Appendix I

Noise Impact Assessment Report

June 6, 2024

City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1

E-mail: sbajaj@citywindsor.ca

Attention: Sonia Bajaj, CPA, CMA
Project Administrator

Re: Noise Impact Study of the Proposed East End Transit Terminal
7310 Tecumseh Road East, Windsor, Ontario
Pinchin File: 340420

1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained by the City of Windsor (Client) to prepare a noise impact study report of its proposed Development at 7310 Tecumseh Road East, Windsor, Ontario. The report has been prepared to evaluate the noise impact from the Development on nearby points of reception.

Based on the information available to Pinchin, it is understood that the Client is proposing to construct a transit terminal at the corner of Tecumseh Road East and Lauzon Parkway.

Figure 1, Appendix B, shows the locations of the proposed Development and nearby noise sensitive receptors.

2.0 NOISE SOURCE SUMMARY

2.1 Noise Source Summary Data

Noise source summary data are provided in the following Figure, Table, and Appendices:

- Appendix A, Table 1: Noise Source Summary Table
- Appendix B, Figure 2: Site Plan, Showing Significant Noise Sources
- Appendix E: CadnaA Sample Output

Pinchin, in consultation with the Client, estimated the potential noise sources associated with the Development. The potential noise sources include the movement and idling of transit buses. In addition, there will be two rooftop units at the Development. Locations of the identified noise sources are shown in Figure 2, Appendix B, and include the following:

- One (1) air conditioner (source AC1);
- One (1) general exhaust (source EX1);

- Ten (10) bus idling spots (sources ID1 to ID10); and
- One (1) transit bus route (line source R_Onsite).

Manufacturer sound data for the air conditioner and general exhaust were provided by the Client. Details of manufacturer sound data are included in Appendix C.

Based on the information provided by the Client, the numbers of peak hour buses in any one day, evening and nighttime hour were estimated at 35, 22 and 12, respectively. It was also advised by the Client that each bus may be idling for approximately 2 minutes. The total idling time at each of the modelled idling spot was then multiplied by the ratio between the number of buses and 10 spots (e.g. 35/10). The following Table summarizes the estimated idling time.

	Daytime	Evening	Nighttime
Buses Per Hour	35	22	12
Modelled Idling Spots	10	10	10
Ratio: Buses/Spots	3.5	2.2	1.2
Idling Time per Bus, min	2	2	2
Adjusted Idling Time per Spot, min	7.0	4.4	2.4

The sound power level for the idling buses was based on measurements on transit buses. The average sound pressure level is 71 dBA at 7.5 m. This is equivalent to a sound power level of 96 dBA.

For moving buses at the terminal, the sound power level was estimated based on the US Federal Highway Administration publication [1]. The estimated sound power level was approximately 100 dBA.

Details of the sound power level estimates and adjustment are included in Appendix C.

3.0 POINT OF RECEPTION DESCRIPTION

In this assessment, four (4) points of reception (R1 to R3 and R4-OPOR) were selected from existing single dwelling located to the southwest of the site. Receptors R1 to R3 represent the dwelling's upper floor windows on the south, east and north facades, respectively. Receptor R4-OPOR represents the associated outdoor living area. Tecumseh Road East and Lauzon Parkway are located to the south and east of the site respectively.

4.0 NOISE CRITERIA

In this study, Pinchin adopted the noise criteria outlined in the MECP Publication NPC-300 [2]. It was our opinion that the area was deemed in a Class 1 area due to the proximity to the existing industrial/commercial operations and roadway traffic on Tecumseh Road East and Lauzon Parkway. For stationary noise sources, NPC-300 states that the one-hour sound exposures (L_{eq}, 1 hour) from stationary noise sources in Class 1 areas shall not exceed:

- the higher of 50 dBA or background noise between 7:00 am and 7:00 pm;
- the higher of 50 dBA or background noise between 7:00 pm and 11:00 pm; and
- the higher of 45 dBA or background noise between 11:00 pm and 7:00 am (excluding outdoor POR).

For the purpose of this assessment, the MECP's exclusionary sound level limits of 50 dBA, 50 dBA, and 45 dBA have been used as the applicable guideline limits at the selected points of reception R1 to R3.

The ambient background noise at receptor R4 during day and evening hours were determined based on the road traffic noise generated from Tecumseh Road East and Lauzon Parkway. Calculations were carried out using the MECP's STAMSON (Version 5.04) [3] computer programme and road traffic data provided by the Client. Note, the calculations include the proposed noise barrier. Details of traffic data and STAMSON calculations are provided in Appendix D.

5.0 PROCEDURE AND PARAMETERS USED TO ASSESS NOISE IMPACTS

An acoustic model of the Development was prepared using CadnaA (Version 2023 MR2) with the implementation of the Traffic Noise Model (TNM) [4]. The TNM (Current Version 3.2) was published by the United States Federal Highway Administration in 2023. CadnaA calculates sound levels surrounding the Development according to the ISO standard 9613-2 [5], "Acoustics – Attenuation of Sound during Propagation Outdoors." The ISO calculation method, considered conservative, accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation, and acoustical shielding. Calculation parameters were set in accordance with the ISO standard, and detailed protocols can be provided upon request.

The following parameters were used in the acoustic model:

- Ground absorption was set to 1.0 for porous grounds. For reflecting surfaces (e.g. roads and parking lots), ground absorption was assigned to 0.0;
- 1st order reflection was taken into account;
- Temperature of 10 ºC and relative humidity of 70%;
- Barrier coefficients: C1: 3.0; C2: 20.0; C3: 0.0;

- All sources were spectral unless otherwise specified; and
- All buildings and structures had a reflection loss of one (1) dB.

6.0 NOISE IMPACT ASSESSMENT

According to NPC-300, the assessment of noise impact requires the determination of the "predictable worst case" impact. In order to determine the largest excessive level, the worst case one hour equivalent sound level (L_{eq}, 1hr) has been predicted based on the following conditions that all equipment was assumed operating continuously for one (1) hour unless stated otherwise. In this assessment, it was assumed that the Development will operate 24 hours a day, 7 days a week.

The following Table summarizes the modelled equipment and vehicle operating hours.

	Daytime	Evening	Nighttime
Air Conditioner (AC1)	60 minutes per Hour	60 minutes per Hour	60 minutes per Hour
General Exhaust (EX1)	60 minutes per Hour	60 minutes per Hour	60 minutes per Hour
Bus Idling Time per Spot (ID1 to ID10)	7.0 minutes per Hour	4.4 minutes per Hour	2.4 minutes per Hour
Moving Buses (R_Onsite)	35 per Hour, 20 km/hr	22 per Hour, 20 km/hr	12 per Hour, 20 km/hr

The predicted contributions of each source at the noise sensitive receptors are summarized in Table 2, Appendix A. Table 3, Appendix A, summarizes the compliance status of the Development at the selected receptor locations. Daytime noise impact contour map is provided in Figure 3, Appendix B. Appendix E includes a sample output from stationary sources at receptor R1.

As shown in Table 3, Appendix A, the predicted noise impacts exceed the MECP guidelines at selected receptor locations. Pinchin, in consultation with the Client, recommends that a noise barrier be constructed along the shared property line between the residence and the Development. The noise barrier is approximately 40 m long and 3.5 m high.

The acoustic barriers may be constructed from a combination of materials such as earth, wood, metal, brick, concrete, etc. The acoustic barriers should have a minimum surface density of 20 kg/m^2. The barriers should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Any gaps under the barriers that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barriers is maintained.

Table 4, Appendix A, summarizes the compliance status of the Development at the selected receptor locations with the proposed noise barrier. Daytime noise impact contour map including the proposed noise barrier is provided in Figure 4, Appendix B.

7.0 CONCLUSIONS

An assessment of the Development attributable sound levels was completed by modelling the individual contributions of the identified noise sources. Predicted worst-case Development noise levels are shown to meet the applicable NPC-300 Class 1 guideline limits for daytime, evening, and nighttime operations at the selected receptor locations, with the proposed noise barrier. Therefore, the Development is expected to be in compliance with the MECP noise requirements.

8.0 TERMS AND LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

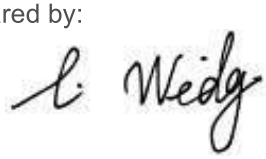
9.0 CLOSURE

Should you have any questions or concerns regarding the contents of this study, please contact the undersigned.

Sincerely,

Pinchin Ltd.

Prepared by:



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10.0 REFERENCES

1. US Federal Highway Administration, Technical Manual - Traffic Noise Model 3.2, December 2023.
2. Ministry of the Environment Publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", August 2013.
3. US Federal Highway Administration, Traffic Noise Model Version 3.2, Released 2023.
4. ISO 9613-2: 1996, Acoustics –Attenuation of Sound During Propagation outdoors. Part 2 – General Method of Calculation.
5. Ministry of the Environment's STAMSON/STEAM Computer Programme, (Version 5.04), 1989.

APPENDIX A

Tables

(5 Pages)

Table 1: Stationary Noise Source Summary Table

Source ID [1]	Source Description	Lw(A) [2]	Source Location [3]	Sound Characteristics [4]	Noise Control Measures [5]	Source of Data [6]
AC1	Air Conditioner	61	O	S	U	Man
EX1	General Exhaust	62	O	S	U	Man
ID1	Bus Idling	96	O	S	U	File + Adj
ID10	Bus Idling	96	O	S	U	File + Adj
ID2	Bus Idling	96	O	S	U	File + Adj
ID3	Bus Idling	96	O	S	U	File + Adj
ID4	Bus Idling	96	O	S	U	File + Adj
ID5	Bus Idling	96	O	S	U	File + Adj
ID6	Bus Idling	96	O	S	U	File + Adj
ID7	Bus Idling	96	O	S	U	File + Adj
ID8	Bus Idling	96	O	S	U	File + Adj
ID9	Bus Idling	96	O	S	U	File + Adj
R_Onsite	Moving Buses	100	O	S	U	TNM + Cal

Notes:

[1] Wherever possible, the Source ID is identical with that used in the ESDM report.

[2] Sound Power Levels of continuous noise sources, in dBA, include sound characteristic adjustments per NPC-104.
Sound Power Levels of impulsive noise sources, in dBAI, are A-weighted incorporating an impulsive time weighting.

[3] Source Location:
O - located/installed outside the building, including on the roof
I - located/installed inside the building

[4] Sound Characteristic
S - Steady
Q - Quasi-Steady Impulsive
T - Tonal

[5] Noise Control Measures
S = Silencer/Muffler
A = Acoustic lining, plenum
B = Barrier, berm, screening

[6] Mea - Measured
Man - Manufacturer Sound Data
Cal - Engineering Calculations
Adj - Adjustment

Table 2: Point of Reception Noise Impact Table

Source ID [1]	Source Description	Point of Reception R1 [2]				Point of Reception R2 [2]			
		Distance (m)	Sound Level at POR [3]			Distance (m)	Sound Level at POR [3]		
			Daytime	Evening	Nighttime		Daytime	Evening	Nighttime
AC1	Air Conditioner	177	-7	-7	-7	173	7	7	7
EX1	General Exhaust	176	-6	-6	-6	172	6	6	6
ID1	Bus Idling	134	17	15	12	130	35	33	30
ID10	Bus Idling	52	20	18	15	48	36	34	31
ID2	Bus Idling	114	19	17	15	110	36	34	32
ID3	Bus Idling	94	22	20	17	90	38	36	34
ID4	Bus Idling	77	18	16	14	73	38	36	33
ID5	Bus Idling	63	18	16	14	60	34	32	29
ID6	Bus Idling	128	16	14	12	124	34	32	29
ID7	Bus Idling	107	19	17	14	103	36	34	31
ID8	Bus Idling	86	21	19	17	82	38	36	34
ID9	Bus Idling	67	19	17	14	63	42	39	37
R_Onsite	Moving Buses	48	31	29	27	46	47	45	42

Notes:

[1]. Wherever possible, the Source ID is identical with that used in the ESDM report.

[2]. Point of Reception (POR) height is 4.5 m unless otherwise stated.

[3]. Sound Level Unit

A-Weighted 1-hour equivalent sound level ($L_{eq,}$ 1-hr) in dBA for continuous sources.

Table 2: Point of Reception Noise Impact Table

Source ID [1]	Source Description	Point of Reception R3 [2]				Point of Reception R4-OPOR, 1.5 m [2]			
		Distance (m)	Sound Level at POR [3]			Distance (m)	Sound Level at POR [3]		
			Daytime	Evening	Nighttime		Daytime	Evening	Nighttime
AC1	Air Conditioner	170	7	7	7	140	3	3	3
EX1	General Exhaust	168	6	6	6	139	7	7	7
ID1	Bus Idling	127	35	33	30	98	38	36	33
ID10	Bus Idling	48	44	42	40	36	47	45	42
ID2	Bus Idling	107	36	34	32	78	40	38	35
ID3	Bus Idling	88	38	36	34	62	42	40	37
ID4	Bus Idling	71	41	39	36	50	43	41	38
ID5	Bus Idling	60	42	40	38	48	43	41	38
ID6	Bus Idling	121	34	32	30	91	38	36	33
ID7	Bus Idling	99	36	34	31	70	40	38	35
ID8	Bus Idling	79	39	36	34	52	43	41	38
ID9	Bus Idling	61	42	40	37	38	46	44	41
R_Onsite	Moving Buses	49	49	47	45	55	53	51	49

Notes:

[1]. Wherever possible, the Source ID is identical with that used in the ESDM report.

[2]. Point of Reception (POR) height is 4.5 m unless otherwise stated.

[3]. Sound Level Unit

A-Weighted 1-hour equivalent sound level ($L_{eq,}$ 1-hr) in dBA for continuous sources.

Table 3: Acoustic Assessment Summary Table - Without Barrier

Point of Reception ID	Point of Reception Description	Time Period [1]	Total Level at POR (L_{eq}, 1-hr) [2]	Verified by Acoustic Audit (Yes/No)	Performance Limit (L_{eq} 1-hr) [3]	Compliance with Performance Limit (Yes/No)
R1	Upper Floor Windows - South Façade	Daytime	33	No	50	Yes
		Evening	31	No	50	Yes
		Nighttime	29	No	45	Yes
R2	Upper Floor Windows - East Façade	Daytime	50	No	50	Yes
		Evening	48	No	50	Yes
		Nighttime	45	No	45	Yes
R3	Upper Floor Windows - North Façade	Daytime	53	No	50	No
		Evening	51	No	50	No
		Nighttime	48	No	45	No
R4-OPOR	Outdoor POR	Daytime	56	No	59	Yes
		Evening	54	No	56	Yes

Notes:

[1] The predictable worst-case one (1) hour period was considered in the study.
[2] Worst-case one hour equivalent sound level from all applicable sources operating in dBA.
[3] Ambient background noise or NPC-300 exclusionary sound level limits of one hour L_{eq} for Class 1 Areas.

Table 4: Acoustic Assessment Summary Table - With 40 m Long, 3.5 m High Barrier

Point of Reception ID	Point of Reception Description	Time Period [1]	Total Level at POR (L_{eq}, 1-hr) [2]	Verified by Acoustic Audit (Yes/No)	Performance Limit (L_{eq} 1-hr) [3]	Compliance with Performance Limit (Yes/No)
R1	Upper Floor Windows - South Façade	Daytime	33	No	50	Yes
		Evening	31	No	50	Yes
		Nighttime	29	No	45	Yes
R2	Upper Floor Windows - East Façade	Daytime	48	No	50	Yes
		Evening	46	No	50	Yes
		Nighttime	44	No	45	Yes
R3	Upper Floor Windows - North Façade	Daytime	50	No	50	Yes
		Evening	48	No	50	Yes
		Nighttime	45	No	45	Yes
R4-OPOR	Outdoor POR	Daytime	52	No	59	Yes
		Evening	50	No	56	Yes

Notes:

[1] The predictable worst-case one (1) hour period was considered in the study.
[2] Worst-case one hour equivalent sound level from all applicable sources operating in dBA.
[3] NPC-300 exclusionary sound level limits of one hour L_{eq} for Class 1 Areas.

APPENDIX B

Figures

(4 Pages)

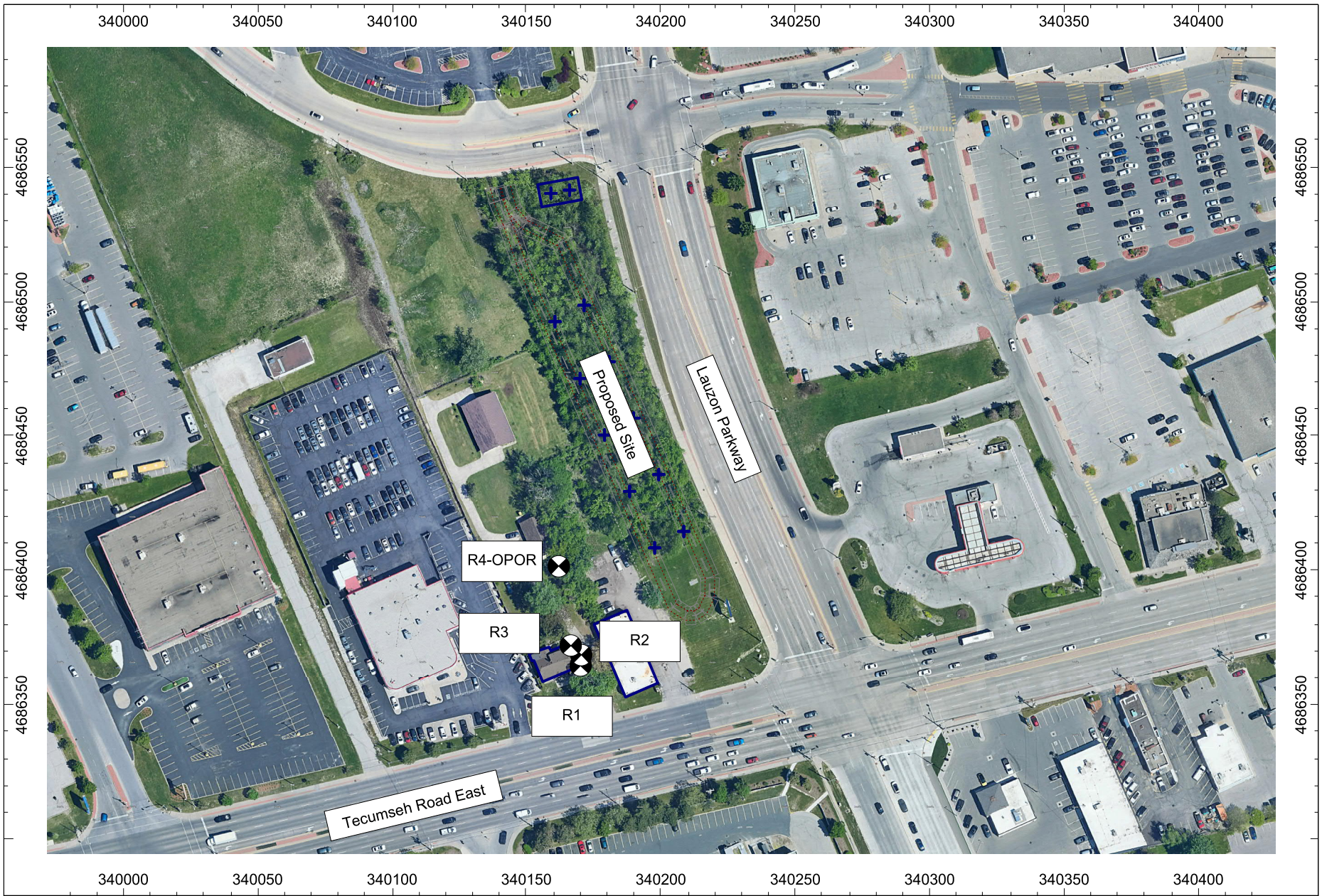

Figure 1 - Scaled Area Plan, Showing the Development and Receptors

N

Drawn by: WNL	
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Date: June 4, 2024	

The City of Windsor, 7310 Tecumseh Road East, Windsor, Ontario

Pinchin Project: 340420

PINCHIN

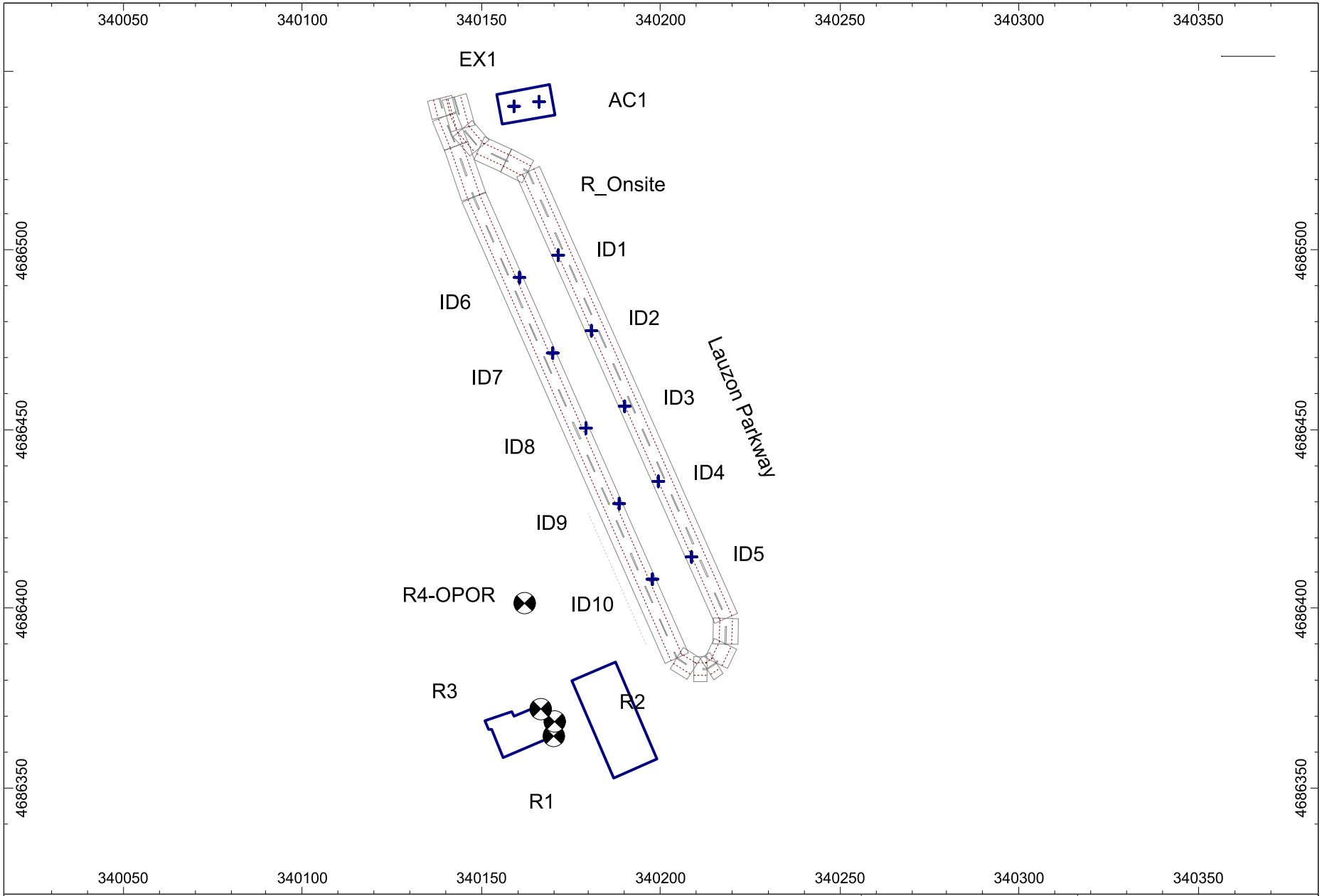

Figure 2 - Site Plan, Showing Significant Noise Sources

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Drawn by: WNL	
Scale: 1:1,500	
Date: June 4, 2024	

The City of Windsor, 7310 Tecumseh Road East, Windsor, Ontario

Pinchin Project: 340420

PINCHIN

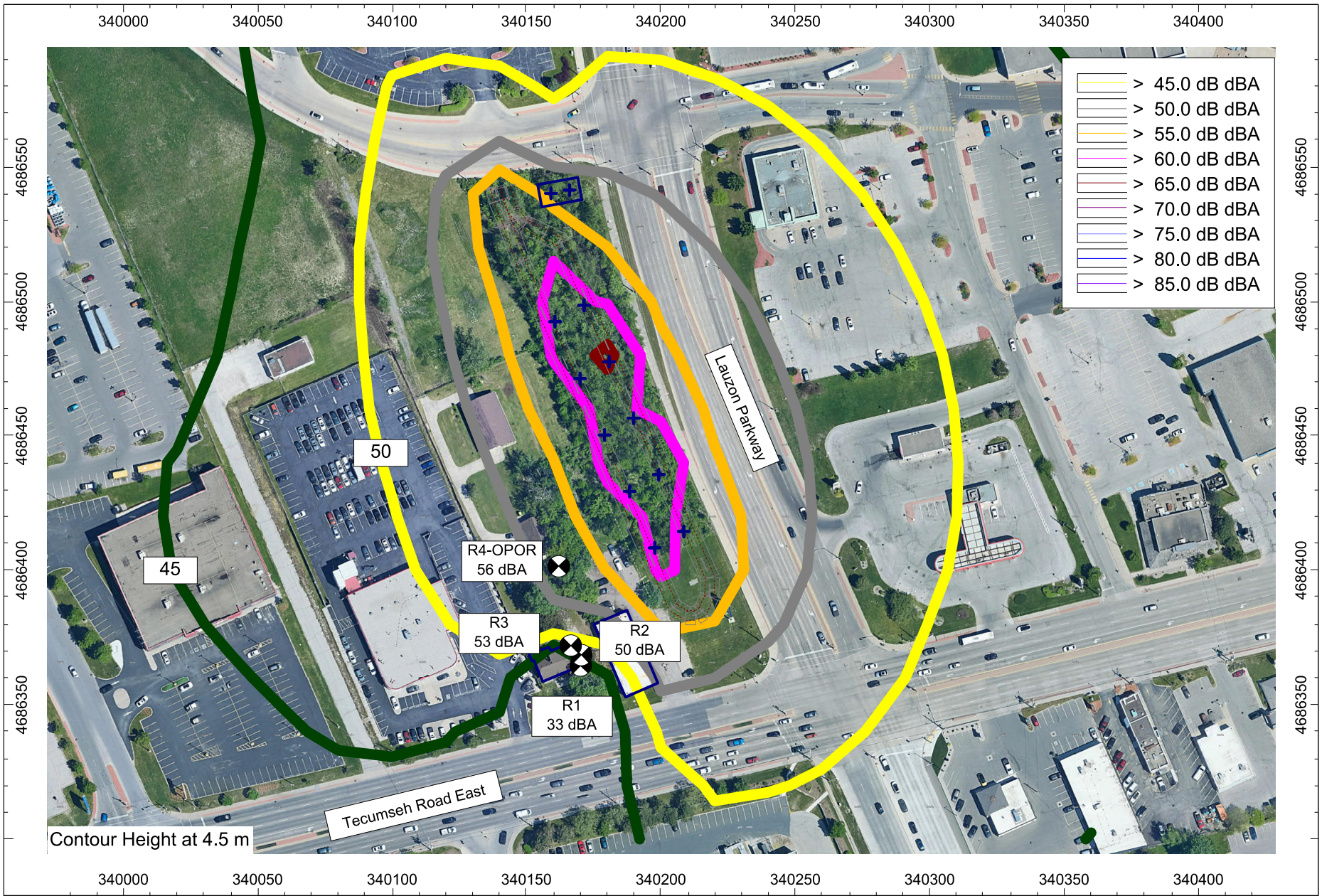

Figure 3 - Daytime Noise Impact Contour Map - Without Barrier

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Drawn by: WNL	
Scale: 1:2,000	
Date: June 4, 2024	

The City of Windsor, 7310 Tecumseh Road East, Windsor, Ontario

Pinchin Project: 340420

PINCHIN

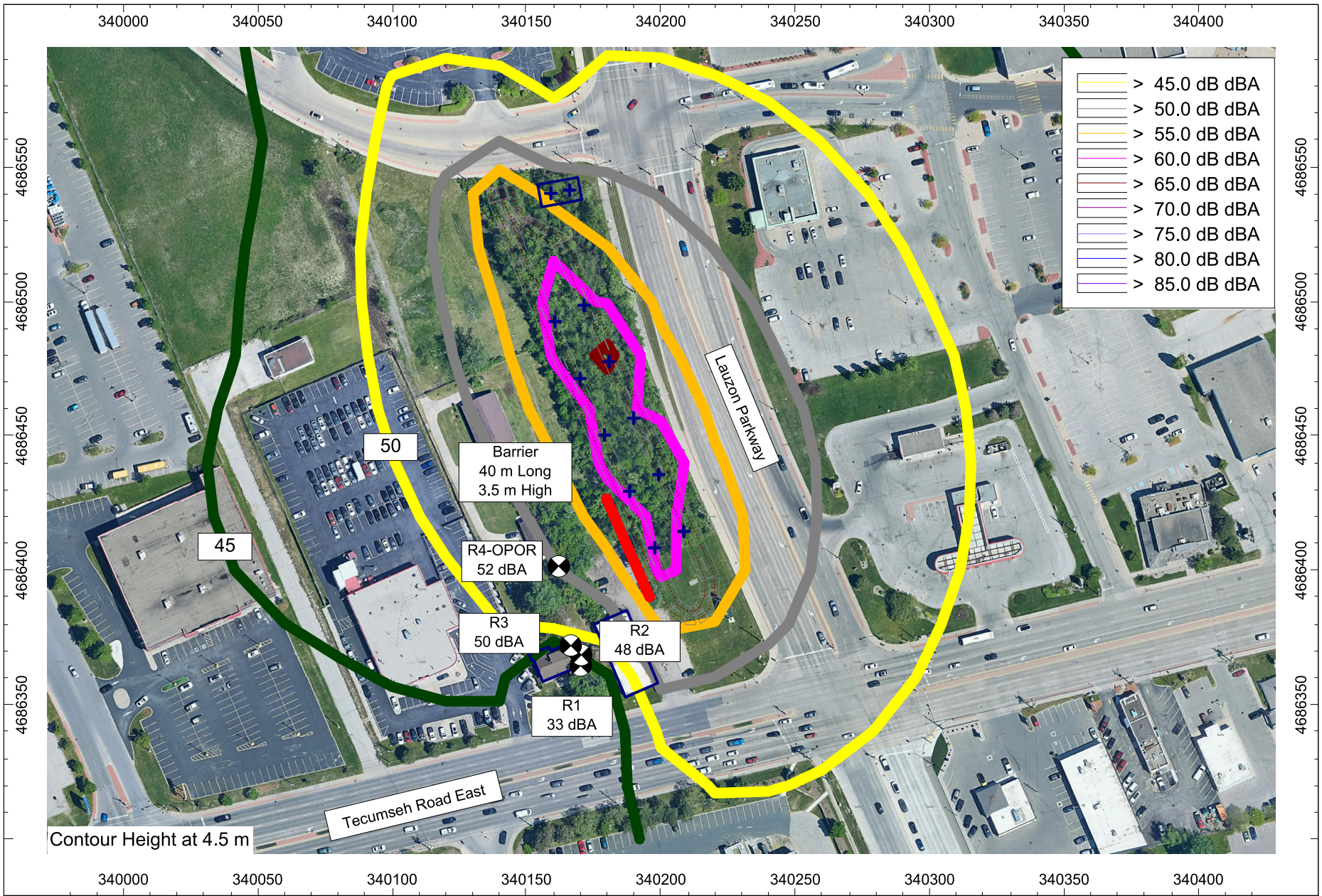

Figure 4 - Daytime Noise Impact Contour Map - With 40 m Long, 3.5 m High Barrier

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The City of Windsor, 7310 Tecumseh Road East, Windsor, Ontario

Pinchin Project: 340420

Drawn by: WNL

Scale: 1:2,000

Date: June 4, 2024

PINCHIN

APPENDIX C

Manufacturer Sound Data and Calculations

(3 Pages)

CITY MULTI

Model: PUMY-HP36NKMU

Job Name:

Schedule Reference: | Date:

OUTDOOR VRF SYSTEM FEATURES

- Single-phase outdoor unit with variable refrigerant flow (VRF) zoning technology
- Inverter-driven (variable speed) compressor
- Total refrigerant piping length of 984' (300 m)
- Connects up to 9 indoor units
- Uses CITY MULTI indoor units and Controls Network
- Standard Base Heater included

OPTIONAL PARTS

- ☐ Branch Joint (T-Branch) CMY-Y62-G-E
- ☐ Header - Four Branch CMY-Y64-G-E
- ☐ Header - Eight Branch CMY-Y68-G-E

- ☐ Snow/Wind Guard (x2) ..... CM-S-FR-NKMU
- ☐ Snow/Wind Guard Rear SG-1-RE
- ☐ Snow/Wind Guard Side SG-1-SD
- ☐ Snow/Wind Guard Blocker ..... CM-S-BLK-NKMU

Note: Mitsubishi Electric (MESCA) supports the use of only MESCA supplied and approved Snow Guard / Wind Deflectors / Windscreens and accessories for proper functioning of the unit(s). Use of non-MESCA supported Snow Guard / Wind Deflectors / Windscreens and accessories will affect warranty coverage.

Specifications		Model Name
Unit Type		PUMY-HP36NKMU
Nominal Cooling Capacity	Btu/h *1	36,000
Nominal Heating Capacity	Btu/h *2	42,000
Operating Temperature Range	Cooling (Outdoor) *3	23°F ~ 115°F (-5°C ~ +46°C) DB
	Heating (Outdoor)	-13°F ~ +59°F (-25°C ~ +15°C) WB
External Dimensions (H x W x D)	In. / mm	52-11/16 x 41-11/32 x 13 (+1) / 1,338 x 1050 x 330 (+25)
External Finish / Colour		Galvanized sheets / Munsell No.3Y 7.8/1.1
Net Weight	Lbs. / kg	273 / 124
Electrical Power Requirements	Voltage, Phase, Hertz	208 / 230V, 1-phase, 60Hz
Minimum Circuit Ampacity (MCA) *	A	36
Maximum Overcurrent Protection	A	44
Piping Diameter (Flared) (In. / mm)	Liquid (High Pressure)	3/8 / 9.52
	Gas (Low Pressure)	5/8 / 15.88
Indoor Unit	Total Capacity	50 to 130% of Outdoor Unit Capacity
	Model / Quantity	P05 to P36 / 1 to 9
Sound Pressure Levels	dB(A) Clg / Htg	49 / 53 AC1 at 1 m
Fan		
Type x Quantity (kW)		Propeller Fan x 2 - (0.074 + 0.074)
Airflow Rate	CFM	3,885
Compressor Operating Range	Cooling	29% to 100%
	Heating	17% to 100%
Compressor Type x Quantity		INVERTER-driven Scroll Hermetic x 1
Compressor Motor Output	kW	2.8
Refrigerant		R410A: 10lbs. + 9oz. (4.8kg)
Lubricant		FV50S (2.3 liters)
High-pressure Protection Device		High pressure Switch, High pressure Sensor
Compressor Protection Device		Compressor thermistor, Overcurrent detection
Inverter Circuit Protection Device		Overcurrent detection, Overheat detection (Heat sink thermistor)
AHRI Ratings Ducted / Non-Ducted	EER	12.6 / 15.0
	SEER	18.3 / 22.3
	COP	NA
	HSPF	11.7 / 12.0

Notes:
*1. Nominal cooling conditions (subject to ISO 15042)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
*2. Nominal heating conditions (subject to ISO 15042)
Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
*3. 50 to 115°F (10 to 46°C)D.B.: When connecting PKFY-P06NBMU, PKFY-P08NHMU, PFFY-P06/08/12NEMU, and PFFY-P06/08/12NRMU type indoor unit.

* All electrical work shall comply with National (CEC) and local codes and regulations.

Should this document be altered or changed without MESCA's permission, it becomes null and void. MESCA assumes no responsibility for any consequences in such cases

Specifications are subject to change without notice.

Job Name: GB-200 Cut Sheet
Tag: MK-1
Quantity: 1
Printed Date: November 8, 2023

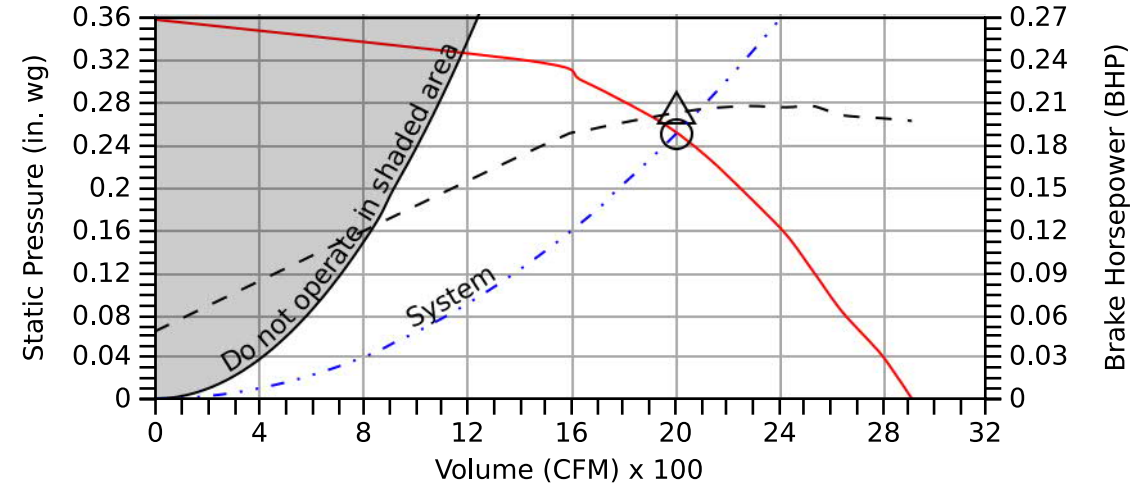
Model: GB-200

Belt Drive Centrifugal Roof Exhaust Fan

Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum wheel. Belt driven motor mounted on vibration isolation.

Fan Configuration	
Drive type	Belt

Performance	
Requested Volume (CFM)	2,000
Actual Volume (CFM)	2,000
Total External SP (in. wg)	0.25
Fan RPM	525
Drive Loss (%)	19
Operating Power (bhp)	0.2
Startup Power (bhp)	0.2
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft^3)	0.072
Elevation (ft)	1100
Static Efficiency (%)	48
Outlet Velocity (ft/min)	837



- Fan curve
- Brake horsepower curve
- Operating Point SP
- Operating Bhp point
- Max system curve
- System curve

Motor	
Size (hp)	1/4
V/C/P	115/60/1
NEC FLA (Amps)	5.8
Min Circuit Ampacity (MCA)	7.2
Max Overload Production (MOP)	15

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	73	70	63	58	55	53	47	40	62	50	5.9

EX1

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.The AMCA certified ratings seal applies to sound and air performance ratings only.Performance certified is for installation type A: Free inlet, free outlet.Power rating includes transmission losses.Performance ratings include the effects of birdscreen.The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301.Values shown are for Installation Type A: free inlet hemispherical sone levels.dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.

FLA - based on tables 150 or 148 of National Electric Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.
MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc.).

Sound Power Level Calculations / Adjustment

1. Bus Sound Level Adjustment - Moving

	32	63	125	250	500	1000	2000	4000	8000	LwA	Notes
Overall Sound Level, dBA	100	100	100	100	100	100	100	100	100		68 dBA at 15 m, per TNM
Overall Sound Level, dBA	106	106	106	106	106	106	106	106	106		Sample - Measured from Moving Vehicle
Octave Band, dB	111	103	101	105	103	102	99	92	88		Sample - Measured 1/1 Octave Band Level
Octave Band Adjustment, dB	-5	3	5	1	3	4	8	14	18		Overall - Octave
Adjust Bus Sound Power Level, dB	104	96	95	99	96	95	92	86	81	100	

2. Bus Sound Level Adjustment - Idling

	32	63	125	250	500	1000	2000	4000	8000	LwA	Notes
Measured Overall Sound Level, dBA	96	96	96	96	96	96	96	96	96		71 dBA at 7.5 m
Overall Sound Level, dBA	93	93	93	93	93	93	93	93	93		Sample - Measured from Moving Vehicle
Octave Band, dB	91	88	84	83	85	88	88	83	76		Sample - Measured 1/1 Octave Band Level
Octave Band Adjustment, dB	2	5	9	9	8	5	5	9	17		Overall - Octave
Adjust Bus Sound Power Level, dB	95	92	88	87	88	92	91	87	80	96	

APPENDIX D

STAMSON Calculations

(4 Pages)

Summary of Road Traffic Data and Predictions

	Tecumseh Road East	Lauzon Parkway
AADT – 2018 / 2024	34,000	30,330
Cars – 95%	32,300	28,814
Medium Trucks – 1%	340	303
Heavy Trucks – 4%	1,360	1,213
Posted Speed, km/hr	60	60
Predicted Level at R4-OPOR	56.81 dBA	58.71 dBA
Combined 24-Hour Level at R4-OPOR	60.9 dBA	
Lowest Daytime Level (-2 dB)	58.9 dBA	
Lowest Evening Level (-5 dB)	55.9 dBA	

STAMSON 5.0 NORMAL REPORT Date: 05-06-2024 12:30:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4_laub.te Time Period: 24 hours
Description: Ambient Background Noise at R4-OPOR from Lauzon Parkway

Road data, segment # 1: LauzonOpen

Car traffic volume : 28814 veh/TimePeriod *
Medium truck volume : 303 veh/TimePeriod *
Heavy truck volume : 1213 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: LauzonOpen

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 : 81.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: LauzBarrier

Car traffic volume : 28814 veh/TimePeriod *
Medium truck volume : 303 veh/TimePeriod *
Heavy truck volume : 1213 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: LauzBarrier

Angle1 Angle2 : -33.00 deg 60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 81.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -33.00 deg Angle2 : 60.00 deg
Barrier height : 3.50 m
Barrier receiver distance : 26.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LauzonOpen

Source height = 1.41 m

ROAD (0.00 + 57.86 + 0.00) = 57.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-33	0.00	70.18	0.00	-7.32	-4.99	0.00	0.00	0.00	57.86

Segment Leq : 57.86 dBA

Results segment # 2: LauzBarrier

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	1.50	1.47	1.47

ROAD (0.00 + 51.21 + 0.00) = 51.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-33	60	0.00	70.18	0.00	-7.32	-2.87	0.00	0.00	-8.77	51.21

Segment Leq : 51.21 dBA

Total Leq All Segments: 58.71 dBA

TOTAL Leq FROM ALL SOURCES: 58.71

STAMSON 5.0 NORMAL REPORT Date: 05-06-2024 12:03:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4_tecu.te Time Period: 24 hours
Description: Ambient Background Noise at R4-OPOR from Tecumseh Road East

Road data, segment # 1: TecuHouse

Car traffic volume : 32300 veh/TimePeriod *
Medium truck volume : 340 veh/TimePeriod *
Heavy truck volume : 1360 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TecuHouse

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 74.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: TecuHouse

Source height = 1.41 m

ROAD (0.00 + 56.81 + 0.00) = 56.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-11.51	-1.46	0.00	-0.90	0.00	56.81

Segment Leq : 56.81 dBA

Total Leq All Segments: 56.81 dBA

TOTAL Leq FROM ALL SOURCES: 56.81

APPENDIX E

CadnaA Sample Output

(3 Pages)

Receiver
Name: R1
ID: R1
X: 340170.13 m
Y: 4686364.49 m
Z: 4.50 m

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID10"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
18	340197.68	4686408.27	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	45.3	0.0	-3.0	0.0	0.0	7.7	0.0	0.0	-4.1
18	340197.68	4686408.27	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	45.3	0.0	-3.0	0.0	0.0	10.1	0.0	0.0	3.9
18	340197.68	4686408.27	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	45.3	0.0	-1.7	0.0	0.0	13.7	0.0	0.0	5.1
18	340197.68	4686408.27	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	45.3	0.1	-1.7	0.0	0.0	17.6	0.0	0.0	7.9
18	340197.68	4686408.27	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	45.3	0.1	-2.3	0.0	0.0	21.0	0.0	0.0	11.7
18	340197.68	4686408.27	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	45.3	0.2	-2.4	0.0	0.0	24.1	0.0	0.0	15.3
18	340197.68	4686408.27	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	45.3	0.5	-2.4	0.0	0.0	25.0	0.0	0.0	14.8
18	340197.68	4686408.27	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	45.3	1.7	-2.4	0.0	0.0	25.0	0.0	0.0	9.2
18	340197.68	4686408.27	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	45.3	6.0	-2.4	0.0	0.0	25.0	0.0	0.0	-4.6

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID5"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
20	340208.53	4686414.49	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	47.0	0.0	-3.0	0.0	0.0	7.8	0.0	0.0	-5.8
20	340208.53	4686414.49	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	47.0	0.0	-3.0	0.0	0.0	10.2	0.0	0.0	2.1
20	340208.53	4686414.49	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	47.0	0.0	-1.9	0.0	0.0	13.9	0.0	0.0	3.4
20	340208.53	4686414.49	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	47.0	0.1	-1.9	0.0	0.0	17.6	0.0	0.0	6.4
20	340208.53	4686414.49	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	47.0	0.1	-2.5	0.0	0.0	20.9	0.0	0.0	10.2
20	340208.53	4686414.49	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	47.0	0.2	-2.5	0.0	0.0	24.0	0.0	0.0	13.7
20	340208.53	4686414.49	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	47.0	0.6	-2.5	0.0	0.0	25.0	0.0	0.0	13.1
20	340208.53	4686414.49	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	47.0	2.1	-2.5	0.0	0.0	25.0	0.0	0.0	7.3
20	340208.53	4686414.49	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	47.0	7.4	-2.5	0.0	0.0	25.0	0.0	0.0	-7.5

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID9"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
22	340188.40	4686429.32	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	47.6	0.0	-3.0	0.0	0.0	7.5	0.0	0.0	-6.2
22	340188.40	4686429.32	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	47.6	0.0	-3.0	0.0	0.0	9.2	0.0	0.0	2.5
22	340188.40	4686429.32	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	47.6	0.0	-1.0	0.0	0.0	11.4	0.0	0.0	4.4
22	340188.40	4686429.32	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	47.6	0.1	-1.0	0.0	0.0	14.2	0.0	0.0	8.3
22	340188.40	4686429.32	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	47.6	0.1	-2.1	0.0	0.0	17.8	0.0	0.0	12.3
22	340188.40	4686429.32	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	47.6	0.2	-2.1	0.0	0.0	22.2	0.0	0.0	14.5
22	340188.40	4686429.32	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	47.6	0.7	-2.1	0.0	0.0	25.0	0.0	0.0	12.1
22	340188.40	4686429.32	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	47.6	2.2	-2.1	0.0	0.0	25.0	0.0	0.0	6.2
22	340188.40	4686429.32	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	47.6	7.9	-2.1	0.0	0.0	25.0	0.0	0.0	-9.0

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID4"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
26	340199.25	4686435.54	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	48.7	0.0	-3.0	0.0	0.0	7.5	0.0	0.0	-7.3
26	340199.25	4686435.54	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	48.7	0.0	-3.0	0.0	0.0	9.2	0.0	0.0	1.4
26	340199.25	4686435.54	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	48.7	0.0	-1.9	0.0	0.0	11.4	0.0	0.0	4.2
26	340199.25	4686435.54	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	48.7	0.1	-1.9	0.0	0.0	14.1	0.0	0.0	8.1
26	340199.25	4686435.54	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	48.7	0.1	-2.5	0.0	0.0	17.6	0.0	0.0	11.8
26	340199.25	4686435.54	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	48.7	0.3	-2.5	0.0	0.0	21.9	0.0	0.0	14.1
26	340199.25	4686435.54	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	48.7	0.7	-2.5	0.0	0.0	25.0	0.0	0.0	11.3
26	340199.25	4686435.54	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	48.7	2.5	-2.5	0.0	0.0	25.0	0.0	0.0	5.1
26	340199.25	4686435.54	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	48.7	9.0	-2.5	0.0	0.0	25.0	0.0	0.0	-10.8

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID8"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
37	340179.12	4686450.36	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	49.7	0.0	-3.0	0.0	0.0	4.0	0.0	0.0	-4.8

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID8"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
37	340179.12	4686450.36	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	49.7	0.0	-3.0	0.0	0.0	5.5	0.0	0.0	4.1
37	340179.12	4686450.36	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	49.7	0.0	0.5	0.0	0.0	7.3	0.0	0.0	4.9
37	340179.12	4686450.36	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	49.7	0.1	0.4	0.0	0.0	9.8	0.0	0.0	9.0
37	340179.12	4686450.36	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	49.7	0.2	-1.5	0.0	0.0	13.0	0.0	0.0	14.3
37	340179.12	4686450.36	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	49.7	0.3	-1.5	0.0	0.0	16.2	0.0	0.0	17.7
37	340179.12	4686450.36	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	49.7	0.8	-1.5	0.0	0.0	19.0	0.0	0.0	15.2
37	340179.12	4686450.36	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	49.7	2.8	-1.5	0.0	0.0	21.0	0.0	0.0	6.8
37	340179.12	4686450.36	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	49.7	10.1	-1.5	0.0	0.0	22.5	0.0	0.0	-11.5
39	340179.12	4686450.36	3.20	1	D	4000	88.2	0.0	-9.3	0.0	0.0	59.3	8.5	-2.3	0.0	0.0	25.0	0.0	1.0	-12.6
39	340179.12	4686450.36	3.20	1	D	8000	78.7	0.0	-9.3	0.0	0.0	59.3	30.3	-2.3	0.0	0.0	25.0	0.0	1.0	-43.9

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID3"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
41	340189.97	4686456.58	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	50.5	0.0	-3.0	0.0	0.0	3.9	0.0	0.0	-5.4
41	340189.97	4686456.58	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	50.5	0.0	-3.0	0.0	0.0	5.3	0.0	0.0	3.6
41	340189.97	4686456.58	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	50.5	0.0	-0.9	0.0	0.0	7.1	0.0	0.0	5.7
41	340189.97	4686456.58	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	50.5	0.1	-0.9	0.0	0.0	9.5	0.0	0.0	10.0
41	340189.97	4686456.58	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	50.5	0.2	-2.1	0.0	0.0	12.4	0.0	0.0	14.8
41	340189.97	4686456.58	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	50.5	0.3	-2.1	0.0	0.0	15.5	0.0	0.0	18.3
41	340189.97	4686456.58	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	50.5	0.9	-2.1	0.0	0.0	18.3	0.0	0.0	15.7
41	340189.97	4686456.58	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	50.5	3.1	-2.1	0.0	0.0	20.4	0.0	0.0	7.0
41	340189.97	4686456.58	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	50.5	11.0	-2.1	0.0	0.0	22.1	0.0	0.0	-12.1
43	340189.97	4686456.58	3.20	1	D	4000	88.2	0.0	-9.3	0.0	0.0	59.2	8.4	-2.5	0.0	0.0	25.0	0.0	1.0	-12.3
43	340189.97	4686456.58	3.20	1	D	8000	78.7	0.0	-9.3	0.0	0.0	59.2	30.0	-2.5	0.0	0.0	25.0	0.0	1.0	-43.3

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID7"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
45	340169.84	4686471.41	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	51.6	0.0	-3.0	0.0	0.0	4.2	0.0	0.0	-6.8
45	340169.84	4686471.41	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	51.6	0.0	-3.0	0.0	0.0	5.7	0.0	0.0	2.0
45	340169.84	4686471.41	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	51.6	0.0	1.5	0.0	0.0	7.1	0.0	0.0	2.2
45	340169.84	4686471.41	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	51.6	0.1	1.4	0.0	0.0	9.9	0.0	0.0	6.2
45	340169.84	4686471.41	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	51.6	0.2	-1.1	0.0	0.0	13.6	0.0	0.0	11.4
45	340169.84	4686471.41	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	51.6	0.4	-1.2	0.0	0.0	16.9	0.0	0.0	14.8
45	340169.84	4686471.41	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	51.6	1.0	-1.2	0.0	0.0	19.5	0.0	0.0	12.3
45	340169.84	4686471.41	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	51.6	3.5	-1.2	0.0	0.0	21.4	0.0	0.0	3.5
45	340169.84	4686471.41	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	51.6	12.5	-1.2	0.0	0.0	22.8	0.0	0.0	-16.4

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
47	340180.69	4686477.63	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	52.1	0.0	-3.0	0.0	0.0	4.0	0.0	0.0	-7.2
47	340180.69	4686477.63	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	52.1	0.0	-3.0	0.0	0.0	5.5	0.0	0.0	1.7
47	340180.69	4686477.63	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	52.1	0.0	-0.3	0.0	0.0	7.5	0.0	0.0	3.1
47	340180.69	4686477.63	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	52.1	0.1	-0.5	0.0	0.0	10.0	0.0	0.0	7.3
47	340180.69	4686477.63	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	52.1	0.2	-1.9	0.0	0.0	13.1	0.0	0.0	12.2
47	340180.69	4686477.63	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	52.1	0.4	-1.9	0.0	0.0	16.3	0.0	0.0	15.6
47	340180.69	4686477.63	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	52.1	1.1	-1.9	0.0	0.0	19.0	0.0	0.0	13.0
47	340180.69	4686477.63	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	52.1	3.7	-1.9	0.0	0.0	21.0	0.0	0.0	3.9
47	340180.69	4686477.63	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	52.1	13.3	-1.9	0.0	0.0	22.5	0.0	0.0	-16.7
49	340180.69	4686477.63	3.20	1	D	2000	92.6	0.0	-9.3	0.0	0.0	58.4	2.3	-2.2	0.0	0.0	25.0	0.0	1.0	-1.2
49	340180.69	4686477.63	3.20	1	D	4000	88.2	0.0	-9.3	0.0	0.0	58.4	7.7	-2.2	0.0	0.0	25.0	0.0	1.0	-11.0
49	340180.69	4686477.63	3.20	1	D	8000	78.7	0.0	-9.3	0.0	0.0	58.4	27.3	-2.2	0.0	0.0	25.0	0.0	1.0	-40.1

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID6"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
52	340160.56	4686492.45	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	53.2	0.0	-3.0	0.0	0.0	4.3	0.0	0.0	-8.5
52	340160.56	4686492.45	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	53.2	0.0	-3.0	0.0	0.0	5.9	0.0	0.0	0.3
52	340160.56	4686492.45	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	53.2	0.1	2.0	0.0	0.0	7.0	0.0	0.0	0.2
52	340160.56	4686492.45	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	53.2	0.1	1.8	0.0	0.0	10.0	0.0	0.0	4.0
52	340160.56	4686492.45	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	53.2	0.2	-1.0	0.0	0.0	14.1	0.0	0.0	9.3

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID6"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
52	340160.56	4686492.45	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	53.2	0.5	-1.1	0.0	0.0	17.2	0.0	0.0	12.6
52	340160.56	4686492.45	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	53.2	1.2	-1.1	0.0	0.0	19.8	0.0	0.0	10.1
52	340160.56	4686492.45	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	53.2	4.2	-1.1	0.0	0.0	21.7	0.0	0.0	0.9
52	340160.56	4686492.45	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	53.2	15.0	-1.1	0.0	0.0	23.0	0.0	0.0	-20.8

Point Source, ISO 9613, Name: "Bus Idling", ID: "ID1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
57	340171.42	4686498.67	3.20	0	D	32	55.3	0.0	-9.3	0.0	0.0	53.6	0.0	-3.0	0.0	0.0	4.2	0.0	0.0	-8.8
57	340171.42	4686498.67	3.20	0	D	63	65.7	0.0	-9.3	0.0	0.0	53.6	0.0	-3.0	0.0	0.0	5.7	0.0	0.0	0.1
57	340171.42	4686498.67	3.20	0	D	125	71.8	0.0	-9.3	0.0	0.0	53.6	0.1	0.4	0.0	0.0	7.6	0.0	0.0	0.8
57	340171.42	4686498.67	3.20	0	D	250	78.5	0.0	-9.3	0.0	0.0	53.6	0.1	0.3	0.0	0.0	10.3	0.0	0.0	4.9
57	340171.42	4686498.67	3.20	0	D	500	85.1	0.0	-9.3	0.0	0.0	53.6	0.3	-1.6	0.0	0.0	13.5	0.0	0.0	10.0
57	340171.42	4686498.67	3.20	0	D	1000	91.8	0.0	-9.3	0.0	0.0	53.6	0.5	-1.7	0.0	0.0	16.8	0.0	0.0	13.3
57	340171.42	4686498.67	3.20	0	D	2000	92.6	0.0	-9.3	0.0	0.0	53.6	1.3	-1.7	0.0	0.0	19.4	0.0	0.0	10.6
57	340171.42	4686498.67	3.20	0	D	4000	88.2	0.0	-9.3	0.0	0.0	53.6	4.4	-1.7	0.0	0.0	21.4	0.0	0.0	1.2
57	340171.42	4686498.67	3.20	0	D	8000	78.7	0.0	-9.3	0.0	0.0	53.6	15.7	-1.7	0.0	0.0	22.8	0.0	0.0	-21.0
59	340171.42	4686498.67	3.20	1	D	2000	92.6	0.0	-9.3	0.0	0.0	57.5	2.0	-2.1	0.0	0.0	25.0	0.0	1.0	-0.2
59	340171.42	4686498.67	3.20	1	D	4000	88.2	0.0	-9.3	0.0	0.0	57.5	6.9	-2.1	0.0	0.0	25.0	0.0	1.0	-9.4
59	340171.42	4686498.67	3.20	1	D	8000	78.7	0.0	-9.3	0.0	0.0	57.5	24.6	-2.1	0.0	0.0	25.0	0.0	1.0	-36.7

Point Source, ISO 9613, Name: "General Exhaust", ID: "EX1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
61	340159.03	4686540.23	5.35	0	D	63	46.8	0.0	0.0	0.0	0.0	55.9	0.0	-3.0	0.0	0.0	5.8	0.0	0.0	-11.9
61	340159.03	4686540.23	5.35	0	D	125	53.9	0.0	0.0	0.0	0.0	55.9	0.1	1.6	0.0	0.0	7.1	0.0	0.0	-10.9
61	340159.03	4686540.23	5.35	0	D	250	54.4	0.0	0.0	0.0	0.0	55.9	0.2	-0.3	0.0	0.0	10.7	0.0	0.0	-12.1
61	340159.03	4686540.23	5.35	0	D	500	54.8	0.0	0.0	0.0	0.0	55.9	0.3	-1.4	0.0	0.0	13.9	0.0	0.0	-14.0
61	340159.03	4686540.23	5.35	0	D	1000	55.0	0.0	0.0	0.0	0.0	55.9	0.6	-1.4	0.0	0.0	17.1	0.0	0.0	-17.3
61	340159.03	4686540.23	5.35	0	D	2000	54.2	0.0	0.0	0.0	0.0	55.9	1.7	-1.4	0.0	0.0	19.8	0.0	0.0	-21.8
61	340159.03	4686540.23	5.35	0	D	4000	48.0	0.0	0.0	0.0	0.0	55.9	5.8	-1.4	0.0	0.0	21.6	0.0	0.0	-33.9
61	340159.03	4686540.23	5.35	0	D	8000	38.9	0.0	0.0	0.0	0.0	55.9	20.6	-1.4	0.0	0.0	23.0	0.0	0.0	-59.1

Point Source, ISO 9613, Name: "Air Conditioner", ID: "AC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
63	340166.01	4686541.51	5.35	0	D	500	61.0	0.0	0.0	0.0	0.0	56.0	0.3	-1.7	0.0	0.0	13.7	0.0	0.0	-7.3