Thornton Tomasetti

Noise Impact Study

120 Lusk Street Development
Ottawa, Ontario

25013472

Prepared For
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Reviewed By
Marcus Li, P.Eng.
Vice President

February 6, 2025

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1.0 Introduction

At the request of NECSA Holdings Corp. (Client), Thornton Tomasetti (TT) presents this Noise Impact Study (NIS) regarding the planned Lusk Street development located at 120 Lusk Street in Ottawa, ON (the Project).

The purpose of this study is to assess the stationary noise impacts of the Project on surrounding noise sensitive areas. This report is intended to support the Site Plan Approval (SPA) application for the Project.

Where applicable, this report will provide noise control recommendations to meet the requirements of the relevant Land Use Planning Authority (LUPA). LUPAs generally adopt the noise criteria developed by the Ontario Ministry of the Environment, Conservation and Parks (MECP), but may also have unique requirements.

2.0 Site and Surrounding Area

2.1 Project Location

The Project is located northwest of the intersection of Lusk Street and Forager Street. The Project is generally surrounded by residential and by undeveloped lands, and a Hampton Inn & Suites Hotel on the south side.

An illustration of the project location and surrounding area is provided in Figure 1.

2.2 Zoning & Official Plan

The Project site is zoned as a Business Park Industrial Zone under the City of Ottawa Zoning By-Law No. 2008-250. Surrounding areas are zoned for business park industrial and residential land uses. As indicated in the zoning allowances, noise sensitive buildings, such as hotels, are permitted uses within the immediate surrounding vacant lands along Lusk Street.

2.3 Planned Development

The Project will consist of a new three storey commercial building which includes a medical offices, a restaurant and a daycare. The Project is expected to include rooftop air cooled condenser units (CU) as part of the heating, ventilation and air-conditioning (HVAC) systems and a kitchen exhaust fan.

The proposed new site plan is provided in Figure 2.

2.4 Topography

For the purposes of predictive noise modelling conducted as part of this report, terrain heights on the Project itself were assumed to be not be significantly different of the surrounding terrain heights. Terrain heights outside the boundaries of the Project grading plan were referenced to publicly available topographic data from Google Earth.

3.0 Ministry of the Environment Conservation and Parks

The MECP does not have direct authority in approving land use planning decisions, but their guidance documents have been widely adopted by LUPAs. The MECP's *Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning* (NPC-300) provides province wide guidance regarding assessment standards and criteria for evaluating noise impacts from transportation sources such as roads, railways and aircraft; as well as stationary sources such as mechanical equipment, and industrial facilities. In preparing this report, TT has referred to *Part A Background* and *Part C Land Use Planning* of NPC-300.

This NIS report has been prepared to support land use planning decisions, and is not intended to support an application for an Environmental Compliance Approval (ECA) in accordance with *Part B Stationary Sources* of NPC-300, and Section 9 of the Environmental Protection Act.

4.0 Land Use Planning Authority

In addition to adopting the MECP's recommended standards and criteria, some LUPAs impose additional requirements on applications for development approval. The LUPA for this Project is the City of Ottawa.

4.1 City of Ottawa

In accordance with the City of Ottawa's *Environmental Noise Control Guidelines* (ENCG), available from the City's website, the following additional considerations beyond those required by NPC-300 have been included in this report.

- ENCG includes default road categories with corresponding assumed traffic levels and related parameters;
- ENCG includes different and expanded warning clause language; and,
- ENCG includes additional requirements and recommendations for the construction of noise barriers.

5.0 Stationary Noise Assessment

5.1 Critical Stationary Noise Receptors

ENCG defines a point of reception for the assessment of stationary noise sources as any location on a noise sensitive land use where noise from a stationary source is received. This typically includes both Points Of Reception on building façades, representing the plane-of-window of noise sensitive spaces (POR) and Outdoor Points Of Reception representing areas such as balconies, gardens, patios, and terraces (OPOR).

5.1.1 Surrounding Receptors

The surrounding Point Of Reception (POR) and surrounding Outdoor Point Of Reception (OPOR) receptor(s) most likely to be affected by stationary noise from the Project include those associated with residential areas to the north and east, vacant lands along Lusk Street\, and existing Hampton Inn & Suites Hotel south of the Project.

Based on public information available through the City of Ottawa, TT understands that a noise sensitive development (Holiday Inn Hotel) is planned and waiting approval for the vacant land immediately adjacent to the west Project site. As the lands are under review and not yet approved for Site Plan Control, these lands were assessed as a "noise sensitive vacant lot" (POR 4 below), as defined in the ENCG and NPC-300.

The locations of the critical receptors in the surrounding area for stationary noise from the Project are summarized in Table 1, and shown in Figure 3. PORs and OPORs were assessed at the most impacted points associated with each cardinal direction.

Table 1: Surrounding Points of Reception – Stationary Noise

Receptor ID	Receptor Description	Receptor Location
POR1	Residential area east of Project	2nd floor (4.5m), west façade centre, 138 Camden Private
POR2	Residential area east of Project	3rd floor (7.5m), east façade centre, 147 Camden Private
POR3	Residential area north of Project	2nd floor (4.5m), south façade centre, 6 Burdock Grove
OPOR3	Outdoor area with residential area north of Project	1.5m high, 30m from south of building façade, 6 Burdock Grove
POR4	Vacant Land west of Project	1.5m high, centre of property, 140 Lusk Street
POR5	Hampton Inn & Suites Hotel south of Project	24m high, north façade centre, 125 Lusk Street

5.2 Stationary Noise Sources

ENCG defines a stationary source of noise as one or more sources of sound that are normally operated within a given property. Stationary sources typically include mechanical equipment such as Heating, Ventilation and Air Conditioning (HVAC) equipment, standby power generators with routine testing, and heavy vehicle traffic (truck idling, driving, and loading).

5.2.1 Project Sources

Based on information provided by the Client, the HVAC & mechanical noise sources associated with the Project are rooftop air cooled condenser units (CUs), which are expected to be operated during daytime and evening hours at full capacity, and at reduced capacity during nighttime hours, seven days a week. In is important to note that the final mechanical equipment selection has not been completed at this point in the Project and for the purposes of this assessment TT has utilized representative noise data for the sound power levels of the proposed CU units.

Table 2 and Figure 3 provide a summary of the equipment sound power levels, and locations.

Table 2: Project Stationary Noise Sources

Source ID	Source Description	Source Location	Source Sound Power dBA	Source Type	Notes & Assumptions
EF	Kitchen Exhaust Fan	1.5m above roof	86	Steady	Daytime/evening: operates for full hour

Source ID	Source Description	Source Location	Source Sound Power dBA	Source Type	Notes & Assumptions
					Nighttime: does not operate
CU-1	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 30 min. every hour
CU-2	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-3	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-4	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-5	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-6	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-7	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-8	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-9	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-10	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour

Source ID	Source Description	Source Location	Source Sound Power dBA	Source Type	Notes & Assumptions
CU-11	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-12	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-13	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour
CU-14	4-tons	1.5m above roof	83	Steady	Daytime/evening: operates for full hour Nighttime: operates for 10 min. every hour

Duty cycling for HVACs was applied based on a conservative continuous operation during the daytime period as the entire building is expected to be occupied, and reduced demands during the night-time period as the majority of offices would be closed. As the Project is understood to include a restaurant, 1 HVAC was assumed to operate with a 30 min/hr duty cycle during the night-time to account for reduced cooling demands from lower night-time temperatures. The remaining HVACs were assumed to be shut down to conserve energy, but assessed based on a conservative 10 min/hr duty cycle to maintain temperature set points.

5.3 Project Area Classification

ENCG defines the applicable sound pressure level limit at a given receptor as the higher of a set exclusionary sound level limit based on the area classification of that receptor, or the actual background sound level at the location of the receptor, whichever is higher. In this report, the defined exclusionary limits were used for the purposes of assessing compliance.

The Project is currently located in a Class 1 area as defined in ENCG, based on the surrounding area features and the proximity from major roads.

5.3.1 Class 1 Area Exclusionary Sound Level Limits

ENCG defines a Class 1 area as having an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum" during both day and night.

Table 3 provides a summary of the applicable exclusionary sound level limits for steady noise sources impacting receptors in a Class 1 area. Steady stationary noise sources are assessed against a 1 hour equivalent sound pressure level (L_{eq}) expressed in A-weighted decibels (dBA).

Table 3: Class 1 Exclusionary Sound Level Limits – Steady Noise

Time Period	Normal Operations Steady Noise ($L_{eq,1hr}$, dBA)	
	POR	OPOR
Daytime (07:00 – 19:00)	50	50
Evening (19:00 – 23:00)	50	50
Nighttime (23:00 – 07:00)	45	-

5.4 Stationary Sound Level Predictions

Sound levels at the PORs due to the nearby stationary sources were calculated using the software CadnaA in accordance with the methods described in ISO 9613-2. The following is noted:

- Absorptive ground was applied in the noise modelling to represent grass and forest areas in the vicinity.
- Three orders of reflection was included to account for the effect of the Project building itself.

A sample modelling output file for stationary noise source modelling on POR5 is included in Appendix B.

The predicted noise impacts described below are based on the conditions identified in current drawings and information provided to TT at the time of this report and include any barriers, equipment specifications, or other measures currently planned for the Project.

5.4.1 Unmitigated Project Stationary Noise Impacts on the Surrounding Area

In modelling the impact of stationary noise sources from the Project onto the surrounding area, TT has considered only the identified stationary sources associated with the Project. The noise impact of existing stationary noise sources located in the surrounding area was not considered. Table 4 provides a summary of the modelling results for stationary noise impacts to the surrounding area, and Appendix B contains the full modelling output and Figure 4 provides an illustration of the results.

Table 4: Predicted Stationary Noise Source Impacts To The Surrounding Area

POR ID	Time Period	Steady Sound Level $L_{eq,1hr}$ (dBA)	Steady Sound Level Limit $L_{eq,1hr}$ (dBA)	Compliance
POR1	Daytime	35	50	Yes
	Evening	35	50	Yes
	Nighttime	27	45	Yes
POR2	Daytime	34	50	Yes
	Evening	34	50	Yes
	Nighttime	27	45	Yes
POR3	Daytime	42	50	Yes
	Evening	42	50	Yes
	Nighttime	34	45	Yes
OPOR3	Daytime	43	50	Yes
	Evening	43	50	Yes
POR4	Daytime	40	50	Yes
	Evening	40	50	Yes
	Nighttime	32	45	Yes
POR5	Daytime	43	50	Yes
	Evening	43	50	Yes
	Nighttime	35	45	Yes

Noise due to stationary noise sources is predicted to meet the applicable sound level limits at all modeled receptors in the surrounding area.

5.5 Stationary Noise Control Recommendations

5.5.1 Mitigation for Surrounding Receptors

No predicted exceedances of the applicable stationary sound level limits at the surrounding receptors have been identified; therefore, no specific mitigation is recommended at this time.

6.0 Concluding Comments

Noise impacts associated with the proposed new commercial building development at 120 Lusk Street in Ottawa, ON are expected to be able to meet all applicable LUPA noise requirements for stationary noise sources. Therefore, the Project is considered to have an appropriate layout and design, based on typical equipment selections.

If changes to the development's design are done which differ from the design utilized as part of this report, acoustical modelling of the impacts of this equipment should be confirmed in order to evaluate compliance with applicable sound limits at surrounding sensitive receptors.

Please do not hesitate to contact us if there are any questions.

Yours Truly,

Thornton Tomasetti

Marc-André Bois
Senior Scientist

Reviewed by:

Marcus Li, P.Eng.
Vice President

Disclaimer

This report is provided in accordance with the contractual agreement between TT and the Client. In addition to our contractual obligations TT notes the following general disclaimers and qualifications regarding the content of this report.

In preparing this report, TT has relied upon the accuracy and completeness of information provided by the Client and other third parties (manufacturers, other consultants, etc.) and accepts no responsibility for errors or emissions by other parties in the information provided to TT.

This report has been prepared solely for the benefit of the Client and the content of this report is intended for informational purposes only. This report shall not be relied upon by any other parties, including but not limited to other consultants retained by the Client, or utilized for any other purposes.

Ultimate responsibility for the design and construction remains solely with the architect/engineer of record and/or the contractor(s). Achieving the required mitigation requirements relies on correct incorporation of mitigation recommendations into Architectural and Mechanical drawings and specifications, as well as correct installation during construction. It is recommended that the implementation of mitigation measures be reviewed by a qualified acoustical consultant.
On request, TT will provide a proposal for additional work such as to peer review noise control measures or observe on-site conditions as appropriate; however, notwithstanding the foregoing, it is expressly understood and agreed that TT shall not have control or charge of, and shall not be responsible for the

acts or omissions, including but not limited to means, methods, techniques, sequences and procedures, of the Design Professionals and/or Contractors performing design and/or construction on the Project. Accordingly, TT shall not be held responsible for the failure of any party to properly incorporate the mitigation measures stated in this report.

Appendix A: Figures

Thornton Tomasetti

Client Name

Dr. Sandra Iroakazi

Project Name

120 Lusk Street
Ottawa, Ontario

Figure Title

Project Location & Surroundings

Produced By

MAB

TT Project #

25013472

Figure #

1

Date

06/02/2025

Thornton Tomasetti

Client Name

Dr. Sandra Iroakazi

Project Name

120 Lusk Street
Ottawa, Ontario

Figure Title

Project Site Plan

Produced By

MAB

TT Project #

25013472

Figure #

2

Date

06/02/2025

Thornton Tomasetti

Client Name

Dr. Sandra Iroakazi

Project Name

120 Lusk Street
Ottawa, Ontario

Points of Noise Reception

ID	Height above ground (m)
POR1	4.5
POR2	7.5
POR3	4.5
OPOR3	1.5
POR4	4.5
POR5	24.0

Legend

Point Source
Building
Receiver

Figure Title

Stationary Noise PORs & Sources

Produced By

MAB

TT Project #

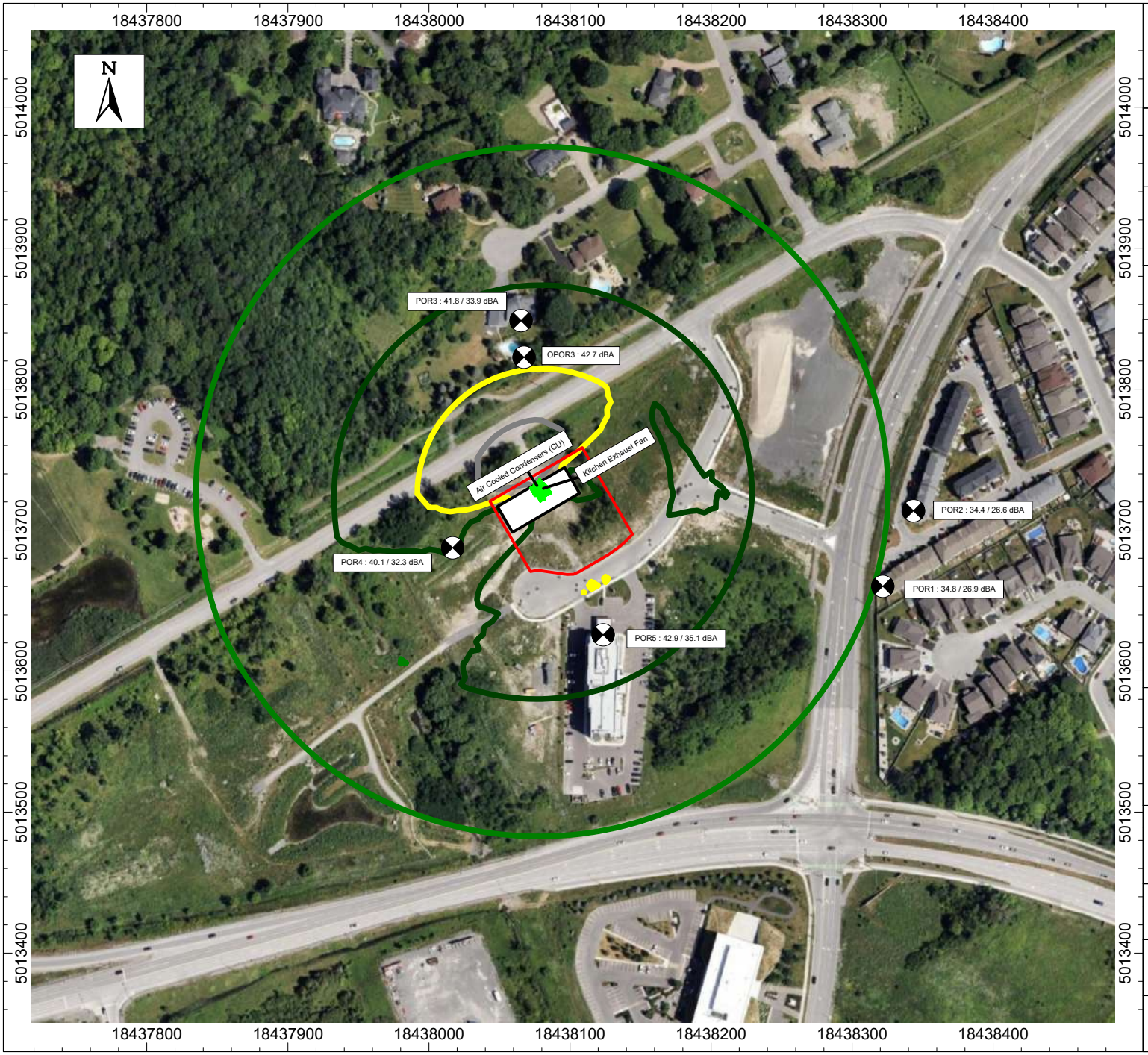
25013472

Figure #

3

Date

06/02/2025



Thornton Tomasetti

Client Name

Dr. Sandra Iroakazi

Project Name

120 Lusk Street
Ottawa, Ontario

Sound Pressure Levels

- > -99.0 dB (A)
- > 35.0 dB (A)
- > 40.0 dB (A)
- > 45.0 dB (A)
- > 50.0 dB (A)
- > 55.0 dB (A)
- > 60.0 dB (A)
- > 65.0 dB (A)
- > 70.0 dB (A)
- > 75.0 dB (A)
- > 80.0 dB (A)
- > 85.0 dB (A)

Grid = 5m x 5m ; height = 4.5m

Legend

- Point Source
- Building
- Receiver

Figure Title

Predicted Noise Impacts (Day / Night)
Unmitigated Steady Noise Sources

Produced By

MAB

TT Project #

25013472

Figure #

4

Date

06/02/2025

Appendix B: CadnaA Calculation Output

Report (20250502 - Lusk Street NIS.cna)

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	0.00
Night-time Penalty (dB)	0.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	3
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	20
rel. Humidity (%)	70
Ground Absorption G	0.80
Wind Speed for Dir. (#(Unit,SPEED))	0.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (NONE)	
Strictly acc. to AzB	

Result Table

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
POR1	!0000!		50	50				0.0	0.0	-	-	0.0	0.0	-	-	-
POR2	!0000!		50	50				0.0	0.0	-	-	0.0	0.0	-	-	-
POR3	!0000!		50	50				0.0	0.0	-	-	0.0	0.0	-	-	-
OPOR3	!0000!		50	50				0.0	0.0	-	-	0.0	0.0	-	-	-
POR4	!0000!		50	50				0.0	0.0	-	-	0.0	0.0	-	-	-
POR5	!0000!		50	50				0.0	0.0	-	-	0.0	0.0	-	-	-

Group Day and Night

Name	Expression	Partial Sum Level																	
		POR1			POR2			POR3			OPOR3			POR4			POR5		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Root	!*	34.8	34.8	26.9	34.4	34.4	26.6	41.8	41.8	33.9	42.7	42.7	34.9	40.1	40.1	32.3	42.9	42.9	35.1
General	!00*																		
Receptors	!0000*																		
Buildings	!0001*																		
Site Buildings	!0002*																		
Labels	!0003*																		
Location	!000300*																		
Site	!000301*																		
Bitmap	!0004*																		
Location	!000400*																		
Site	!000401*																		
Zoning	!000402*																		
Steady	!01*	34.8	34.8	26.9	34.4	34.4	26.6	41.8	41.8	33.9	42.7	42.7	34.9	40.1	40.1	32.3	42.9	42.9	35.1
Noise Sources	!0100*	34.8	34.8	26.9	34.4	34.4	26.6	41.8	41.8	33.9	42.7	42.7	34.9	40.1	40.1	32.3	42.9	42.9	35.1
Evaluation Grid	!0101*																		
Labels	!0102*																		
General	!010200*																		
Receptor	!010201*																		
Mitigation	!0103*																		
Impulse	!02*																		
Noise Sources	!0200*																		
Generator	!03*																		
Noise Sources	!0300*																		
Labels	!0301*																		

Partial Day/Night

Source			Partial Level																	
Name	M.	ID	POR1			POR2			POR3			OPOR3			POR4			POR5		
			Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
CU-1		!0100!	22.7	22.7	19.7	22.3	22.3	19.3	29.5	29.5	26.5	30.4	30.4	27.3	28.2	28.2	25.2	31.0	31.0	28.0
CU-2		!0100!	22.6	22.6	14.9	22.3	22.3	14.5	29.6	29.6	21.8	30.5	30.5	22.7	28.3	28.3	20.5	30.9	30.9	23.1
CU-3		!0100!	22.6	22.6	14.8	22.3	22.3	14.5	29.7	29.7	21.9	30.6	30.6	22.8	28.3	28.3	20.5	30.8	30.8	23.0
CU-4		!0100!	22.6	22.6	14.8	22.3	22.3	14.5	29.7	29.7	21.9	30.7	30.7	22.9	28.3	28.3	20.5	30.7	30.7	23.0
CU-5		!0100!	22.5	22.5	14.8	22.2	22.2	14.4	29.8	29.8	22.0	30.8	30.8	23.1	28.4	28.4	20.6	30.6	30.6	22.9
CU-6		!0100!	22.7	22.7	14.9	22.4	22.4	14.6	29.6	29.6	21.8	30.4	30.4	22.6	28.0	28.0	20.2	31.0	31.0	23.2
CU-7		!0100!	22.7	22.7	14.9	22.4	22.4	14.6	29.6	29.6	21.9	30.5	30.5	22.8	27.9	27.9	20.1	30.9	30.9	23.1
CU-8		!0100!	22.7	22.7	14.9	22.3	22.3	14.5	29.7	29.7	21.9	30.7	30.7	22.9	28.0	28.0	20.2	30.8	30.8	23.0
CU-9		!0100!	22.6	22.6	14.8	22.3	22.3	14.5	29.8	29.8	22.0	30.8	30.8	23.0	28.0	28.0	20.2	30.7	30.7	22.9
CU-10		!0100!	22.6	22.6	14.8	22.3	22.3	14.5	29.9	29.9	22.1	30.9	30.9	23.1	28.1	28.1	20.3	30.6	30.6	22.8
CU-11		!0100!	22.8	22.8	15.0	22.4	22.4	14.7	29.6	29.6	21.8	30.4	30.4	22.7	27.6	27.6	19.9	31.0	31.0	23.2
CU-12		!0100!	22.8	22.8	15.0	22.4	22.4	14.7	29.7	29.7	21.9	30.6	30.6	22.8	27.5	27.5	19.8	30.9	30.9	23.2
CU-13		!0100!	22.7	22.7	14.9	22.3	22.3	14.6	29.9	29.9	22.1	30.9	30.9	23.1	27.6	27.6	19.8	30.7	30.7	22.9
CU-14		!0100!	22.6	22.6	14.8	22.3	22.3	14.5	29.9	29.9	22.2	31.0	31.0	23.2	27.8	27.8	20.0	30.6	30.6	22.8

Source			Partial Level																	
Name	M.	ID	POR1			POR2			POR3			OPOR3			POR4			POR5		
			Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
Kitchen Exhaust		!0100!	26.1	26.1		26.0	26.0		33.1	33.1		33.9	33.9		31.1	31.1		34.2	34.2	

Sound Sources

Point Sources

Name	Sel.	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
				(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
CU-1			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	30.00	0.0		(none)	1.50	g	18438078.83	5013723.74	11.80
CU-2			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438078.10	5013724.99	11.80
CU-3			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438077.36	5013726.34	11.80
CU-4			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438076.61	5013727.58	11.80
CU-5			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438075.81	5013728.98	11.80
CU-6			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438080.34	5013724.50	11.80
CU-7			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438079.58	5013725.86	11.80
CU-8			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438078.79	5013727.21	11.80
CU-9			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438078.02	5013728.56	11.80
CU-10			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438077.26	5013729.83	11.80
CU-11			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438082.02	5013724.91	11.80
CU-12			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438081.86	5013726.33	11.80
CU-13			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438079.57	5013730.11	11.80
CU-14			!0100!	82.5	82.5	82.5	Lw	HVAC_1fan		0.0	0.0	0.0				60.00	60.00	10.00	0.0		(none)	1.50	g	18438078.35	5013731.23	11.80
Kitchen Exhaust			!0100!	85.9	85.9	85.9	Lw	KEF		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)	1.50	g	18438081.08	5013728.42	11.80

Receptors

Name	Sel.	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
				Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
POR1			!0000!	34.8	34.8	26.9	50.0	50.0	45.0				4.50	r	18438321.57	5013659.36	4.50
POR2			!0000!	34.4	34.4	26.6	50.0	50.0	45.0				7.50	r	18438343.38	5013712.96	7.50
POR3			!0000!	41.8	41.8	33.9	50.0	50.0	45.0				4.50	r	18438065.15	5013847.85	4.50
OPOR3			!0000!	42.7	42.7	34.9	50.0	50.0	0.0				1.50	r	18438067.22	5013821.88	1.50
POR4			!0000!	40.1	40.1	32.3	50.0	50.0	45.0				4.50	r	18438016.65	5013686.68	4.50
POR4		-	!0000!	-88.0	-88.0	-88.0	50.0	50.0	45.0				10.60	r	18438048.03	5013704.34	10.60
POR5			!0000!	42.9	42.9	35.1	50.0	50.0	45.0				24.00	r	18438123.27	5013624.98	24.00

Obstacles

Building

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	
							Begin	
							(m)	
			!0002!		0	0.21	10.30	r

Geometry Building

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(m)		(m)	(m)	(m)	(m)
			!0002!		0	0.21	10.30	r	18438048.45	5013716.05	10.30	0.00
									18438095.95	5013743.71	10.30	0.00
									18438106.57	5013725.37	10.30	0.00
									18438059.08	5013697.75	10.30	0.00

Receiver
Name: POR5
ID: !0000!
X: 18438123.27 m
Y: 5013624.98 m
Z: 24.00 m

Point Source, ISO 9613, Name: "CU-1", ID: "!0100!"																				
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)
6	18438078.83	5013723.74	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	51.7	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	31.0
6	18438078.83	5013723.74	11.80	0	N	A	82.5	0.0	-3.0	0.0	0.0	51.7	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	28.0
6	18438078.83	5013723.74	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	51.7	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	31.0

Point Source, ISO 9613, Name: "Kitchen Exhaust", ID: "!0100!"																				
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)
9	18438081.08	5013728.42	11.80	0	D	A	85.9	0.0	0.0	0.0	0.0	52.0	0.6	-0.9	0.0	0.0	0.0	0.0	0.0	34.2
9	18438081.08	5013728.42	11.80	0	N	A	85.9	0.0	-188.0	0.0	0.0	52.0	0.6	-0.9	0.0	0.0	0.0	0.0	0.0	-153.8
9	18438081.08	5013728.42	11.80	0	E	A	85.9	0.0	0.0	0.0	0.0	52.0	0.6	-0.9	0.0	0.0	0.0	0.0	0.0	34.2

Point Source, ISO 9613, Name: "CU-11", ID: "!0100!"																				
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)
12	18438082.02	5013724.91	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	51.7	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	31.0
12	18438082.02	5013724.91	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	51.7	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.2
12	18438082.02	5013724.91	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	51.7	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	31.0

Point Source, ISO 9613, Name: "CU-6", ID: "!0100!"																				
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)
15	18438080.34	5013724.50	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	51.8	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	31.0
15	18438080.34	5013724.50	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	51.8	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.2
15	18438080.34	5013724.50	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	51.8	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	31.0

Point Source, ISO 9613, Name: "CU-12", ID: "!0100!"																				
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	18438081.86	5013726.33	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	51.8	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.9
18	18438081.86	5013726.33	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	51.8	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.2
18	18438081.86	5013726.33	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	51.8	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.9

Point Source, ISO 9613, Name: "CU-2", ID: "!0100!"																				
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)
21	18438078.10	5013724.99	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	51.9	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.9
21	18438078.10	5013724.99	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	51.9	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.1
21	18438078.10	5013724.99	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	51.9	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.9

Point Source, ISO 9613, Name: "CU-7", ID: "!0100!"																				
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)
24	18438079.58	5013725.86	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	51.9	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.9
24	18438079.58	5013725.86	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	51.9	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.1
24	18438079.58	5013725.86	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	51.9	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.9

Point Source, ISO 9613, Name: "CU-3", ID: "!0100!"																				
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)
27	18438077.36	5013726.34	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.8
27	18438077.36	5013726.34	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.0
27	18438077.36	5013726.34	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.8

Point Source, ISO 9613, Name: "CU-8", ID: "!0100!"																				
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)
29	18438078.79	5013727.21	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.8
29	18438078.79	5013727.21	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	23.0
29	18438078.79	5013727.21	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	30.8

Point Source, ISO 9613, Name: "CU-4", ID: "!0100!"																				
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)
32	18438076.61	5013727.58	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.1	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.7
32	18438076.61	5013727.58	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.1	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	23.0
32	18438076.61	5013727.58	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.1	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.7

Point Source, ISO 9613, Name: "CU-9", ID: "!0100!"																				
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)
35	18438078.02	5013728.56	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.1	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.7
35	18438078.02	5013728.56	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.1	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	22.9
35	18438078.02	5013728.56	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.1	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.7

Point Source, ISO 9613, Name: "CU-13", ID: "!0100!"																				
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)
42	18438079.57	5013730.11	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.7
42	18438079.57	5013730.11	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	22.9
42	18438079.57	5013730.11	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.7

Point Source, ISO 9613, Name: "CU-5", ID: "!0100!"																				
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)
51	18438075.81	5013728.98	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.6
51	18438075.81	5013728.98	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	22.9
51	18438075.81	5013728.98	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.6

Point Source, ISO 9613, Name: "CU-10", ID: "!0100!"																				
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)
54	18438077.26	5013729.83	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.6
54	18438077.26	5013729.83	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	22.8
54	18438077.26	5013729.83	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.2	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.6

Point Source, ISO 9613, Name: "CU-14", ID: "!0100!"																				
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)
57	18438078.35	5013731.23	11.80	0	D	A	82.5	0.0	0.0	0.0	0.0	52.3	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.6
57	18438078.35	5013731.23	11.80	0	N	A	82.5	0.0	-7.8	0.0	0.0	52.3	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	22.8
57	18438078.35	5013731.23	11.80	0	E	A	82.5	0.0	0.0	0.0	0.0	52.3	0.7	-1.0	0.0	0.0	0.0	0.0	0.0	30.6