

NOISE CONTROL FEASIBILITY STUDY

85 Gemini Way Lot B Development

Project Address:

85 Gemini Way Residential Development
85 Gemini Way Lot B
Ottawa, Ontario

Client:

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C/O:
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TABLE OF CONTENTS

1.0 INTRODUCTION.....	8
1.1 REFERENCES.....	9
1.2 PURPOSE.....	10
1.3 SCOPE.....	10
2.0 SURFACE TRANSPORTATION NOISE.....	11
2.1 CRITERIA.....	11
2.1.1 Outdoor Spaces.....	11
2.1.2 Indoor Spaces.....	11
2.2 ROAD TRAFFIC INFORMATION.....	13
2.3 POINTS OF ASSESSMENT.....	14
2.4 ANALYSIS AND RESULTS.....	15
2.4.1 STAMSON Calculations.....	15
2.4.2 POA Sound Level Calculation Results.....	18
2.4.3 Requirements for Outdoor Living Areas.....	18
2.4.4 Requirements for Indoor Residential Spaces.....	19
3.0 STATIONARY SOURCE NOISE.....	20
3.1 GENERAL CRITERIA.....	20
3.1.1 Steady and Varying Sound.....	20
3.1.2 Emergency Equipment Noise.....	21
3.2 OFF-SITE STATIONARY SOURCE ASSESSMENT: GEMINI TOWER.....	21
3.2.1 Noise Source Summary.....	21
3.2.2 Installed Noise Control.....	22
3.2.3 Point of Reception Summary.....	23
3.2.4 Assessment Criteria.....	23
3.2.5 Impact Assessment.....	24
3.2.6 Discussion: AC Condenser Units.....	24
3.2.7 Discussion: Emergency Generator.....	25
3.3 OFF SITE STATIONARY SOURCE ASSESSMENT: 1 CENTREPOINTE DR.....	26
3.3.1 Noise Source Summary	26
3.3.2 Noise Sources: Carrier Air Handling Units.....	28
3.3.3 Noise Source: Wall-Mounted Rogers AC Unit.....	29

3.3.4 Noise Source: Rogers Emergency Generator.....29

3.3.5 Point of Reception Summary.....29

3.3.6 Impact Assessment.....31

3.4 ASSESSMENT OF THE SITE AS A STATIONARY SOURCE.....33

4.0 WARNING CLAUSES.....34

5.0 SUMMARY AND CONCLUSIONS.....35

5.1 SURFACE TRANSPORTATION NOISE.....35

5.2 STATIONARY SOURCE NOISE.....36

FIGURES.....38

APPENDICES.....50



LIST OF TABLES

Table 1: Sound Level Limit for Outdoor Living Areas.....	11
Table 2: Sound Level Limits for Indoor Living Areas.....	12
Table 3: Ventilation Requirements.....	13
Table 4: Building Component Requirements.....	13
Table 5: Roadway Traffic Flow Data.....	14
Table 6: STAMSON Calculation Inputs.....	15
Table 7: Summary of Traffic Noise Level Calculation Results.....	18
Table 8: Surface Transportation Noise Requirement for Indoor Residential Spaces.....	19
Table 9: Exclusion Limits for Class 1 Area.....	20
Table 10: Noise Source Summary Table (Gemini Tower).....	22
Table 11: PORs, Gemini Tower Noise.....	23
Table 12: Point of Reception Impact – Gemini Tower Noise.....	24
Table 13: Acoustic Assessment Summary – Gemini Tower Noise.....	24
Table 14: Noise Source Summary Table (1 Centrepointhe Drive).....	27
Table 15: Carrier Unit Cooling Stages by Time-of-Day.....	28
Table 16: PORs, 1 Centrepointhe Noise.....	29
Table 17: Sound Level Limits, Noise from 1 Centrepointhe Drive.....	31
Table 18: Acoustic Assessment Summary – Non-Emergency Noise (1 Centrepointhe).....	32
Table 19: Acoustic Assessment Summary – Emergency Test Noise (1 Centrepointhe).....	32
Table A.1: STAMSON Adjustments, POA D2 and D6, Daytime Levels.....	52
Table A.2: STAMSON Adjustments, POA D2 and D6, Nighttime Levels.....	52
Table D.1: Point of Reception Noise Impact (Non-Emergency Noise, 1 Centrepointhe)...	111
Table D.2: Point of Reception Noise Impact (Emergency Test Noise, 1 Centrepointhe)...	111

LIST OF FIGURES

Figure 1: Area Plan.....	39
Figure 2: Site Plan.....	40
Figure 3: Distances and Angles POAs A2, A6, D2, D6.....	41
Figure 4: Distances and Angles POAs B2, B6, E2, E6.....	42
Figure 5: Distances and Angles POAs C2, C6, F2, F6.....	43
Figure 6: Distances and Angles POA OLA.....	44
Figure 7: Indoor Noise Control Measures.....	45
Figure 8: Gemini Tower Stationary Source Noise.....	46
Figure 9: 1 Centreponte Stationary Source Noise, Non-Emergency.....	47
Figure 10: 1 Centreponte Stationary Source Noise, Emergency Generator.....	48
Figure 11: Rogers AC Unit Noise Barrier Sketch.....	49

LIST OF APPENDICES

Appendix A: STAMSON Adjustments for Short POA Distances.....	51
Appendix B: STAMSON Calculation Results.....	53
Appendix C: Supporting Information, Gemini Tower Noise.....	105
Appendix D: Supporting Information, 1 Centreponte Noise.....	110

EXECUTIVE SUMMARY

In accordance with the City of Ottawa Environmental Noise Control Guidelines, this Report presents a feasibility assessment of the environmental noise impacts from transportation and Stationary Sources upon new noise-sensitive land uses. The proposal is to sever a portion of the property at 1 Centrepoin Drive in Ottawa, for the development of a new six-storey wood-framed multi-unit residential building. The severed lot is identified as 85 Gemini Way Lot B. The project is identified as 85 Gemini Way Residential Development, and is proposed by Appelt Properties on behalf of Centurion Appelt (1 Centrepoin) LP.

The results of the transportation noise impact assessment are summarized below.

- The Outdoor Living Area (OLA) will be exposed to transportation noise in excess of the applicable limit, but within a 5 dB tolerance of the limit, per City Guidelines. The site design already provides significant screening between the OLA and roadways. Deletion of the Outdoor Living Area is not recommended.
- Some units require air conditioning. Other units require that provisions be included for the future installation of air conditioning by occupants, at their discretion. These measures provide occupants with the option of keeping windows closed to reduce indoor noise from transportation sources. Alternatively, air conditioning can be provided for all units (recommended).
- Building envelope components (exterior walls, windows, doors) must be evaluated to ensure that they provide the sound insulation required to meet indoor sound level limits. This evaluation has not been completed, due to insufficient information available at the time of preparation of this Report. It will need to be completed at a later stage. Feasible options will be available to ensure that indoor sound level limits are met.

Assessments of noise impacts from existing off-site Stationary Sources have also been completed. It is concluded that noise control will be required to address emissions from equipment on the retained lands. The recommended noise control includes the addition of a noise barrier, and modifications to the operating set points of installed rooftop HVAC units to ensure limited cooling demands during the evening and overnight time periods.

It is concluded that the project can feasibly 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, see Reference [1]) and Ontario Ministry of the Environment publication NPC-300 (NPC-300, [2]), this Report presents a feasibility study of the environmental noise impact resulting from the proposal by Appelt Properties to sever a portion of the property at 1 Centrepointhe Drive in Ottawa, for the development of a new six-storey wood-framed multi-unit residential building. The severed lot is identified as 85 Gemini Way Lot B.

This Report has been updated from a previous version dated 12 December 2024, to include assessments of noise impacts from off-site Stationary Sources.

The proposed lot is currently a parking lot east of the Nepean Medical Centre at 1 Centrepointhe Drive, a four-storey building. The proposed lot is adjacent to Baseline Road to the north, and to Gemini Tower at 2140 Baseline Road to the east. Gemini Tower is a newly-built 15-storey residential building. The proposed development would front onto Gemini Way to the south.

The proposed development will feature two levels of underground parking, and six levels of residential suites above. The proposed building has a C-shape, with an Outdoor Living Area proposed in the central portion of the lot, where it will be screened from transportation noise sources in all directions.

Significant environmental noise sources proximate to the proposed development include roadways to the north, south and east (Baseline Road, Gemini Way, and Constellation Drive), installed outdoor equipment at Gemini Tower to the east, and equipment to remain on the retained lands to the west. No other significant transportation noise sources or Stationary Sources have been identified.

Site Plans are included in the Figures section, consistent with the Grading Plan [3] and Architectural Plans [4] received for the proposed development.

This Report assesses impacts from multiple sources of environmental noise upon the 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 Stationary Sources
- Section 4.0 contains draft wording for Notices-On-Title with respect to environmental noise.

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

1.1 REFERENCES

This Report makes reference to the following documents.

- [1] City of Ottawa Environmental Noise Control Guidelines updated January 2016 (ENCG)
- [2] 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
- [3] Conceptual Grading and Servicing Plan for the project, identified as Drawing C401 by LRL Engineering and dated 11/24
- [4] Architectural drawing set for the development, prepared by Brouwer Architecture Inc., revision DD-1 dated Aug-24
- [5] City of Ottawa Transportation Master Plan, November 2013 (TMP)
- [6] Ontario Ministry of the Environment, Conservation and Parks (MECP) modelling tool STAMSON, version 5.04
- [7] Rooftop mechanical drawing received from QM&E mechanical, drawing M-255, revision 64 dated 7 Aug 2024
- [8] Report prepared by Gradient Wind Engineering titled "Building Acoustics Assessment - 2140 Baseline Road, Ottawa, Ontario", dated 20 July 2023
- [9] Issued For Construction architectural drawings for 2140 Baseline Road, revision 9 "SPA Resubmission", dated 2023-02-28. Found at URL <https://ottwatch.ca/devapp/D02-02-22-0113>
- [10] CadnaA environmental noise modelling software by DataKustik GmbH, Version 2024 MR 1 (64 Bit) (build: 205.5427)
- [11] ISO Standard 9613: Acoustics - Attenuation of Sound During Propagation Outdoors. Part 1: Calculation of the Absorption of Sound by the Atmosphere, First Edition dated 1 June 1993
- [12] ISO Standard 9613: Acoustics - Attenuation of Sound During Propagation Outdoors. Part 2: General Method of Calculation, First Edition dated 15 December 1996
- [13] 2022 Intersection volume totals posted on Open Ottawa, at url <https://open.ottawa.ca/datasets/ottawa::intersection-volume-2022/about>

- [14] Peter VanDelden, Scott Penton, Aaron Hanif, "Typical Hourly Traffic Distribution for Noise Modelling", published in Canadian Acoustics Vol. 36 No. 3 (2008)
- [15] City of Ottawa GeoOttawa map, at URL maps.ottawa.ca/geoottawa
- [16] Aerial imagery from Google, using Google Earth Pro software
- [17] City of Ottawa Noise By-law No. 217-255
- [18] Ontario Ministry of the Environment, Conservation and Parks (MECP) Technical Document ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation), dated October 1989 and prepared by V. Schroter and C. Chiu

In this Report:

- noise levels are reported in terms of sound pressure levels (SPL), in decibels (dB), with the reference sound pressure equal to 2×10^{-5} pascals;
- sound levels described as dBA Leq represent the equivalent (average) A-weighted sound pressure level over a specified time period; and
- sound power levels are reported in decibels (dB), with the reference sound power equal to 10^{-12} watts.

1.2 PURPOSE

The purpose of this Report is to demonstrate that the 85 Gemini Way Residential Development can feasibly be developed in a manner that meets all applicable requirements with respect to environmental noise.

1.3 SCOPE

This Noise Control Feasibility Study presents a feasibility assessment only. It is concluded that an Acoustic Insulation Factor (AIF) analysis is required, to ensure that indoor sound level limits from transportation sources are met. This analysis will need to be completed at a later date, once unit layouts and façade designs have been developed.

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

The 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 85 Gemini Way Residential 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

The sound level limit for Outdoor Living Areas (OLAs) per the ENCG is provided in Table 1.

Table 1: Sound Level Limit for Outdoor Living Areas

Type of Space	Time Period	Surface Transportation dBA Leq (Road and Rail noise combined, without rail whistle noise)
Outdoor Living Area	16 hours between 07:00-23:00	55*
	8 hours between 23:00-07:00	No requirement

*Where it can be demonstrated to the satisfaction of the City of Ottawa that achieving the outdoor 55 dBA Leq is not technically or economically feasible, a tolerance of not more than 5 dB above the stated limit may be acceptable.

Of note, balconies less than 4 metres deep do not qualify as OLAs per the ENCG.

2.1.2 Indoor Spaces

The applicable indoor sound level limits are summarized in Table 2.

Table 2: Sound Level Limits for Indoor Living Areas

Type of Space	Time Period	Road Leq dBA
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	16 hours between 07:00-23:00	45
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	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 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 the ENCG are summarized in Table 3.
2. An analysis of building components (exterior walls, windows, and doors as applicable) may be required to ensure that the building façade provides sound attenuation sufficient to meet the indoor sound level limits. The building component requirements per the ENCG are summarized in Table 4.

Table 3: Ventilation Requirements

Assessment Location	Noise Source	Daytime Noise Level (Leq 16 hr, 07:00-23:00)	Nighttime Noise Level (Leq 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 4: Building Component Requirements

Assessment Location	Noise Source	Daytime Noise Level (Leq 16 hr)	Nighttime Noise Level (Leq 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 City of Ottawa Transportation Master Plan [5] has been used to identify significant roadways within the vicinity of the project that must be included in noise level calculations. The significant roadways are Baseline Road, Constellation Drive, and Gemini Way (see Area Plan, Figure 1). Average Annual Daily Traffic (AADT) volumes have been assigned and divided by time-of-day and vehicle categories per ENCG requirements ([1], Appendix B). The traffic data used for noise level calculations are summarized in Table 5. Both Baseline Road and Constellation Drive have been sub-divided into separate segments per direction of travel, and to account for changes in roadway directions near the site.

Table 5: Roadway Traffic Flow Data

Roadway	Roadway Class	Segment ID	Speed Limit (km/h)	Total AADT	AADT by Vehicle Type and Time of Day (Daytime / Nighttime)		
					Cars	Medium Trucks	Heavy Trucks
Baseline Road	6-Lane Urban Arterial-Divided	BaselineEB	60	25000	20240/1760	1610/140	1150/100
		BaselineEB2	60	25000	20240/1760	1610/140	1150/100
		BaselineWB	60	25000	20240/1760	1610/140	1150/100
		BaselineWB2	60	25000	20240/1760	1610/140	1150/100
Constellation Drive	4-Lane Major Collector	ConstNB	50	12000	9715/845	773/67	552/48
		ConstNB2	50	12000	9715/845	773/67	552/48
		ConstSB	50	12000	9715/845	773/67	552/48
		ConstSB2	50	12000	9715/845	773/67	552/48
Gemini Way	2-Lane Urban Collector	Gemini	50	8000	6477/563	515/45	368/32

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

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. The assessment locations are shown on the Site Plan (Figure 2).

- POAs 'A2' and 'A6' are located on the 2nd and 6th floors of the north façade of the building, with worst-case exposure to Baseline Road. The assessment heights are 4.5 m and 16.5 m above ground, respectively.
- POAs 'B2' and 'B6' are located on the 2nd and 6th floors of the east façade of the building, near the north corner, with significant exposure to Baseline Road, and partial screening from Gemini Tower. The assessment heights are 4.5 m and 16.5 m above ground, respectively.
- POAs 'C2' and 'C6' are located on the 2nd and 6th floors of the east façade of the building, near the south corner, with significant exposure to Gemini

Way. The assessment heights are 4.5 m and 16.5 m above ground, respectively.

- POAs 'D2' and 'D6' are located on the 2nd and 6th floors of the south façade of the building, with full exposure to Gemini Way and significant exposure to Constellation Drive. The assessment heights are 4.5 m and 16.5 m above ground, respectively.
- POAs 'E2' and 'E6' are located on the 2nd and 6th floors of the west façade of the building near the south corner, with significant exposure to Gemini Way and Baseline Road. The assessment heights are 4.5 m and 16.5 m above ground, respectively.
- POAs 'F2' and 'F6' are located on the 2nd and 6th floors of the west façade of the building near the north corner, with significant exposure to Baseline Road and Gemini Way. The assessment heights are 4.5 m and 16.5 m above ground, respectively.
- POA 'OLA' is located near the centre of the proposed OLA. The OLA will be significantly screened from major roadways to the north, west, and south by the proposed building. Gemini Tower provides significant additional screening to the north and east. The assessment height is 1.5 m above ground.

All calculations assume a flat topography.

2.4 ANALYSIS AND RESULTS

2.4.1 STAMSON Calculations

Noise level calculations were made at each POA using the MECP tool STAMSON, version 5.04 [6]. The following table summarizes the inputs used for each STAMSON POA sound level calculation. Reference angles are set at 0.00 degrees in all cases. Detailed drawings showing POA exposure angles and distances are include as Figures 3 through 6.

Table 6: STAMSON Calculation Inputs

POA		Roadway Segment			Noise Barrier			
ID	H (1)	Name	Exposure (2)	D (3)	Name (4)	Exposure (2)	H (2)	D (3)
A2	4.5	BaselineEB	-90 to -83	15.9				
		BaselineEB2	-81 to 90	19.7	GTN	83 to 90	42	0.9
		BaselineWB	-90 to -58	35.8				

POA		Roadway Segment			Noise Barrier			
ID	H (1)	Name	Exposure (2)	D (3)	Name (4)	Exposure (2)	H (2)	D (3)
		BaselineWB2	-58 to 90	36.0	GTN	82 to 90	42	1.4
		ConstNB	-9 to 0	81.6				
		ConstSB	-8 to 3	67.8				
A6	16.5	BaselineEB	-90 to -83	15.9				
		BaselineEB2	-81 to 90	19.7	GTN	83 to 90	42	0.9
		BaselineWB	-90 to -58	35.8				
		BaselineWB2	-58 to 90	36.0	GTN	82 to 90	42	1.4
		ConstNB	-9 to 0	81.6	GTE	-9 to 0	42	58.7
		ConstSB	-8 to 3	67.8	GTE	-8 to 3	42	57.1
B2	4.5	BaselineEB2	1 to 90	21.9	GTN	44 to 90	42	3.2
		BaselineWB2	0 to 90	38.2	GTN	43 to 90	42	3.5
		ConstNB	-12 to 56	75.0	GTE	-12 to 49	42	52.1
		ConstNB2	53 to 73	80.2				
		ConstSB	-11 to 61	61.2	GTE	-11 to 52	42	50.6
		ConstSB2	56 to 73	70.9				
		Gemini	-40 to 0	70.9				
B6	16.5	BaselineEB2	1 to 90	21.9	GTN	44 to 90	42	3.2
		BaselineWB2	0 to 90	38.2	GTN	43 to 90	42	3.5
		ConstNB	-12 to 56	75.0	GTE	-12 to 49	42	52.1
		ConstNB2	53 to 73	80.2				
		ConstSB	-11 to 61	61.2	GTE	-11 to 52	42	50.6
		ConstSB2	56 to 73	70.9				
		Gemini	-40 to 0	70.9				
C2	4.5	BaselineEB2	1 to 90	77.8	GTN	2 to 90	42	59
		BaselineWB2	0 to 90	94.0	GTN	1 to 90	42	59.4
		ConstNB	-45 to 37	72.5	GTE	-45 to 5	42	49.6
		ConstNB2	34 to 70	75.0				
		ConstSB	-48 to 42	61.5	GTE	-48 to 8	42	50.9
		ConstSB2	37 to 69	66.3				
		Gemini	-75 to -1	15.1				
C6	16.5	BaselineEB2	1 to 90	77.8	GTN	2 to 90	42	59
		BaselineWB2	0 to 90	94.0	GTN	1 to 90	42	59.4
		ConstNB	-45 to 37	72.5	GTE	-45 to 5	42	49.6
		ConstNB2	34 to 70	75.0				
		ConstSB	-48 to 42	61.5	GTE	-48 to 8	42	50.9
		ConstSB2	37 to 69	66.3				
		Gemini	-75 to -1	15.1				
D2	4.5	ConstNB	0 to 34	74.2				
		ConstNB2	31 to 69	76.6				
		ConstSB	3 to 39	63.5				
		ConstSB2	34 to 68	67.9				
		Gemini	-79 to 87	15.0*				
D6	16.5	ConstNB	0 to 34	74.2				
		ConstNB2	31 to 69	76.6				
		ConstSB	3 to 39	63.5				
		ConstSB2	34 to 68	67.9				
		Gemini	-79 to 87	15.0*				

POA		Roadway Segment			Noise Barrier			
ID	H (1)	Name	Exposure (2)	D (3)	Name (4)	Exposure (2)	H (2)	D (3)
E2	4.5	BaselineEB	-90 to -55	74.0				
		BaselineEB2	-54 to 0	76.9				
		BaselineWB	-90 to -18	93.5				
		BaselineWB2	-18 to -1	93.6				
		Gemini	-1 to 85	15.2				
E6	16.5	BaselineEB	-90 to -55	74.0				
		BaselineEB2	-54 to 0	76.9				
		BaselineWB	-90 to -18	93.5				
		BaselineWB2	-18 to -1	93.6				
		Gemini	-1 to 85	15.2				
F2	4.5	BaselineEB	-90 to -80	18.2				
		BaselineEB2	-79 to 2	21.2				
		BaselineWB	-90 to -39	37.8				
		BaselineWB2	-39 to 1	37.8				
		Gemini	0 to 67	70.9				
F6	16.5	BaselineEB	-90 to -80	18.2				
		BaselineEB2	-79 to 2	21.2				
		BaselineWB	-90 to -39	37.8				
		BaselineWB2	-39 to 1	37.8				
		Gemini	0 to 67	70.9				
OLA	1.5	BaselineEB	-90 to -71	46.1	OLAN	-90 to -71	18	9.5
		BaselineEB2	-69 to 90	49.9	OLAN	-69 to 90	18	9.9
		BaselineWB	-90 to -42	66.0	OLAN	-90 to -42	18	9.7
		BaselineWB2	-42 to 90	66.1	OLAN	-42 to 90	18	9.7
		ConstNB	-29 to 46	79.1	GTE	-29 to 30	42	56.2
		ConstNB2	43 to 70	83.0				
		ConstSB	-31 to 51	66.8	GTE	-31 to 32	42	56.2
		ConstSB2	46 to 70	74.0				
		Gemini	-56 to 77	42.9	OLAS	-30 to 77	18	11.2

Table 6 Notes:

- (1) Height above ground, in metres. For POAs, the same value is used during the day and night.
- (2) Exposure angles, in degrees.
- (3) Distance to POA, in metres.
 - * At POAs D2 and D6, the STAMSON-minimum distance of 15 m was entered. The actual distance is 11.4 m. See discussion below and in Appendix A.
- (4) Identifies the noise barrier segment (refer to the Figures section):
 - GTE = Gemini Tower, east façade
 - GTN = Gemini Tower, north façade
 - OLAN = Barrier effect due to the proposed building and Gemini Tower, north of the OLA
 - OLAS = Barrier effect due to the proposed building, south of the OLA

Of note, POAs D2 and D6 are located 11.4 m from Gemini Way, but STAMSON requires a minimum input distance of 15 m. The calculations were thus completed using the STAMSON-minimum distance of 15 m, and manually adjusted to

represent noise at an 11.4 m distance from the roadway. Additional details are provided as Appendix A.

2.4.2 POA Sound Level Calculation Results

The calculation results are summarized below.

Table 7: 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 A2 North façade 2 nd floor	72.78 dBA Leq	65.18 dBA Leq
POA A6 North façade 6 th floor	72.78 dBA Leq	65.18 dBA Leq
POA B2 East façade 2 nd floor, near north corner	66.87 dBA Leq	59.28 dBA Leq
POA B6 East façade 6 th floor, near north corner	66.88 dBA Leq	59.28 dBA Leq
POA C2 East façade 2 nd floor, near south corner	64.02 dBA Leq	56.43 dBA Leq
POA C6 East façade 6 th floor, near south corner	64.03 dBA Leq	56.43 dBA Leq
POA D2 South façade 2 nd floor, near east corner	67.41 dBA Leq*	59.82 dBA Leq*
POA D6 South façade 6 th floor, near east corner	67.41 dBA Leq*	58.82 dBA Leq*
POA E2 West façade 2 nd floor near south corner	66.74 dBA Leq	59.15 dBA Leq
POA E6 West façade 2 nd floor near south corner	66.74 dBA Leq	59.15 dBA Leq
POA F2 West façade 2 nd floor near north corner	69.87 dBA Leq	62.27 dBA Leq
POA F6 West façade 6 th floor near north corner	69.87 dBA Leq	62.27 dBA Leq
OLA Central Outdoor Living Area	59.29 dBA Leq	n/a

* Indicates that a manual adjustment was applied to the STAMSON-calculated level, per Appendix A

2.4.3 Requirements for Outdoor Living Areas

The noise level calculation at the proposed Outdoor Living Area exceeds the 55 dBA limit for surface transportation noise. The location of the OLA means that it is nonetheless significantly screened from major roadways. Given the context of the site, there are no practical noise mitigation options to further reduce noise

levels at the OLA. The predicted sound level is within the 5 dB tolerance limit noted in the ENCG.

No noise control measures are recommended for the OLA. A Notice-On-Title is required to alert occupants of the potential for disturbance. Recommended wording is included in Section 4.0.

2.4.4 Requirements for Indoor Residential Spaces

The POW noise level calculation results show that noise control is required for surface transportation noise. Notices-On-Title are also required. The requirements are listed in Table 8 below, and shown on Figure 7.

It is concluded that an assessment of building envelope components is required, to ensure that transportation noise levels are attenuated such that the indoor sound level limits are met. Per the ENCG, the preferred assessment method is the Acoustic Insulation Factor (AIF) analysis. This analysis requires design details not ready at the time of preparation of this Report (floor plans with dimensions, and the location and dimensions of exterior windows, doors, and exterior wall types).

Based on the POW noise level calculation results, double glazing will be required for exterior windows and glass balcony doors. The project can be designed such that indoor noise level limits are met, through a combination of exterior component selections, room sizes, and the locations and dimensions of glazing and other exterior façade components.

Table 8: Surface Transportation Noise Requirement for Indoor Residential Spaces

Units (Representative POAs)	Central Air Conditioning*	Building Envelope Components	Notices-on-Title
East façade units, south of the OLA, except for south corner units (POAs C2, C6)	Provision for future installation by occupants	Per OBC	Required
All other units: • north façade (A2, A6) • east façade north of the OLA (B2, B6) • south façade (D2, D6) • west façade (E2, E6, F2, F6)	Required	Designed to meet indoor noise limits	Required

* Or other suitable mechanical ventilation meeting NPC-300 requirements

3.0 STATIONARY SOURCE NOISE

The proposed development is proximate to two properties that are considered Stationary Sources: Gemini Tower to the east; and the retained lands at 1 Centrepointhe Drive to the west. The following sections present separate noise impact assessments from each of these Stationary Sources, as per the ENCG [1] and NPC-300 [2] requirements.

3.1 GENERAL CRITERIA

3.1.1 Steady and Varying Sound

The proposed development is located within a Class 1 area, which is the acoustical environment typical of a major population centre. The surrounding environment can be characterized as a mix of commercial and residential properties, adjacent to major transportation arteries. In the following table, sound level exclusion limits for stationary and varying sound from Stationary Sources are extracted from the ENCG [1] and NPC-300 [2].

Table 9: Exclusion Limits for Class 1 Area

Receiver Area (Class #)	Time Period	Exclusion Limit Value, 1-hour Leq, dBA	
		<i>Outdoor Point of Reception</i>	<i>Plane of Window of Noise Sensitive Space</i>
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.

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.

3.1.2 Emergency Equipment Noise

Stationary Source noise generated from dedicated emergency equipment is subject to different requirements per NPC-300, as summarized below.

1. No sound level limits apply to noise generated from emergency equipment operating during an emergency.
2. Non-emergency operation of dedicated emergency equipment (e.g. for routine maintenance and testing) shall be assessed separately from all other noise associated with the Stationary Source.
3. The sound level limit for non-emergency operation of dedicated emergency equipment is 5 dB greater than the sound level limit that would otherwise apply.

3.2 OFF-SITE STATIONARY SOURCE ASSESSMENT: GEMINI TOWER

A new residential tower is under construction adjacent to the proposed development to the east: Gemini Tower, located at 2140 Baseline Road. The building includes 15 storeys of residences and indoor amenity spaces, and various rooftop amenity areas, including at the 15th floor height. Mechanical equipment serving common areas of the building are installed in and around a mechanical penthouse, above the 15th floor.

Requests for information were made to the owners of Gemini Tower and the mechanical engineering firm for the project. The information received, and additional publicly available documents, were used to prepare an acoustic model.

3.2.1 Noise Source Summary

A rooftop mechanical plan was received (Reference [7]), which depicts two makeup air units, four air conditioning condenser units, and a emergency backup power generator. A cooling tower is also installed on the roof, fully enclosed by the mechanical penthouse wall and noise barrier on three sides. The locations of this equipment on the roof are shown in Figure 8.

Manufacturer-reported sound level information and dimensions were identified for the cooling tower and two make-up air units (extracts are provided in Appendix C). No details were provided regarding equipment make and model numbers or noise

emissions for the air conditioning condenser units and emergency generator, and so they are excluded from this acoustic assessment. Potential noise impacts from this equipment are discussed in sections 3.2.6 and 3.2.7.

Table 10: Noise Source Summary Table (Gemini Tower)

Source ID	Source Description	Sound Power Level (dBA)	Source Location [1]	Sound Characteristics [2]	Noise Control Measures [3]
CT	Tower Tech TTXR Cooling Tower	101.8	O	S	B
MAU-01	Engineered Air Makeup Air Unit (North)	82.7	O	S	U
MAU-02	Engineered Air Makeup Air Unit (South)	82.7	O	S	U

Table 10 Notes

[1] Source Location

O: located/installed Outside of the building, including on the roof

I: located/installed Inside the building

[2] Sound Characteristics

S: Steady

Q: Quasi steady impulsive

I: Impulsive

B: Buzzing

T: Tonal

C: Cyclic

[3] Noise Control Measures

S: Silencer, acoustic louvre, muffler

A: Acoustic lining, plenum

B: Barrier, berm, screening

L: Lagging

E: acoustic Enclosure

O: Other

U: Uncontrolled

AC: Administrative Controls

3.2.2 Installed Noise Control

A report prepared by Gradient Wind Engineering (GWE) containing noise and vibration recommendations for the design of Gemini Tower was provided to Integral DX Engineering Ltd. [8]. This Report included the following recommendations for environmental noise control.

1. A 2 m tall acoustic barrier was recommended to reduce noise emissions from makeup air unit MAU-01, with a surface density of 20 kg/m^2 , and no gaps in the construction. It is unknown to Integral DX Engineering whether

this barrier was ultimately installed. No noise barrier is presumed in this acoustic assessment.

2. The cooling tower was to be installed within a 5.2 m tall acoustic barrier enclosure, constructed of material with a surface density of 20 kg/m^2 , and no gaps in the construction. On site visits, IDX observed that this barrier was partially installed on 09 December 2024 and completed by 19 March 2025. Details regarding the final noise barrier height and material were not provided to IDX. Based on available elevation drawings for Gemini Tower [9] and our observation that the noise barrier height appears to match the height of the mechanical penthouse roof, the noise barrier height is set at 4.6 m in the acoustic model.
3. The emergency generator was to be located within an enclosure to attenuate outdoor noise emissions.

3.2.3 Point of Reception Summary

The worst-case Points of Reception (PORs) on the proposed development receiving noise from Gemini Tower were determined in the acoustic model, and are summarized below. Each POR is given the prefix “GT” for Gemini Tower (as the Stationary Source), and sequential letters A, B, C. Each of the identified PORs represent the Plane of Window (POW) of a noise-sensitive indoor space.

Table 11: PORs, Gemini Tower Noise

POR ID	Type	Height	Description
GTA	POW	18.5 m	Worst-case POR for Gemini Tower noise at the north end of the proposed building
GTB	POW	18.5 m	Worst-case POR for Gemini Tower noise in the central portion of the proposed building
GTC	POW	18.5 m	Worst-case POR for Gemini Tower noise at the south end of the proposed building.

3.2.4 Assessment Criteria

It is unknown whether the identified noise sources operate under different limits at different times of day. Therefore, this impact assessment is based on the conservative assumption that the noise sources may operate continuously for one hour or more at any time-of-day. The night time period (23:00 to 07:00) is therefore the worst-case time period. Hourly average noise from traffic will be low at the PORs most affected by noise from Gemini Tower. The nighttime Exclusion Limit value of 45 dBA therefore sets the sound level limit.

3.2.5 Impact Assessment

An environmental noise model was prepared using CadnaA software [10], configured to conform to ISO Standard 9613 (1996) [11], [12]. The location and geometry of Gemini Tower was set based on references [7], [8], and [9]. A plot showing the elements of the noise model, key dimensions, and results is included as Figure 8. The local topography is modelled as flat. The default ground absorption value is 0 (sound-reflective ground), with areas of sound-absorptive ground cover (grass) added to the model.

The Point of Reception Impact Table following shows sound level calculations from each Gemini Tower noise source at the worst-case PORs at the proposed development. The Acoustic Assessment Summary Table (Table 13) confirms that the overall sound levels are compliant with the worst-case 45 dBA sound level limit at the worst-case PORs.

Table 12: Point of Reception Impact – Gemini Tower Noise

Source ID	GTA		GTB		GTC	
	Distance (m)	Sound Level (dBA Leq)	Distance (m)	Sound Level (dBA Leq)	Distance (m)	Sound Level (dBA Leq)
CT	49.2	41.6	57.8	43.0	45.7	42.7
MAU-01	26.1	25.6	43.9	25.0	45.5	23.6
MAU-02	56.3	20.1	62.8	20.8	48.2	21.1

Table 13: Acoustic Assessment Summary – Gemini Tower Noise

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)
GTA	East façade, north	Night	41.7	45.0	Yes
GTB	East façade, central	Night	43.1	45.0	Yes
GTC	East façade, south	Night	42.8	45.0	Yes

3.2.6 Discussion: AC Condenser Units

No information was provided regarding the air conditioning units at Gemini Tower. The following observations are provided regarding their potential noise impacts.

1. As per the results shown in Table 12, POR noise levels are almost completely determined by the cooling tower noise, with the MAUs having only a small noise impact by comparison.
2. The AC units are shown as much smaller units than the MAUs on the provided mechanical roof plan.
3. Units AC-03 and AC-04 are located east of the mechanical penthouse building. Therefore, the mechanical penthouse acts as a noise barrier, further reducing noise emissions towards PORs to the west.
4. As with the other mechanical rooftop equipment, it is likely that the air conditioning units have been selected to limit noise emissions at the Level 15 rooftop amenity space at Gemini Tower, and at other noise-sensitive areas and façades of the project. The proposed development PORs are located at greater distances, which will tend to reduce noise impacts.
5. The acoustic analysis presumes continuous nighttime cooling demands from all equipment as a worst-case. It is possible that worst-case cooling demands will be less, which will tend to reduce one-hour average noise levels.

Based on these observations, it is the professional opinion of Integral DX Engineering that these air conditioning units will not result in noise excesses at the proposed development.

3.2.7 Discussion: Emergency Generator

No information was provided regarding noise emissions of the rooftop generator, other than that it was to be installed within an enclosure to reduce environmental noise emissions.

The following observations are provided regarding the potential environmental noise impact from the generator.

1. It is expected that all non-emergency operation of the generator will occur during daytime hours only. The daytime Exclusion Limit (50 dBA) may be exceeded by traffic noise. The applicable sound level limit is therefore at least 55 dBA, and potentially higher (daytime traffic noise minimum one-hour average, plus 5 dB). No sound level limits apply to the generator while operating during an active emergency (power outage).

2. The generator is proximate to the Level 15 outdoor amenity area, and will have line-of-sight (or near line-of-sight) to that space. The generator is required to meet MECP noise limits at the outdoor amenity space. By comparison, the proposed building will not have line-of-sight to the generator (because of its lower height), and is at significantly greater horizontal distance. These factors ensure that noise levels will be less at the proposed building compared to the Level 15 outdoor amenity area.

Based on these observations, it is the professional opinion of Integral DX Engineering that noise emissions from the emergency generator will not result in a noise excess at the proposed development.

3.3 OFF SITE STATIONARY SOURCE ASSESSMENT: 1 CENTREPOINTE DR

The proposed lot would be severed from the current property at 1 CentrepoinTE Drive, where the Nepean Medical Centre currently operates. The medical building includes rooftop mechanical equipment. Rogers Communications Inc. also operates a small telecommunications enclosure and emergency backup generator on the northeast end of the retained lands.

As assessment of Stationary Source noise impacts follows.

3.3.1 Noise Source Summary

Table 14 lists significant noise-generating equipment identified during site visits by Integral DX Engineering on 2024-12-09, 2024-12-17, and 2025-03-19. Sound levels for this equipment were obtained by measurement or data from manufacturers (see Appendix D).

Two Carrier air handling units are installed on the roof of the Nepean Medical Centre. The associated noise sources are identified with prefixes CN and CS (for **C**arrier **N**orth/**S**outh). Individual noise sources are modelled for the equipment's condenser fans (e.g. CN.Fan1) and heat exchanger grills (e.g. CN.HE1). Noise control is recommended for the Carrier units. Details are provided in section 3.3.2.

The Rogers telecommunications enclosure includes a wall-mounted AC unit, identified as noise source RAC (for **R**ogers **A**ir **C**onditioner). Noise control is recommended for this equipment. Details are provided in section 3.3.3.

The Rogers generator is identified as noise source GEN, and discussed in section 3.3.4. No further noise control is required for the generator.

The remaining noise sources are an **Air Conditioning** unit (AC) and **Exhaust Fan** (EF-1), both located on the roof of the Nepean Medical Centre. No noise control is required for these noise sources.

Table 14: Noise Source Summary Table (1 Centrepointhe Drive)

Source ID	Source Description	Sound Power Level (dBA)	Source Location [1]	Sound Characteristics [2]	Noise Control Measures [3]
CN.Fan1-4 CS.Fan1-4	Individual condenser fans (4 total per unit), north and south Carrier condenser unit	89.5	O	S	U (AC)
CN.HE1-2 CS.HE1-2	North and south Carrier unit heat exchanger grills. Each grill represents noise emissions from two compressors located within the cabinet.	91.7	O	S	U (AC)
RAC	Wall-mounted air conditioning unit, Rogers utility building	76.2	O	S	U (B)
GEN	Emergency backup generator for the Rogers utility enclosure	82.7	O	S	E
AC	Air conditioning unit located on the roof of the Nepean Medical Centre	80.0	O	S	U
EF-1	Exhaust fan located on the roof of the Nepean Medical Centre	79.9	O	S	U

Table 14 Notes

[1] Source Location

O: located/installed Outside of the building, including on the roof

I: located/installed Inside the building

[2] Sound Characteristics

S: Steady

Q: Quasi steady impulsive

I: Impulsive

B: Buzzing

T: Tonal

C: Cyclic

[3] Noise Control Measures. Letters in parentheses represent noise control not currently implemented, but recommended and included in the acoustic assessment.

S: Silencer, acoustic louvre, muffler
 A: Acoustic lining, plenum
 B: Barrier, berm, screening
 L: Lagging
 E: Acoustic Enclosure
 O: Other
 U: Uncontrolled
 AC: Administrative Controls

3.3.2 Noise Sources: Carrier Air Handling Units

The Nepean Medical Centre features two identical large air handlers on the roof, identified as Carrier 48P3 packaged air-handling units. These provide both heating and cooling, and feature a power exhaust mode.

Integral DX Engineering completed a review and sound level measurements of this equipment on 19 March 2025. It was confirmed that only cooling mode generates significant environmental noise emissions. Each Carrier unit has two independent cooling stages, each with two condenser fans and two compressors (four fans and four compressors total per unit). Sound level measurements were completed in order to quantify noise emissions for each cooling stage.

The Nepean Medical Centre is only occupied during normal business hours, and so the greatest demands for cooling will only occur during the daytime. Based on the noise measurement results and acoustic modelling, it was confirmed that the the following equipment assumptions by time-period will ensure that environmental noise limits are met at all times.

Table 15: Carrier Unit Cooling Stages by Time-of-Day

Time Period	Carrier Unit Operation Condition
Day (07:00 to 19:00)	Both cooling stages for both units may run continuously.
Evening (19:00 to 23:00)	One cooling stage may operate continuously, with the other stage off, for both units.
Night (23:00 to 07:00)	One cooling stage may operate for no more than 15 minutes per hour, with the other stage off. This applies to both units.

It was confirmed to Integral DX Engineering that the Carrier units can be made to respect the operating conditions in Table 15 by manipulating its temperature set points and schedule, and that this will be done prior to occupancy of the new building. A confirmation letter from Francis HVAC is included in Appendix D.

3.3.3 Noise Source: Wall-Mounted Rogers AC Unit

A wall-mounted air conditioning unit provides cooling to the Rogers enclosure, which may operate for any duration at any time-of-day. A noise barrier is recommended, to reduce noise emissions at the nearest PORs and ensure compliance with the applicable sound level limits. The recommended noise barrier is 2.4 m tall and constructed in wood. The barrier must have a minimum surface density of 20 kg/m². The barrier shall be continuous with no gaps in its construction and make continuous contact to the ground. A sketch showing the location of the barrier relative to the Rogers AC unit is included as Figure 11.

3.3.4 Noise Source: Rogers Emergency Generator

A stand-alone generator provides backup power to the Rogers telecommunications enclosure in the event of a power outage. The generator is periodically operated for maintenance and testing purposes for one hour or more. All non-emergency operation of the generator occurs during daytime hours only.

The generator is installed within an acoustic enclosure, and representative sound levels are included in Appendix D. No additional noise control is required nor assumed for the Rogers generator.

3.3.5 Point of Reception Summary

The worst-case Points of Reception (PORs) on the proposed development receiving noise from 1 Centrepointhe Drive were determined in the acoustic model, and are summarized below. Each POR is given the prefix “CP” (identifying 1 Centrepointhe Drive as the Stationary Source), and sequential letters from A to I. Each of the identified PORs represents either the Plane of Window (POW) of a noise-sensitive indoor space, or an Outdoor Point of Reception (OPOR).

Table 16: PORs, 1 Centrepointhe Noise

POR ID	Type	Height	Description
CPA	POW	16.0 m	Worst-case POR for nighttime noise emissions on the west façade, near the north corner of the building, proximate to the wall-mounted AC unit, with near line-of-sight over the top of the noise barrier.
CPB	POW	16.0 m	Near-worst-case location south of CPA
CPC	POW	16.0 m	Near-worst-case location south of CPB
CPD	POW	18.5 m	Worst-case POR for daytime noise emissions on the west façade, with maximum exposure to Carrier rooftop units
CPE	POW	16.5 m	Near-worst-case location south of CPD
CPF	OPOR	1.5 m	Outdoor location closest to the Rogers generator

POR ID	Type	Height	Description
CPG	POW	2.5 m	Façade location closest to the Rogers generator
CPH	OPOR	1.5 m	Outdoor location south of CPF, with lower background noise
CPI	POW	2.5 m	Façade location south of CPG, with lower background noise

Assessment Criteria

The installed equipment at 1 CentrepoinTE primarily impact the west façade of the proposed building. The west façade will also be exposed to significant background traffic noise due to its proximity to Baseline Road. An assessment of daytime and nighttime background noise levels was completed for comparison to the MECP Exclusion Limit values at five receptors at varying distances from Baseline Road. The background noise assessment locations are identified with prefix “BG” (for **background**) and sequential numbers from 1 to 5, per Table 17 and Figure 9. Note that the surface transportation noise assessment calculation results, section 2.4.2, are not valid for these purposes, since they are based on different assumptions and have different objectives.

The assessment of background noise levels due to traffic was based on actual vehicle counts at intersections from the City of Ottawa [13]. Minimum hourly traffic volumes were then estimated using typical hourly traffic distributions based on data from roadways throughout Ontario [14]. Calculation details for the purpose of determining one-hour traffic volumes are included in Appendix D. STAMSON [6] was then used to calculate resulting one-hour average traffic noise levels. Supporting information and STAMSON calculation results are included in Appendix D.

The traffic noise calculation results confirm that minimum one-hour average sound levels will exceed MECP Exclusion Limit values at some PORs and in some time periods. As per NPC-300 (discussed in section 3.1.1) the applicable sound level limits at various locations along the west façade of the proposed building are set as follows, in each time period.

- At each traffic noise assessment location, the sound level limit is set as the greater value between (1) the calculated traffic noise level, and (2) the Exclusion Limit value.
- For all locations in between two traffic noise assessment locations, the limit at the south assessment location (i.e. farther from Baseline Road) sets the sound level limit.

The applicable sound level limits along the west façade of the proposed development are summarized in Table 17, and shown on Figure 9.

Table 17: Sound Level Limits, Noise from 1 Centrepointhe Drive

Traffic Noise Assessment Location	Application Area (West Façade)	Sound Level Limit (Leq 1hr)			
		Daytime	Evening	Nighttime	Emergency Test Noise (daytime)
Exclusion Limit (for reference)		50 dBA	50 dBA	45 dBA	55 dBA ⁺
BG1	BG1 to north corner	60.5 dBA [*]	50 dBA ^{**}	46.6 dBA [*]	65.5 dBA ⁺
BG2	BG1 to BG2	59.1 dBA [*]	50 dBA ^{**}	45.6 dBA [*]	64.1 dBA ⁺
BG3	BG2 to BG3	58.0 dBA [*]	50 dBA ^{**}	45 dBA ^{**}	63.0 dBA ⁺
BG4	BG3 to BG4	56.5 dBA [*]	50 dBA ^{**}	45 dBA ^{**}	61.5 dBA ⁺
BG5	BG4 to BG5	55.5 dBA [*]	50 dBA ^{**}	45 dBA ^{**}	60.5 dBA ⁺

Table 17 Notes:

- * Based on the minimum calculated one-hour average traffic noise level during this time period
- ** Based on the Exclusion Limit value for this time period. Hourly traffic noise levels will at times be less than this value.
- + Based on the limit that would otherwise apply (Daytime column), plus 5 dB (see 3.1.2).

3.3.6 Impact Assessment

An environmental noise model was prepared using CadnaA software [10], configured to conform to ISO Standard 9613 (1996) [11], [12]. The location and geometry of 1 Centrepointhe Drive noise sources was set based on on-site measurements and references [15] and [16]. The local topography is modelled as flat. The default ground absorption value is 0 (sound-reflective ground), with areas of sound-absorptive ground cover (grass) added to the model.

Table 18 provides the results of the acoustic assessment of all non-emergency noise sources (combined) at 1 Centrepointhe. These results are also presented on Figure 9. A Point of Reception Impact Table is included as Table D.1 (Appendix D), showing the calculated noise levels from each noise source at each POR, and the distances between noise sources and PORs.

Table 19 provides the results of the acoustic assessment of the Rogers emergency backup generator operations in non-emergency situations. These results are also presented on Figure 10. A POR Impact Table is provided as Table D.2 (Appendix D).

The results confirm that sound levels are compliant with the applicable limit in all cases.

Table 18: Acoustic Assessment Summary – Non-Emergency Noise (1 CentrepoinTE)

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)
CPA	West façade, north	Day	50.8	59.1	Yes
		Evening	49.3	50.0	Yes
		Night	45.2	45.6	Yes
CPB	West façade, north	Day	51.3	59.1	Yes
		Evening	49.5	50.0	Yes
		Night	45.1	45.6	Yes
CPC	West façade, north/mid	Day	51.5	58.0	Yes
		Evening	49.5	50.0	Yes
		Night	44.5	45.0	Yes
CPD	West façade middle, closest to Carrier units	Day	52.2	56.5	Yes
		Evening	49.0	50.0	Yes
		Night	44.0	45.0	Yes
CPE	West façade, south end	Day	51.5	55.5	Yes
		Evening	47.4	50.0	Yes
		Night	42.4	45.0	Yes

Table 19: Acoustic Assessment Summary – Emergency Test Noise (1 CentrepoinTE)

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)
CPF	North property line closest to generator	Day	63.6	65.5	Yes
CPG	West façade closest to generator	Day	62.0	65.5	Yes
CPH	North property line near generator	Day	59.5	64.1	Yes
CPI	West façade near generator	Day	58.6	64.1	Yes

3.4 ASSESSMENT OF THE SITE AS A STATIONARY SOURCE

With reference to the ENCG and NPC-300, operation of 85 Gemini Way Residential Development, in its entirety, is considered a Stationary Source which may impact other noise-sensitive developments in its vicinity. As part of the mechanical design, all equipment with external noise emissions and serving common areas of the building must be selected to comply with Stationary Source noise limits per the ENCG and NPC-300.

Mechanical equipment dedicated to individual residential units (e.g. condensing units for air conditioning systems) must be selected to comply with the City of Ottawa Noise By-law [17].

At the time of preparation of this Report, the selection of mechanical equipment has not been completed. Feasible design solutions will be available to ensure that all applicable environmental noise requirements are met.

4.0 WARNING CLAUSES

Draft wording for Notices-On-Title are provided below, based on the results of the surface transportation noise assessment. These are based on the recommended wording found in the ENCG Part 4, Appendix A, with minor edits as applicable to the proposed development. Further edits will be required based on the results of a future AIF analysis for the project, to add details regarding façade component upgrades for noise.

Reference is also made to equivalent NPC-300 Warning Clauses, where applicable.

Reference	Warning Clause Text	Applicable Units
ENCG Part 4 Table A1 (Similar to NPC-300 Type B)	<i>Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.</i>	All units
ENCG Part 4 Table A1	<i>To help address the need for sound attenuation this development includes:</i> <i>multi-pane glass;</i> <i>(any other upgrades as per the AIF analysis)</i> <i>To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.</i>	All units
ENCG Part 4 Table A1 (Similar to NPC-300 Type C)	<i>This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning 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.</i>	Any units for which central air condition will not be provided
ENCG Part 4 Table A1 (Similar to NPC-300 Type D)	<i>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.</i>	All units with central air conditioning provided

5.0 SUMMARY AND CONCLUSIONS

The results of the environmental noise control feasibility study for the proposed development at 85 Gemini Way Lot B are summarized below.

5.1 SURFACE TRANSPORTATION NOISE

1. The predicted daytime noise level from roadways at the proposed OLA exceeds the applicable limit for Outdoor Living Areas. However, there are no practical options to mitigate outdoor noise levels at the OLA. Because the noise excess is no more than 5 dB, the only requirement is that a Warning Clause be provided to inform future occupants that outdoor noise levels may exceed the applicable limit. Deletion of the OLA is not recommended.
2. Provisions for the installation of central air conditioning by the occupant at their discretion are required for some units on the east façade, whereas central air conditioning is required for all other units (see Figure 7). Alternatively, central air conditioning can be provided for all units (recommended).
3. Building envelope components must be designed to ensure that indoor sound level limits are met. This analysis will need to be completed at a later design stage. Based on the calculated façade noise levels, feasible design options will be available to ensure that indoor sound level limits are met, including double glazing for windows and balcony doors.
4. Notices-on-Title with respect to environmental noise are required. Draft recommended wording is included in Section 4.0. Edits will be required following completion of the building envelope analysis.

5.2 STATIONARY SOURCE NOISE

5. The proposed development is proximate to Gemini Tower at 2140 Baseline Road. An assessment of noise impacts from Gemini Tower at the proposed development was completed, based on the information made available to Integral DX Engineering. It is concluded that noise emissions from Gemini Tower will not exceed the applicable sound level limits. Noise emissions from an emergency backup generator and four small rooftop air conditioning condenser units could not be assessed, but in the professional opinion of Integral DX Engineering, are unlikely to cause applicable limits to be exceeded at the proposed development.
6. The retained lands include outdoor equipment with the potential to impact the proposed development. Noise control will be required to ensure that total noise emissions do not exceed the applicable Stationary Source sound level limits. The following noise control is recommended and is demonstrated to result in compliance with Stationary Source noise limits.
 - a) A noise barrier installed on two sides of the wall-mounted air conditioning unit on the utility building housing Rogers equipment. The barrier shall be 2.4 m tall and installed at the location shown on Figure 11. A minimum surface density of 20 kg/m^2 is required. There shall be no gaps in the construction of the barrier.
 - b) The Carrier rooftop HVAC units shall be programmed such that they do not exceed the operating conditions listed in Table 15.
7. All new on-site mechanical equipment serving common areas of the proposed development will need to be selected and designed to comply with ENCG requirements for noise emissions from a Stationary Source and the City of Ottawa Noise By-law. No concerns regarding the feasibility of the future equipment to meet these requirements have been identified.

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

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Checked and Approved by:



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This Noise Control Feasibility Study was prepared by Integral DX Engineering for the account of Appelt Properties. 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

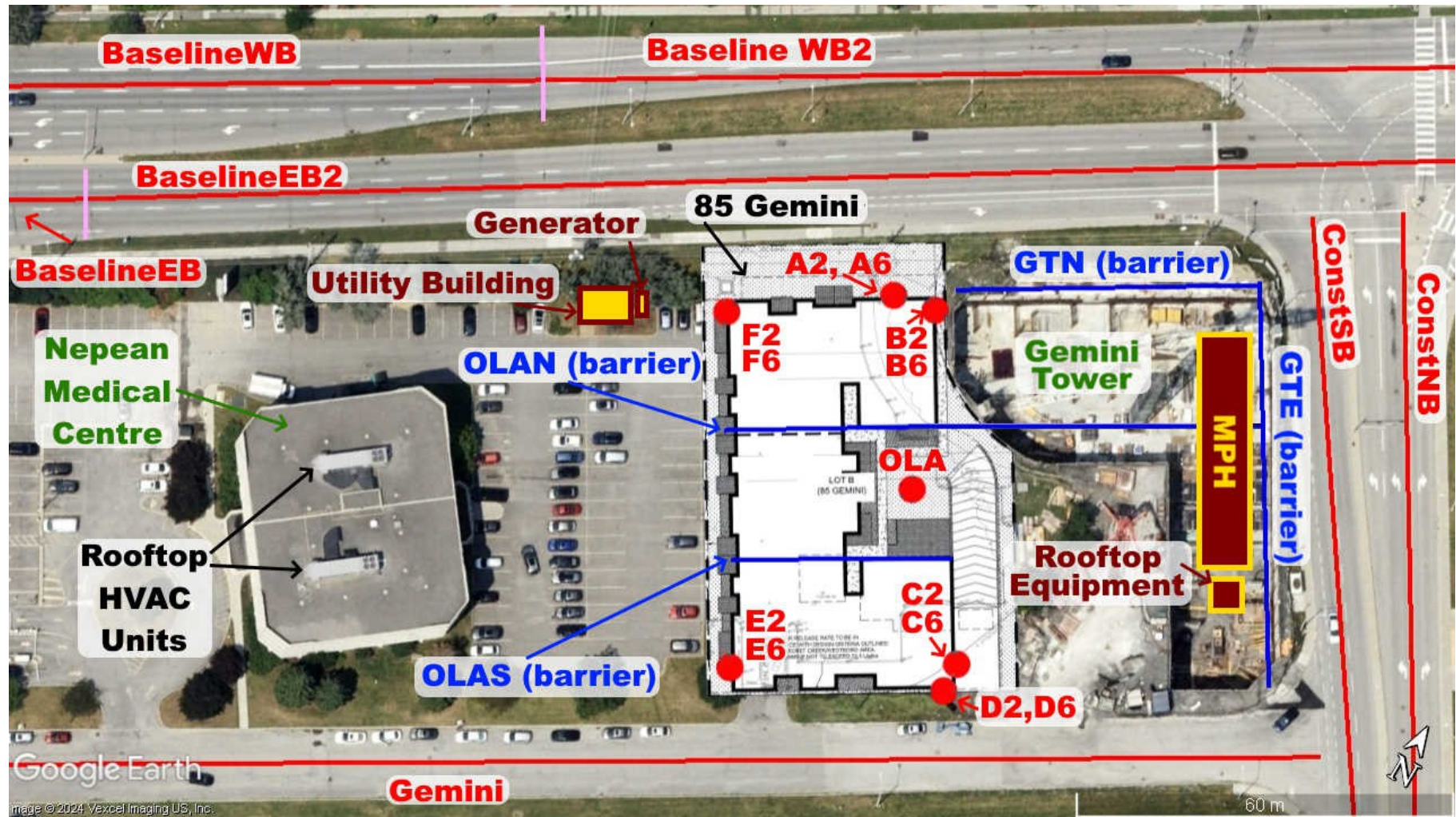
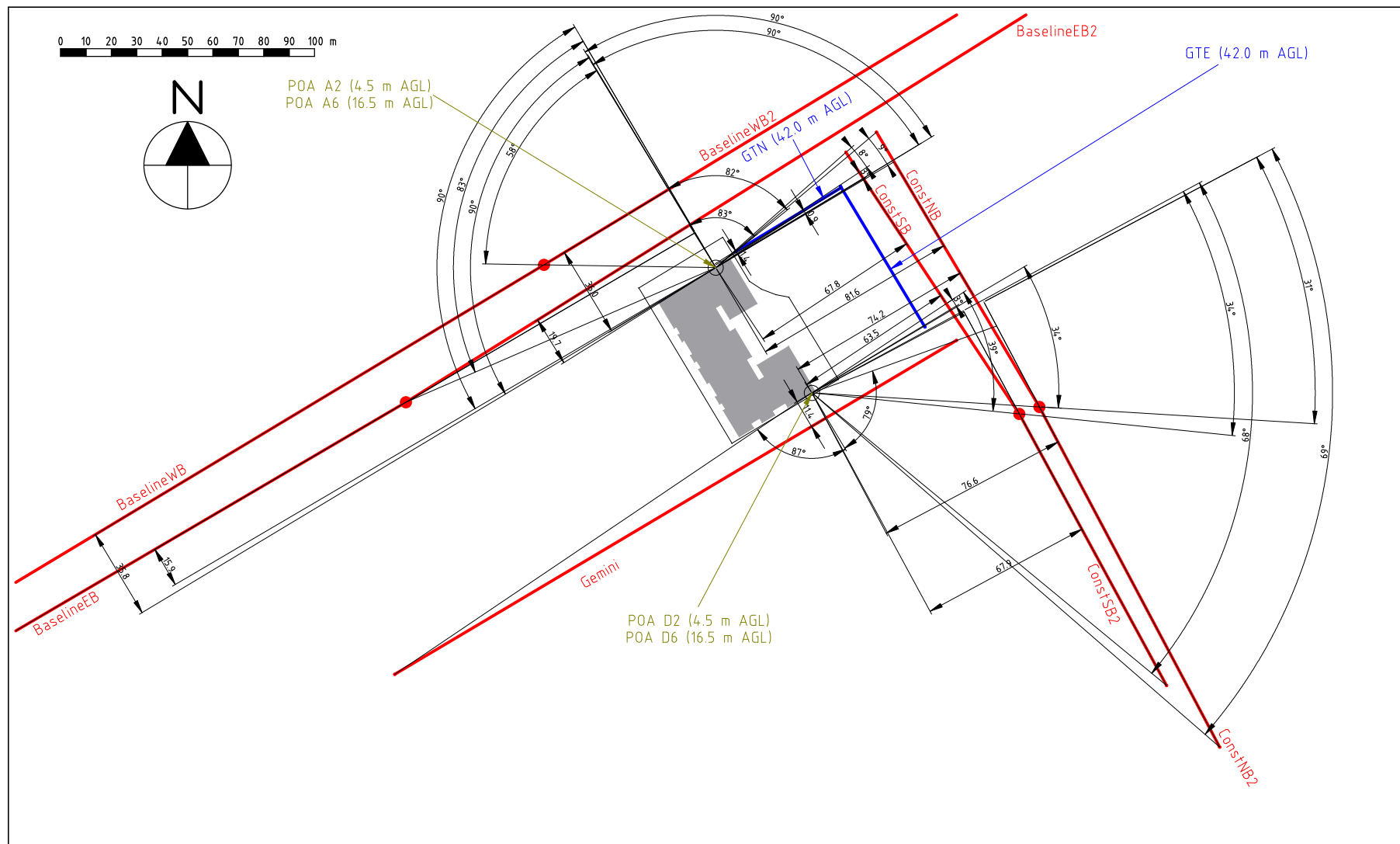


Figure 2: Site Plan

MPH = Mechanical Penthouse (atop Gemini Tower)



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Distances and Angles POAs A2, A6, D2, D6

Plan view of POA, including distances and angles to roadway segments and noise barrier segments.
A constant absolute grade height of 85.0 m is assumed.
Heights above grade are shown. All roadways are at grade with no additional height.

Rev: 0

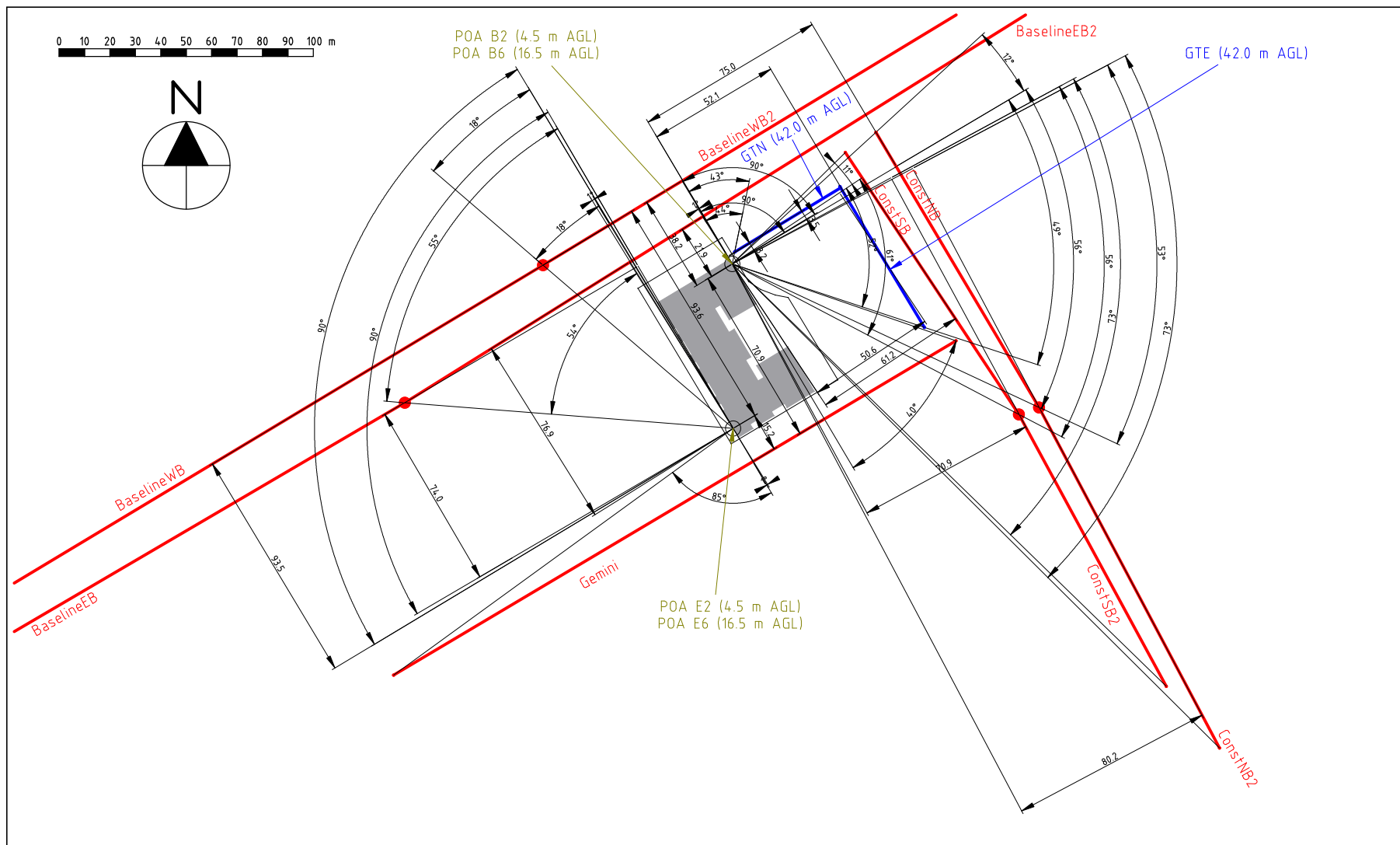
Date: 2024-12-05

Drawn By: PGL

Scale: as shown

Figure 3

85 Gemini Lot B Development
Ottawa, Ontario



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Distances and Angles POAs B2, B6, E2, E6

Plan view of POA, including distances and angles to roadway segments and noise barrier segments.
A constant absolute grade height of 85.0 m is assumed.
Heights above grade are shown. All roadways are at grade with no additional height.

Rev: 0

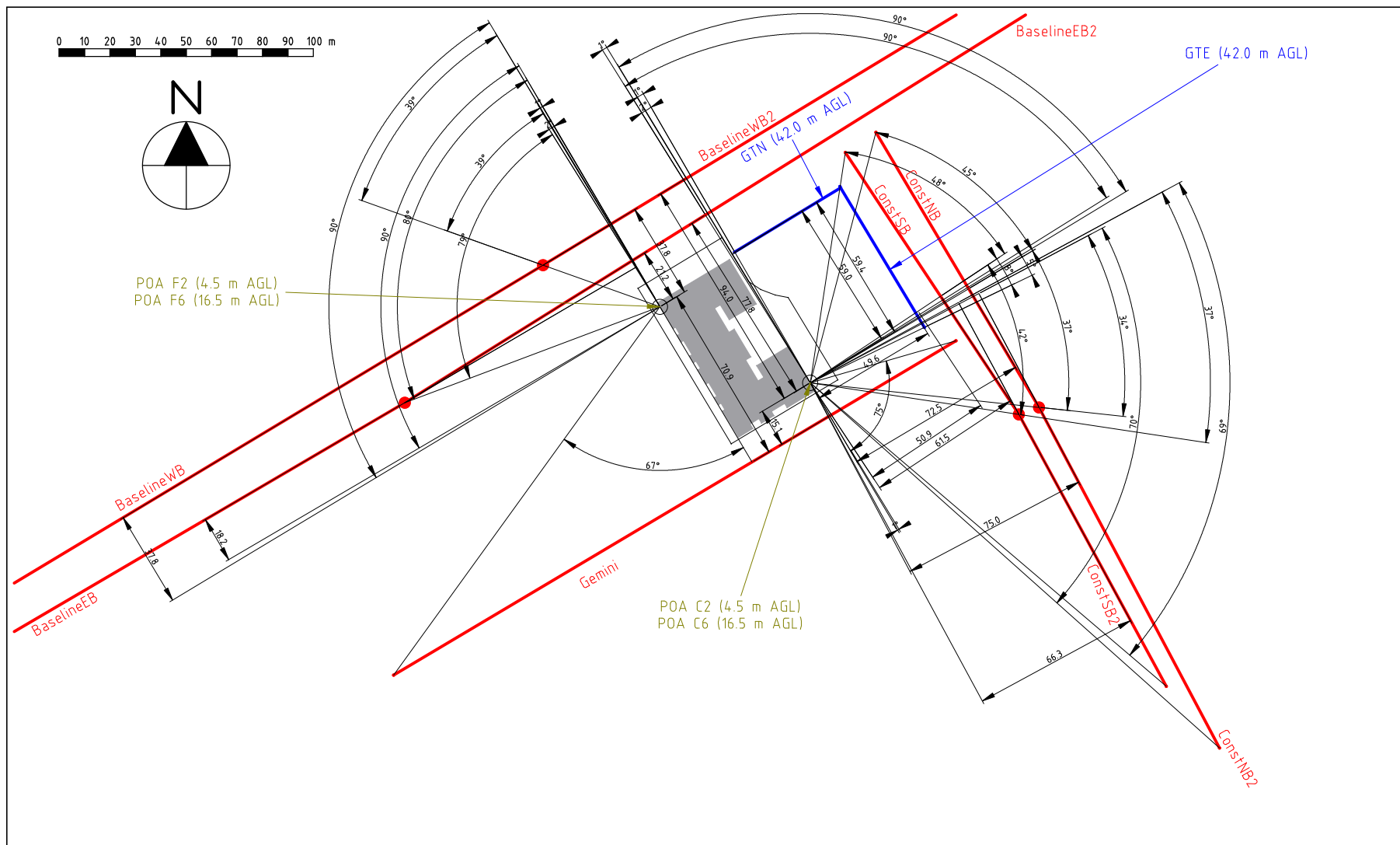
Date: 2024-12-05

Drawn By: PGL

Scale: as shown

Figure 4

85 Gemini Lot B Development
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Distances and Angles POAs C2, C6, F2, F6

Plan view of POA, including distances and angles to roadway segments and noise barrier segments.
A constant absolute grade height of 85.0 m is assumed.
Heights above grade are shown. All roadways are at grade with no additional height.

Rev: 0

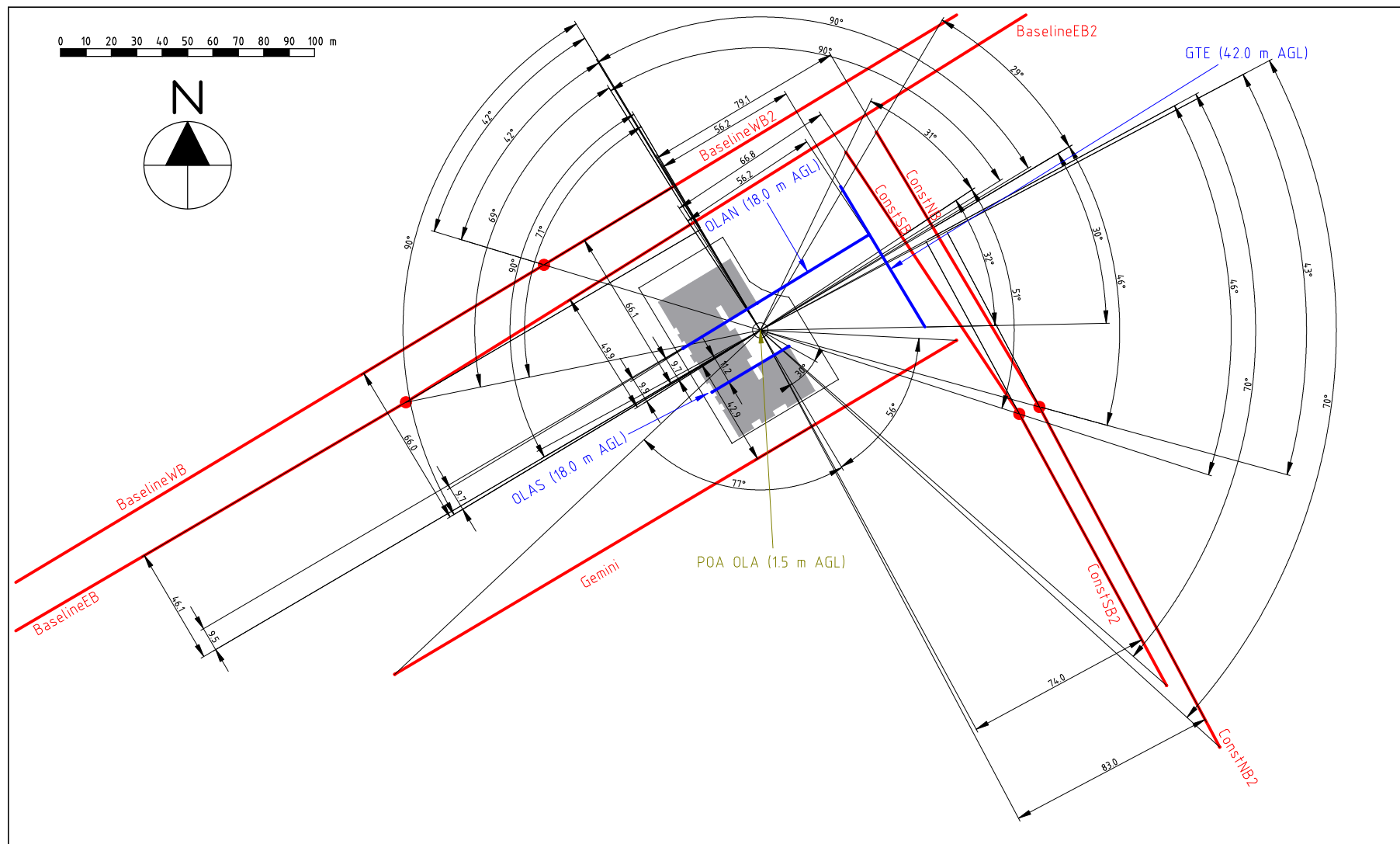
Date: 2024-12-05

Drawn By: PGL

Scale: as shown

Figure 5

85 Gemini Lot B Development
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Distances and Angles POA OLA

Plan view of POA, including distances and angles to roadway segments and noise barrier segments.
A constant absolute grade height of 85.0 m is assumed.
Heights above grade are shown. All roadways are at grade with no additional height.

Rev: 0

Date: 2024-12-05

Drawn By: PGL

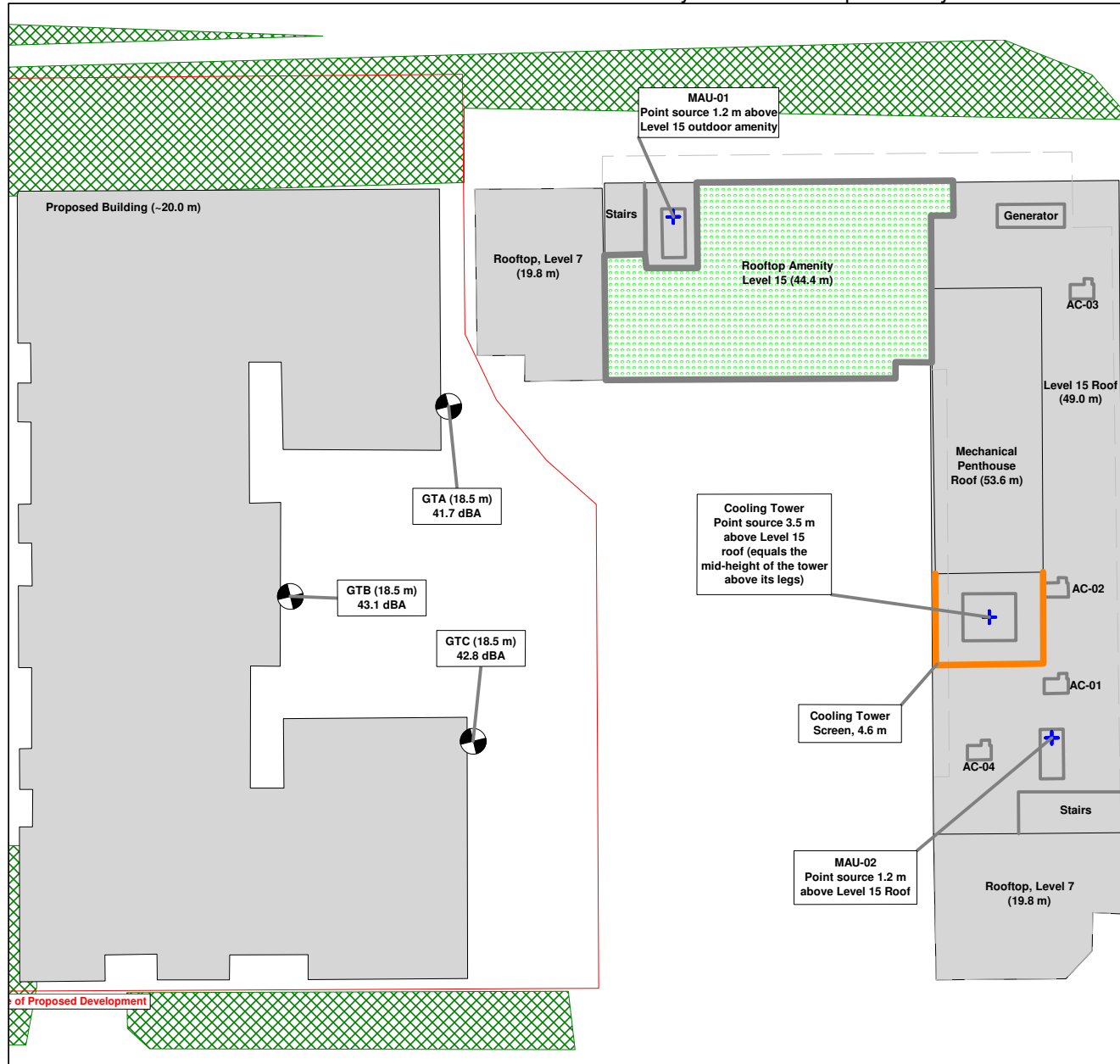
Scale: as shown

Figure 6

85 Gemini Lot B Development
Ottawa, Ontario



85 Gemini Way Lot B Noise Impact Study



Project and Location:
85 Gemini Way Lot B
Ottawa, Ontario

Description
View of the proposed building and Gemini Tower as implemented in the acoustic model. Roof and POR heights are indicated relative to local grade (assumed flat). Gemini Tower noise sources are shown. The worst-case POR locations and noise level predictions are identified.

Key:
 Soft ground cover (grass)
 Building or object
 Point of Reception (POR)
 Noise Source
 Noise Barrier
 Traced feature (transparent)

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Figure 8:
Gemini Tower Stationary
Source Noise



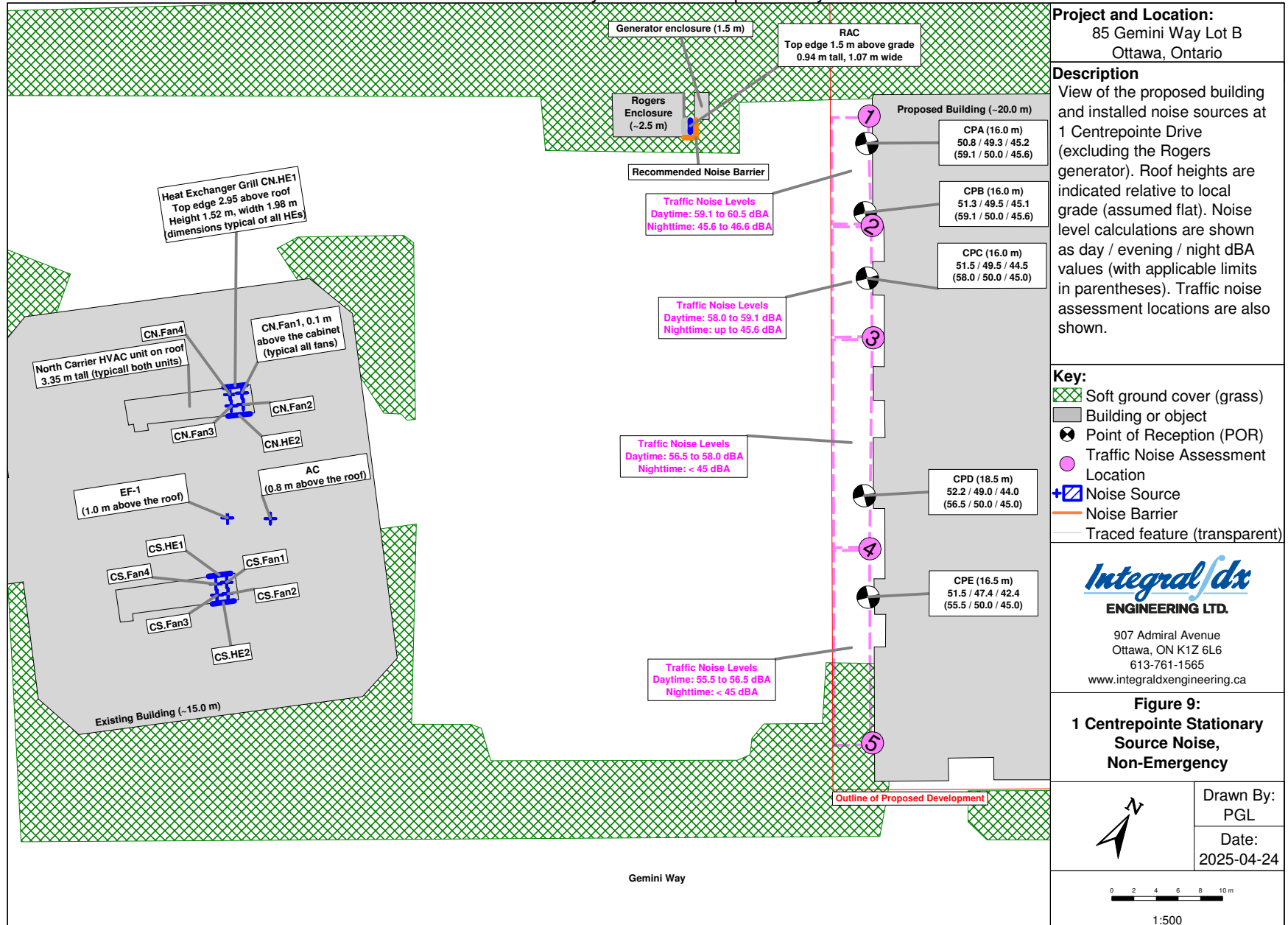
Drawn By:
PGL
Date:
2025-04-24

0 2 4 6 8 10 m

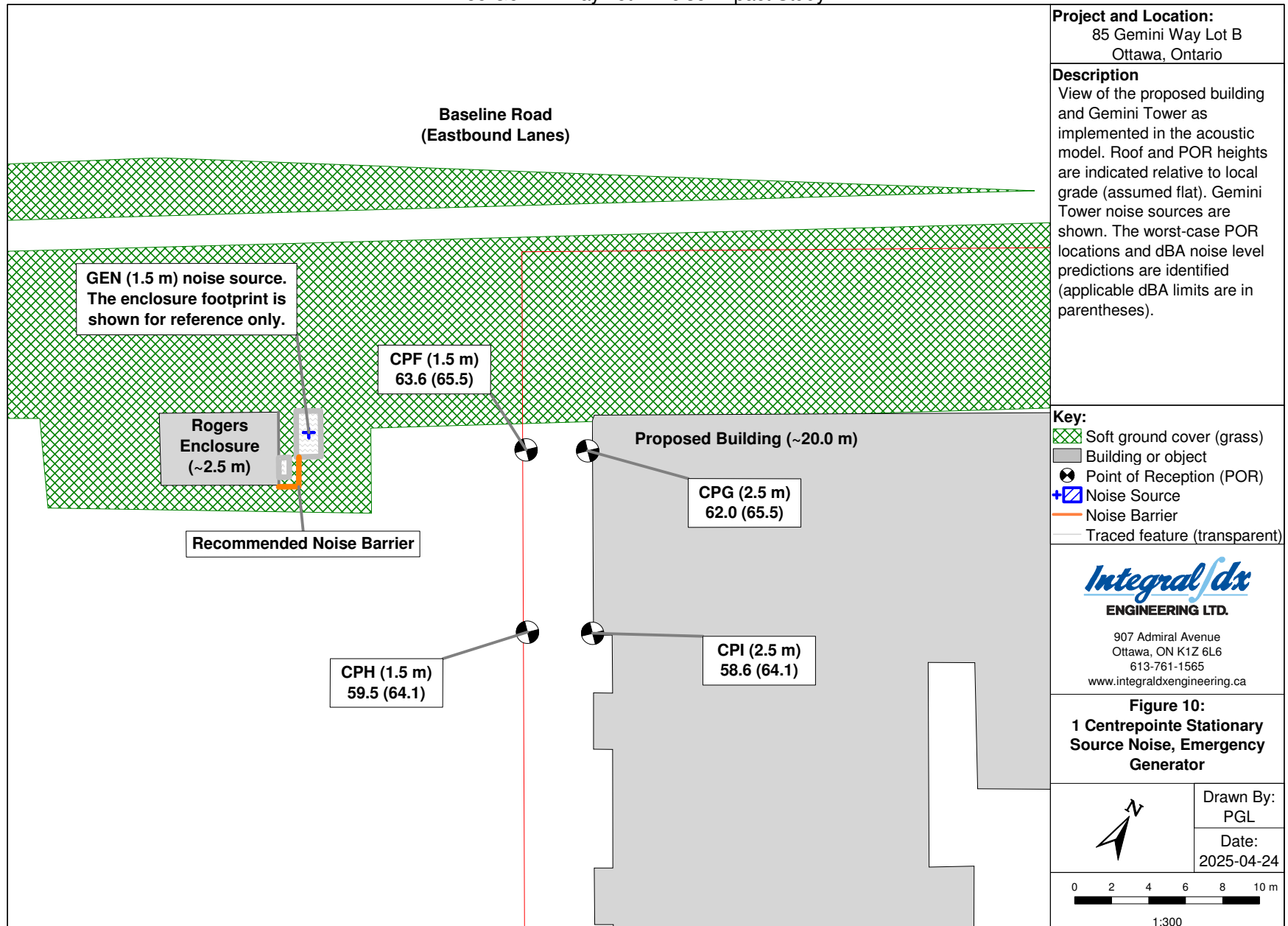
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CadnaA Version 2025 (64 Bit)

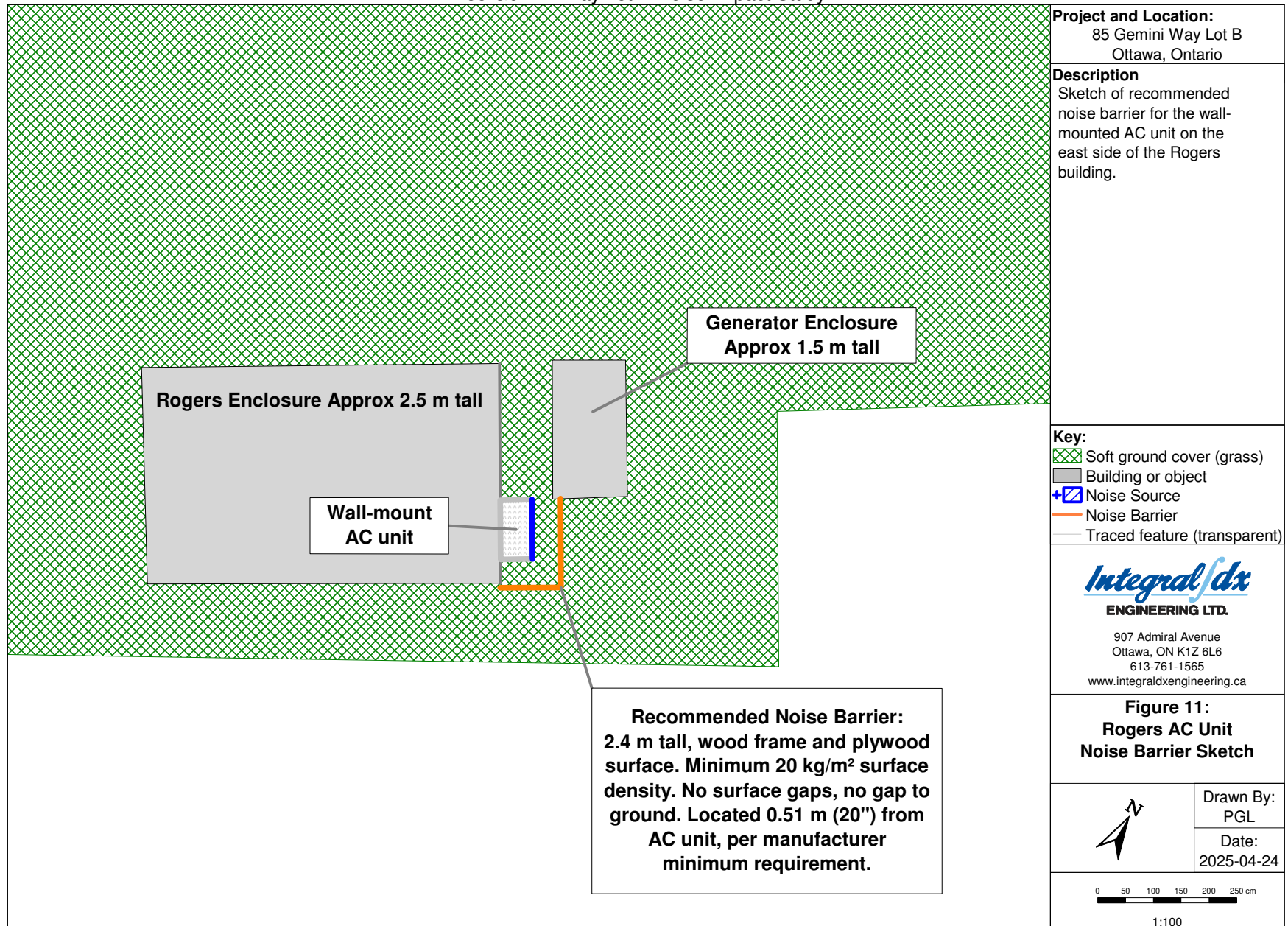
85 Gemini Way Lot B Noise Impact Study



85 Gemini Way Lot B Noise Impact Study



85 Gemini Way Lot B Noise Impact Study



APPENDICES

APPENDIX A: STAMSON ADJUSTMENTS FOR SHORT POA DISTANCES

The minimum input distance between POAs and roadways in STAMSON is 15 m. POAs D2 and D6 are less than 15 m from Gemini Way. Therefore, an adjustment to the STAMSON results has been applied for POAs D2 and D6.

Per the documentation forming the basis of STAMSON calculations (ORNAMENT, see Reference [18]), sound levels are calculated based on determining a reference sound level given the makeup of vehicles travelling on the roadway, and then applying various adjustments. The adjustment for the source-receive distance, A_d , is given by:

$$A_d = 10(1 + \alpha) \log(D_{ref}/D) \quad \text{ORNAMENT equation 13}$$

Where

α is the ground absorption coefficient (0 for sound-reflective ground)

D_{ref} is the reference distance, 15 metres

D is the horizontal distance from the POA to the roadway

The calculations were initially completed in STAMSON using the minimum permitted input distance of 15 m for Gemini Way. For a true horizontal distance of 11.4 m, A_d for Gemini at POAs D2 D6 should be 1.19 dB, whereas A_d is calculated as 0 dB by STAMSON for an input distance of 15 m. Therefore, a correction of +1.19 dB must be applied to the STAMSON calculation for noise from Gemini. No other roadway noise calculation requires a correction.

The applied adjustments for POAs D2 and D6, during the daytime and nighttime, are summarized in the following tables. Because the only difference between POAs D2 and D6 are their heights, and since the ground surface between the POA and each roadway is set as sound-reflective, both POAs have identical STAMSON calculation results. The total noise level was calculated by logarithmic addition of all roadway noise levels (the corrected level, in the case of Gemini Way).

Table A.1: STAMSON Adjustments, POA D2 and D6, Daytime Levels

Roadway	STAMSON Result (dBA Leq 16hr)	Correction (dB)	Corrected Result (dBA Leq 16hr)
ConstNB	53.33	0.00	53.33
ConstNB2	53.67	0.00	53.67
ConstSB	54.25	0.00	54.25
ConstSB2	53.72	0.00	53.72
Gemini	65.40	1.19	66.59
TOTAL			67.41

Table A.2: STAMSON Adjustments, POA D2 and D6, Nighttime Levels

Roadway	STAMSON Result (dBA Leq 8hr)	Correction (dB)	Corrected Result (dBA Leq 8hr)
ConstNB	45.73	0.00	45.73
ConstNB2	46.08	0.00	46.08
ConstSB	46.66	0.00	46.66
ConstSB2	46.12	0.00	46.12
Gemini	57.81	1.19	59.00
TOTAL			59.82

APPENDIX B: STAMSON CALCULATION RESULTS

STAMSON 5.0 SUMMARY REPORT Date: 04-12-2024 14:23:20
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: A2.TE Time Period: Day/Night 16/8 hours
 Description: North facade near east corner, floor 2

Road data, segment # 1: BaselineEB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB (day/night)

```
-----
Angle1 Angle2 : -90.00 deg -83.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.90 / 15.90 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : -81.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 19.70 / 19.70 m
Receiver height : 4.50 / 4.50 m
```

Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 83.00 deg Angle2 : 90.00 deg
 Barrier height : 42.00 m
 Barrier receiver distance : 0.90 / 0.90 m
 Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Road data, segment # 3: BaselineWB (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 : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: BaselineWB (day/night)

 Angle1 Angle2 : -90.00 deg -58.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 35.80 / 35.80 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 4: BaselineWB2 (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 : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 4: BaselineWB2 (day/night)

 Angle1 Angle2 : -58.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 36.00 / 36.00 m
 Receiver height : 4.50 / 4.50 m

Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 82.00 deg Angle2 : 90.00 deg
 Barrier height : 42.00 m
 Barrier receiver distance : 1.40 / 1.40 m
 Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Road data, segment # 5: ConstNB (day/night)

 Car traffic volume : 9715/845 veh/TimePeriod *
 Medium truck volume : 773/67 veh/TimePeriod *
 Heavy truck volume : 552/48 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): 12000
 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: ConstNB (day/night)

 Angle1 Angle2 : -9.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 81.60 / 81.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 6: ConstSB (day/night)

 Car traffic volume : 9715/845 veh/TimePeriod *
 Medium truck volume : 773/67 veh/TimePeriod *
 Heavy truck volume : 552/48 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): 12000
 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: ConstSB (day/night)

 Angle1 Angle2 : -8.00 deg 3.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 67.80 / 67.80 m
 Receiver height : 4.50 / 4.50 m

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary (day)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	1.50	!	57.86	!	57.86
2.BaselineEB2	!	1.50	!	70.63	!	70.63
3.BaselineWB	!	1.50	!	60.94	!	60.94
4.BaselineWB2	!	1.50	!	67.33	!	67.33
5.ConstNB	!	1.50	!	47.14	!	47.14
6.ConstSB	!	1.50	!	48.82	!	48.82
Total						72.78 dBA

Result summary (night)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	1.50	!	50.26	!	50.26
2.BaselineEB2	!	1.50	!	63.03	!	63.03
3.BaselineWB	!	1.50	!	53.34	!	53.34
4.BaselineWB2	!	1.50	!	59.73	!	59.73
5.ConstNB	!	1.50	!	39.55	!	39.55
6.ConstSB	!	1.50	!	41.22	!	41.22
Total						65.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.78
(NIGHT): 65.18

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 04-12-2024 14:24:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: A6.TE Time Period: Day/Night 16/8 hours
Description: North facade near east corner, floor 6

Road data, segment # 1: BaselineEB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB (day/night)

```
-----
Angle1 Angle2 : -90.00 deg -83.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.90 / 15.90 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : -81.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 19.70 / 19.70 m
Receiver height : 16.50 / 16.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 83.00 deg Angle2 : 90.00 deg
Barrier height : 42.00 m
```

Barrier receiver distance : 0.90 / 0.90 m
 Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Road data, segment # 3: BaselineWB (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 : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: BaselineWB (day/night)

 Angle1 Angle2 : -90.00 deg -58.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 35.80 / 35.80 m
 Receiver height : 16.50 / 16.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 4: BaselineWB2 (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 : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 4: BaselineWB2 (day/night)

 Angle1 Angle2 : -58.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 36.00 / 36.00 m
 Receiver height : 16.50 / 16.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 82.00 deg Angle2 : 90.00 deg
 Barrier height : 42.00 m

Barrier receiver distance : 1.40 / 1.40 m
 Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Road data, segment # 5: ConstNB (day/night)

 Car traffic volume : 9715/845 veh/TimePeriod *
 Medium truck volume : 773/67 veh/TimePeriod *
 Heavy truck volume : 552/48 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): 12000
 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: ConstNB (day/night)

 Angle1 Angle2 : -9.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 81.60 / 81.60 m
 Receiver height : 16.50 / 16.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 6: ConstSB (day/night)

 Car traffic volume : 9715/845 veh/TimePeriod *
 Medium truck volume : 773/67 veh/TimePeriod *
 Heavy truck volume : 552/48 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): 12000
 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: ConstSB (day/night)

 Angle1 Angle2 : -8.00 deg 3.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 67.80 / 67.80 m
 Receiver height : 16.50 / 16.50 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.BaselineEB	!	1.50	!	57.86	!	57.86
2.BaselineEB2	!	1.50	!	70.63	!	70.63
3.BaselineWB	!	1.50	!	60.94	!	60.94
4.BaselineWB2	!	1.50	!	67.33	!	67.33
5.ConstNB	!	1.50	!	47.14	!	47.14
6.ConstSB	!	1.50	!	48.82	!	48.82
Total						72.78 dBA

Result summary (night)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	1.50	!	50.26	!	50.26
2.BaselineEB2	!	1.50	!	63.03	!	63.03
3.BaselineWB	!	1.50	!	53.34	!	53.34
4.BaselineWB2	!	1.50	!	59.73	!	59.73
5.ConstNB	!	1.50	!	39.55	!	39.55
6.ConstSB	!	1.50	!	41.22	!	41.22
Total						65.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.78
(NIGHT): 65.18

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 27-11-2024 14:08:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: B2.TE Time Period: Day/Night 16/8 hours
Description: East facade near north corner, floor 2

Road data, segment # 1: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : 1.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.90 / 21.90 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 44.00 deg Angle2 : 90.00 deg
Barrier height : 42.00 m
Barrier receiver distance : 3.20 / 3.20 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00
```

Road data, segment # 2: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineWB2 (day/night)

```
-----
Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
```



```

Surface                :      2      (Reflective ground surface)
Receiver source distance : 38.20 / 38.20 m
Receiver height         : 4.50 / 4.50 m
Topography              :      2      (Flat/gentle slope; with barrier)
Barrier angle1          : 43.00 deg  Angle2 : 90.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 3.50 / 3.50 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 3: ConstNB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48     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): 12000
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: ConstNB (day/night)

```

-----
Angle1  Angle2          : -12.00 deg  56.00 deg
Wood depth : 0          (No woods.)
No of house rows : 0 / 0
Surface     : 2          (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height : 4.50 / 4.50 m
Topography   : 2          (Flat/gentle slope; with barrier)
Barrier angle1 : -12.00 deg  Angle2 : 49.00 deg
Barrier height : 42.00 m
Barrier receiver distance : 52.10 / 52.10 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00

```

Road data, segment # 4: ConstNB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48     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): 12000
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: ConstNB2 (day/night)

```

-----
Angle1   Angle2       : 53.00 deg  73.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 80.20 / 80.20 m
Receiver height  :  4.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 5: ConstSB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB (day/night)

```

-----
Angle1   Angle2       : -11.00 deg  61.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 61.20 / 61.20 m
Receiver height  :  4.50 / 4.50 m
Topography      :      2      (Flat/gentle slope; with barrier)
Barrier angle1   : -11.00 deg  Angle2 : 52.00 deg
Barrier height   : 42.00 m
Barrier receiver distance : 50.60 / 50.60 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle  : 0.00

```

Road data, segment # 6: ConstSB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB2 (day/night)

```

-----
Angle1   Angle2       : 56.00 deg  73.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 70.90 / 70.90 m
Receiver height  :  4.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 7: Gemini (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    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): 8000
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 # 7: Gemini (day/night)

```

-----
Angle1   Angle2       : -40.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 70.90 / 70.90 m
Receiver height  :  4.50 / 4.50 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.BaselineEB2 ! 1.50 ! 64.40 ! 64.40
2.BaselineWB2 ! 1.50 ! 61.99 ! 61.99
3.ConstNB ! 1.50 ! 46.78 ! 46.78
4.ConstNB2 ! 1.50 ! 50.69 ! 50.69
5.ConstSB ! 1.50 ! 48.69 ! 48.69
6.ConstSB2 ! 1.50 ! 50.52 ! 50.52
7.Gemini ! 1.50 ! 52.47 ! 52.47
-----
Total 66.87 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq

```

	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB2	!	1.50	!	56.81	!	56.81
2.BaselineWB2	!	1.50	!	54.39	!	54.39
3.ConstNB	!	1.50	!	39.18	!	39.18
4.ConstNB2	!	1.50	!	43.09	!	43.09
5.ConstSB	!	1.50	!	41.09	!	41.09
6.ConstSB2	!	1.50	!	42.92	!	42.92
7.Gemini	!	1.50	!	44.88	!	44.88
Total						59.28 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.87
(NIGHT): 59.28

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 27-11-2024 14:08:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: B6.TE Time Period: Day/Night 16/8 hours
Description: East facade near north corner, floor 6

Road data, segment # 1: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB2 (day/night)

Angle1 Angle2 : 1.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.90 / 21.90 m
Receiver height : 16.50 / 16.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 44.00 deg Angle2 : 90.00 deg
Barrier height : 42.00 m
Barrier receiver distance : 3.20 / 3.20 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00

Road data, segment # 2: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineWB2 (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

```

Surface                :      2      (Reflective ground surface)
Receiver source distance : 38.20 / 38.20 m
Receiver height         : 16.50 / 16.50 m
Topography              :      2      (Flat/gentle slope; with barrier)
Barrier angle1          : 43.00 deg   Angle2 : 90.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 3.50 / 3.50 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 3: ConstNB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48     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): 12000
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: ConstNB (day/night)

```

-----
Angle1 Angle2          : -12.00 deg   56.00 deg
Wood depth              : 0           (No woods.)
No of house rows        : 0 / 0
Surface                 : 2           (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height         : 16.50 / 16.50 m
Topography              : 2           (Flat/gentle slope; with barrier)
Barrier angle1          : -12.00 deg   Angle2 : 49.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 52.10 / 52.10 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 4: ConstNB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48     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): 12000
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: ConstNB2 (day/night)

```

-----
Angle1   Angle2       : 53.00 deg  73.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 80.20 / 80.20 m
Receiver height  : 16.50 / 16.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 5: ConstSB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB (day/night)

```

-----
Angle1   Angle2       : -11.00 deg  61.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 61.20 / 61.20 m
Receiver height  : 16.50 / 16.50 m
Topography      :      2      (Flat/gentle slope; with barrier)
Barrier angle1   : -11.00 deg  Angle2 : 52.00 deg
Barrier height   : 42.00 m
Barrier receiver distance : 50.60 / 50.60 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle  : 0.00

```

Road data, segment # 6: ConstSB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB2 (day/night)

```

-----
Angle1   Angle2       : 56.00 deg  73.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 70.90 / 70.90 m
Receiver height  : 16.50 / 16.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 7: Gemini (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    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): 8000
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 # 7: Gemini (day/night)

```

-----
Angle1   Angle2       : -40.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 70.90 / 70.90 m
Receiver height  : 16.50 / 16.50 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.BaselineEB2 ! 1.50 ! 64.41 ! 64.41
2.BaselineWB2 ! 1.50 ! 61.99 ! 61.99
3.ConstNB ! 1.50 ! 46.78 ! 46.78
4.ConstNB2 ! 1.50 ! 50.69 ! 50.69
5.ConstSB ! 1.50 ! 48.69 ! 48.69
6.ConstSB2 ! 1.50 ! 50.52 ! 50.52
7.Gemini ! 1.50 ! 52.47 ! 52.47
-----
Total 66.88 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq

```

	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB2	!	1.50	!	56.81	!	56.81
2.BaselineWB2	!	1.50	!	54.39	!	54.39
3.ConstNB	!	1.50	!	39.18	!	39.18
4.ConstNB2	!	1.50	!	43.09	!	43.09
5.ConstSB	!	1.50	!	41.09	!	41.09
6.ConstSB2	!	1.50	!	42.92	!	42.92
7.Gemini	!	1.50	!	44.88	!	44.88
Total						59.28 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.88
(NIGHT): 59.28

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 28-11-2024 12:39:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: C2.TE Time Period: Day/Night 16/8 hours
Description: East facade near south corner, floor 2

Road data, segment # 1: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : 1.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.80 / 77.80 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 2.00 deg Angle2 : 90.00 deg
Barrier height : 42.00 m
Barrier receiver distance : 59.00 / 59.00 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00
```

Road data, segment # 2: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineWB2 (day/night)

```
-----
Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
```



```

Surface                :      2      (Reflective ground surface)
Receiver source distance : 94.00 / 94.00 m
Receiver height         : 4.50 / 4.50 m
Topography              :      2      (Flat/gentle slope; with barrier)
Barrier angle1          : 1.00 deg   Angle2 : 90.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 59.40 / 59.40 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 3: ConstNB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48     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): 12000
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: ConstNB (day/night)

```

-----
Angle1 Angle2          : -45.00 deg 37.00 deg
Wood depth              : 0          (No woods.)
No of house rows        : 0 / 0
Surface                 : 2          (Reflective ground surface)
Receiver source distance : 72.50 / 72.50 m
Receiver height         : 4.50 / 4.50 m
Topography              : 2          (Flat/gentle slope; with barrier)
Barrier angle1          : -45.00 deg Angle2 : 5.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 49.60 / 49.60 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 4: ConstNB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48     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): 12000
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: ConstNB2 (day/night)

```

-----
Angle1   Angle2      : 34.00 deg  70.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height  :  4.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 5: ConstSB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB (day/night)

```

-----
Angle1   Angle2      : -48.00 deg  42.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 61.50 / 61.50 m
Receiver height  :  4.50 / 4.50 m
Topography      :      2      (Flat/gentle slope; with barrier)
Barrier angle1   : -48.00 deg  Angle2 : 8.00 deg
Barrier height    : 42.00 m
Barrier receiver distance : 50.90 / 50.90 m
Source elevation  : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation  : 85.00 m
Reference angle   : 0.00

```

Road data, segment # 6: ConstSB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB2 (day/night)

```

-----
Angle1   Angle2       : 37.00 deg  69.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 66.30 / 66.30 m
Receiver height  :  4.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 7: Gemini (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    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): 8000
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 # 7: Gemini (day/night)

```

-----
Angle1   Angle2       : -75.00 deg -1.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 15.10 / 15.10 m
Receiver height  :  4.50 / 4.50 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.BaselineEB2 ! 1.50 ! 45.43 ! 45.43
2.BaselineWB2 ! 1.50 ! 44.67 ! 44.67
3.ConstNB      ! 1.50 ! 53.23 ! 53.23
4.ConstNB2     ! 1.50 ! 53.53 ! 53.53
5.ConstSB      ! 1.50 ! 54.22 ! 54.22
6.ConstSB2     ! 1.50 ! 53.56 ! 53.56
7.Gemini       ! 1.50 ! 61.86 ! 61.86
-----
Total                                     64.02 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)

```

	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB2	!	1.50	!	37.83	!	37.83
2.BaselineWB2	!	1.50	!	37.08	!	37.08
3.ConstNB	!	1.50	!	45.64	!	45.64
4.ConstNB2	!	1.50	!	45.93	!	45.93
5.ConstSB	!	1.50	!	46.62	!	46.62
6.ConstSB2	!	1.50	!	45.96	!	45.96
7.Gemini	!	1.50	!	54.27	!	54.27
Total						56.43 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.02
(NIGHT): 56.43

STAMSON 5.0 SUMMARY REPORT Date: 28-11-2024 12:39:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: C6.TE Time Period: Day/Night 16/8 hours
Description: East facade near south corner, floor 6

Road data, segment # 1: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : 1.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.80 / 77.80 m
Receiver height : 16.50 / 16.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 2.00 deg Angle2 : 90.00 deg
Barrier height : 42.00 m
Barrier receiver distance : 59.00 / 59.00 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00
```

Road data, segment # 2: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineWB2 (day/night)

```
-----
Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
```

```

Surface                :      2      (Reflective ground surface)
Receiver source distance : 94.00 / 94.00 m
Receiver height         : 16.50 / 16.50 m
Topography              :      2      (Flat/gentle slope; with barrier)
Barrier angle1          : 1.00 deg   Angle2 : 90.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 59.40 / 59.40 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 3: ConstNB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstNB (day/night)

```

-----
Angle1 Angle2          : -45.00 deg  37.00 deg
Wood depth              : 0          (No woods.)
No of house rows        : 0 / 0
Surface                 : 2          (Reflective ground surface)
Receiver source distance : 72.50 / 72.50 m
Receiver height         : 16.50 / 16.50 m
Topography              : 2          (Flat/gentle slope; with barrier)
Barrier angle1          : -45.00 deg  Angle2 : 5.00 deg
Barrier height          : 42.00 m
Barrier receiver distance : 49.60 / 49.60 m
Source elevation         : 85.00 m
Receiver elevation       : 85.00 m
Barrier elevation        : 85.00 m
Reference angle          : 0.00

```

Road data, segment # 4: ConstNB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstNB2 (day/night)

```

-----
Angle1   Angle2       : 34.00 deg  70.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height  : 16.50 / 16.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 5: ConstSB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB (day/night)

```

-----
Angle1   Angle2       : -48.00 deg  42.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 61.50 / 61.50 m
Receiver height  : 16.50 / 16.50 m
Topography      :      2      (Flat/gentle slope; with barrier)
Barrier angle1   : -48.00 deg  Angle2 : 8.00 deg
Barrier height   : 42.00 m
Barrier receiver distance : 50.90 / 50.90 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle  : 0.00

```

Road data, segment # 6: ConstSB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB2 (day/night)

```

-----
Angle1   Angle2       : 37.00 deg  69.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 66.30 / 66.30 m
Receiver height  : 16.50 / 16.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

Road data, segment # 7: Gemini (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    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): 8000
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 # 7: Gemini (day/night)

```

-----
Angle1   Angle2       : -75.00 deg -1.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 15.10 / 15.10 m
Receiver height  : 16.50 / 16.50 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.BaselineEB2 ! 1.50 ! 45.47 ! 45.47
2.BaselineWB2 ! 1.50 ! 44.73 ! 44.73
3.ConstNB ! 1.50 ! 53.23 ! 53.23
4.ConstNB2 ! 1.50 ! 53.53 ! 53.53
5.ConstSB ! 1.50 ! 54.22 ! 54.22
6.ConstSB2 ! 1.50 ! 53.56 ! 53.56
7.Gemini ! 1.50 ! 61.86 ! 61.86
-----
Total 64.03 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq

```

	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB2	!	1.50	!	37.87	!	37.87
2.BaselineWB2	!	1.50	!	37.14	!	37.14
3.ConstNB	!	1.50	!	45.64	!	45.64
4.ConstNB2	!	1.50	!	45.93	!	45.93
5.ConstSB	!	1.50	!	46.62	!	46.62
6.ConstSB2	!	1.50	!	45.96	!	45.96
7.Gemini	!	1.50	!	54.27	!	54.27
Total				56.43 dBA		

TOTAL Leq FROM ALL SOURCES (DAY): 64.03
(NIGHT): 56.43

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 NORMAL REPORT Date: 02-12-2024 14:42:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: D2.TE Time Period: Day/Night 16/8 hours
Description: South facade near east corner, floor 2

Road data, segment # 1: ConstNB (day/night)

```
-----
Car traffic volume : 9715/845    veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48    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): 12000
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: ConstNB (day/night)

```
-----
Angle1 Angle2 : 0.00 deg 34.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.20 / 74.20 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: ConstNB2 (day/night)

```
-----
Car traffic volume : 9715/845    veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48    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): 12000
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: ConstNB2 (day/night)

```
-----
Angle1 Angle2 : 31.00 deg 69.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.60 / 76.60 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 3: ConstSB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB (day/night)

```

-----
Angle1 Angle2      : 3.00 deg 39.00 deg
Wood depth          : 0        (No woods.)
No of house rows    : 0 / 0
Surface            : 2        (Reflective ground surface)
Receiver source distance : 63.50 / 63.50 m
Receiver height     : 4.50 / 4.50 m
Topography          : 1        (Flat/gentle slope; no barrier)
Reference angle     : 0.00

```

Road data, segment # 4: ConstSB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB2 (day/night)

```

-----
Angle1 Angle2      : 34.00 deg 68.00 deg
Wood depth          : 0        (No woods.)
No of house rows    : 0 / 0
Surface            : 2        (Reflective ground surface)
Receiver source distance : 67.90 / 67.90 m
Receiver height     : 4.50 / 4.50 m
Topography          : 1        (Flat/gentle slope; no barrier)
Reference angle     : 0.00

```

Road data, segment # 5: Gemini (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    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): 8000
 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: Gemini (day/night)

```
-----
Angle1 Angle2      : -79.00 deg  87.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 2          (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height     : 4.50 / 4.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
-----
```

Results segment # 1: ConstNB (day)

```
-----
Source height = 1.50 m

ROAD (0.00 + 53.33 + 0.00) = 53.33 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
0      34      0.00 67.51  0.00 -6.94 -7.24  0.00  0.00  0.00 53.33
-----
```

Segment Leq : 53.33 dBA

Results segment # 2: ConstNB2 (day)

```
-----
Source height = 1.50 m

ROAD (0.00 + 53.67 + 0.00) = 53.67 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
31      69      0.00 67.51  0.00 -7.08 -6.75  0.00  0.00  0.00 53.67
-----
```

Segment Leq : 53.67 dBA

Results segment # 3: ConstSB (day)

```
-----
Source height = 1.50 m

ROAD (0.00 + 54.25 + 0.00) = 54.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
3       39      0.00 67.51  0.00 -6.27 -6.99  0.00  0.00  0.00 54.25
-----
```

Segment Leq : 54.25 dBA

Results segment # 4: ConstSB2 (day)

Source height = 1.50 m

ROAD (0.00 + 53.72 + 0.00) = 53.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
34	68	0.00	67.51	0.00	-6.56	-7.24	0.00	0.00	0.00	53.72

Segment Leq : 53.72 dBA

Results segment # 5: Gemini (day)

Source height = 1.50 m

ROAD (0.00 + 65.40 + 0.00) = 65.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	87	0.00	65.75	0.00	0.00	-0.35	0.00	0.00	0.00	65.40

Segment Leq : 65.40 dBA

Total Leq All Segments: 66.45 dBA

Results segment # 1: ConstNB (night)

Source height = 1.50 m

ROAD (0.00 + 45.73 + 0.00) = 45.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	34	0.00	59.91	0.00	-6.94	-7.24	0.00	0.00	0.00	45.73

Segment Leq : 45.73 dBA

Results segment # 2: ConstNB2 (night)

Source height = 1.50 m

ROAD (0.00 + 46.08 + 0.00) = 46.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
31	69	0.00	59.91	0.00	-7.08	-6.75	0.00	0.00	0.00	46.08

Segment Leq : 46.08 dBA

Results segment # 3: ConstSB (night)

Source height = 1.50 m

ROAD (0.00 + 46.66 + 0.00) = 46.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------	--------

```
-----
      3      39      0.00  59.91      0.00  -6.27  -6.99      0.00      0.00      0.00  46.66
-----
```

Segment Leq : 46.66 dBA

Results segment # 4: ConstSB2 (night)

Source height = 1.50 m

ROAD (0.00 + 46.12 + 0.00) = 46.12 dBA

```
-----
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
      34      68      0.00  59.91      0.00  -6.56  -7.24      0.00      0.00      0.00  46.12
-----
```

Segment Leq : 46.12 dBA

Results segment # 5: Gemini (night)

Source height = 1.50 m

ROAD (0.00 + 57.81 + 0.00) = 57.81 dBA

```
-----
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
     -79      87      0.00  58.16      0.00      0.00  -0.35      0.00      0.00      0.00  57.81
-----
```

Segment Leq : 57.81 dBA

Total Leq All Segments: 58.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.45
(NIGHT): 58.86

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 27-11-2024 14:09:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: D6.TE Time Period: Day/Night 16/8 hours
Description: South facade near east corner, floor 6

Road data, segment # 1: ConstNB (day/night)

```
-----
Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: ConstNB (day/night)

```
-----
Angle1 Angle2 : 0.00 deg 34.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.20 / 74.20 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: ConstNB2 (day/night)

```
-----
Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: ConstNB2 (day/night)

```
-----
Angle1 Angle2 : 31.00 deg 69.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.60 / 76.60 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 3: ConstSB (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB (day/night)

```

-----
Angle1 Angle2      : 3.00 deg 39.00 deg
Wood depth          : 0        (No woods.)
No of house rows    : 0 / 0
Surface            : 2        (Reflective ground surface)
Receiver source distance : 63.50 / 63.50 m
Receiver height     : 16.50 / 16.50 m
Topography          : 1        (Flat/gentle slope; no barrier)
Reference angle     : 0.00

```

Road data, segment # 4: ConstSB2 (day/night)

```

-----
Car traffic volume : 9715/845   veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume  : 552/48    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): 12000
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: ConstSB2 (day/night)

```

-----
Angle1 Angle2      : 34.00 deg 68.00 deg
Wood depth          : 0        (No woods.)
No of house rows    : 0 / 0
Surface            : 2        (Reflective ground surface)
Receiver source distance : 67.90 / 67.90 m
Receiver height     : 16.50 / 16.50 m
Topography          : 1        (Flat/gentle slope; no barrier)
Reference angle     : 0.00

```

Road data, segment # 5: Gemini (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    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): 8000
 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: Gemini (day/night)

 Angle1 Angle2 : -79.00 deg 87.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 16.50 / 16.50 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.ConstNB	! 1.50 !	53.33	! 53.33
2.ConstNB2	! 1.50 !	53.67	! 53.67
3.ConstSB	! 1.50 !	54.25	! 54.25
4.ConstSB2	! 1.50 !	53.72	! 53.72
5.Gemini	! 1.50 !	65.40	! 65.40
Total			66.45 dBA

Result summary (night)

	! source !	Road	! Total
	! height !	Leq	! Leq
	! (m) !	(dBA)	! (dBA)
1.ConstNB	! 1.50 !	45.73	! 45.73
2.ConstNB2	! 1.50 !	46.08	! 46.08
3.ConstSB	! 1.50 !	46.66	! 46.66
4.ConstSB2	! 1.50 !	46.12	! 46.12
5.Gemini	! 1.50 !	57.81	! 57.81
Total			58.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.45
 (NIGHT): 58.86

STAMSON 5.0 SUMMARY REPORT Date: 28-11-2024 11:57:08
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: E2.TE Time Period: Day/Night 16/8 hours
 Description: West facade near south corner, floor 2

Road data, segment # 1: BaselineEB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB (day/night)

```
-----
Angle1 Angle2 : -90.00 deg -55.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : -54.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.90 / 76.90 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 3: BaselineWB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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: BaselineWB (day/night)

```

-----
Angle1 Angle2 : -90.00 deg -18.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.50 / 93.50 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 4: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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 # 4: BaselineWB2 (day/night)

```

-----
Angle1 Angle2 : -18.00 deg -1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.60 / 93.60 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 5: Gemini (day/night)

```

-----
Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
 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: Gemini (day/night)

 Angle1 Angle2 : -1.00 deg 85.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.20 / 15.20 m
 Receiver height : 4.50 / 4.50 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.BaselineEB	! 1.50 !	58.17	! 58.17
2.BaselineEB2	! 1.50 !	59.89	! 59.89
3.BaselineWB	! 1.50 !	60.29	! 60.29
4.BaselineWB2	! 1.50 !	54.01	! 54.01
5.Gemini	! 1.50 !	62.48	! 62.48
Total			66.74 dBA

Result summary (night)

	! source !	Road	! Total
	! height !	Leq	! Leq
	! (m) !	(dBA)	! (dBA)
1.BaselineEB	! 1.50 !	50.57	! 50.57
2.BaselineEB2	! 1.50 !	52.29	! 52.29
3.BaselineWB	! 1.50 !	52.69	! 52.69
4.BaselineWB2	! 1.50 !	46.42	! 46.42
5.Gemini	! 1.50 !	54.89	! 54.89
Total			59.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.74
 (NIGHT): 59.15

STAMSON 5.0 SUMMARY REPORT Date: 28-11-2024 11:57:17
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: E6.TE Time Period: Day/Night 16/8 hours
 Description: West facade near south corner, floor 6

Road data, segment # 1: BaselineEB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB (day/night)

```
-----
Angle1 Angle2 : -90.00 deg -55.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : -54.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.90 / 76.90 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 3: BaselineWB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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: BaselineWB (day/night)

```

-----
Angle1 Angle2 : -90.00 deg -18.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.50 / 93.50 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 4: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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 # 4: BaselineWB2 (day/night)

```

-----
Angle1 Angle2 : -18.00 deg -1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.60 / 93.60 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 5: Gemini (day/night)

```

-----
Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
 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: Gemini (day/night)

 Angle1 Angle2 : -1.00 deg 85.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.20 / 15.20 m
 Receiver height : 16.50 / 16.50 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.BaselineEB	! 1.50 !	58.17	58.17
2.BaselineEB2	! 1.50 !	59.89	59.89
3.BaselineWB	! 1.50 !	60.29	60.29
4.BaselineWB2	! 1.50 !	54.01	54.01
5.Gemini	! 1.50 !	62.48	62.48
Total			66.74 dBA

Result summary (night)

	! source !	Road	Total
	! height !	Leq	Leq
	! (m) !	(dBA)	(dBA)
1.BaselineEB	! 1.50 !	50.57	50.57
2.BaselineEB2	! 1.50 !	52.29	52.29
3.BaselineWB	! 1.50 !	52.69	52.69
4.BaselineWB2	! 1.50 !	46.42	46.42
5.Gemini	! 1.50 !	54.89	54.89
Total			59.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.74
 (NIGHT): 59.15

STAMSON 5.0 SUMMARY REPORT Date: 28-11-2024 11:57:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: F2.TE Time Period: Day/Night 16/8 hours
Description: West facade near north corner, floor 2

Road data, segment # 1: BaselineEB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB (day/night)

Angle1 Angle2 : -90.00 deg -80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.20 / 18.20 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineEB2 (day/night)

Angle1 Angle2 : -79.00 deg 2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.20 / 21.20 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: BaselineWB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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: BaselineWB (day/night)

```

-----
Angle1 Angle2 : -90.00 deg -39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.80 / 37.80 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 4: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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 # 4: BaselineWB2 (day/night)

```

-----
Angle1 Angle2 : -39.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.80 / 37.80 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 5: Gemini (day/night)

```

-----
Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
 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: Gemini (day/night)

 Angle1 Angle2 : 0.00 deg 67.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 70.90 / 70.90 m
 Receiver height : 4.50 / 4.50 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.BaselineEB	! 1.50 !	58.82	! 58.82
2.BaselineEB2	! 1.50 !	67.24	! 67.24
3.BaselineWB	! 1.50 !	62.72	! 62.72
4.BaselineWB2	! 1.50 !	61.67	! 61.67
5.Gemini	! 1.50 !	54.71	! 54.71
Total			69.87 dBA

Result summary (night)

	! source !	Road	! Total
	! height !	Leq	! Leq
	! (m) !	(dBA)	! (dBA)
1.BaselineEB	! 1.50 !	51.23	! 51.23
2.BaselineEB2	! 1.50 !	59.65	! 59.65
3.BaselineWB	! 1.50 !	55.13	! 55.13
4.BaselineWB2	! 1.50 !	54.07	! 54.07
5.Gemini	! 1.50 !	47.12	! 47.12
Total			62.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.87
 (NIGHT): 62.27

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 28-11-2024 11:57:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: F6.TE Time Period: Day/Night 16/8 hours
Description: West facade near north corner, floor 6

Road data, segment # 1: BaselineEB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 1: BaselineEB (day/night)

```
-----
Angle1 Angle2 : -90.00 deg -80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.20 / 18.20 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: BaselineEB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 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 # 2: BaselineEB2 (day/night)

```
-----
Angle1 Angle2 : -79.00 deg 2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.20 / 21.20 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```



Road data, segment # 3: BaselineWB (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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: BaselineWB (day/night)

```

-----
Angle1 Angle2 : -90.00 deg -39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.80 / 37.80 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 4: BaselineWB2 (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 : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 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 # 4: BaselineWB2 (day/night)

```

-----
Angle1 Angle2 : -39.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.80 / 37.80 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Road data, segment # 5: Gemini (day/night)

```

-----
Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *

```

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

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): 8000
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: Gemini (day/night)

Angle1 Angle2 : 0.00 deg 67.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.90 / 70.90 m
Receiver height : 16.50 / 16.50 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.BaselineEB ! 1.50 ! 58.82 ! 58.82
2.BaselineEB2 ! 1.50 ! 67.24 ! 67.24
3.BaselineWB ! 1.50 ! 62.72 ! 62.72
4.BaselineWB2 ! 1.50 ! 61.67 ! 61.67
5.Gemini ! 1.50 ! 54.71 ! 54.71

Total 69.87 dBA

Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)

1.BaselineEB ! 1.50 ! 51.23 ! 51.23
2.BaselineEB2 ! 1.50 ! 59.65 ! 59.65
3.BaselineWB ! 1.50 ! 55.13 ! 55.13
4.BaselineWB2 ! 1.50 ! 54.07 ! 54.07
5.Gemini ! 1.50 ! 47.12 ! 47.12

Total 62.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.87
(NIGHT): 62.27



Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 12-12-2024 10:35:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: OLA.TE Time Period: 16 hours
Description: Central OLA

Road data, segment # 1: BaselineEB

```
-----
Car traffic volume : 20240 veh/TimePeriod *
Medium truck volume : 1610 veh/TimePeriod *
Heavy truck volume : 1150 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: BaselineEB

```
-----
Angle1 Angle2 : -90.00 deg -71.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.10 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -71.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 9.50 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00
```

Road data, segment # 2: BaselineEB2

```
-----
Car traffic volume : 20240 veh/TimePeriod *
Medium truck volume : 1610 veh/TimePeriod *
Heavy truck volume : 1150 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 2: BaselineEB2

```
-----
Angle1 Angle2 : -69.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 49.90 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -69.00 deg Angle2 : 90.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 9.90 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00
```

Road data, segment # 3: BaselineWB

```
-----
Car traffic volume : 20240 veh/TimePeriod *
Medium truck volume : 1610 veh/TimePeriod *
Heavy truck volume : 1150 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
```



Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: BaselineWB

```

-----
Angle1 Angle2 : -90.00 deg -42.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -42.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 9.70 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00

```

Road data, segment # 4: BaselineWB2

```

-----
Car traffic volume : 20240 veh/TimePeriod *
Medium truck volume : 1610 veh/TimePeriod *
Heavy truck volume : 1150 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

Data for Segment # 4: BaselineWB2

```

-----
Angle1 Angle2 : -42.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.10 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : 90.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 9.70 m
Source elevation : 85.00 m
Receiver elevation : 85.00 m
Barrier elevation : 85.00 m
Reference angle : 0.00

```

Road data, segment # 5: ConstNB

```

-----
Car traffic volume : 9715 veh/TimePeriod *
Medium truck volume : 773 veh/TimePeriod *
Heavy truck volume : 552 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

Data for Segment # 5: ConstNB

```

-----
Angle1 Angle2 : -29.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.10 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -29.00 deg Angle2 : 30.00 deg
Barrier height : 42.00 m
Barrier receiver distance : 56.20 m

```

Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Road data, segment # 6: ConstNB2

 Car traffic volume : 9715 veh/TimePeriod *
 Medium truck volume : 773 veh/TimePeriod *
 Heavy truck volume : 552 veh/TimePeriod *
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 6: ConstNB2

 Angle1 Angle2 : 43.00 deg 70.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 83.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 7: ConstSB

 Car traffic volume : 9715 veh/TimePeriod *
 Medium truck volume : 773 veh/TimePeriod *
 Heavy truck volume : 552 veh/TimePeriod *
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 7: ConstSB

 Angle1 Angle2 : -31.00 deg 51.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 66.80 m
 Receiver height : 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -31.00 deg Angle2 : 32.00 deg
 Barrier height : 42.00 m
 Barrier receiver distance : 56.20 m
 Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Road data, segment # 8: ConstSB2

 Car traffic volume : 9715 veh/TimePeriod *
 Medium truck volume : 773 veh/TimePeriod *
 Heavy truck volume : 552 veh/TimePeriod *
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 8: ConstSB2

 Angle1 Angle2 : 46.00 deg 70.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0

Surface : 2 (Reflective ground surface)
 Receiver source distance : 74.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 9: Gemini

 Car traffic volume : 6477 veh/TimePeriod *
 Medium truck volume : 515 veh/TimePeriod *
 Heavy truck volume : 368 veh/TimePeriod *
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 9: Gemini

 Angle1 Angle2 : -56.00 deg 77.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 42.90 m
 Receiver height : 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -30.00 deg Angle2 : 77.00 deg
 Barrier height : 18.00 m
 Barrier receiver distance : 11.20 m
 Source elevation : 85.00 m
 Receiver elevation : 85.00 m
 Barrier elevation : 85.00 m
 Reference angle : 0.00

Result summary

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.BaselineEB	! 1.50 !	40.88 !	40.88
2.BaselineEB2	! 1.50 !	47.03 !	47.03
3.BaselineWB	! 1.50 !	41.80 !	41.80
4.BaselineWB2	! 1.50 !	45.15 !	45.15
5.ConstNB	! 1.50 !	49.94 !	49.94
6.ConstNB2	! 1.50 !	51.84 !	51.84
7.ConstSB	! 1.50 !	51.40 !	51.40
8.ConstSB2	! 1.50 !	51.83 !	51.83
9.Gemini	! 1.50 !	52.96 !	52.96
Total			59.29 dBA

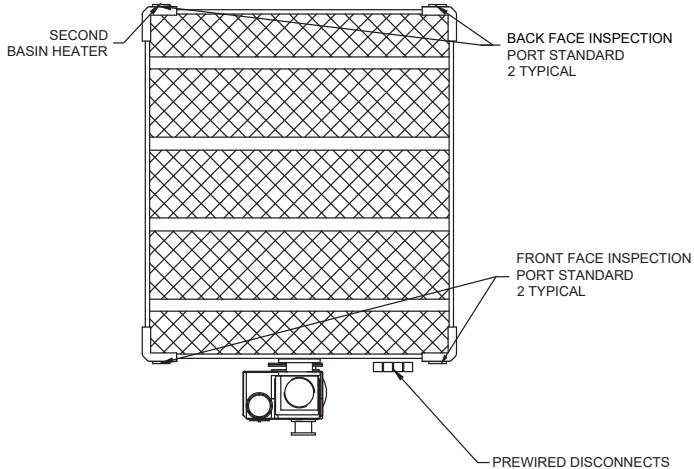
TOTAL Leq FROM ALL SOURCES: 59.29

APPENDIX C: SUPPORTING INFORMATION, GEMINI TOWER NOISE

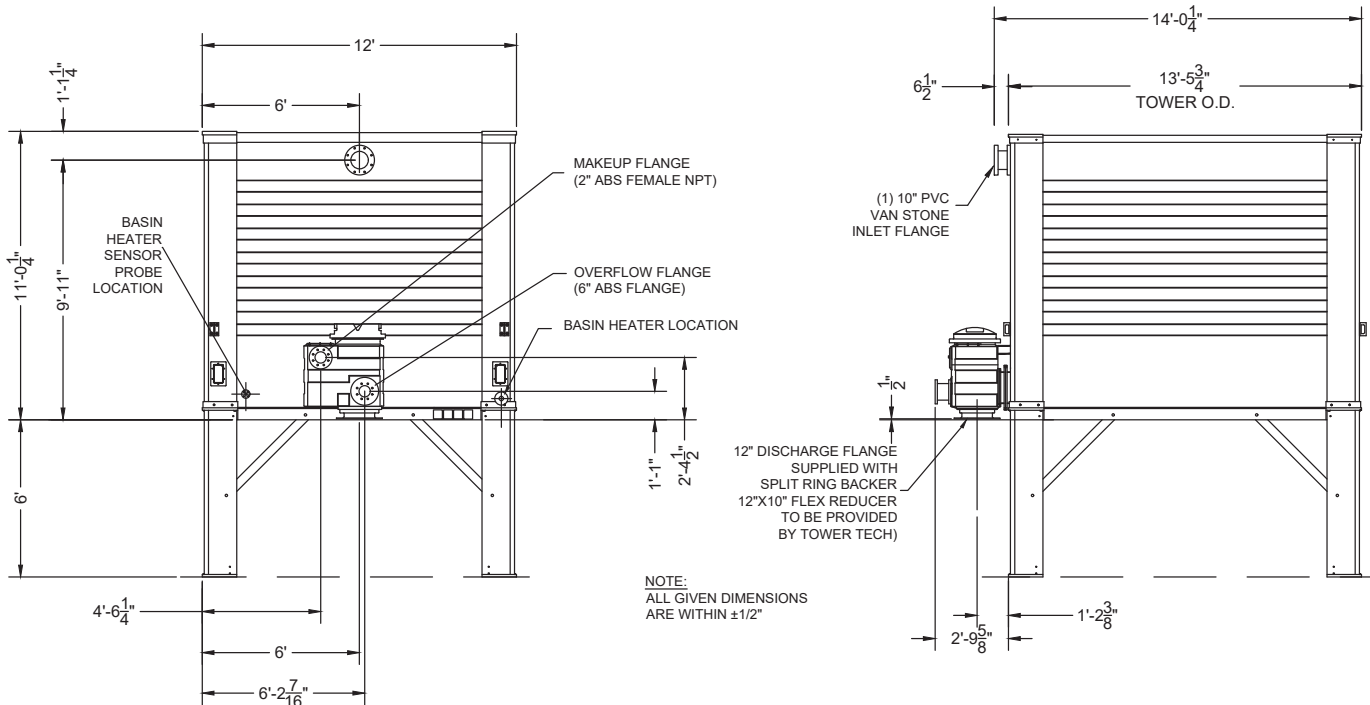
Included information:

1. Cooling Tower: dimensions and sound power level
2. Makeup Air Units: dimensions and sound power levels.

Cooling Tower Dimensions



- NOTES:**
1. ALL EXTERNAL PIPING PROVIDED BY CUSTOMER.
 2. EXTERNAL PIPING TO BE "STAND ALONE" (INDEPENDENTLY SUPPORTED. FINAL CONNECTIONS TO THE COOLING TOWER POWER MODULE MUST BE FIELD FITTED AFTER TOWER INSTALLATION TO PREVENT PIPE STRESS ON TOWER.
 - 3 NO LOAD TO BE APPLIED TO TOWER TECH TOWER OR SUMP.
 4. FOR APPROPRIATE WATER LEVEL REFER TO STARTUP SECTION IN TOWER TECH'S DESIGN, INSTALLATION & OPERATION MANUAL.
 5. MAKE-UP CONNECTION/FLOAT VALVE CONNECTION FLANGE IS MADE FROM HIGH QUALITY PLASTIC TO ELIMINATE CORROSION.
 6. THE MAXIMUM MAKE-UP INLET PRESSURE IS 25 PSIG. WHEN USING A MECHANICAL FLOAT VALVE, FLOAT VALVE MAY NOT SHUT OFF AGAINST HIGHER PRESSURES.
* THERE ARE NO MAXIMUM PRESSURE REQUIREMENTS WHEN USING ELECTRONIC LEVEL CONTROL AND A SOLENOID VALVE.



TOWER TECH



TELEPHONE: (405) 979-2100
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WEBSITE: www.towertechusa.com
ADDRESS: 100 E California Ave.
Oklahoma City, Oklahoma 73104

Longhill Energy
1 - Unit Installation
TTXR-041950
Plan and Elevation
2140 Baseline Road
Ottawa, Canada

FOR APPROVAL BY		DATE
Longhall Energy		
Tower Tech Design Team		

REVISIONS		
NO.	DATE	REVISION

DATE: July 7 2021	
DRAWING#: XR-04-2	
PROJECT#: 2021-037	
CUST PO#: 14811	
DRAWN BY: SJC	
CHECKED BY:	
Plan and Elevation	2

Cooling Tower - Noise Data



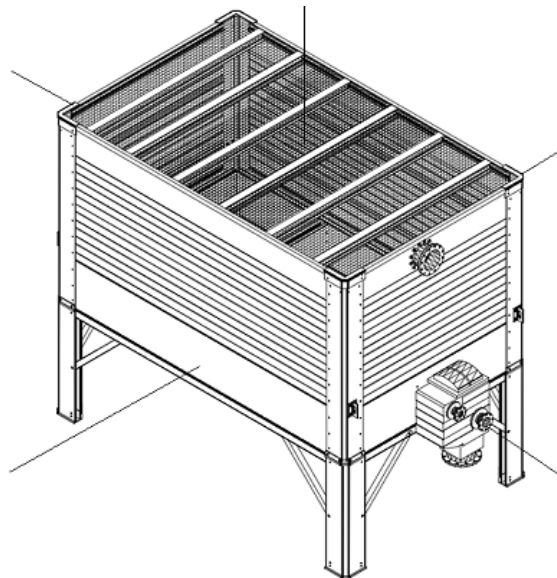
SOUND REPORT

Project Name: 2140 Baseline
Tower Series: TTXR
Tower Model: 041950
VFD Operation: 60Hz
State/Province: Ontario
Country:
Date: 02/15/2025

TOP		
	5ft	50ft
63Hz	73	61
125Hz	85	78
250Hz	83	71
500Hz	81	69
1kHz	75	64
2kHz	68	57
4kHz	60	52
8kHz	46	38
dBA	81	70

END		
	5ft	50ft
63Hz	73	64
125Hz	83	78
250Hz	89	74
500Hz	86	68
1kHz	84	67
2kHz	79	61
4kHz	73	55
8kHz	64	46
dBA	88	72

SIDE		
	5ft	50ft
63Hz	73	64
125Hz	85	76
250Hz	88	74
500Hz	86	69
1kHz	84	66
2kHz	79	60
4kHz	73	54
8kHz	64	44
dBA	88	72



SIDE		
	5ft	50ft
63Hz	73	64
125Hz	85	76
250Hz	88	74
500Hz	86	69
1kHz	84	66
2kHz	79	60
4kHz	73	54
8kHz	64	44
dBA	88	72

END		
	5ft	50ft
63Hz	73	64
125Hz	83	78
250Hz	89	74
500Hz	86	68
1kHz	84	67
2kHz	79	61
4kHz	73	55
8kHz	64	46
dBA	88	72

	PWL	SPL	
	60Hz	5ft	50ft
63Hz	95	83	63
125Hz	109	97	77
250Hz	105	93	73
500Hz	101	89	69
1kHz	98	86	66
2kHz	92	80	60
4kHz	86	74	54
8kHz	76	64	44
dBA		91.3	71.3

Unit Sound Data

October 4, 2021

JOB NAME: 2140 BASELINE

JOB NUMBER: M21085

INSTALLATION:

UNIT TAG: MUA-1, 2

UNIT CONSTRUCTION:

CASING METAL:	18 ga	INSULATION DEPTH:	1 in
LINER METAL:	Partial Solid Liner	INSULATION DENSITY:	1.5 lbs /cu.ft.

SOUND SOURCE DATA:

Blower	Make	Type	Size	Qty	Total CFM	TSP ("wc)	Speed (rpm)	BHP (hp)	Sound Power Data								
										63	125	250	500	1000	2000	4000	8000
S/A	Lau	FC DIDW	12/12	1	2700	2.7	1324	1.83	Inlet	88	86	82	80	80	78	76	74
									Outlet	88	86	82	80	80	78	76	74

OTHER SOURCE SOUND DATA:

Other Sources	Make	Model/Size	Qty	Operating condition	63	125	250	500	1000	2000	4000	8000
Compressor	Emerson	ZP24K5E	3		55	55	55	55	55	55	55	55
Cond. Fan	LAU	0.75	1	82dBA	78.9	83.5	78.2	78.3	79.3	72.5	65	50.6

UNIT S/A OUTLET:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	84.9	86.0	82.0	80.0	80.0	78.0	75.5	73.5	85.1

UNIT O/A INLET:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	82.2	79.2	72.3	68.0	66.2	63.6	61.8	59.3	72.4

UNIT CASING *:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	81.7	83.9	78.5	78.5	79.4	72.7	66.2	60.3	82.2

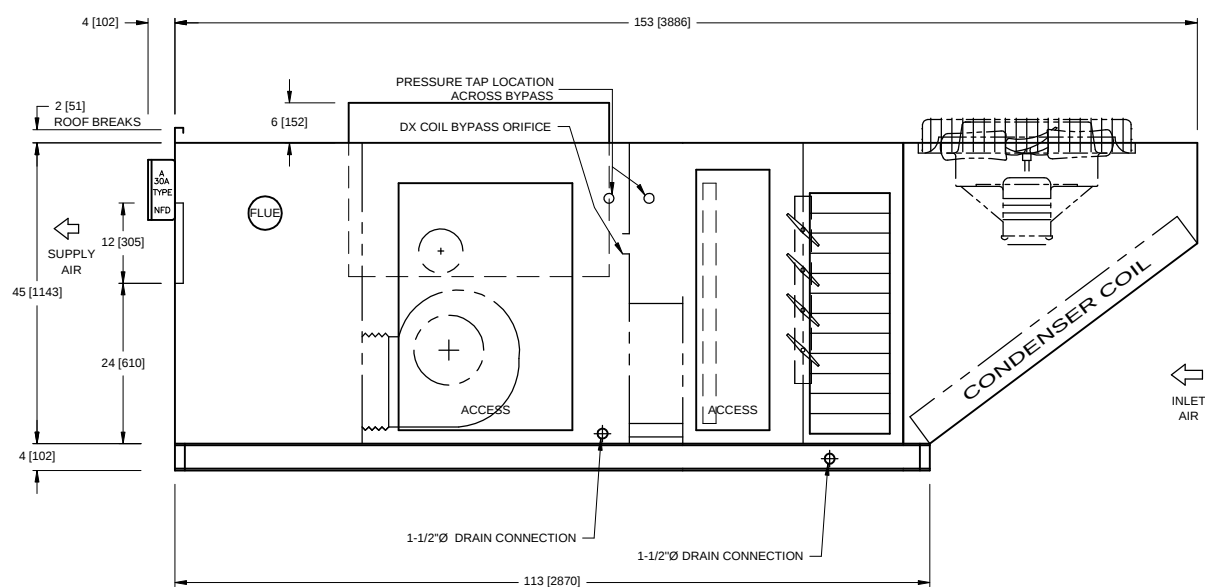
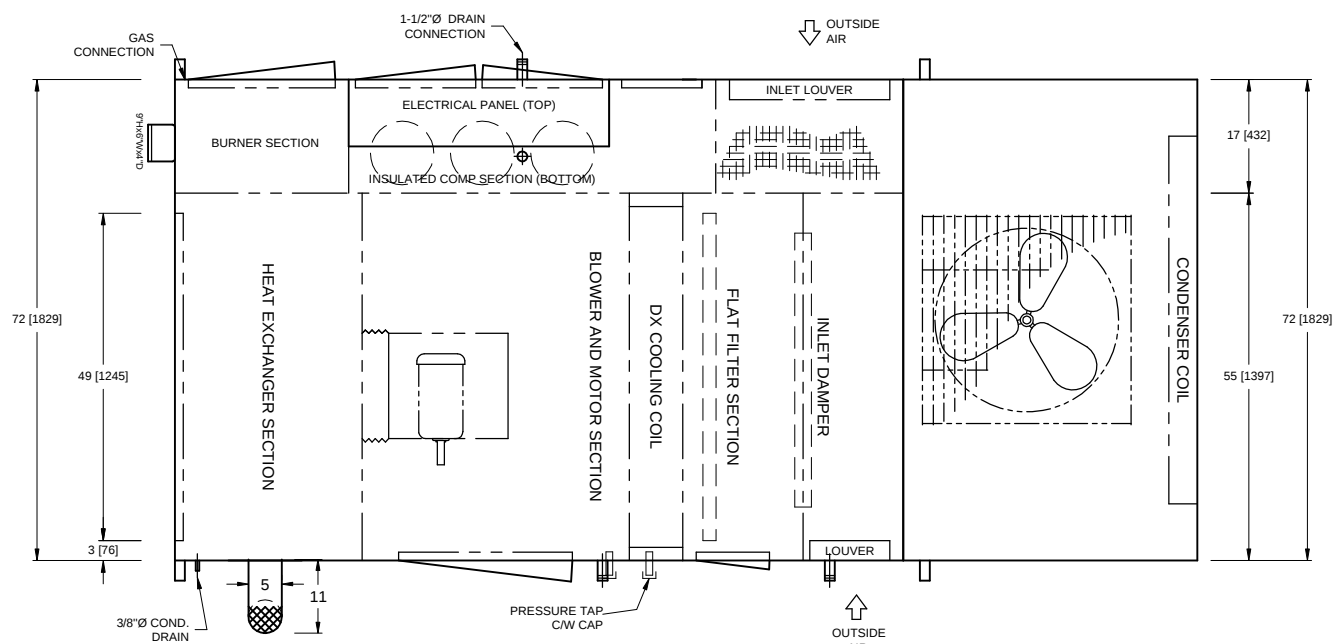
* Unit casing sound includes casing breakout and sound sources outside the air streams only. Sound from openings are not included in unit casing sound.

Note:

Unit sound data are calculated for the specified unit construction and operating condition as shown above.

Total sound level calculated by combining O/A Inlet and Unit Casing levels.

Makeup Air Units MAU-01 and MAU-02 - Dimensions



DOOR SIZES AND INTERNAL COMPONENTS ARE APPROX. VALUES. DIMENSIONS SHOWN IN INCHES & [MM] UNLESS OTHERWISE NOTED.

M21085

TAG: MUA-1, 2

FWE63/DJE40/O/MV
HEAT/COOL UNIT

EngA[®]

ENGINEERED AIR[®]

generated by
ProUnit™

REVISIONS: OCT 5 2021

DATE:
AUG 31 2021

DRWN BY:	DCC
----------	-----

CHKD BY:	KWL
----------	-----

DRWG NO.:
M21085M-01-1

APPENDIX D: SUPPORTING INFORMATION, 1 CENTREPOINTE NOISE

Included Information:

1. Point of Reception Impact Tables for 1 CentrepoinTE Drive
2. Rogers AC Unit: sound level data, sound spectrum estimate, dimensions
3. Rogers Generator: sound level information and spectrum estimate
4. Carrier HVAC Units: measurement results and sound power conversions
5. Confirmation letter from Francis HVAC regarding the Carrier units.
6. EF-1: manufacturer information and sound level estimate
7. AC (small unit above 1 CentrepoinTE): manufacturer sound power level
8. Summary of minimum one-hour traffic volume estimate, for background noise level calculations.
9. STAMSON calculation results for background noise levels.

Table D.1: Point of Reception Noise Impact (Non-Emergency Noise, 1 Centrepoinete)

Source ID	CPA				CPB				CPC				CPD				CPE			
	D (m)	Sound Level (dBA Leq)			D (m)	Sound Level (dBA Leq)			D (m)	Sound Level (dBA Leq)			D (m)	Sound Level (dBA Leq)			D (m)	Sound Level (dBA Leq)		
		Day	Evening	Night		Day	Evening	Night		Day	Evening	Night		Day	Evening	Night		Day	Evening	Night
AC	21.6	32.0	32.0	32.0	23.0	32.4	32.4	32.4	25.8	32.8	32.8	32.8	40.8	33.9	33.9	33.9	48.1	33.5	33.5	33.5
CN.Fan1	60.5	37.9	37.9	31.9	58.3	38.2	38.2	32.2	57.2	38.4	38.4	32.4	56.6	39.0	39.0	33.0	59.2	38.1	38.1	32.1
CN.Fan2	60.8	37.8			58.5	38.2			57.2	38.4			56.4	39.0			58.8	38.2		
CN.Fan3	61.8	37.5			59.6	37.8			58.3	38.0			57.4	38.4			59.7	37.8		
CN.Fan4	61.5	37.5	37.5	31.5	59.4	37.8	37.8	31.8	58.2	38.0	38.0	32.0	57.7	38.4	38.4	32.4	60.2	37.7	37.7	31.7
CN.HE1	60.8	44.5	44.5	38.5	58.7	44.9	44.9	38.8	57.7	45.0	45.0	39.0	57.4	41.1	41.1	35.0	60.0	38.9	38.9	32.8
CN.HE2	61.5	40.3			59.1	41.8			57.8	43.1			56.6	45.2			58.8	44.9		
CS.Fan1	69.8	36.6	36.6	30.6	66.3	37.1	37.1	31.1	63.7	37.4	37.4	31.4	57.8	38.8	38.8	32.8	57.7	38.4	38.4	32.4
CS.Fan2	70.3	36.5			66.7	37.0			64.1	37.4			57.8	38.8			57.5	38.4		
CS.Fan3	71.1	36.2			67.6	36.7			65.0	37.0			58.8	38.2			58.5	38.0		
CS.Fan4	70.7	36.3	36.3	30.3	67.3	36.7	36.7	30.7	64.7	37.1	37.1	31.0	58.8	38.2	38.2	32.2	58.7	38.0	38.0	31.9
CS.HE1	69.9	43.2	43.2	37.2	66.5	43.7	43.7	37.6	64.0	44.0	44.0	38.0	58.3	44.9	44.9	38.9	58.3	42.4	42.4	36.4
CS.HE2	71.0	36.9			67.5	38.1			64.8	39.4			58.4	43.5			57.9	45.0		
EF-1	66.6	30.7	30.7	30.7	63.5	31.2	31.2	31.2	61.4	31.5	31.5	31.5	57.3	33.2	33.2	33.2	58.0	32.4	32.4	32.4
RAC	21.5	41.1	41.1	41.1	22.7	40.1	40.1	40.1	25.5	36.6	36.6	36.6	40.4	33.3	33.3	33.3	47.6	28.3	28.3	28.3

Table D.2: Point of Reception Noise Impact (Emergency Test Noise, 1 Centrepoinete)

Source ID	CPF		CPG		CPH		CPI	
	D (m)	Sound Level (dBA Leq)	D (m)	Sound Level (dBA Leq)	D (m)	Sound Level (dBA Leq)	D (m)	Sound Level (dBA Leq)
Gen	11.8	63.6	15.1	62.0	15.9	59.5	18.8	58.6

RAC - Rogers enclosure wall-mounted AC Unit

Clearances Required for Service Access and Adequate Condenser Inlet Airflow

MODELS	LEFT SIDE	RIGHT SIDE
W18AA, W24AA, W30AA, W36AA	15"	20"
W42AA, W48AA, W60AB, W72AB	20"	20"

NOTE: For side-by-side installation of two (2) WA models, there must be 20" between units. This can be reduced to 15" by using a WL model (left side compressor and controls) for the left unit and WA (right side compressor and controls) for right unit.

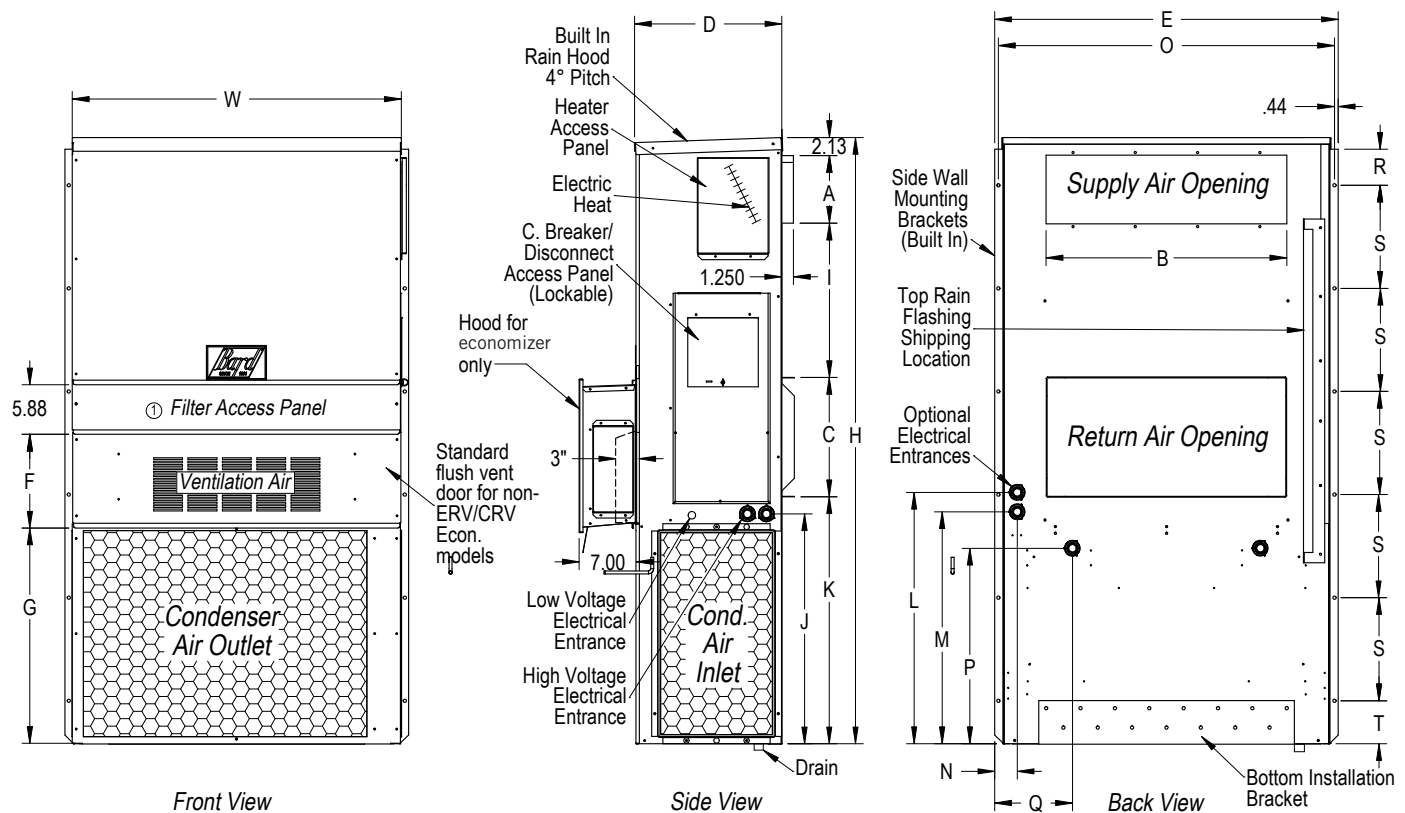
Minimum Clearances Required to Combustible Materials

MODELS ①	SUPPLY AIR DUCT FIRST THREE FEET	CABINET
W18AA, W24AA	0"	0"
W30AA, W36AA	1/4"	0"
W42AA, W48AA, W60AB, W72AB	1/4"	0"

① Refer to the Installation Manual for more detailed information.

Dimensions of W18-72A Basic Unit for Architectural & Installation Requirements (Nominal)

MODEL	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY		RETURN																
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	P	Q	R	S	T
W18AA W24AA	33.300	17.125	74.563	7.88	19.88	11.88	19.88	35.00	10.88	29.75	20.56	30.75	32.06	33.25	31.00	2.63	34.13	26.06	10.55	4.19	12.00	9.00
W30AA W36AA	38.200	17.125	74.563	7.88	27.88	13.88	27.88	40.00	10.88	29.75	17.93	30.75	32.75	33.25	31.00	2.75	39.13	26.75	9.14	4.19	12.00	9.00
W42AA W48AA	42.075	22.432	84.875	9.88	29.88	15.88	29.88	43.88	13.56	31.66	30.00	32.68	26.94	34.69	32.43	3.37	43.00	23.88	10.00	1.44	16.00	1.88
W60AB W72AB	42.075	22.432	93.000	9.88	29.88	15.88	29.88	43.88	13.56	37.00	30.00	40.81	35.06	42.81	40.56	3.37	43.00	31.00	10.00	1.44	16.00	10.00



MIS-3796

① Not used when WECO Economizers installed. Filter access is through the WECO hood.

RAC - Rogers enclosure wall-mounted AC Unit

Bard W60AB Series Sound Data Matrix (dBA @ 10 feet)

	Duct Free				Ducted - Front Outlet							
Unit Mounting	Direct	WMICF5 Isolation Curb	WMICF5 Isolation Curb	WMICF5 Isolation Curb	Direct	WMICF5 Isolation Curb	Direct	WMICF5 Isolation Curb				
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer				
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer				
Vent Option CRV	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM				
Ventilation Only	51.3	50.1	47.8	44.6	49.1	42.2	47.7	41.2				
Full Load	56.0	53.5	48.6	45.6	55.7	48.3	52.5	43.9				
Integrated dBA	54.9	52.6	48.3	45.3	54.4	47.0	51.4	43.2				
Outdoor @ 10 Feet				67.4								
Sound Power Full Load	63.7			54.1	63.6			50.6				
Outdoor Sound Power					76.2							
Vent Option ERV	Low	Low	Low	Low	Low	Low	Low	Low				
Ventilation Only	53.4			45.0	52.1			42.8				
Full Load	56.7			46.7	55.2			46.5				
Integrated dBA	55.8			46.2	54.4			45.6				
Vent Option ERV	Med	Med	Med	Med	Med	Med	Med	Med				
Ventilation Only	54.7			45.1	53.9			43.4				
Full Load	57.6			47.5	56.8			48.5				
Integrated dBA	56.8			46.8	56.0			47.3				
Vent Option ERV	High	High	High	High	High	High	High	High				
Ventilation Only	56.7			45.5	56.4			43.6				
Full Load	58.9			47.0	58.6			48.5				
Integrated dBA	58.3			46.5	58.0			47.4				

Bard W60AB Series Sound Data Matrix (dBA @ 5 feet)

Bard	Duct Free				Ducted - Front Outlet							
Unit Mounting	Direct	WMICF5 Isolation Curb	WMICF5 Isolation Curb	WMICF5 Isolation Curb	Direct	WMICF5 Isolation Curb	Direct	WMICF5 Isolation Curb				
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer				
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer				
Vent Option CRV	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM	570 CFM				
Ventilation Only	54.3	52.0	48.4	47.1	51.6	44.6	50.8	43.4				
Full Load	59.4	57.0	49.2	48.4	59.2	50.0	56.7	47.4				
Integrated dBA	58.2	55.9	48.9	48.0	57.8	48.8	55.4	46.4				
Outdoor @ 5 Feet				69.9								
Vent Option ERV	Low	Low	Low	Low	Low	Low	Low	Low				
Ventilation Only	56.1			47.9	55.3			45.5				
Full Load	59.0			48.8	58.1			48.7				
Integrated dBA	58.2			48.5	57.3			47.9				
Vent Option ERV	Med	Med	Med	Med	Med	Med	Med	Med				
Ventilation Only	57.2			48.2	57.0			46.1				
Full Load	60.1			49.0	59.7			49.8				
Integrated dBA	59.3			48.7	59.0			48.9				
Vent Option ERV	High	High	High	High	High	High	High	High				
Ventilation Only	59.5			48.8	59.8			46.6				
Full Load	61.6			49.4	61.4			50.4				
Integrated dBA	61.0			49.2	60.9			49.4				

¹ Integrated values calculated per ANSI/ASA S12.60-2009/Part 2, Section 5.2.2.1, Table 2 Triple Mode Type 3 HVAC System Duty Cycles: Ventilation 58%, Part Load 25%, Full Load 17%

² Integrated Sound Vales are also applicable for use in learning spaces for LEED schools; EQ Prerequisite 3 - Minimum Acoustical Performance, OPTION 1. Using methods prescribed in ANSI S12.60, classroom must achieve a maximum background noise level of 45 dBA.

Results Referenced Were Recorded In The Bard Manufacturing Company, Inc. Sound Lab Facility
Actual Field Application Results May Vary With Classroom Design and Construction Methods

Rogers Generator - Noise Level in enclosure per equipment supplier

Subject: Re: 1 Centrepointhe Ottawa generator - noise levels

From: Matthieu Boudreault <MBoudreault@wajax.com>

Date: 16/01/2025, 5:03 p.m.

To: "pier-gui@integrалdxengineering.ca" <pier-gui@integrалdxengineering.ca>

CC: Linda Lemay <LLemay@wajax.com>

Hello Mr. Lalonde,

The Kohler enclosure on this generator set is designed to reduce the sound level to 68 dBA at 7 meters. This performance is based on a free-field installation.

Regarding periodic exercises, they can be configured according to the customer's needs via the local controller. Generally, exercises are scheduled to take place during the week—often on Wednesdays—for one hour around noon. This should be verified for the specific installation in question.

I hope this information is helpful and complete.

Let me know if you have any other questions.

Thank you.

Regards,

Matthieu Boudreault, ing. | P.Eng. (il/lui)

Directeur ingénierie | Engineering Manager

WAJAX

Génératrice Drummond

MBoudreault@wajax.com | wajax.com

Direct 819 395 3063 | Cell 819 388 2430

243 Rue des Artisans, St-Germain-de-Grantham, QC, J0C 1K0

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From: Pier-Gui Lalonde <pier-gui@integrалdxengineering.ca>

Sent: Thursday, January 16, 2025 9:09 AM

To: Linda Lemay <LLemay@wajax.com>

Subject: Re: 1 Centrepointhe Ottawa generator - noise levels

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You have not previously corresponded with this sender.

Rogers Generator Sound Power Level

Project: 85 Gemini Way Lot B
Engineer: PGL
Date: 2025-04-09

Description: Sound power and relative spectrum estimate for the Rogers emergency generator.

Value (dB) at Octave Band Centre Frequency (Hz)												
31.5	63	125	250	500	1000	2000	4000	8000			dB	dBA
A-Weighting Factors	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1			

Noise Source													
REF	Description												
1	Sound Pressure Level (dBA)	68											
	Measurement Distance (m)	7.0											
	Hemispherical spreading is assumed.												
2	dBA Target from Relative Spectra	Relative Spectra (dB)		72	69	78	71	64	60	55	46	80.1	72.8
		Target A-weighted level	68.0										
		Adjusted Level (dB)	SPL	67.2	64.2	73.2	66.2	59.2	55.2	50.2	41.2	75.3	68.0
	Point Source PWL	Sound Pressure Level (SPL)		67.2	64.2	73.2	66.2	59.2	55.2	50.2	41.2		
		Measurement distance (m)	7										
		Sphere divisions	2										
		Control surface area (m²)	307.88										
		Sound Power Level (dB)		92.0	89.0	98.0	91.0	84.0	80.0	75.0	66.0	100.2	92.9
Calculated Sound Power Level (dB)				92.0	89.0	98.0	91.0	84.0	80.0	75.0	66.0	100.2	92.9

- REF Description
- 1 Data from the generator supplier
 - 2 Relative spectra originate from IDX measurements of an enclosed generator on another site.

1 Centrepointe Drive Carrier HVAC Units - Measurements and Calculations

Project: 85 Gemini Way Lot B
Engineer: PGL
Date: 2025-04-09

Description: Summary of sound pressure level measurements and sound power level calculations for Carrier HVAC unit noise sources at 1 Centrepointe Drive.

		Value (dB) at Octave Band Centre Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	dBA
A-Weighting Factors		-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1	
Noise Source: Carrier HVAC Unit Condenser Fan											
Measured sound pressure level, single condenser fan	SPL (dB)	82.0	84.0	84.0	79.0	75.0	73.0	72.0	67.0		82.1
Distance, fan to measurement position (m):	0.94										
Point source spreading factor (hemispherical):	2										
Point source spreading area (m²):	5.58										
Calculated Sound Power Level (applied to each condenser fan)	PWL (dB)	89.5	91.5	91.5	86.5	82.5	80.5	79.5	74.5		89.5
Noise Source: Carrier HVAC Unit Grill											
Measured SPL at heat exchanger grill with two compressors on	SPL (dB)	79.0	88.0	83.0	86.0	84.0	82.0	79.0	74.0	71.0	86.9
Measured width of grill (m):	1.98										
Measured height of grill (m):	1.52										
Area of (rectangular) grill (m²):	3.02										
Calculated Sound Power Level (applied to each grill)	PWL (dB)	83.8	92.8	87.8	90.8	88.8	86.8	83.8	78.8	75.8	91.7

All measurements completed on 2025-03-19, using a Class 1 B&K Type 2236 Sound Level Meter fitted with a wind screen.
 Proof of calibration is available on request.



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Kelowna, BC
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To whom it may concern:

This letter is to confirm that the unoccupied setpoints have been adjusted to the requested thresholds as described below:

- **Evening (7:00pm – 11:00pm):** One stage per unit (2 fans + 2 compressors) to run continuously; other stages to remain off.
- **Overnight (11:00pm – 7:00am):** One stage per unit to run for **no more than 15 minutes per hour**; the other stage to remain off.

Should there be any questions you can contact me at 613-723-7869 or tylerfrancis@francishvac.ca OR you can also contact the property management, Appelt Properties at 250-980-3577

Thank you,

Tyler Francis
General Manager

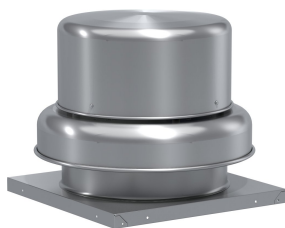


SKU
GB-300-15140XQD-DR2

Job Name:
Mark:
Submitted By:
Date: 03/20/2025

EF-1 Manufacturer Sound Level Data

Centrifugal Downblast Exhaust Fan, Product # GB-300-15140XQD-DR2, 4704-9881 CFM

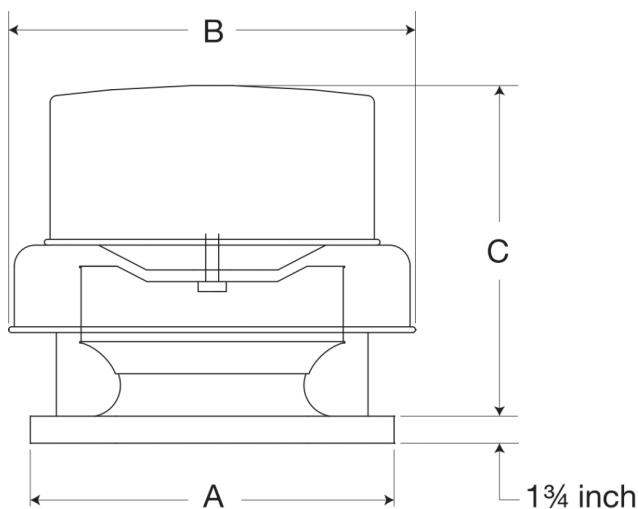


Model GB, belt drive centrifugal roof exhaust fans are designed to meet the general clean air exhaust requirements for industrial and commercial buildings. Units feature a fully rolled windband bead for increased stability and easy transport. Fresh outside air is drawn in under the motor cover to maximize motor life.

- 40 x 40 inch base with prepunched mounting holes for easy attachment to roof curb
- Variable pitch adjustable motor pulley to optimize fan performance
- 36.5 x 36.5 inch recommended roof opening

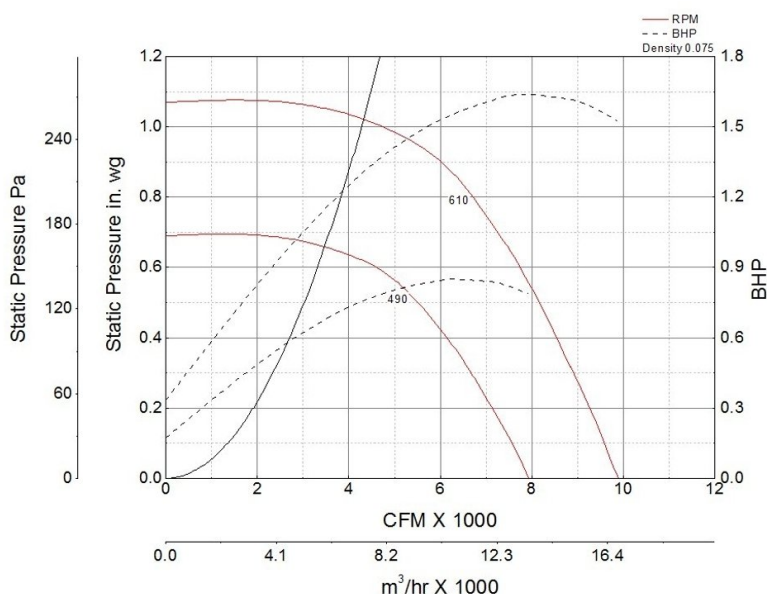
Certifications

AMCA Sound & Air
High Wind and Hurricane
Seismic
UL/cUL 705



A	B	C
40 in	50 in	36 in

Performance Characteristics



Construction Features

Housing Material	Spun Aluminum
Drive Type	Belt Drive
Impeller Type	Centrifugal Wheel
Impeller Material	Aluminum
Includes	Unassembled drive package
Certifications	AMCA Sound & Air High Wind and Hurricane Seismic UL/cUL 705
Drive Package Description	Motor and drives shipped loose
Required Accessory	Roof curb for new installations

Motor Information

Motor Insulation	B
Motor Phase	1
Motor Type	NEMA
Voltage	115/208-230
HP	1 1/2
Hertz	60
Motor Enclosure	Open Drip Proof
RPM	1800
Thermal Protection	AutoOverload

Worst-case 16.5 sones

Air and Sound Performance

Motor HP	Max BHP	Max Fan RPM	Min Fan RPM	Ps (in. wg)	0	0.125	0.25	0.375	0.5	0.625	0.75	0.875	1
1 1/2	1.63	610	490	CFM	9,881	9,503	9,086	8,633	8,152	7,615	6,981	6,158	4,704
				Sones	16.5	16	15.5	14.9	14.5	13.8	12.8	11.8	10.4



- Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.
- Performance certified is for installation type A: Free inlet, Free outlet.
- Power rating (BHP/kW) includes transmission losses.
- Performance ratings include the effects of birdscreen.
- The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels.

California Residents

WARNING

This product can expose you to chemicals including cadmium used in the processing of corrosion resistant metal and fasteners, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information visit www.P65Warnings.ca.gov

WARNING

1 Centrepoinete Drive EF-1 - Sound Power Level Calculations

Project: 85 Gemini Way Lot B

Engineer: PGL

Date: 2025-04-09

Description: Sound power level estimate for rooftop fan EF-1 at 1 Centrepointhe Drive.

	Value (dB) at Octave Band Centre Frequency (Hz)										
	31.5	63	125	250	500	1000	2000	4000	8000	dB	dBA
A-Weighting Factors	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1		

Noise Source															
REF	Description														
1	Reported sound level at 1.5 m distance (sones)		16.5												
2	Sones to dBA Estimation		Sones	16.5											
	Approximate Sound Pressure Level (dBA)		68.4												
	Point Source Sound Power		Sound pressure level (dBA)	68.4											
			Measurement distance (m)	1.5											
			Sphere divisions	2											
			Control surface area (m²)	14.14											
			Sound Power Level (dBA)	79.9											
3	SET-S, Roof or Wall Ventilator		Volume flow q (m³/s)	4.48											
	These results are only used to estimate relative noise levels by octave band.		pressure increase/loss Δp (Pa)	60											
			Ventilator type	Roof (radial)											
				Sound Power Level (dB)	78.2	75.9	74.9	73.9	71.6	67.6	63.6	59.0	52.4	82.6	73.2
	dBA Target from Relative Spectra		Relative Spectra (dB)		78.2	75.9	74.9	73.9	71.6	67.6	63.6	59.0	52.4	82.6	73.2
			Target A-weighted level	79.9											
			Adjusted Level (dB)		84.9	82.6	81.6	80.6	78.3	74.3	70.3	65.7	59.1	89.4	79.9
	Calculated Sound Power Level (dB)				84.9	82.6	81.6	80.6	78.3	74.3	70.3	65.7	59.1	87.4	79.9

<u>REF</u>	<u>Description</u>
1	Manufacturer data
2	https://sengpielaudio.com/calculatorSonephon.htm
3	CadnaA Reference Manual 2025 Chapter 11.2, p. 1136/1403

Small Rooftop AC Unit at 1 CentrepoinTE (AC) - Manufacturer Sound Level Data

Electrical data

UNIT SIZE-SERIES	V/PH	OPER VOLTS*		COMPR		FAN FLA	MCA	60° MIN WIRE SIZE†	75° MIN WIRE SIZE†	60° MAX LENGTH (Ft)‡	75° MAX LENGTH (Ft)‡	MAX FUSE** OR CKT BKR AMPS
		Max	Min	LRA	RLA							
018-33	208-230/1	253	197	48.0	9.0	0.5	11.7	14	14	66	62	20
024-33				60.0	11.5	0.5	14.9	14	14	53	50	20
030-33				73.0	14.1	0.8	18.4	14	14	39	37	30
036-34				82.0	16.0	1.4	21.4	12	12	57	54	30
042-33				105.0	17.7	1.4	23.5	12	12	52	50	40
048-37				131.0	22.8	1.4	28.6	10	10	67	63	50
060-35				144.0	28.4	1.4	36.9	8	8	78	74	60

* Permissible limits of the voltage range at which the unit will operate satisfactorily. Operation outside these limits may result in unit failure.

† If wire is applied at ambient greater than 30°C (86°F), consult Table 310-16 of the NEC (ANSI/NFPA 70).

The ampacity of nonmetallic-sheathed cable (NM), trade name ROMEX, shall be that of 60°C (140°F) conductors, per the NEC (ANSI/NFPA 70) Article 336-26.

If other than uncoated (non-plated), 60 or 75°C (140 or 167°F) insulation, copper wire (solid wire for 10 AWG and smaller, stranded wire for larger than 10 AWG) is used, consult applicable tables of the NEC (ANSI/NFPA 70).

‡ Length shown is as measured 1 way along wire path between unit and service panel for a voltage drop not to exceed 2%.

** Time-delay fuse.

FLA — Full Load Amps

LRA — Locked Rotor Amps

MCA — Minimum Circuit Amps

RLA — Rated Load Amps

NOTES:

1. Control circuit is 24v on all units and requires external power source.
2. Copper wire must be used from service disconnect to unit.
3. All motors/compressors contain internal overload protection.

A-weighted sound power (dBA)

UNIT SIZE-SERIES	STANDARD RATING	TYPICAL OCTAVE BAND SPECTRUM (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018-33	76	52.5	62.0	68.5	70.0	69.0	66.0	57.5
024-33	78	53.0	62.0	72.0	69.0	69.0	65.0	58.0
030-33	79	59.5	65.5	71.0	72.5	71.5	68.5	61.0
036-34	80	61.5	67.0	73.5	74.5	73.5	70.5	63.5
042-33	81	63.0	69.0	72.0	75.0	75.0	72.0	67.0
048-37	82	62.0	66.0	71.5	76.5	73.5	70.5	64.5
060-35	82	65.0	67.0	72.0	77.0	74.0	72.0	67.0

NOTE: Tested in accordance with ARI standard 270-95. (Not listed with ARI.)

Calculation of Baseline Road Minimum 1-hr Traffic by Time Period

85 Gemini Way Lot B

Calculation of Background Noise Levels from Traffic on Baseline Road

Summary prepared by PGL, 2025-04-09

Line	Information	AADT, All Vehicles	Trucks		
			% of AADT	Truck AADT	
1	AADT at Baseline/Centrepointe Intersection	29838	2.26%	674.3	(see next page)
2	Line 1 includes vehicles travelling through the intersection to/from Baseline Road, Centrepointe Drive, and Cobden Road. Use the AADT at Centrepointe Drice near Marble Arch as an estimate of all vehicles travelling on Centrepointe Drive.				
3	AADT at Centrepointe Drive near Marble Arch Crescent	2972	4.11%	122.1	(see next page)
4	No AADT data is available on Cobden Road. Use Line 3 as an estimate for the AADT at Line 1 representative of vehicles travelling on Coben Road.	2972	4.11%	122.1	
5	Calculate AADT for Baseline Road = Line1 – (Line 3 + Line 4)	23894		430.0	

Minimum 1-hr Traffic Estimate by Time Period

Refer to Table 1 below.

	Hour Beginning	Typical AADT %	1-hr Traffic Volume		
			All	Cars	Trucks
Minimum Daytime Traffic (07:00-19:00)	07:00	5.05%	1206.6	1184.9	21.7
Minimum Nighttime Traffic (23:00-07:00)	03:00	0.30%	71.7	70.4	1.3

Traffic Assignment in STAMSON

The Minimum Daytime Traffic is divided equally between the eastbound and westbound lanes.

Each direction of travel: 592 Cars
11 Medium Trucks

The Minimum Nighttime Traffic is not divided by direction as travel, since the total vehicle count per hour would be less than the STAMSON minimum value (40 vehicles per hour). All traffic is assigned to the westbound lanes to ensure a conservative analysis (since the westbound lanes are at a greater distance to the PORs).

Westbound roadway segment: 70 Cars
1 Medium Truck

Table 1. Range of Values and Standard Deviation for the Supporting Data Set (in Percent)

Hour Beginning	Typical	Maximum	Minimum	Standard Deviation
0:00	0.87	1.88	0.18	0.44
1:00	0.49	1.21	0.09	0.27
2:00	0.36	0.86	0.07	0.21
3:00	0.30	0.76	0.05	0.17
4:00	0.36	0.87	0.07	0.21
5:00	0.95	2.68	0.37	0.54
6:00	2.75	5.18	1.19	1.43
7:00	5.05	8.59	2.13	2.30
8:00	6.55	11.08	3.30	2.81
9:00	5.62	7.70	3.96	2.24
10:00	5.50	7.73	3.81	2.21
11:00	6.04	9.76	4.19	2.48
12:00	6.48	9.78	4.45	2.65
13:00	6.26	9.75	4.24	2.56
14:00	6.60	9.62	4.44	2.63
15:00	7.41	10.40	5.51	2.91
16:00	7.82	10.34	5.83	3.06
17:00	7.65	9.30	5.58	3.01
18:00	6.27	8.72	4.42	2.50
19:00	5.12	7.44	3.52	2.06
20:00	4.09	6.30	2.18	1.69
21:00	3.41	5.21	1.30	1.44
22:00	2.41	4.09	0.78	1.08
23:00	1.67	3.79	0.46	0.86

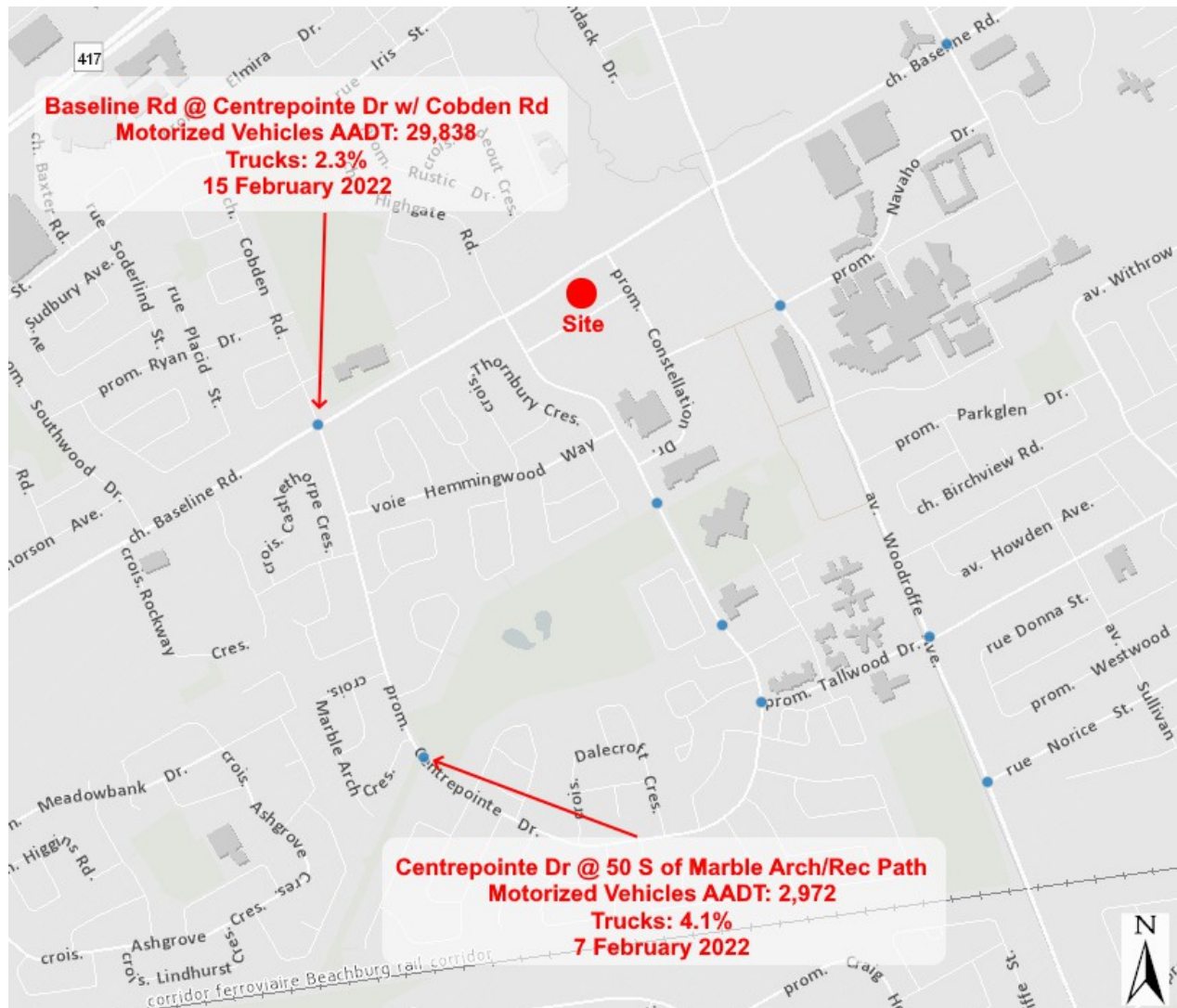
Table 1 extracted from:
Peter VanDelden, Scott Penton, Aaron Hanif, "Typical Hourly Traffic Distribution for Noise Modelling", published in Canadian Acoustics Vol.36 No.3 (2008)

Detailed STAMSON calculation results are available upon request.

85 Gemini Way Lot B

Calculation of Background Noise Levels from Traffic on Baseline Road

Summary prepared by PGL, 2025-04-09



STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:06:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BGld.TE Time Period: 1 hours
Description: 1hr background (night), west facade near Baseline

Road data, segment # 1: BaselineEB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: BaselineEB

Angle1 Angle2 : -90.00 deg -80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.20 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineEB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: BaselineEB2

Angle1 Angle2 : -79.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.20 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: BaselineWB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: BaselineWB

Angle1 Angle2 : -90.00 deg -39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.80 m
Receiver height : 16.50 m

Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 4: BaselineWB2

 Car traffic volume : 592 veh/TimePeriod
 Medium truck volume : 11 veh/TimePeriod
 Heavy truck volume : 0 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: BaselineWB2

 Angle1 Angle2 : -39.00 deg 1.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 37.90 m
 Receiver height : 16.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Result summary

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.BaselineEB	! 0.50 !	49.64 !	49.64
2.BaselineEB2	! 0.50 !	58.00 !	58.00
3.BaselineWB	! 0.50 !	53.54 !	53.54
4.BaselineWB2	! 0.50 !	52.47 !	52.47
	Total		60.51 dBA

TOTAL Leq FROM ALL SOURCES: 60.51

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:02:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BGln.TE Time Period: 1 hours
Description: 1hr background (night), west facade near Baseline

Road data, segment # 1: BaselineWB

```
-----
Car traffic volume : 70 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: BaselineWB

```
-----
Angle1 Angle2 : -90.00 deg -39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.80 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: BaselineWB2

```
-----
Car traffic volume : 70 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 2: BaselineWB2

```
-----
Angle1 Angle2 : -39.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.90 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Result summary

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.BaselineWB	! 0.50 !	44.06 !	44.06
2.BaselineWB2	! 0.50 !	42.99 !	42.99
Total			46.57 dBA

TOTAL Leq FROM ALL SOURCES: 46.57



STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:06:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BG2d.TE Time Period: 1 hours
Description: 1hr background (night), west facade north

Road data, segment # 1: BaselineEB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: BaselineEB

Angle1 Angle2 : -90.00 deg -75.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.10 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineEB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: BaselineEB2

Angle1 Angle2 : -74.00 deg 2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 31.10 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: BaselineWB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: BaselineWB

Angle1 Angle2 : -90.00 deg -33.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.60 m
Receiver height : 16.50 m

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: BaselineWB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: BaselineWB2

Angle1 Angle2 : -33.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.70 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	0.50	!	49.51	!	49.51
2.BaselineEB2	!	0.50	!	56.12	!	56.12
3.BaselineWB	!	0.50	!	53.02	!	53.02
4.BaselineWB2	!	0.50	!	50.77	!	50.77
		Total				59.13 dBA

TOTAL Leq FROM ALL SOURCES: 59.13

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:02:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BG2n.TE Time Period: 1 hours
Description: 1hr background (night), west facade north

Road data, segment # 1: BaselineWB

Car traffic volume : 70 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: BaselineWB

Angle1 Angle2 : -90.00 deg -33.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.60 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineWB2

Car traffic volume : 70 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: BaselineWB2

Angle1 Angle2 : -33.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.70 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.BaselineWB	! 0.50 !	43.54 !	43.54
2.BaselineWB2	! 0.50 !	41.29 !	41.29
Total			45.57 dBA

TOTAL Leq FROM ALL SOURCES: 45.57



STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:06:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BG3d.TE Time Period: 1 hours
Description: 1hr background (night), west facade north/mid

Road data, segment # 1: BaselineEB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: BaselineEB

Angle1 Angle2 : -90.00 deg -70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 38.10 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineEB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: BaselineEB2

Angle1 Angle2 : -69.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 41.10 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: BaselineWB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: BaselineWB

Angle1 Angle2 : -90.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.70 m
Receiver height : 16.50 m

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: BaselineWB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: BaselineWB2

Angle1 Angle2 : -28.00 deg -1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.80 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	0.50	!	49.44	!	49.44
2.BaselineEB2	!	0.50	!	54.49	!	54.49
3.BaselineWB	!	0.50	!	52.55	!	52.55
4.BaselineWB2	!	0.50	!	48.93	!	48.93
Total						57.97 dBA

TOTAL Leq FROM ALL SOURCES: 57.97

STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:06:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BG4d.TE Time Period: 1 hours
Description: 1hr background (night), west facade mid/south

Road data, segment # 1: BaselineEB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: BaselineEB

Angle1 Angle2 : -90.00 deg -62.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.10 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineEB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: BaselineEB2

Angle1 Angle2 : -60.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 60.10 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: BaselineWB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: BaselineWB

Angle1 Angle2 : -90.00 deg -22.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.60 m
Receiver height : 16.50 m

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: BaselineWB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: BaselineWB2

Angle1 Angle2 : -22.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.70 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	0.50	!	49.14	!	49.14
2.BaselineEB2	!	0.50	!	52.30	!	52.30
3.BaselineWB	!	0.50	!	51.72	!	51.72
4.BaselineWB2	!	0.50	!	46.81	!	46.81
	+		+		+	
		Total				56.52 dBA

TOTAL Leq FROM ALL SOURCES: 56.52

STAMSON 5.0 SUMMARY REPORT Date: 07-04-2025 09:06:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BG5d.TE Time Period: 1 hours
Description: 1hr background (night), west facade south

Road data, segment # 1: BaselineEB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: BaselineEB

Angle1 Angle2 : -90.00 deg -55.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.80 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: BaselineEB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: BaselineEB2

Angle1 Angle2 : -53.00 deg 1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.80 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: BaselineWB

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: BaselineWB

Angle1 Angle2 : -90.00 deg -18.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.40 m
Receiver height : 16.50 m

Noise Control Feasibility Study: 85 Gemini Way Lot B Development

25 April 2025

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: BaselineWB2

Car traffic volume : 592 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: BaselineWB2

Angle1 Angle2 : -18.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.50 m
Receiver height : 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.BaselineEB	!	0.50	!	48.94	!	48.94
2.BaselineEB2	!	0.50	!	50.65	!	50.65
3.BaselineWB	!	0.50	!	51.06	!	51.06
4.BaselineWB2	!	0.50	!	45.03	!	45.03
		Total				55.49 dBA

TOTAL Leq FROM ALL SOURCES: 55.49