upgrade is required for noise.

The window requirements are determined based on the floor area of the indoor space and the total area of each type of its associated façade components. Therefore, any change to floor plans and/or the size or composition of façade components may change these requirements.

Table 7: Minimum Glazing Requirements

Facade	Window and Balcony Door Locations	AIF Minimum Double Glazing Specifications*	Equivalent STC**
East	Levels 2-3-4 Bedrooms, southeast corner units	3-16-3, or 3-6-6, or 6-6-6	33
	Level 4 Bedroom, southwest corner unit	2-15-2, or 3-6-3	31
	Ground floor and basement Bedrooms	2-6-2	26
	Living/Dining windows, all floors	2-13-2	22
	Levels 2-3 Dens, southwest units	Per OBC	29
South	Level 4 bedroom window, southwest corner unit	2-6-2	29
	All other south façade windows	2-6-2	21
West	Balcony doors on levels 1-2-3	2-13-2	21
	Balcony door on level 4	2-13-2	30
	All other west façade windows	2-6-2	29
North	All windows	Per OBC	N/A

*Double glazing specifications are in the format “a-b-c” where:
a is the thickness of the first pane of glass, in mm
b is the interpane thickness, in mm, and
c is the thickness of the second pane of glass, in mm

**The results of the AIF Analysis are the prescriptive double glazing specifications. The Equivalent Sound Transmission Class (STC) ratings are estimated values provided for information only. The Equivalent STC of similar glazing specifications will differ based on the ratio of window to floor area.

3.0 STATIONARY SOURCE NOISE

3.1 CRITERIA

The proposed development is located within a Class 1 area for the purposes of Stationary Source noise assessments. A Class 1 area has an acoustical environment representative of a major population centre. The surrounding environment includes a mix of residential, commercial, and institutional uses, with major transportation arteries nearby. In the following table, sound level exclusion limits for steady and varying sound from Stationary Sources are extracted from NPC-300.

Table 8: Exclusion Limits for Class 1 Area

Receiver Area (Class #)	**Time Period**	**Exclusion Limit Value, 1-hour L_{eq}, dBA**	
		Outdoor Point of Reception	*Plane of Window of Noise Sensitive Space*
Class 1 (Ref: MECP NPC-300)	07:00 – 19:00	50	50
	19:00 – 23:00	50	50
	23:00 – 07:00	(n/a)	45

The sound level limit is set as the higher of either the applicable exclusion limit, or the minimum one-hour average background sound level at the Point of Reception in each MECP time period.

Per NPC-300, Stationary Source noise impacts shall be assessed separately from transportation noise impacts. Except for special circumstances not applicable to the proposed development, the noise control measures applicable to surface transportation noise (ventilation and building component requirements) are not applicable to noise from Stationary Sources.

3.2 ASSESSMENT OF OFF-SITE STATIONARY SOURCES

An initial site visit was completed on 09 September 2022, to confirm local conditions and assess whether significant Stationary Sources of environmental

noise exist near the proposed development. The Embassy of Madagascar building at 3 Raymond Street is adjacent to the proposed development to the south. Louvres were identified on the north façade of the Embassy building, which will be within a few metres of operable windows and balcony doors on the south façade of the proposed building (see Figure 9). A review of aerial imagery identified rooftop mechanical units on the Embassy building, which may also impact Points of Reception on the proposed development (see Figure 10). No other Stationary Sources were identified whose influence area would include the proposed development.

3.2.1 Noise Source Summary

A site visit to gather additional details on the noise sources identified at the Embassy of Madagascar was completed on 05 December 2022. The following observations were made.

1. The small louvres on the north façade of the Embassy (Figure 9) are for bathroom fans, which were not functional at the time of our visit. Bathroom fans typically generate modest outdoor noise levels since they serve occupied spaces. It was concluded that any noise from the small louvres with bathroom fans on would be insignificant.

2. The large louvres on the north façade of the Embassy (Figure 9) are fresh air intakes associated with the air conditioning systems for the building. Noise at the louvres would primarily be generated from the ventilator drawing outside air. Because these ventilators are designed to serve occupied spaces, insignificant noise levels are expected at the grills.

3. The three rooftop units are condensers for air conditioning systems. They were identified as identical 5-ton Lennox units, model number TSA060S4N42J. Manufacturer-reported octave band sound power levels for this equipment were identified, and included in Appendix C.

Based on these findings, the only significant noise sources that warrant further investigation are the three rooftop Lennox condenser units. These units are expected to operate continuously during worst-case conditions: daytime hours during hot summer days, when building cooling demands are greatest. Overnight, cooling demands are expected to be far less. The assessment considers that the units will operate up to 30 minutes per hour as a representative worst-case assumption at night, equivalent to a 3 dB reduction to one-hour average noise emissions at night. The complete list of significant noise sources included in the Stationary Source assessment is included following.

Table 9: Noise Source Summary Table

Source ID	Source Description	Sound Power Level (dBA Leq 1 Hr) day-evening / night	Source Location	Sound Characteristics	Noise Control Measures
C1	5-ton condenser	79.7 / 76.7	Outdoors	Steady	None
C2	5-ton condenser	79.7 / 76.7	Outdoors	Steady	None
C3	5-ton condenser	79.7 / 76.7	Outdoors	Steady	None

3.2.2 Points of Reception

Points of Reception (PORs) were identified at the worst-case operable window or balcony door on the second, third, and fourth floors of the south façade of the proposed development, labelled as R2, R3, and R4, respectively. These windows have the greatest exposure to noise from the Embassy rooftop equipment. The PORs are identified on Figure 11.

3.2.3 Minimum Background Traffic Noise and Assessment Criteria

The PORs are all on the south façade of the building, with significant exposure to noise from Highway 417. An assessment of minimum hourly average background noise levels was completed, to determine the applicable sound level limit at each POR.

Ontario Ministry of Transportation per-hour vehicle counts on Highway 417 were used to determine background noise levels. The data is provided in Appendix C. The data was collected over a 7-day period from 29 March to 05 April 2012 at a location 0.6 km west of the Vanier Parkway. The minimum hourly traffic volume including both directions of travel occurred on 03 April between 03:00 and 04:00. The minimum Daytime-Evening hourly traffic volume including both directions of travel occurred on 01 April between 07:00 and 08:00. These data were used as the basis of STAMSON calculations of minimum 1-hour average sound levels at PORs.

Vehicle types are not included with the vehicle count data. During the minimum Daytime-Evening hour, the ENCG proportions of 5% for Heavy Trucks and 7% for Medium Trucks were applied to the vehicle count. For the Night time period, all trucks were instead assumed to be Medium Trucks, using the minimum hourly

truck count permitted by STAMSON (40 vehicles per hour). In reality, a portion of the vehicles would be classified as Heavy Trucks, which would tend to generate more noise (and therefore higher Stationary Source sound level limits). A summary of the traffic volume assignments is included below.

Table 10: Minimum Hourly Highway Traffic Input Data

Parameter	Day-Evening		Night	
	HWY 417 Eastbound	HWY 417 Westbound	HWY 417 Eastbound	HWY 417 Westbound
Minimum 1-hour vehicle count Day-Evening: 01 April, 07:00 to 08:00 Night: 03 April, 03:00 to 04:00	962	1113	311	227
Assigned number of heavy trucks	48	56	0	0
Proportion of heavy trucks	5.0%	5.0%	0.0%	0.0%
Assigned number of medium trucks	67	78	40	40
Proportion of medium trucks	7.0%	7.0%	12.9%	17.6%
Assigned number of cars	847	979	271	187

STAMSON calculations were completed on each of the top three floors of the south façade of the proposed building. The detailed STAMSON results are included in Appendix C, and the results are summarized below. In each case, the calculated one-hour average background sound level exceeded the applicable MECP Exclusion Limit value. Therefore, the calculated background sound levels set the sound level limits for noise from operation of the Embassy of Madagascar as a Stationary Source.

Table 11: Sound Level Limits for Stationary Source Noise

POR Name	POR Location	Sound Level Limit (minimum 1-hr average background sound level)	
		Daytime-Evening	Nighttime
R4	Fourth floor window	63.2 dBA	55.8 dBA
R3	Third floor window	61.3 dBA	54.0 dBA
R2	Second floor window	59.4 dBA	52.1 dBA

3.2.4 Impact Assessment

An environmental noise model was prepared using CadnaA Version 2023 (32 Bit) (build 195.5312), configured to conform to ISO Standard 9613 (Reference 14). A plot showing the elements of the noise model, key dimensions, and results is included as Figure 11. The model include the proposed building as well as the Embassy of Madagascar building. The three rooftop condenser units are included as point sources atop the Embassy building. The Embassy building features a parapet around its perimeter, which was included in the model. The local topography was modelled as flat. The PORs are modelled as Receivers along the south facade of the proposed building.

The calculated sound levels and the results of the Stationary Source noise impact assessment at each POR are summarized in the table below. The predicted noise due to the operation of the Embassy of Madagascar as a Stationary Source is less than the applicable limit in all cases. Noise reduction of the identified noise sources is not required.

Table 12: Acoustic Assessment Summary Table

Point of Reception ID	Point of Reception Description	Time of Day	Sound Level at Point of Reception (dBA Leq)	Performance Limit (dBA Leq)	Compliance with Performance Limit (Yes/No)
R4	Fourth floor window	Day-Evening	56.1	63.2	YES
		Night	53.1	55.8	YES
R3	Third floor window	Day-Evening	51.6	61.3	YES
		Night	48.6	54.0	YES
R2	Second floor window	Day-Evening	46.2	59.4	YES
		Night	43.2	52.1	YES

3.3 ASSESSMENT OF THE SITE AS A STATIONARY SOURCE

With reference to the ENCG and NPC-300, operation of the 370 Cambridge Development, in its entirety, is considered a “Stationary Source”. All individual noise sources (e.g. rooftop mechanical equipment) for this site must therefore be designed to comply with ENCG and MECP requirements for noise emissions from a Stationary Source.

As part of the mechanical design, any new equipment serving common areas of the building which generates noise outside of the building must be selected to comply with City of Ottawa Stationary Source noise limits at adjacent noise-sensitive land uses. Given the nature of the proposed development, its location, and the surrounding environment, technical solutions will be available to ensure that the applicable sound level limits are met.

Mechanical equipment dedicated to individual residential units (e.g. condensing units for air conditioning systems) will also need to be selected to comply with the City of Ottawa Noise By-law (Reference 4).

At the time of preparation of this Report, the selection of mechanical equipment has not been completed.

4.0 WARNING CLAUSES

Recommended wording for Notices-On-Title for all units is provided below. These are based on the recommended wording found in the ENCG Part 4, Appendix A Table A1, for type “No outdoor amenity area”, with minor edits as applicable to the proposed development. The content is consistent with NPC-300 Warning Clauses Types A and D.

> Purchasers/tenants are advised that sound levels due to increasing road traffic will interfere with outdoor activities as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.
>
> To help address the need for sound attenuation this development includes multi-pane glass windows and balcony doors. To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.
>
> This dwelling unit has been supplied with a central air conditioning system and other measures 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 City and the Ministry of the Environment.

5.0 SUMMARY AND CONCLUSIONS

The results of the Noise Impact Assessment Study are summarized below.

1. Central air conditioning (or an alternative mechanical ventilation system meeting the requirements described in NPC-300) must be provided for all units.

2. Building envelope components must be designed to ensure that indoor sound level limits are met. The minimum requirements for windows and balcony doors are provided in Table 7. The proposed window specification, consisting of double glazing with each pane 6 mm thick and 13.4 mm interpane spacing, exceeds the minimum requirements in all cases.

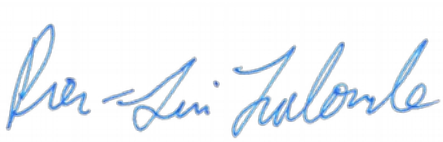
3. The Embassy of Madagascar was identified as a Stationary Source adjacent to the proposed development. An assessment was completed to determine whether noise emissions will exceed the applicable limits at the proposed development. It is concluded that noise impacts will be lower than the applicable limits at all times, and that no noise control is required (the results of the assessment are summarized in Table 12). No other nearby Stationary Sources were identified.

4. On-site mechanical equipment will need to be selected and designed to comply with City of Ottawa requirements for noise emissions from a Stationary Source and the City of Ottawa Noise By-law. No concerns regarding the feasibility of on-site noise sources to meet the applicable sound level limits have been identified.

5. Notices-on-Title with respect to environmental noise are also required. Recommended wording is included as Section 4.0.

We conclude that the project can be developed such that all requirements for noise from transportation sources and Stationary Sources are met.

Report Prepared by:



Pier-Gui Lalonde, P.Eng.
613-761-1565 ext. 118

Checked and Approved by:

Gregory E. Clunis, P.Eng.
613-761-1565 ext. 112

2023-12-01

This Noise Impact Assessment Study was prepared by Integral DX Engineering for the accounts of 2250276 Ontario Inc. and Miroca Design. The material in it reflects Integral DX Engineering's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibilities of such third parties. Integral DX Engineering accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

FIGURES

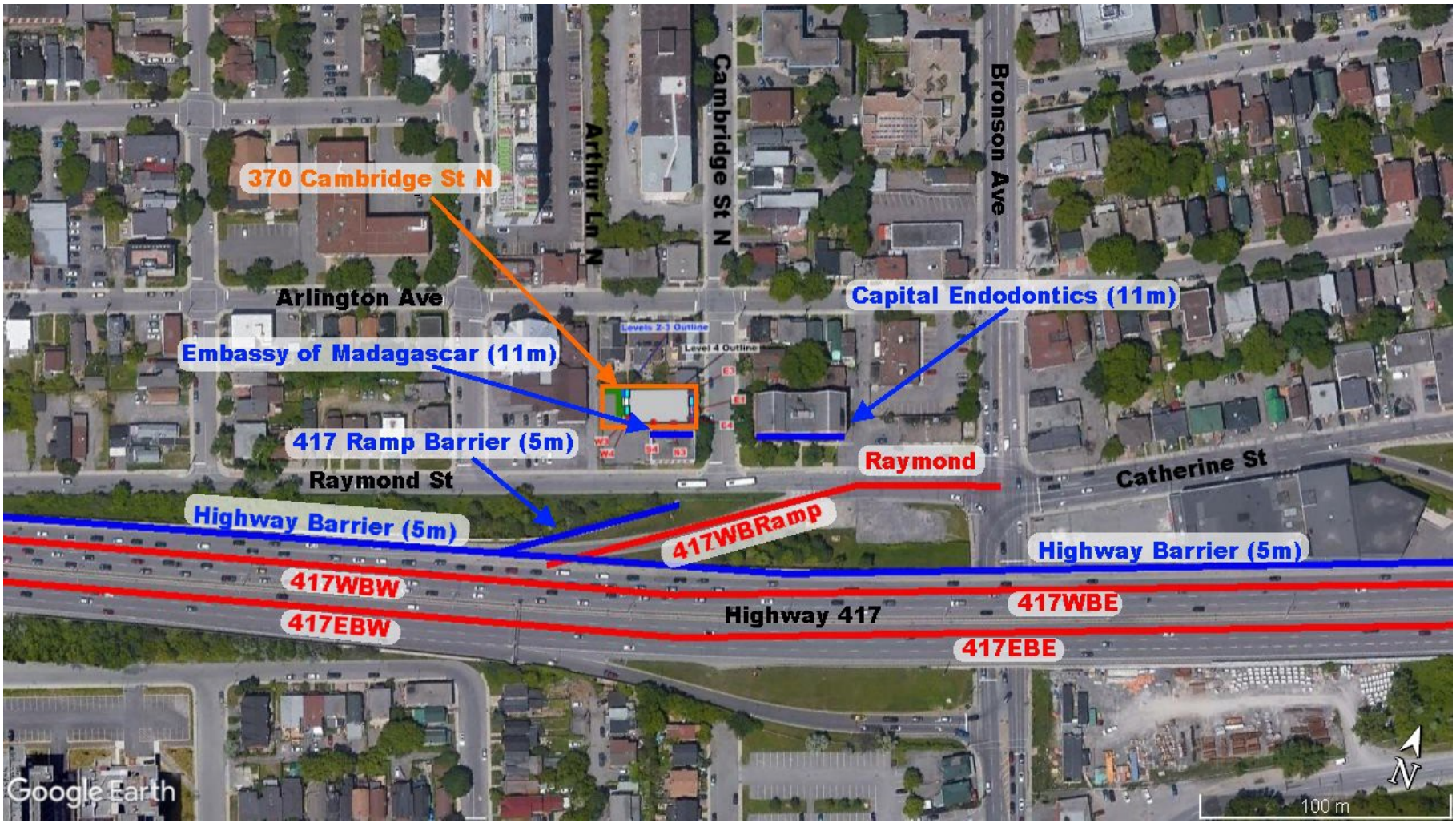


Figure 1: Area Plan

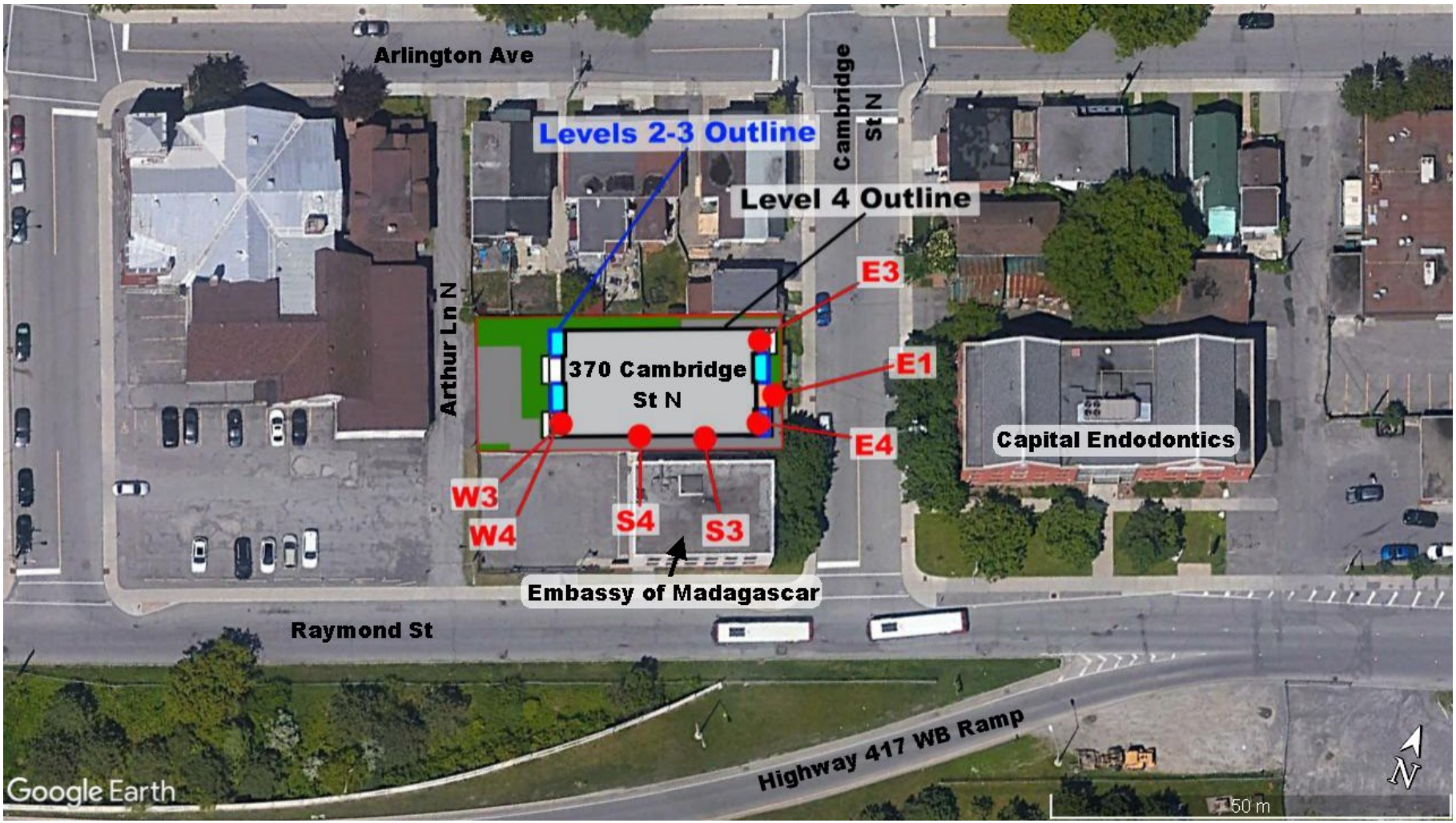
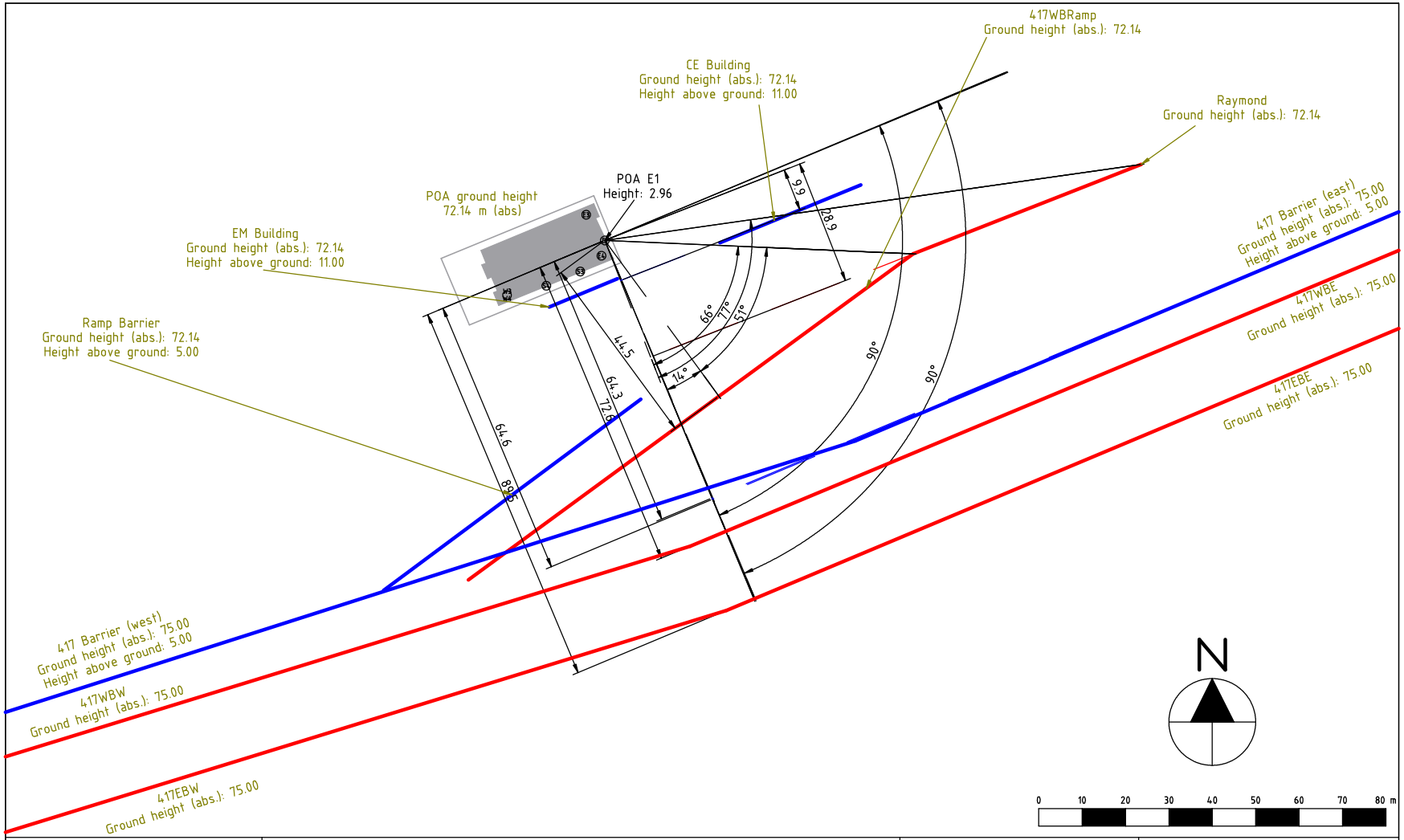


Figure 2: Site Plan



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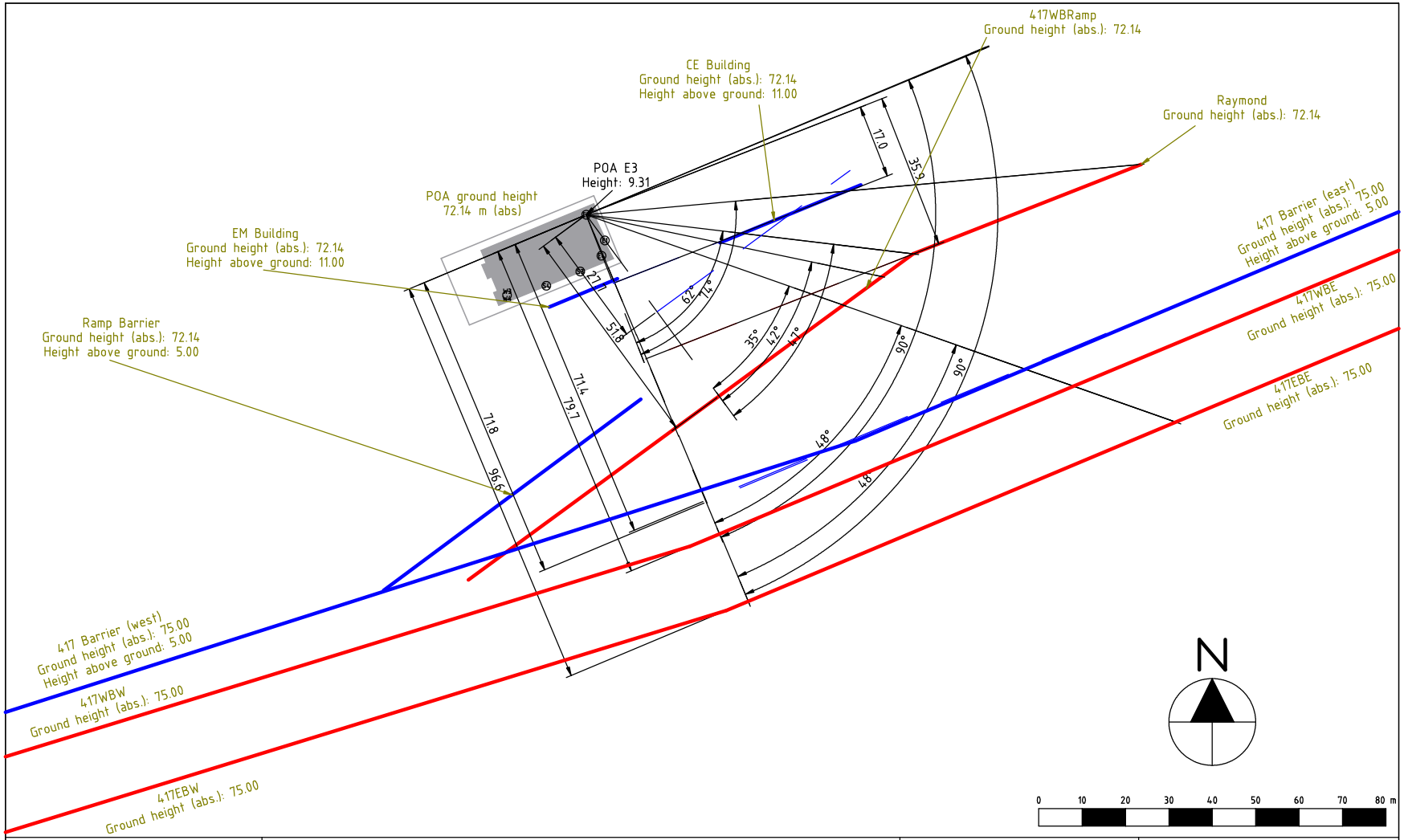
POA E1 Plan View

Plan view of POA, including distances and angles to roadway segments and noise barrier segments. Grade heights and heights above grade are also shown. All dimensions are in metres.

Rev:	0
Date:	2023-09-06
Drawn By:	PGL
Scale:	as shown

Figure 3

370 Cambridge Development
Ottawa, Ontario



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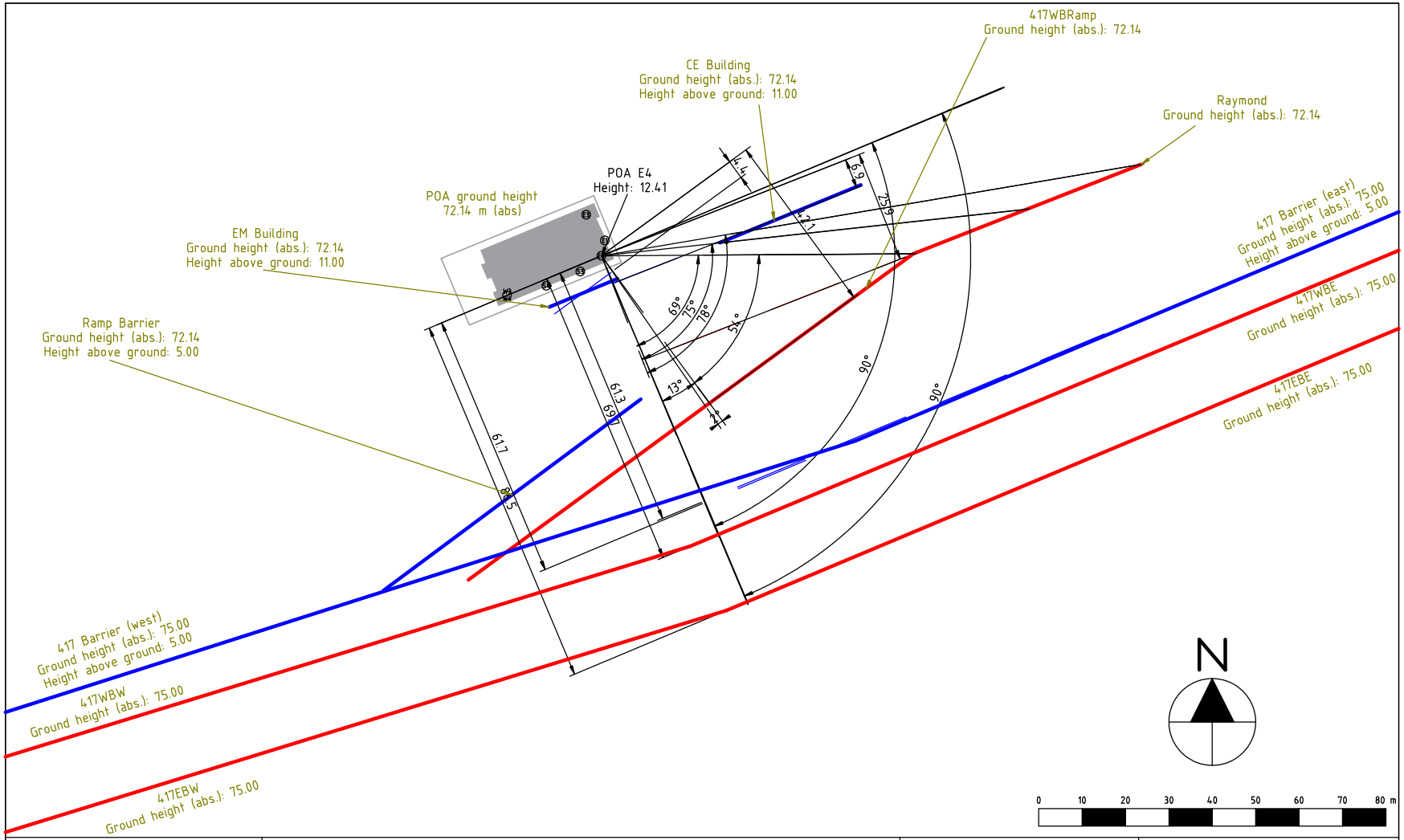
POA E3 Plan View

Plan view of POA, including distances and angles to roadway segments and noise barrier segments. Grade heights and heights above grade are also shown. All dimensions are in metres.

Rev:	0
Date:	2023-09-06
Drawn By:	PGL
Scale:	as shown

Figure 4

370 Cambridge Development
Ottawa, Ontario



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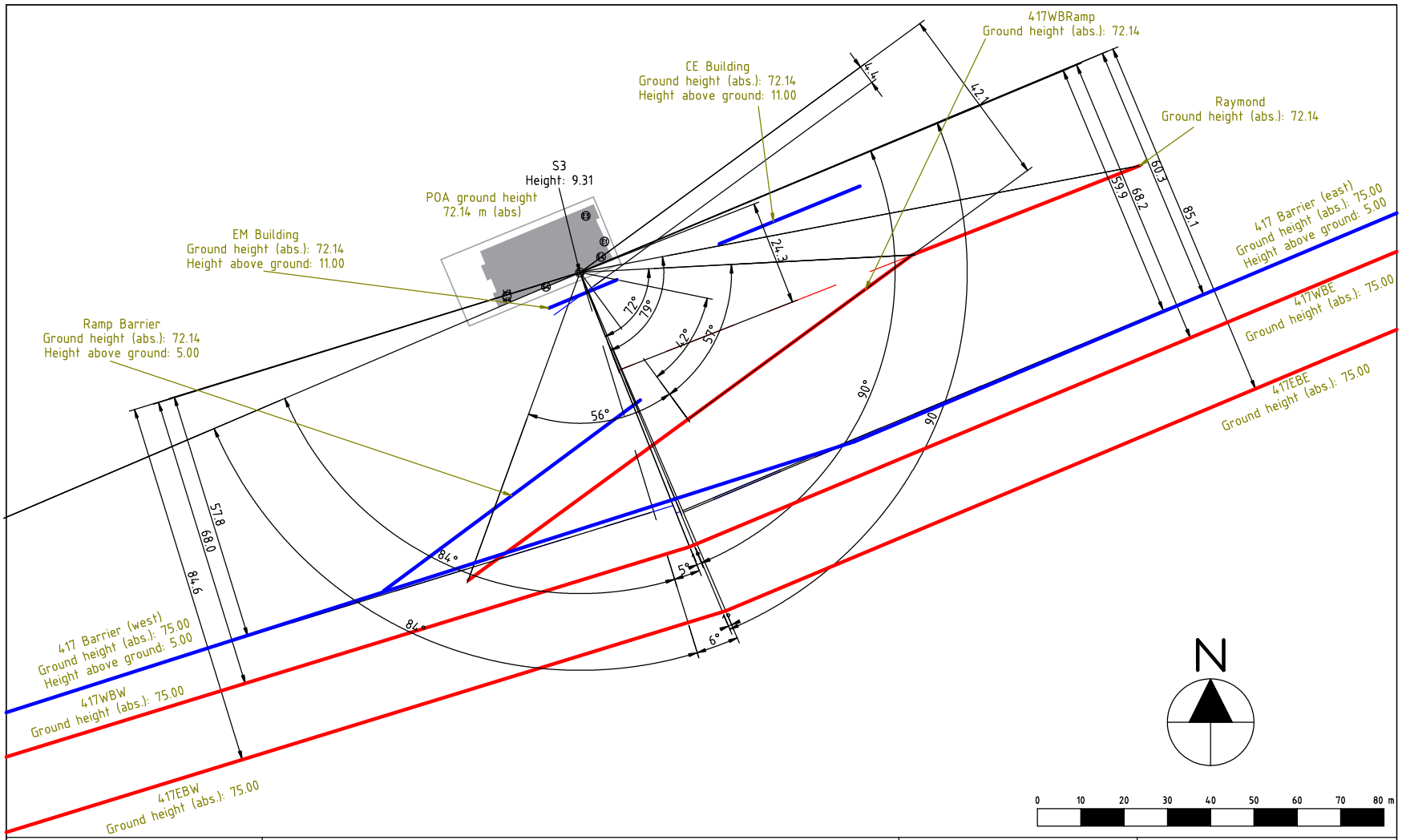
POA E4 Plan View

Plan view of POA, including distances and angles to roadway segments and noise barrier segments. Grade heights and heights above grade are also shown. All dimensions are in metres.

Rev:	0
Date:	2023-09-06
Drawn By:	PGL
Scale:	as shown

Figure 5

370 Cambridge Development
Ottawa, Ontario



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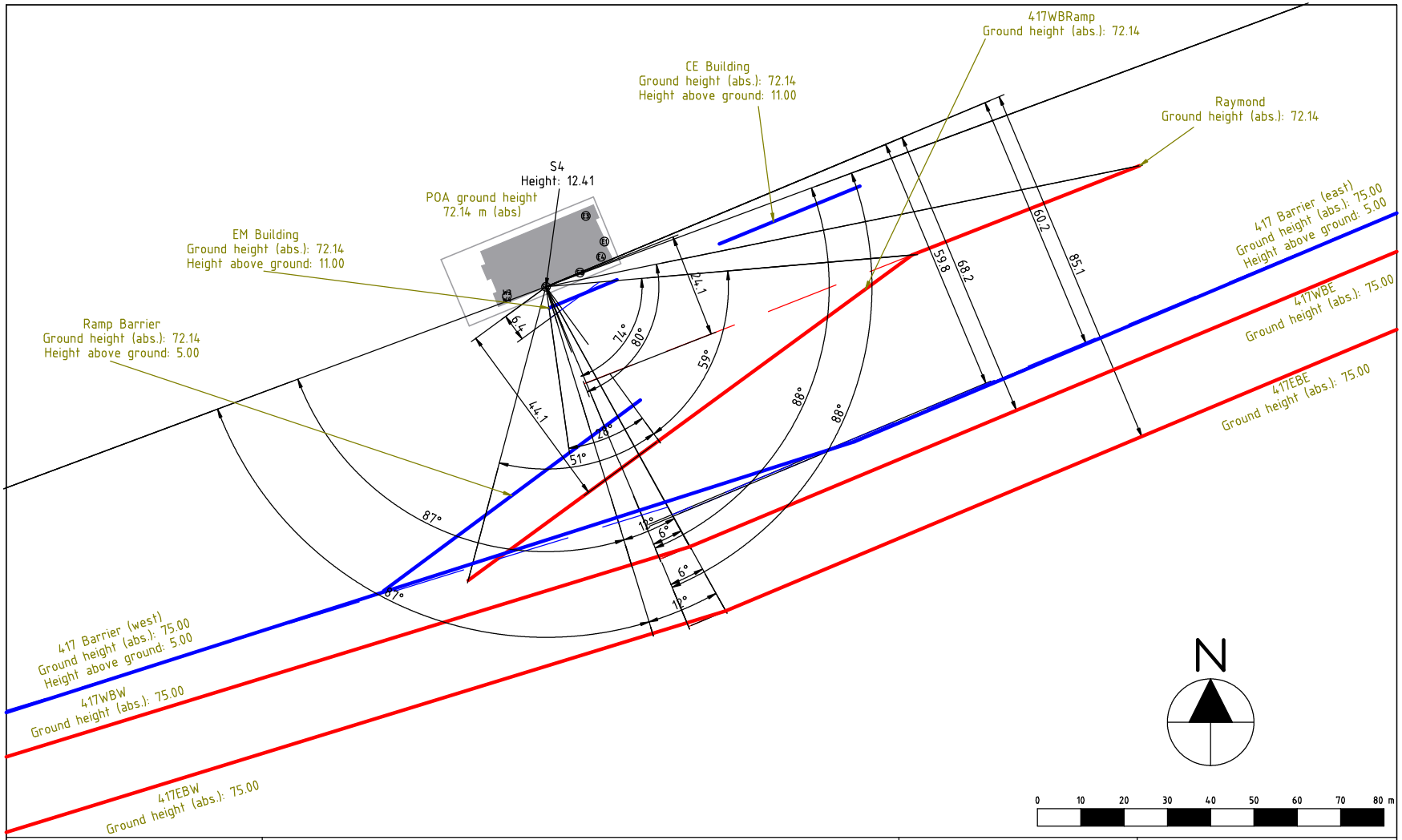
POA S3 Plan View

Plan view of POA, including distances and angles to roadway segments and noise barrier segments. Grade heights and heights above grade are also shown. All dimensions are in metres.

Rev:	0
Date:	2023-09-06
Drawn By:	PGL
Scale:	as shown

Figure 6

370 Cambridge Development
Ottawa, Ontario



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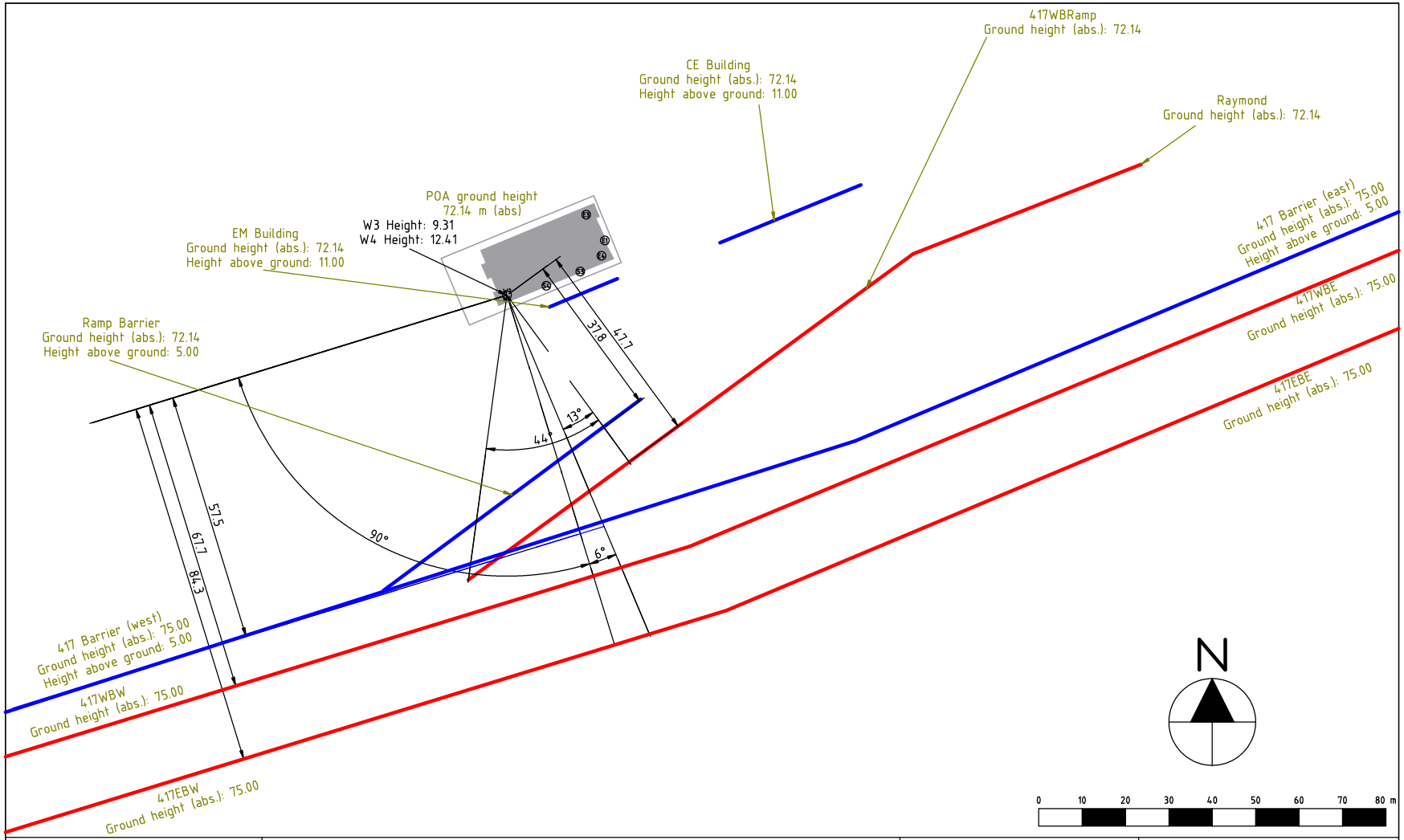
POA S4 Plan View

Plan view of POA, including distances and angles to roadway segments and noise barrier segments. Grade heights and heights above grade are also shown. All dimensions are in metres.

Rev:	0
Date:	2023-09-06
Drawn By:	PGL
Scale:	as shown

Figure 7

370 Cambridge Development
Ottawa, Ontario



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POA W3, W4 Plan View

Plan view of POA, including distances and angles to roadway segments and noise barrier segments. Grade heights and heights above grade are also shown. All dimensions are in metres.

Rev:	0
Date:	2023-09-06
Drawn By:	PGL
Scale:	as shown

Figure 8

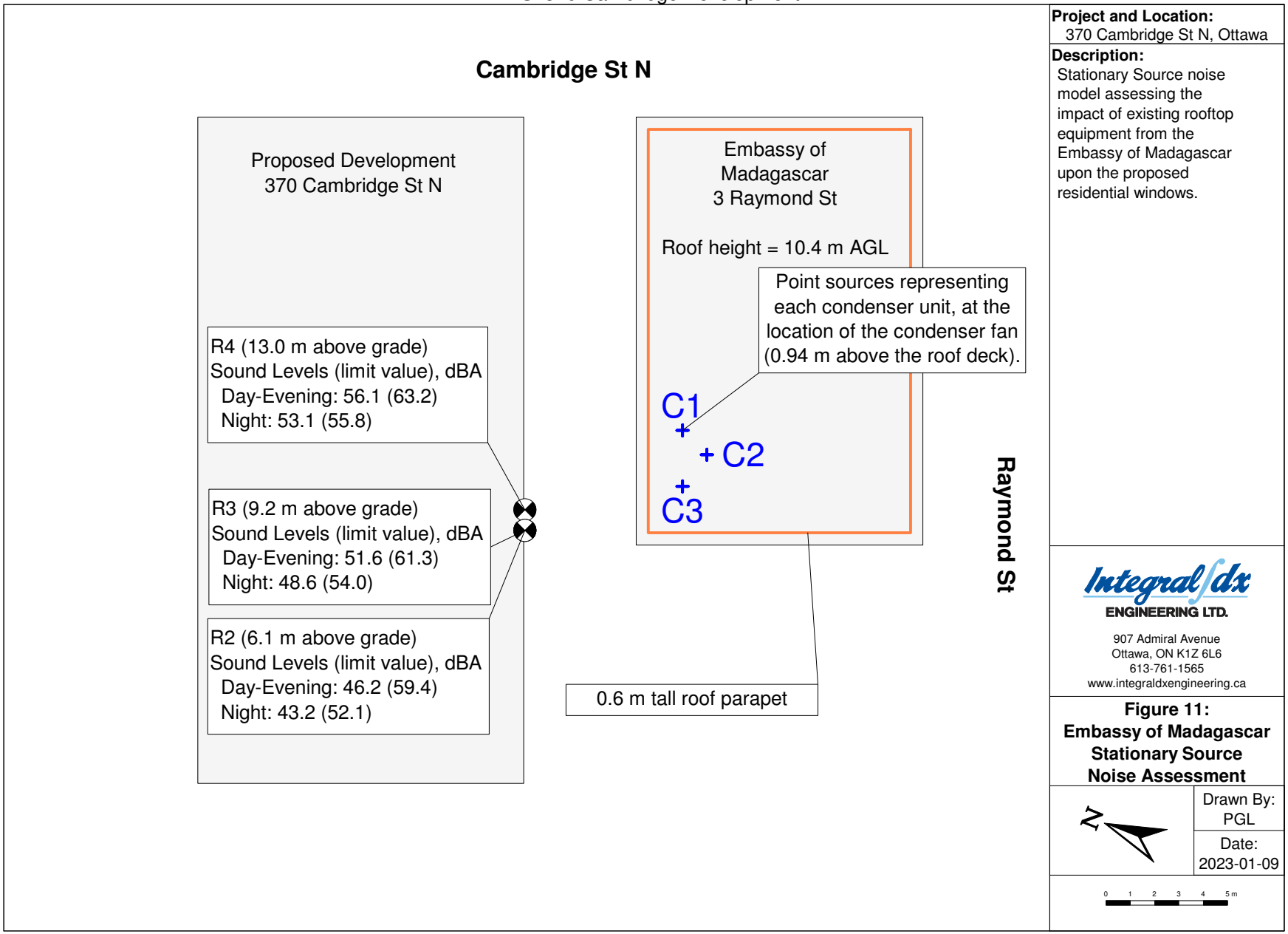
370 Cambridge Development
Ottawa, Ontario

Figure 9: View of the North Facade of the Embassy of Madagascar

Three large grills (red arrows) and three small grills (yellow arrows) are identified.

Figure 10: Aerial View of Rooftop Noise Sources, Embassy of Madagascar

Imagery via GeoOttawa



Project and Location:
370 Cambridge St N, Ottawa

Description:
Stationary Source noise model assessing the impact of existing rooftop equipment from the Embassy of Madagascar upon the proposed residential windows.

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Figure 11:
Embassy of Madagascar Stationary Source Noise Assessment

Drawn By: PGL

Date: 2023-01-09

0 1 2 3 4 5 m

APPENDICES

APPENDIX A: STAMSON CALCULATION RESULTS

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:44:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: E4.TE               Time Period: Day/Night 16/8 hours
Description: Top floor east bedroom window


Road data, segment # 1: 417WBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  69.70 / 69.70  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  61.30 / 61.30  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417EBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  86.50 / 86.50  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  61.70 / 61.70  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: Raymond (day/night)
-------------------------------------------
Car traffic volume  : 20240/1760  veh/TimePeriod  *
Medium truck volume :  1610/140   veh/TimePeriod  *
Heavy truck volume  :  1150/100   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):  25000
    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: Raymond (day/night)
-----------------------------------------
Angle1   Angle2           : -78.00 deg   -69.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.90 / 25.90  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -78.00 deg   Angle2 : -75.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   6.90 / 6.90   m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 4: 417WBRamp (day/night)
---------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           : -54.00 deg   13.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  42.10 / 42.10  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :   2.00 deg   Angle2 : 13.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   4.40 / 4.40   m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBE           !     1.50 !    60.94 !    60.94
 2.417EBE           !     1.50 !    64.62 !    64.62
 3.Raymond          !     1.50 !    53.98 !    53.98
 4.417WBRamp        !     1.50 !    66.60 !    66.60 *
--------------------+----------+----------+----------
                      Total                   69.52 dBA

  * Bright Zone  !


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBE           !     1.49 !    53.34 !    53.34
 2.417EBE           !     1.49 !    57.03 !    57.03
 3.Raymond          !     1.50 !    46.38 !    46.38
 4.417WBRamp        !     1.49 !    59.00 !    59.00 *
--------------------+----------+----------+----------
                      Total                   61.93 dBA

  * Bright Zone  !



TOTAL Leq FROM ALL SOURCES (DAY): 69.52
                           (NIGHT): 61.93
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:44:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: E3.TE               Time Period: Day/Night 16/8 hours
Description: Third floor den window, east faade


Road data, segment # 1: 417WBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   -48.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  79.70 / 79.70  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -48.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  71.40 / 71.40  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417EBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   -48.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  96.60 / 96.60  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -48.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  71.80 / 71.80  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: Raymond (day/night)
-------------------------------------------
Car traffic volume  : 20240/1760  veh/TimePeriod  *
Medium truck volume :  1610/140   veh/TimePeriod  *
Heavy truck volume  :  1150/100   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):  25000
    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: Raymond (day/night)
-----------------------------------------
Angle1   Angle2           : -74.00 deg   -62.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.90 / 35.90  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -74.00 deg   Angle2 : -62.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  17.00 / 17.00  m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 4: 417WBRamp (day/night)
---------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           : -47.00 deg   -35.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.80 / 51.80  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -47.00 deg   Angle2 : -42.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  27.70 / 27.70  m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBE           !     1.50 !    57.96 !    57.96
 2.417EBE           !     1.50 !    60.10 !    60.10
 3.Raymond          !     1.50 !    40.10 !    40.10
 4.417WBRamp        !     1.50 !    55.95 !    55.95
--------------------+----------+----------+----------
                      Total                  63.12 dBA


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBE           !     1.49 !    50.36 !    50.36
 2.417EBE           !     1.49 !    52.51 !    52.51
 3.Raymond          !     1.50 !    32.50 !    32.50
 4.417WBRamp        !     1.49 !    48.35 !    48.35
--------------------+----------+----------+----------
                      Total                  55.53 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.12
                           (NIGHT): 55.53
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:44:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: E1.TE               Time Period: Day/Night 16/8 hours
Description: First floor east bedroom window


Road data, segment # 1: 417WBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  72.60 / 72.60  m
Receiver height           :   2.96 / 2.96   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  64.30 / 64.30  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417EBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  89.50 / 89.50  m
Receiver height           :   2.96 / 2.96   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  64.60 / 64.60  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: Raymond (day/night)
------------------------------------------
Car traffic volume  : 20240/1760  veh/TimePeriod  *
Medium truck volume :  1610/140   veh/TimePeriod  *
Heavy truck volume  :  1150/100   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):  25000
    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: Raymond (day/night)
-----------------------------------------
Angle1   Angle2           : -77.00 deg   -66.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  28.90 / 28.90  m
Receiver height           :   2.96 / 2.96   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -77.00 deg   Angle2 : -67.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   9.90 / 9.90   m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 4: 417WBRamp (day/night)
---------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           : -51.00 deg   14.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  44.50 / 44.50  m
Receiver height           :   2.96 / 2.96   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBE           !     1.50 !    58.39 !    58.39
 2.417EBE           !     1.50 !    59.76 !    59.76
 3.Raymond          !     1.50 !    45.77 !    45.77
 4.417WBRamp        !     1.50 !    66.23 !    66.23
--------------------+----------+----------+----------
                      Total                  67.69 dBA


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBE           !     1.49 !    50.79 !    50.79
 2.417EBE           !     1.49 !    52.16 !    52.16
 3.Raymond          !     1.50 !    38.18 !    38.18
 4.417WBRamp        !     1.49 !    58.63 !    58.63
--------------------+----------+----------+----------
                      Total                  60.09 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 67.69
                           (NIGHT): 60.09
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:44:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: S4.TE               Time Period: Day/Night 16/8 hours
Description: Top floor south bedroom window


Road data, segment # 1: 417WBW (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBW (day/night)
----------------------------------------
Angle1   Angle2           : -12.00 deg   87.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  67.10 / 67.10  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -12.00 deg   Angle2 : 87.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  56.90 / 56.90  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBE (day/night)
----------------------------------------
Angle1   Angle2           : -88.00 deg   -6.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 / 68.20  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -88.00 deg   Angle2 : -6.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.80 / 59.80  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: 417EBW (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBW (day/night)
----------------------------------------
Angle1   Angle2           : -12.00 deg   87.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  83.80 / 83.80  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -12.00 deg   Angle2 : 87.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  56.90 / 56.90  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBE (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBE (day/night)
-----------------------------------------
Angle1   Angle2           : -88.00 deg   -6.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 / 85.10  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -88.00 deg   Angle2 : -6.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.20 / 60.20  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 5: Raymond (day/night)
-------------------------------------------
Car traffic volume  : 20240/1760  veh/TimePeriod  *
Medium truck volume :  1610/140   veh/TimePeriod  *
Heavy truck volume  :  1150/100   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):  25000
    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: Raymond (day/night)
-----------------------------------------
Angle1   Angle2           : -80.00 deg   -74.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.10 / 24.10  m
Receiver height           :  12.41 / 12.41  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 6: 417WBRamp (day/night)
---------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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 # 6: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           : -59.00 deg   51.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  44.10 / 44.10  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -59.00 deg   Angle2 : 28.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   6.40 / 6.40   m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    62.01 !    62.01
 2.417WBE           !     1.50 !    60.57 !    60.57
 3.417EBW           !     1.50 !    65.56 !    65.56
 4.417EBE           !     1.50 !    64.38 !    64.38
 5.Raymond          !     1.50 !    53.87 !    53.87
 6.417WBRamp        !     1.50 !    65.11 !    65.11
--------------------+----------+----------+----------
                     Total                   70.99 dBA


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.49 !    54.42 !    54.42
 2.417WBE           !     1.49 !    52.97 !    52.97
 3.417EBW           !     1.49 !    57.96 !    57.96
 4.417EBE           !     1.49 !    56.78 !    56.78
 5.Raymond          !     1.50 !    46.27 !    46.27
 6.417WBRamp        !     1.49 !    57.51 !    57.51
--------------------+----------+----------+----------
                     Total                   63.39 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 70.99
                           (NIGHT): 63.39
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:45:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: W3.TE               Time Period: Day/Night 16/8 hours
Description: Third floor west balcony door


Road data, segment # 1: 417WBW (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBW (day/night)
----------------------------------------
Angle1   Angle2           :  -6.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  67.70 / 67.70  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 90.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.50 / 57.50  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417EBW (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBW (day/night)
----------------------------------------
Angle1   Angle2           :  -6.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.30 / 84.30  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 90.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.50 / 57.50  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: 417WBRamp (day/night)
-----------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           :  13.00 deg   44.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  47.70 / 47.70  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  13.00 deg   Angle2 : 44.00 deg
Barrier height            :   5.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  37.80 / 37.80  m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    61.10 !    61.10
 2.417EBW           !     1.50 !    63.65 !    63.65
 3.417WBRamp        !     1.50 !    52.03 !    52.03
--------------------+----------+----------+----------
                      Total                  65.76 dBA
```

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.417WBW	1.49	53.50	53.50
2.417EBW	1.49	56.05	56.05
3.417WBRamp	1.49	44.42	44.42
Total			58.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.76
(NIGHT): 58.16

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:44:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: S3.TE               Time Period: Day/Night 16/8 hours
Description: Third floor south window


Road data, segment # 1: 417WBW (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBW (day/night)
----------------------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 / 68.00  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 / 57.80  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBE (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 / 68.20  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 1.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 / 59.90  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: 417EBW (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBW (day/night)
----------------------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 / 84.60  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 / 57.80  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBE (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBE (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 / 85.10  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -1.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 / 60.30  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 5: Raymond (day/night)
-------------------------------------------
Car traffic volume  : 20240/1760  veh/TimePeriod  *
Medium truck volume :  1610/140   veh/TimePeriod  *
Heavy truck volume  :  1150/100   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):  25000
    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: Raymond (day/night)
-----------------------------------------
Angle1   Angle2           : -79.00 deg   -72.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.30 / 24.30  m
Receiver height           :   9.31 / 9.31   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 6: 417WBRamp (day/night)
---------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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 # 6: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           : -57.00 deg   56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  42.10 / 42.10  m
Receiver height           :   9.31 / 9.31   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -42.00 deg   Angle2 : 56.00 deg
Barrier height            :  11.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   4.40 / 4.40   m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    60.08 !    60.08
 2.417WBE           !     1.50 !    60.18 !    60.18
 3.417EBW           !     1.50 !    63.15 !    63.15
 4.417EBE           !     1.50 !    63.05 !    63.05
 5.Raymond          !     1.50 !    54.50 !    54.50
 6.417WBRamp        !     1.50 !    60.78 !    60.78
--------------------+----------+----------+----------
                      Total                  68.82 dBA


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.49 !    52.48 !    52.48
 2.417WBE           !     1.49 !    52.58 !    52.58
 3.417EBW           !     1.49 !    55.55 !    55.55
 4.417EBE           !     1.49 !    55.45 !    55.45
 5.Raymond          !     1.50 !    46.90 !    46.90
 6.417WBRamp        !     1.49 !    53.18 !    53.18
--------------------+----------+----------+----------
                      Total                  61.22 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 68.82
                           (NIGHT): 61.22
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-10-2022 10:45:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: W4.TE               Time Period: Day/Night 16/8 hours
Description: Top floor west bedroom window


Road data, segment # 1: 417WBW (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417WBW (day/night)
-----------------------------------------
Angle1   Angle2           :  -6.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  67.70 / 67.70  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 90.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.50 / 57.50  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417EBW (day/night)
-----------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 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):  73332
    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: 417EBW (day/night)
-----------------------------------------
Angle1   Angle2           :  -6.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.30 / 84.30  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 90.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.50 / 57.50  m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: 417WBRamp (day/night)
-----------------------------------------------
Car traffic volume  : 14842/1291  veh/TimePeriod  *
Medium truck volume :  1181/103   veh/TimePeriod  *
Heavy truck volume  :   843/73    veh/TimePeriod  *
Posted speed limit  :   100 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):  18333
    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: 417WBRamp (day/night)
-------------------------------------------
Angle1   Angle2           :  13.00 deg   44.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  47.70 / 47.70  m
Receiver height           :  12.41 / 12.41  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  13.00 deg   Angle2 : 44.00 deg
Barrier height            :   5.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  37.80 / 37.80  m
Source elevation          :  72.14 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    62.19 !    62.19
 2.417EBW           !     1.50 !    65.41 !    65.41
 3.417WBRamp        !     1.50 !    54.61 !    54.61
--------------------+----------+----------+----------
                      Total                 67.34 dBA
```

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.417WBW	1.49	54.59	54.59
2.417EBW	1.49	57.81	57.81
3.417WBRamp	1.49	47.00	47.00
Total			59.74 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.34
(NIGHT): 59.74

APPENDIX B: DETAILED AIF CALCULATION RESULTS

The following table shows intermediate calculation results for the AIF analysis. The calculations were completed per BRN148. Worst-case noise sensitive indoor locations were considered, factoring in façade noise levels, indoor noise level limits, floor areas, façade component areas, and the number of façade components.

Table B.1: Detailed AIF Calculation Results

Indoor Location and Façade Assessed	Road Noise				N (1)	Average AIF Needed	Floor Area (m^2)	Components				
	Indoor Limit		Facade Level					Type (2)	Area (m^2)	AR (3)	Actual Performance	
	Day	Night	Day	Night							AIF	▲PWL (4)
East Facade, top floor SE unit bedroom	45	40	69.52	61.93	4	33	11.1	EW	3.1	27.9	43	-22
								OP-W	2.8	25.1	31	15
								F-W	2.8	25.1	34	-5
											Total	*-12*
East façade, top floor SE unit living/dining room	45	45	69.52	61.93	2	30	21.8	EW	4.6	21.0	44	-45
								OP-W	5.6	25.5	28	29
											Total	*-16*
East façade, top floor NE unit bedroom	45	40	69.52	61.93	3	31	11.3	EW	3.7	32.4	42	-30
								OP-W	2.8	24.6	29	20
								F-W	2.8	24.6	32	-7
											Total	*-17*
South façade, top floor SW unit bedroom	45	40	70.99	63.39	3	33	10.0	EW	7.1	70.8	39	-25
								OP-W	1.1	11.2	31	20
								F-W	1.1	11.2	34	-7
											Total	*-12*
South façade, Floor 3 bachelor unit open area	45	40	68.82	61.22	2	29	22.4	EW	10.6	47.4	40	-45
								OP-W	5.1	22.8	27	29
											Total	*-16*
South façade, floor 3 SE unit den	45	45	68.82	61.22	2	29	6.8	EW	5.6	82.4	38	-44
								OP-W	1.1	16.4	29	0
											Total	*-44*
West façade, top floor SW unit bedroom	45	40	67.34	59.74	4	30	11.1	EW	3.1	27.8	43	-22
								OP-W	2.8	25.0	28	15
								F-W	2.8	25.0	31	-5
											Total	*-12*
West façade, floor 3 SW unit open living/dining kitchen	45	45	65.76	58.16	4	29	17.9	EW	3.4	19.0	44	-22
								OP-W	5.6	31.2	27	15
											Total	*-7*
East façade, ground floor bedroom window	45	45	67.69	60.09	3	29	13.5	EW	5.1	37.7	41	-30
								OP-W	1.7	12.3	30	-7
								F-W	1.7	12.3	33	-20
											Total	*-57*

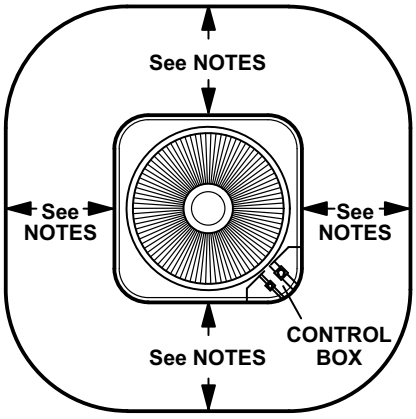
Notes:
(1) N refers to the number of different types of components.
(2) Component Types:
EW = Exterior Wall
OP-W = Operable Window
F-W = Fixed Window
(3) AR refers to the ratio of the component area and floor area, expressed as a percentage value.
(4) ▲PWL refers to the change in transmitted sound power for the specified component, compared to a component with an AIF rating equal to the average required level. The room total value is provided, and must be less than or equal to 0 to meet the indoor sound level limit.

APPENDIX C: SUPPORTING INFORMATION, STATIONARY SOURCE NOISE IMPACT ASSESSMENT

Included information:

1. Manufacturer-reported sound level data for the Lennox rooftop units installed on the roof of the Embassy of Madagascar (2 pages).
2. MTO Hourly traffic counts, Highway 417 0.6 km West of Vanier Parkway (3 pages).
3. STAMSON calculations, minimum one-hour average background sound levels at PORs (16 pages).

INSTALLATION CLEARANCES - INCHES (MM)



NOTES:

Service clearance of 30 in. (762 mm) must be maintained on one of the sides adjacent to the control box.

Clearance to one of the other three sides must be 36 in. (914 mm)

Clearance to one of the remaining two sides may be 12 in. (305 mm) and the final side may be 6 in. (152 mm).

A clearance of 24 in. (610 mm) must be maintained between two units.

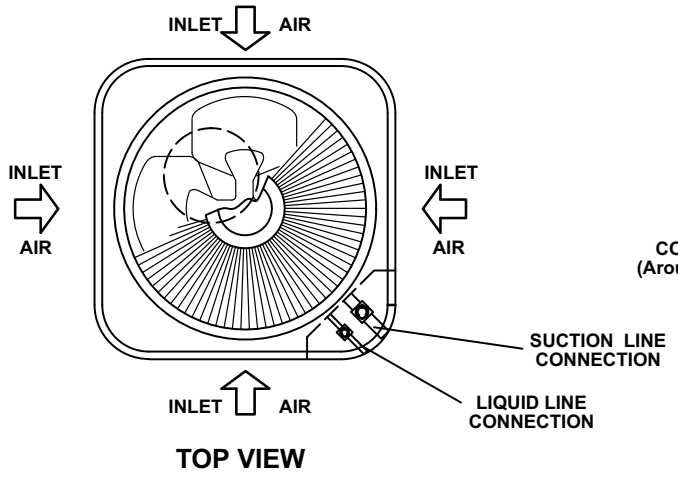
48 in. (1219 mm) clearance required on top of unit.

OUTDOOR SOUND DATA

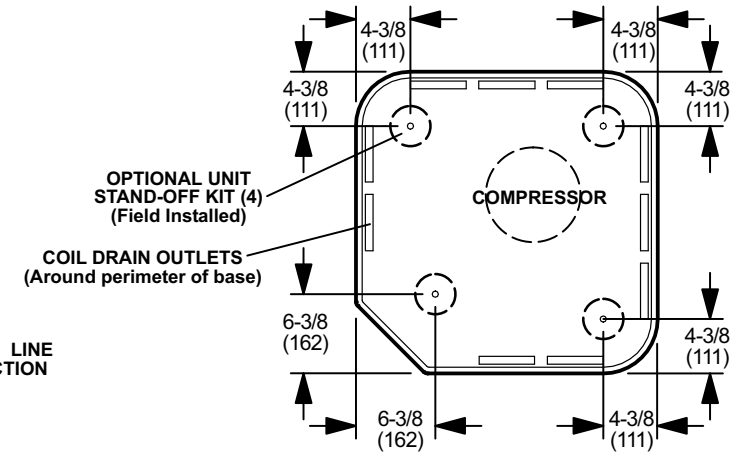
[1] Unit Model No.	Octave Band Sound Power Levels dBA, re 10^{-12} Watts Center Frequency - HZ							[1] Sound Rating Number (dB)
	125	250	500	1000	2000	4000	8000	
TSA036S4	70.5	67.5	69.5	72.5	69.5	63	59	76
TSA042S4	74	76.5	76.5	75.5	72	68	63.5	80
TSA048S4	73.5	76	76	76.5	72.5	69.5	64.5	80
TSA060S4	73.5	74.5	77	75	72	69	64.5	80

NOTE - the octave sound power data does not include tonal correction.
[1] Tested according to ARI Standard 270 test conditions.

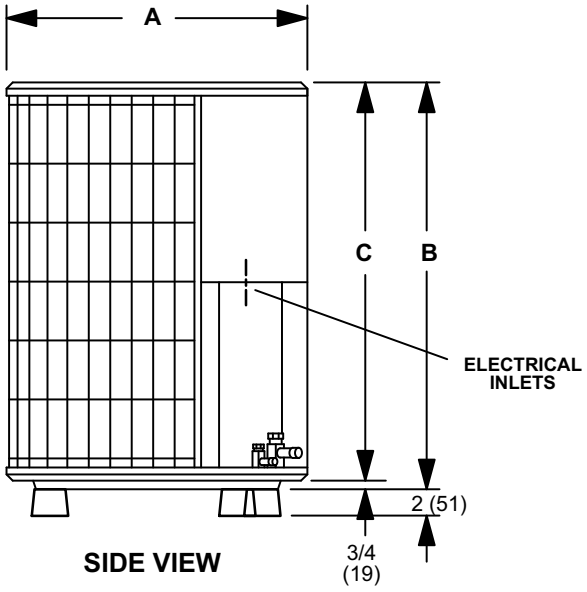
DIMENSIONS - INCHES (MM)



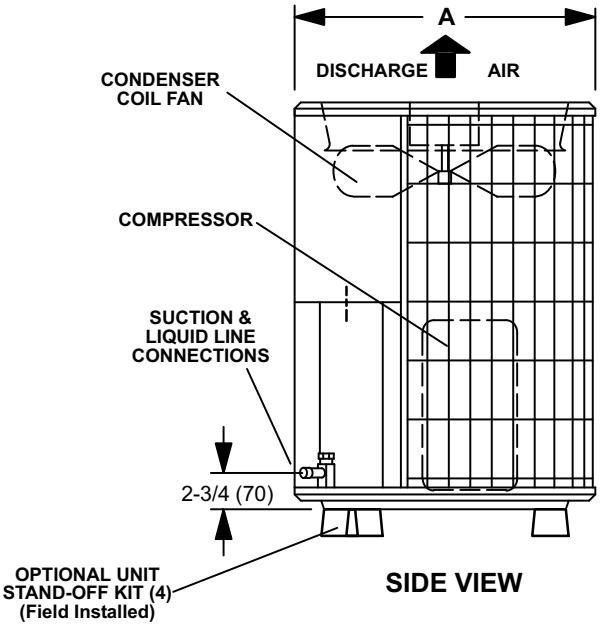
TOP VIEW



TOP VIEW BASE SECTION



SIDE VIEW



SIDE VIEW

Model No.	A		B		C	
	in.	mm	in.	mm	in.	mm
TSA036S4	24-1/4	616	29-1/4	743	28-1/2	724
TSA042S4	24-1/4	616	33-1/4	845	32-1/2	826
TSA048S4	28-1/4	718	29-1/4	743	28-1/2	724
TSA060S4	28-1/4	718	37-1/4	946	36-1/4	921

Traffic Engineering Software

Weekly Volume Summary

Thu, May 10, 2012

Location: Hwy 417 - 0.6 km West of Vanier Parkway IC117

LHRS/Offset: 49379 / 0.0 **Region:** Eastern

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 417130

Count Direction: EB **Report Dates:** Mar 29, 2012 **to** Apr 4, 2012

Hour Interval	Thu 12/03/29	Fri 30	Sat 31	Sun 1	Mon 2	Tue 3	Wed 4	Thu 5
0:00- 1:00		803	1,290	1,493	615	549	627	650
1:00- 2:00		533	904	1,044	427	368	371	438
2:00- 3:00		483	850	905	370	292	309	352
3:00- 4:00		393	584	667	311	311	281	308
4:00- 5:00		463	388	374	398	405	433	428
5:00- 6:00		1,380	481	356	1,473	1,457	1,458	1,499
6:00- 7:00		4,439	1,031	727	4,655	4,720	4,798	4,699
7:00- 8:00		5,901	1,744	962	5,850	6,020	5,924	6,140
8:00- 9:00		5,746	2,833	1,468	5,879	5,677	5,649	5,686
9:00-10:00		5,165	4,100	2,520	4,833	4,982	5,197	4,774
10:00-11:00		4,894	4,523	3,412	4,419	4,607	4,711	5,155
11:00-12:00		5,487	5,241	4,000	4,847	4,982	5,120	5,511
AM Total	0	35,687	23,969	17,928	34,077	34,370	34,878	35,640
12:00-13:00	5,312	5,820	5,629	4,668	5,039	5,310	5,400	
13:00-14:00	5,404	5,994	5,455	5,032	5,056	5,269	5,527	
14:00-15:00	6,204	6,629	5,507	5,136	5,603	5,907	3,431	
15:00-16:00	7,319	7,473	5,408	4,868	6,902	7,160	6,087	
16:00-17:00	7,029	6,931	5,054	4,768	6,149	6,673	5,681	
17:00-18:00	6,173	5,631	4,819	3,957	5,937	6,055	6,146	
18:00-19:00	5,159	5,380	3,928	3,321	4,600	4,864	5,339	
19:00-20:00	4,258	4,015	3,293	2,839	3,519	3,767	4,050	
20:00-21:00	3,450	3,143	2,804	2,578	2,882	3,124	3,422	
21:00-22:00	3,267	3,318	2,803	2,245	2,606	2,823	2,998	
22:00-23:00	2,290	2,591	2,652	2,109	1,657	2,898	2,110	
23:00-24:00	1,345	1,884	2,037	1,500	1,023	1,580	1,233	
PM Total	57,210	58,809	49,389	43,021	50,973	55,430	51,424	0
24 Hr. Total	57,210	94,496	73,358	60,949	85,050	89,800	86,302	35,640
Noon - Noon		92,897	82,778	67,317	77,098	85,343	90,308	87,064

Traffic Engineering Software

Weekly Volume Summary

Thu, May 10, 2012

Location: Hwy 417 - 0.6 km West of Vanier Parkway IC117

LHRS/Offset: 49379 / 0.0 **Region:** Eastern

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 417130

Count Direction: WB **Report Dates:** Mar 29, 2012 **to** Apr 4, 2012

Hour Interval	Thu 12/03/29	Fri 30	Sat 31	Sun 1	Mon 2	Tue 3	Wed 4	Thu 5
0:00- 1:00		650	1,153	1,314	586	543	702	647
1:00- 2:00		356	827	850	346	311	356	350
2:00- 3:00		504	579	653	239	277	308	283
3:00- 4:00		355	430	391	253	227	286	324
4:00- 5:00		418	340	265	406	448	435	427
5:00- 6:00		1,369	567	329	1,426	1,418	1,393	1,441
6:00- 7:00		4,971	1,197	759	5,152	5,228	4,696	5,088
7:00- 8:00		6,837	1,776	1,113	7,009	6,977	6,336	6,262
8:00- 9:00		7,192	3,094	1,750	7,140	7,234	6,843	7,217
9:00-10:00		5,974	4,084	2,746	5,824	6,161	6,405	6,419
10:00-11:00		5,176	4,416	3,619	4,824	4,883	4,792	4,971
11:00-12:00		5,845	5,107	4,068	4,805	5,144	5,175	5,350
AM Total	0	39,647	23,570	17,857	38,010	38,851	37,727	38,779
12:00-13:00	5,289	5,810	5,480	4,716	4,997	4,978	5,221	
13:00-14:00	5,218	5,540	5,434	4,969	4,815	4,991	4,946	
14:00-15:00	5,645	5,944	5,154	4,919	5,435	5,340	5,355	
15:00-16:00	6,634	6,603	5,356	4,778	6,478	6,577	6,684	
16:00-17:00	5,844	5,667	5,422	4,498	5,507	5,682	5,721	
17:00-18:00	5,567	5,338	5,266	4,428	4,918	5,320	5,260	
18:00-19:00	4,905	5,300	4,783	3,640	4,315	4,807	4,990	
19:00-20:00	4,016	4,447	3,516	3,330	3,334	3,556	3,725	
20:00-21:00	3,305	3,379	2,748	3,051	2,906	3,004	3,107	
21:00-22:00	2,773	3,048	2,603	2,277	2,517	2,594	2,659	
22:00-23:00	1,928	2,382	2,376	1,579	1,657	1,779	1,812	
23:00-24:00	1,261	1,627	1,750	1,146	1,096	1,205	1,166	
PM Total	52,385	55,085	49,888	43,331	47,975	49,833	50,646	0
24 Hr. Total	52,385	94,732	73,458	61,188	85,985	88,684	88,373	38,779
Noon - Noon		92,032	78,655	67,745	81,341	86,826	87,560	89,425

Traffic Engineering Software

Weekly Volume Summary

Thu, May 10, 2012

Location: Hwy 417 - 0.6 km West of Vanier Parkway IC117

LHRS/Offset: 49379 / 0.0 **Region:** Eastern

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 417130

Count Direction: EB/WB **Report Dates:** Mar 29, 2012 **to** Apr 4, 2012

Hour Interval	Thu 12/03/29	Fri 30	Sat 31	Sun 1	Mon 2	Tue 3	Wed 4	Thu 5
0:00- 1:00		1,453	2,443	2,807	1,201	1,092	1,329	1,297
1:00- 2:00		889	1,731	1,894	773	679	727	788
2:00- 3:00		987	1,429	1,558	609	569	617	635
3:00- 4:00		748	1,014	1,058	564	538	567	632
4:00- 5:00		881	728	639	804	853	868	855
5:00- 6:00		2,749	1,048	685	2,899	2,875	2,851	2,940
6:00- 7:00		9,410	2,228	1,486	9,807	9,948	9,494	9,787
7:00- 8:00		12,738	3,520	2,075	12,859	12,997	12,260	12,402
8:00- 9:00		12,938	5,927	3,218	13,019	12,911	12,492	12,903
9:00-10:00		11,139	8,184	5,266	10,657	11,143	11,602	11,193
10:00-11:00		10,070	8,939	7,031	9,243	9,490	9,503	10,126
11:00-12:00		11,332	10,348	8,068	9,652	10,126	10,295	10,861
AM Total	0	75,334	47,539	35,785	72,087	73,221	72,605	74,419
12:00-13:00	10,601	11,630	11,109	9,384	10,036	10,288	10,621	
13:00-14:00	10,622	11,534	10,889	10,001	9,871	10,260	10,473	
14:00-15:00	11,849	12,573	10,661	10,055	11,038	11,247	8,786	
15:00-16:00	13,953	14,076	10,764	9,646	13,380	13,737	12,771	
16:00-17:00	12,873	12,598	10,476	9,266	11,656	12,355	11,402	
17:00-18:00	11,740	10,969	10,085	8,385	10,855	11,375	11,406	
18:00-19:00	10,064	10,680	8,711	6,961	8,915	9,671	10,329	
19:00-20:00	8,274	8,462	6,809	6,169	6,853	7,323	7,775	
20:00-21:00	6,755	6,522	5,552	5,629	5,788	6,128	6,529	
21:00-22:00	6,040	6,366	5,406	4,522	5,123	5,417	5,657	
22:00-23:00	4,218	4,973	5,028	3,688	3,314	4,677	3,922	
23:00-24:00	2,606	3,511	3,787	2,646	2,119	2,785	2,399	
PM Total	109,595	113,894	99,277	86,352	98,948	105,263	102,070	0
24 Hr. Total	109,595	189,228	146,816	122,137	171,035	178,484	174,675	74,419
Noon - Noon		184,929	161,433	135,062	158,439	172,169	177,868	176,489

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
166,627	177,864	172,313	173,453	182,652	171,718	161,975	17,576

```
STAMSON 5.0        SUMMARY REPORT        Date: 16-12-2022 12:02:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: SS4DAY.TE            Time Period: 1 hours
Description: Fourth floor stationary source bg noise, day


Road data, segment # 1: 417WBW
------------------------------
Car traffic volume  :   979 veh/TimePeriod
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: 417WBW
------------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE
------------------------------
Car traffic volume  :   979 veh/TimePeriod
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: 417WBE
------------------------------
Angle1   Angle2           : -90.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 1.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 3: 417EBW
------------------------------
Car traffic volume  :   847 veh/TimePeriod
```

```
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: 417EBW
----------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBE
------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: 417EBE
----------------------------
Angle1   Angle2           : -90.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -1.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00

Result summary
--------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    55.58 !    55.58
 2.417WBE           !     1.50 !    55.28 !    55.28
 3.417EBW           !     1.49 !    58.62 !    58.62
 4.417EBE           !     1.49 !    58.28 !    58.28
--------------------+----------+----------+----------
                      Total                 63.22 dBA

TOTAL Leq FROM ALL SOURCES:       63.22
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 16-12-2022 11:21:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: SS4.TE              Time Period: 1 hours
Description: Fourth floor stationary source bg noise


Road data, segment # 1: 417WBW
------------------------------
Car traffic volume  :   227 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: 417WBW
------------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE
------------------------------
Car traffic volume  :   227 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: 417WBE
------------------------------
Angle1   Angle2           : -90.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 1.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00

Road data, segment # 3: 417EBW
------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
```

```
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: 417EBW
-----------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00

Road data, segment # 4: 417EBE
------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: 417EBE
-----------------------------
Angle1   Angle2           : -90.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :  12.41 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -1.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00

Result summary
--------------
                    !  source  !   Road    !  Total
                    !  height  !   Leq     !   Leq
                    !    (m)   !  (dBA)    !  (dBA)
--------------------+----------+-----------+----------
 1.417WBW           !     0.50 !    46.70  !    46.70
 2.417WBE           !     0.50 !    46.74  !    46.74
 3.417EBW           !     0.50 !    51.71  !    51.71
 4.417EBE           !     0.50 !    51.36  !    51.36
--------------------+----------+-----------+----------
                      Total                   55.79 dBA


TOTAL Leq FROM ALL SOURCES:       55.79
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 16-12-2022 11:56:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: SS3day.TE            Time Period: 1 hours
Description: Third floor stationary source bg noise


Road data, segment # 1: 417WBW
------------------------------
Car traffic volume  :   979 veh/TimePeriod
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: 417WBW
------------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE
------------------------------
Car traffic volume  :   979 veh/TimePeriod
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: 417WBE
------------------------------
Angle1   Angle2           : -56.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : 1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 3: 417WBE2
------------------------------
Car traffic volume  :   979 veh/TimePeriod
```

```
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: 417WBE2
------------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBW
------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: 417EBW
------------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 5: 417EBE
------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 5: 417EBE
------------------------------
Angle1   Angle2           : -56.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : -1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 6: 417EBE2
-------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 6: 417EBE2
-----------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Result summary
--------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    54.32 !    54.32
 2.417WBE           !     1.50 !    50.55 !    50.55
 3.417WBE2          !     1.50 !    52.56 !    52.56
 4.417EBW           !     1.49 !    56.72 !    56.72
 5.417EBE           !     1.49 !    49.15 !    49.15
 6.417EBE2          !     1.49 !    53.72 !    53.72
--------------------+----------+----------+----------
                      Total                  61.31 dBA



TOTAL Leq FROM ALL SOURCES:       61.31
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 16-12-2022 11:21:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: SS3.TE              Time Period: 1 hours
Description: Third floor stationary source bg noise


Road data, segment # 1: 417WBW
------------------------------
Car traffic volume  :   227 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: 417WBW
------------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE
------------------------------
Car traffic volume  :   227 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: 417WBE
------------------------------
Angle1   Angle2           : -56.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : 1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 3: 417WBE2
------------------------------
Car traffic volume  :   227 veh/TimePeriod
```

```
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: 417WBE2
------------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBW
------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: 417EBW
------------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 5: 417EBE
------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 5: 417EBE
------------------------------
Angle1   Angle2           : -56.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : -1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 6: 417EBE2
-------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 6: 417EBE2
-----------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   9.31 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Result summary
--------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     0.50 !    45.61 !    45.61
 2.417WBE           !     0.50 !    43.44 !    43.44
 3.417WBE2          !     0.50 !    44.43 !    44.43
 4.417EBW           !     0.50 !    49.65 !    49.65
 5.417EBE           !     0.50 !    43.26 !    43.26
 6.417EBE2          !     0.50 !    47.22 !    47.22
--------------------+----------+----------+----------
                      Total                  54.02 dBA



TOTAL Leq FROM ALL SOURCES:       54.02
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 16-12-2022 11:56:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: SS2day.TE            Time Period: 1 hours
Description: Second floor stationary source bg noise


Road data, segment # 1: 417WBW
------------------------------
Car traffic volume  :   979 veh/TimePeriod
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: 417WBW
----------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE
------------------------------
Car traffic volume  :   979 veh/TimePeriod
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: 417WBE
----------------------------
Angle1   Angle2           : -56.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : 1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 3: 417WBE2
------------------------------
Car traffic volume  :   979 veh/TimePeriod
```

```
Medium truck volume :    78 veh/TimePeriod
Heavy truck volume  :    56 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: 417WBE2
-----------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBW
------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: 417EBW
-----------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 5: 417EBE
------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 5: 417EBE
-----------------------------
Angle1   Angle2           : -56.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : -1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 6: 417EBE2
-------------------------------
Car traffic volume  :   847 veh/TimePeriod
Medium truck volume :    67 veh/TimePeriod
Heavy truck volume  :    48 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 6: 417EBE2
-----------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Result summary
--------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     1.50 !    53.11 !    53.11
 2.417WBE           !     1.50 !    44.16 !    44.16
 3.417WBE2          !     1.50 !    51.88 !    51.88
 4.417EBW           !     1.49 !    54.57 !    54.57
 5.417EBE           !     1.49 !    42.42 !    42.42
 6.417EBE2          !     1.49 !    52.57 !    52.57
--------------------+----------+----------+----------
                      Total                  59.39 dBA



TOTAL Leq FROM ALL SOURCES:       59.39
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 16-12-2022 11:20:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: SS2.TE              Time Period: 1 hours
Description: Second floor stationary source bg noise


Road data, segment # 1: 417WBW
------------------------------
Car traffic volume  :   227 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: 417WBW
------------------------------
Angle1   Angle2           :  -5.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -5.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 2: 417WBE
------------------------------
Car traffic volume  :   227 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: 417WBE
------------------------------
Angle1   Angle2           : -56.00 deg   1.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : 1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 3: 417WBE2
------------------------------
Car traffic volume  :   227 veh/TimePeriod
```

```
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: 417WBE2
------------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.20 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  59.90 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 4: 417EBW
------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: 417EBW
------------------------------
Angle1   Angle2           :  -6.00 deg   84.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  84.60 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  -6.00 deg   Angle2 : 84.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  57.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Road data, segment # 5: 417EBE
------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 5: 417EBE
------------------------------
Angle1   Angle2           : -56.00 deg   -1.00 deg
Wood depth                :      0       (No woods.)
```

```
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -56.00 deg   Angle2 : -1.00 deg
Barrier height            :  11.00 m
Elevation                 :   2.90 m
Barrier receiver distance :   4.80 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  72.14 m
Reference angle           :   0.00


Road data, segment # 6: 417EBE2
-------------------------------
Car traffic volume  :   311 veh/TimePeriod
Medium truck volume :    40 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 6: 417EBE2
-----------------------------
Angle1   Angle2           : -90.00 deg   -56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  85.10 m
Receiver height           :   6.05 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -56.00 deg
Barrier height            :   5.00 m
Elevation                 :   2.90 m
Barrier receiver distance :  60.30 m
Source elevation          :  75.00 m
Receiver elevation        :  72.14 m
Barrier elevation         :  75.00 m
Reference angle           :   0.00


Result summary
--------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.417WBW           !     0.50 !    44.57 !    44.57
 2.417WBE           !     0.50 !    37.30 !    37.30
 3.417WBE2          !     0.50 !    43.83 !    43.83
 4.417EBW           !     0.50 !    47.62 !    47.62
 5.417EBE           !     0.50 !    36.73 !    36.73
 6.417EBE2          !     0.50 !    46.07 !    46.07
--------------------+----------+----------+----------
                      Total                  52.07 dBA



TOTAL Leq FROM ALL SOURCES:       52.07
```