

Noise Impact & D6 Study

6285 & 6289 Main Street Niagara Falls, Ontario

SW23295.00

Prepared For

Peter Horn

**Zeljko Holdings Limited, Main-Murray
4724 Dorchester Road, Unit 11B (2nd Floor)**

Niagara Falls, ON L2E 7H9

Tel: 647.242.6956

tphorn75@gmail.com

Prepared By

Farhad Mirhosseini, P.Eng.

Thornton Tomasetti

23-366 Revus Avenue

Mississauga, Ontario L5G 4S5

Tel: +1 905.216.2810

FMirhosseini@ThorntonTomasetti.com

www.ThorntonTomasetti.com

Reviewed By

Robert Fuller, P.Eng.

Project Engineer

December 13, 2023

Table of Contents

1.0 Introduction..... 1

2.0 Site and Surrounding Area..... 1

2.1 Project Location 1

2.2 Zoning & Official Plan 1

2.3 Planned Development 2

2.4 Site Inspection 2

 2.4.1 Sound Level Measurements 2

2.1 Topography 2

3.0 Ministry of the Environment Conservation and Parks 3

4.0 Land Use Planning Authority 3

5.0 Transportation Noise Assessment 3

5.1 Critical Transportation Noise Receptors 3

5.2 Transportation Noise Sources 4

 5.2.1 Road Noise Sources 4

5.3 Transportation Sound Level Limits 5

 5.3.1 Outdoor Living Areas 5

 5.3.2 Indoor Living Areas..... 5

5.4 Transportation Sound Level Predictions 6

 5.4.1 Unmitigated Road Traffic 6

5.5 Transportation Noise Control Recommendations 6

 5.5.1 Outdoor Living Areas – Barriers 7

 5.5.2 Indoor Living Areas - Ventilation..... 7

 5.5.3 Indoor Living Areas - Building Components 8

 5.5.4 Warning Clauses 8

6.0 Stationary Noise Assessment..... 8

6.1 Critical Stationary Noise Receptors 8

 6.1.1 Project Receptors..... 9

 6.1.2 Surrounding Receptors 9

6.2 Stationary Noise Sources 10

 6.2.1 Project Sources 10

 6.2.2 Surrounding Sources 10

6.3 Project Area Classification 11

 6.3.1 Class 1 Area Exclusionary Sound Level Limits 11

6.4 Stationary Sound Level Predictions 12

 6.4.1 Unmitigated Stationary Noise Impacts on the Project 12

6.5 Stationary Noise Control Recommendations 13

 6.5.1 Mitigation for Project Receptors 13

 6.5.2 Mitigation for Surrounding Receptors 13

7.0 Land Use Compatibility 13

7.1 Regulatory Background	14
7.1.1 Provincial Policy Statement	14
7.1.2 Growth Plan	14
7.1.3 Environmental Protection Act	15
7.2 Recommended Setbacks	15
7.3 Surrounding Industrial Facilities	16
7.4 Facilities within Potential Influence Area	17
7.5 Facilities within Recommended Separation Distance	17
7.6 Project Design Recommendations	17
7.6.1 Noise Impacts	17
7.6.2 Odour & Dust Impacts	18
8.0 Concluding Comments	19

Appendix A : Figures

Appendix B : Traffic Data

Appendix C : Transportation Noise Predictions

Appendix D : Measured Sound Levels

Appendix E : Manufacturer Specifications

Appendix F : CadnaA Calculation Output

List of Tables

Table 1: Construction Elevations	3
Table 2: Points of Reception – Transportation Noise	4
Table 3: Traffic Data Summary	4
Table 4: Road Traffic Data Summary	5
Table 5: MECP Outdoor Sound Level Limit & Mitigation for OLAs – Road Traffic	5
Table 6: POW Sound Level Limit: Ventilation & Warning Clauses – Road Traffic	6
Table 7: Calculated Sound Levels due to Road Sources	6
Table 8: Transportation Noise Control Measures Summary	7
Table 9: OLA Barrier Specifications	7
Table 10: Project Points of Reception – Stationary Noise	9
Table 11: Surrounding Points of Reception – Stationary Noise	10
Table 12: Surrounding Stationary Noise Sources	11
Table 13: Class 1 Exclusionary Sound Level Limits – Steady Noise	12
Table 14: Predicted Stationary Noise Source Impacts to the Project	13
Table 15: D-6 Separation Distances for Industry Classes	15
Table 16: D-6 Industrial Categorization Criteria	16
Table 17: Actual or Potential Industrial Facilities Surrounding the Project	17

List of Figures

Figure 1: Project Location & Surroundings	20
Figure 2: Zoning Map	20
Figure 3: Project Site Plan	20

Figure 4: Transportation Noise PORs & Sources 20
Figure 5: Stationary Noise PORs & Sources 20
Figure 6: Recommended Mitigation Measures 20

1.0 Introduction

At the request of Zeljko Holdings Limited (Client), Thornton Tomasetti (TT) presents this Noise Impact Study (NIS) regarding the planned Main-Murray development located at 6285 & 6289 Main Street, and a portion of the former road allowance for Murray Street (the Project).

The purpose of this study is to assess the noise impacts on the Project from surrounding sources and the noise impact of the Project on surrounding noise sensitive areas. This report is intended to support the Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) application for the Project as a feasibility study.

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.

Where predicted noise impacts are lower than applicable action thresholds identified, the project should be designed to meet the Ontario Building Code (OBC) as a minimum standard.

2.0 Site and Surrounding Area

2.1 Project Location

The Project is located on the northwest corner of the intersection of Main Street, Murray Street, and Allendale Avenue, approximately 140m west of Stanley Avenue.

The Project is bordered on the north, east, and south by Tourist Commercial land uses. The Project is bordered on the west by Parking land uses. The broader neighborhood includes mixed commercial and industrial uses to the north, east, and south of the Project, and residential uses to the west of the Project.

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 TC "Tourist Commercial" under the City of Niagara Falls Zoning By-Law No. 79-200. Surrounding areas are zoned for residential, commercial, and institutional uses.

Based on the current planning applications webpage of the City of Niagara Falls, TT understands that two (2) significant developments are planned within ~300m of the Project Site in the surrounding area that could potentially introduce new surrounding noise sources or receptors that might impact or be impacted by the development. These developments include:

1. 5602 & 5592 Robinson Street (AM-2022-012): Zoning By-law Amendment & Official Plan Amendment (OPA) for a 77-storey building with a podium and tower consisting of 962 residential units (condo & hotel), up to 5553 sf of commercial space, bike parking, and below-, at-, and above-grade vehicle parking space;

A zoning map is presented in Figure 2.

2.3 Planned Development

The Project will consist of a new 20-storey residential condominium tower with town houses on the ground and second floors which includes five (5) levels of underground parking. The building will have a maximum height of approximately 72m. The Project includes a rooftop mechanical penthouse.

The proposed new site plan is provided in Figure 3.

2.4 Site Inspection

TT personnel attended the Project site on October 18, 2023, in order to inspect the acoustical environment in the area of the Project.

Transportation noise at the Project site was observed to be dominated by traffic noise from the nearby Stanley Avenue and nearby Main Street. Transportation noise from adjacent roadways is discussed in Section 5.0 of this report.

Audible noise from stationary sources located at Hydro One Murray Transformer Station facility, located at 5900 Murray Street, as well as HVAC noise from Fallsview Casino and Hilton Niagara Falls Hotel was observed at the Project site. The Hydro One Murray Transformer Station facility is operating under Certificate of Approval # 5178-4YKSSM according to the MECP. Stationary noise sources are discussed in Section 6.0 of this report.

2.4.1 Sound Level Measurements

A 20-minute noise measurement was conducted at the southeast corner of the Project site starting at 10:30am. This location is the closest point on the Project site to the rooftop HVAC equipment belonging to OLG Stage at Fallsview Casino and Hilton Niagara Falls, and the measured sound level was found to be 62 dBA, L_{eq-1hr} . Since another road noise measurement conducted at the northwest corner of the Project site yielded the same sound level of 62 dBA, it is TT's opinion that the measured noise level at southeast corner of the Project site was dominated by road traffic rather than the HVAC equipment from the casino and the hotel.

Three sound level measurements, each lasting 2 minutes, were conducted for the Hydro One Murray Transformer Station facility on its northern property line. Based on the results obtained, the sound power level of the facility was determined to be 46 dBA.

Details of the measurement conditions, methodology, and results are included in Appendix D.

2.1 Topography

Based on the observed and/or reported conditions on and around the Project site, the local topography is expected to be approximately flat.

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 LUPAs for this Project are the Niagara Region and the City of Niagara Falls. These LUPAs defer to the MECP’s guidelines as documented in NPC-300.

5.0 Transportation Noise Assessment

5.1 Critical Transportation Noise Receptors

NPC-300 defines a point of reception for the assessment of transportation noise sources as either the Plane of Window (POW) of a noise sensitive indoor space or an Outdoor Living Area (OLA) representing an area of a noise sensitive land use intended for quiet enjoyment of the outdoor environment.

The POW receptor(s) most likely to be affected by transportation noise are those representing the residential suites of the Project that have maximum exposure to Main Street and Stanley Ave. Specifically, POW receptors were assessed for the north, east, and west façades of the proposed development having exposure to Main Street and Stanley Avenue, at the highest elevation.

Based on provided site plans of the Project, TT understands that a total of 2 potential OLAs will be present, including the Level 2 Outdoor Amenity and the Rooftop Amenity. Each of these OLAs has been assessed. There are other terraces, and individual suites will have balconies, however because these are less than 4m in depth they have not been considered as OLAs.

The elevation of relevant floor levels of the Project is summarized in Table 1.

Table 1: Construction Elevations

Floor Level	Elevation (m)	Floor Height (m)	Midpoint Height (m)
2	214.32	8.82	-
20	269.18	63.68	65.18
Rooftop	272.54	67.04	-

The locations of the critical receptors for transportation noise are summarized in Table 2 and shown in Figure 4. POW elevations were taken to be the midpoint height of the highest floor with windows, and OLA elevations were taken to be 1.5m above the applicable level.

Table 2: Points of Reception – Transportation Noise

Receptor ID	Receptor Description	Receptor Location
POW1	North façade, highest window	Façade centre, 65m above ground
POW2	East façade, highest window	Façade centre, 65m above ground
POW3	West façade, highest window	Façade centre, 65m above ground
OLA1	Second Floor Outdoor Amenity	1.5m above second floor roof
OLA2	Rooftop Amenity	68.5m above ground

5.2 Transportation Noise Sources

5.2.1 Road Noise Sources

Main Street (adjacent to the north) and Stanley Avenue (~150m to the east) represent the significant road noise sources for the Project. Traffic data for Stanley Avenue and Main Street was obtained from the Niagara Region and the City of Niagara Falls, respectively, which provide Turning Movement Count (TMC) information for the intersection of Murray Street and Stanley Avenue and for Main Street, between Allendale Avenue and Symmes Street. This data is presented in Appendix B.

The highest hourly volumes of cars, trucks and busses recorded in the TMC data were identified and converted to AADT values by multiplying by 10 the greater of the AM and PM peak hour volumes. AADT estimates are summarized in Table 3.

Table 3: Traffic Data Summary

Street	Section	Time Period	Cars		Trucks		AADT
			Year	Volume	Year	Volume	
Stanley Avenue North of	Murray Street	AM Peak	2015	717	2015	55	13220
		PM Peak	2015	1278	2015	44	
		From 7 to 18	2015	7942	2015	342	
Main Street Between	Allendale Ave & Symmes St	AM Peak	2021	237	-	-	3908
		PM Peak	2021	313	-	-	
		Daily	2021	3908	-	-	

The total Annual Average Daily Traffic (AADT) was projected forward to 2035 (10 years after expected completion) using a growth rate of 2% per year from the noted year of measurement.

Truck percentages were estimated based on the TMC count for Stanley Avenue. The TMC data for Stanley Ave does not distinguish between medium trucks and heavy trucks. As such, as a conservative measure, all trucks are considered heavy trucks for the sake of this assessment. As for Main Street, the data provided by the City of Niagara Falls does not distinguish between vehicle types, therefore, trucks were assumed to comprise 13% of the traffic volume including 8% heavy trucks and 5 % medium trucks, as suggested by MTO’s Environmental Guide for Noise.

Posted speed limits on Stanley Avenue and Main Street are 50 and 40 km/hr, respectively. Road grades were assumed to be 0% in the area under review. The day/night split was assumed to be 90%/10%.

The traffic data used in the sound level calculations is summarized in Table 4.

Table 4: Road Traffic Data Summary

Parameter	Stanley Avenue	Main Street
AADT	13,220 (2015)	3,908 (2021)
% Annual Growth	2%	2%
Years of Annual Growth	20	14
% Medium Trucks	0%	5%
% Heavy Trucks	3.33%	8%
% Day (16h) / Night (8h)	90% / 10%	90% / 10%
Speed Limit	50 km/hr	40 km/hr
Gradient	0%	0%

5.3 Transportation Sound Level Limits

5.3.1 Outdoor Living Areas

Impacts to OLAs from road traffic are assessed against a 16-hour daytime (07:00 – 23:00) equivalent sound pressure level (L_{eq}) reported in dBA. The MECP outdoor sound level limits and the sliding scale of required noise reduction measures for road noise at OLAs are listed in Table 5.

Table 5: MECP Outdoor Sound Level Limit & Mitigation for OLAs – Road Traffic

Category	Sound Level $L_{eq,16hr}$ (dBA)	Mitigation Measures	NPC-300 Warning Clause Required
Outdoor Limit	55	None	None
OLA Mitigation Threshold	56 - 60	Optional	Type A unless sound level brought below 55 dBA
OLA Mitigation Threshold	>60	Required to achieve sound level below 60 dBA	Type B unless sound level brought below 55 dBA

5.3.2 Indoor Living Areas

Impacts to indoor living areas are assessed against a 16-hour daytime (07:00 – 23:00) and 8-hour nighttime (23:00 – 07:00) equivalent sound pressure level (L_{eq}) reported in dBA, at the relevant POW receptors.

Requirements for ventilation and warning clauses to address transportation noise impacts to the project Façades are determined based on the impact of road transportation sources. The applicable POW sound level limits and the sliding scale of required ventilation measures and warning clauses are listed in Table 6.

Table 6: POW Sound Level Limit: Ventilation & Warning Clauses – Road Traffic

Category	Daytime L _{eq,16hr} (dBA)	Nighttime L _{eq,8hr} (dBA)	Mitigation Measures	NPC-300 Warning Clause Required
POW Limit	55	50	None	None
POW Mitigation Threshold Living & Bedrooms	56 - 65	51 – 60	Include forced air heating and provision for central air conditioning	Type C
POW Mitigation Threshold Living & Bedrooms	>65	>60	Include central air conditioning	Type D

5.4 Transportation Sound Level Predictions

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, or other measures currently planned for the Project, but do not include additional noise measures identified in Section 5.5 of this report.

5.4.1 Unmitigated Road Traffic

Calculations of road traffic sound levels were performed using STAMSON 5.04, the software implementation of the MECP ORNAMENT model, which was developed and published by the MECP for transportation noise prediction. Only daytime sound levels are considered for outdoor amenity areas. The calculated sound levels at the receptors are presented in Table 7.

Table 7: Calculated Sound Levels due to Road Sources

POR ID	Predicted Transportation Sound Levels (dBA)	
	Daytime (07:00–23:00) L _{eq,16hr}	Nighttime (23:00–07:00) L _{eq,8hr}
POW01	64	57
POW02	62	55
POW03	61	54
OLA01	64	-
OLA02	64	-

The STAMSON calculation outputs for the traffic noise predictions are attached in Appendix C.

5.5 Transportation Noise Control Recommendations

Noise control recommendations for the identified critical receptors and the corresponding noise sensitive land uses that they represent in the proposed redevelopment are summarized in Table 8 and Figure 6 and discussed in the subsequent sections.

Table 8: Transportation Noise Control Measures Summary

POR ID	Noise Barrier	Ventilation	Warning Clause	Building Components
POW01	N/A	Forced-Air Heating	Type C*	Meet OBC Requirements
POW02	N/A	Forced-Air Heating	Type C*	Meet OBC Requirements
POW03	N/A	Forced-Air Heating	Type C*	Meet OBC Requirements
OLA1	Yes	N/A	N/A	A 2.0 m Tall Noise Barrier
OLA2	Yes	N/A	N/A	A 1.8 m Tall Noise Barrier

*Type D if central AC is provided.

5.5.1 Outdoor Living Areas – Barriers

Sound levels at the OLAs associated with the 2nd floor outdoor amenity and the rooftop outdoor amenity are expected to be higher than 60 dBA, and therefore require mitigation through a noise barrier.

Proposed noise barrier heights for OLAs are summarized in Table 9 and illustrated in Figure 6.

Table 9: OLA Barrier Specifications

Receptor ID	Mitigation Level	Predicted Sound Level L _{eq} (16h, day) dBA
OLA1	Unmitigated	64
	Noise barrier along north & east sides of 2 nd Floor Outdoor Amenity, 2m above roof	54
OLA2	Unmitigated	64
	Noise barrier along north & east sides of Rooftop Amenity 1.8 m above roof	53

NPC-300 indicates that typical noise barriers, if constructed, should have a minimum surface density (face weight) of 20 kg/m². Barriers should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained. To improve the visual characteristics of the barrier, transparent elements and/or landscaped soil berms may be included, if they meet the above conditions.

5.5.2 Indoor Living Areas - Ventilation

Sensitive receptors along the north, east, and west facade of the Project are expected to face POW sound levels between 55 dBA and 65 dBA during the 16-hour day (07:00 – 23:00) and/or 50 dBA and 60 dBA during the 8-hour night (23:00 – 07:00) due to road noise, therefore forced air heating with the provision for central air conditioning is the minimum requirement for these units.

Sensitive receptors along the south facade of the Project are expected to face POW sound levels below 55 dBA during the 16-hour day (07:00 – 23:00) and/or 50 dBA during the 8-hour night (23:00 – 07:00) due to road noise, therefore no specific ventilation requirements apply for the purposes of addressing transportation noise.

TT understands that the Project plan includes forced air heating and central air conditioning for the entirety of the Project, therefore the above noted requirements are expected to be met.

5.5.3 Indoor Living Areas - Building Components

None of the sensitive receptors along all the façades of the Project are expected to face POW sound levels above 65dBA during the 16-hour day (07:00 – 23:00) and/or 60- dBA during the 8-hour night (23:00 – 07:00) due to road noise, therefore building components on these façades need only be designed to meet the requirements of OBC.

5.5.4 Warning Clauses

The following examples of warning clause wordings are based on applicable guidance documents and TT's experience regarding common requests from stakeholders. Precise wordings may be modified by the Client with input from the relevant LUPA(s) and legal counsel if required.

The **Type C** warning clause is required to be included in the development agreements for specific dwelling units if one or more representative POW receptors is predicted to be exposed to transportation sound pressure levels greater than 55 dBA and less than or equal to 65 dBA during the 16-hour day (07:00 – 23:00) or greater than 50 dBA and less than or equal to 60 dBA during the 8-hour night (23:00 – 07:00) (excluding train whistle noise), and the Project includes forced air heating with the provision for installation of central air conditioning in the future. An example of a Type C warning clause is as follows:

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

The **Type D** warning clause is required to be included in the development agreements for specific dwelling units if one or more representative POW receptors is predicted to be exposed to transportation sound pressure levels greater than 65 dBA during the 16-hour day (07:00 – 23:00) or 60 dBA during the 8-hour night (23:00 – 07:00), and the Project includes central air conditioning. An example of a Type D warning clause is as follows:

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

6.0 Stationary Noise Assessment

6.1 Critical Stationary Noise Receptors

NPC-300 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). These locations may be the same or different from the POW and OLA receptors identified as part of a transportation noise assessment.

6.1.1 Project Receptors

The Project Point Of Reception (PPOR) and Project Outdoor Point of Reception (POPOR) receptor(s) on the Project most likely to be affected by stationary noise sources are those representing the residential suites that have maximum exposure to stationary noise sources associated with the surrounding properties in each direction, and the project itself.

Based on provided site plans of the Project, TT understands that a total of 2 potential POPORs will be present, including the Level 2 Outdoor Amenity and rooftop amenity. Each of these POPORs has been assessed. Individual suites will have balconies, however because these are less than 4m in depth they have not been considered as POPORs.

The locations of the critical receptors on the Project for stationary noise are summarized in Table 10 and shown in Figure 5. PPORs were assessed using a grid of receptors across the full facade, and POPORs were assessed at the most impacted point(s) within 30m of a building façade, 1.5m above ground/floor level.

Table 10: Project Points of Reception – Stationary Noise

Receptor ID	Receptor Description	Receptor Location
PPOR1	East façade	Building evaluation of full façade
PPOR2	North façade	Building evaluation of full façade
PPOR3	West façade	Building evaluation of full façade
PPOR4	South façade	Building evaluation of full façade
PPOR5	Eastern Façade (Townhouse)	Building evaluation of full façade
POPOR1	2 nd Floor Outdoor Amenity	SE corner, 1.5m above lower roof
POPOR2	Rooftop Amenity	E edge centre, 1.5m above roof

6.1.2 Surrounding Receptors

The Surrounding Point Of Reception (SPOR) and Surrounding Outdoor Point Of Reception (SOPOR) receptor(s) most likely to be affected by stationary noise from the Project include those associated with residential areas (*R1E: Residential 1E Density Zone & R5A: Residential Apartment 5A Density Zone*) to the west of the Project. Areas east, north, and south of the project are mainly zoned as *TC: Tourist Commercial Zone*.

The locations of the critical receptors in the surrounding area for stationary noise from the Project are summarized in Table 11, and shown in Figure 5. SPORs and SOPORs were assessed at the most impacted points associated with each cardinal direction.

Table 11: Surrounding Points of Reception – Stationary Noise

Receptor ID	Receptor Description	Receptor Location
SPOR1	Residential area west of Project	Ground floor (1.5m), east façade centre, 5675 Murray Street
SPOR2	Residential area west of Project	3 rd floor (7.5m), east façade centre, 6245 Main Street

6.2 Stationary Noise Sources

NPC-300 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).

Certain sources of noise, such as residential air conditioners, passenger automobile traffic in parking lots, or temporary noise such as that related to construction are not considered to be stationary sources in NPC-300 and are not assessed in this report. These sources are typically handled in a more qualitative fashion by applicable noise by-laws.

6.2.1 Project Sources

Due to the early stage of planning for the Project, detailed information regarding stationary noise sources at the project is not currently available. However, a preliminary sound level assessment at SPOR1 and SPOR2 illustrates that in order to respect the Class 1 exclusion limits, the overall sound power level of all the mechanical equipment (located on the roof of the project) of the project should not exceed 118 dB.

Note that stricter limitations may apply in order to achieve acceptable sound levels on the Project itself. Additional analysis should be conducted as the design progresses.

6.2.2 Surrounding Sources

Based on a review of satellite imagery and field inspection, exterior HVAC equipment and cooling tower(s) have been identified in the area surrounding the project. Table 12 and Figure 5 provide a summary of the assumed surrounding stationary source data. Because TT was unable to inspect equipment installed on surrounding properties, the following assumptions have been made:

- “Small” HVAC equipment (2 visible fans) was assumed to have a sound power level of approximately 82 dBA (based on Carrier model 48HCD07)
- “Small” HVAC equipment (1 visible fan) was assumed to have a sound power level of approximately 76 dBA (based on Carrier model 48HCA04)
- Cooling Tower was assumed to have a sound power level of 103 dB (based on BAC model S3E-1424-12S)

Table 12: Surrounding Stationary Noise Sources

Source ID	Source Description	Source Location	Source Sound Power	Source Type	Notes & Assumptions
			dBA		
SHVAC2 – SHVAC3	“Small” HVAC units (1 visible fan)	Hilton Niagara Falls	76	Steady	60 min/hr (07:00 – 23:00) 30 min/hr (23:00 – 07:00)
SHVAC1	“Small” HVAC units (2 visible fans)	Hilton Niagara Falls	85	Steady	60 min/hr (07:00 – 23:00) 30 min/hr (23:00 – 07:00)
SCOOL	Cooling Tower	Hilton Niagara Falls	103	Steady	60 min/hr (07:00 – 23:00) 30 min/hr (23:00 – 07:00)

6.3 Project Area Classification

NPC-300 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 NPC-300, based on the surrounding area features and its distance from major roads.

6.3.1 Class 1 Area Exclusionary Sound Level Limits

NPC-300 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 13 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). Routine testing of emergency equipment, if applicable, is assessed separately from other stationary noise sources, and is compared to sound level limits that are 5 dBA higher than would otherwise apply.

Table 13: Class 1 Exclusionary Sound Level Limits – Steady Noise

Time Period	Normal Operations Steady Noise (L _{eq,1hr} , dBA)		Emergency Equipment Testing Steady Noise (L _{eq,1hr} , dBA)	
	POR	OPOR	POR	OPOR
Daytime (07:00 – 19:00)	50	50	55	55
Evening (19:00 – 23:00)	50	50	55	55
Nighttime (23:00 – 07:00)	45	-	50	-

6.4 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 CadnaA calculation outputs are presented in Appendix F.

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, but do not include additional noise measures identified in Section 6.5 of this report.

6.4.1 Unmitigated Stationary Noise Impacts on the Project

The impact of stationary noise sources located on the project itself is not required to be assessed, as NPC-300 does not consider properties to be sensitive to their own noise sources: *“A land use that would normally be considered noise sensitive, such as a dwelling, but is located within the property boundaries of the stationary source is not considered a noise sensitive land use.”* TT has not considered these sources as part of this land use planning report, but recommends that they be evaluated as part of the design process, for example as part of an architectural acoustics report.

Table 14 provides a summary of the modelling results for stationary noise impacts to the Project, and Appendix F contains the full modelling output and illustrations.

Table 14: Predicted Stationary Noise Source Impacts to the Project

POR ID	Time Period	Steady Sound Level L_{eq,1hr} (dBA)	Steady Sound Level Limit L_{eq,1hr} (dBA)	Compliance
PPOR1	Daytime	45	50	Yes
	Evening	45	50	Yes
	Nighttime	42	45	Yes
PPOR2	Daytime	45	50	Yes
	Evening	45	50	Yes
	Nighttime	42	45	Yes
PPOR3	Daytime	44	50	Yes
	Evening	44	50	Yes
	Nighttime	41	45	Yes
PPOR4	Daytime	45	50	Yes
	Evening	45	50	Yes
	Nighttime	42	45	Yes
POPOR1	Daytime	45	50	Yes
	Evening	45	50	Yes
POPOR2	Daytime	45	50	Yes
	Evening	45	50	Yes

Noise due to the identified stationary noise sources is predicted to meet the applicable sound level limits at all modeled receptors on the Project.

6.5 Stationary Noise Control Recommendations

6.5.1 Mitigation for Project Receptors

No predicted exceedances of the applicable stationary sound level limits at the Project receptors have been identified; therefore, no additional mitigation is recommended at this time. Constructing the Project to meet OBC and the identified requirements for mitigation of transportation noise is expected to be sufficient to address potential impacts from minor stationary noise sources in the vicinity of the Project.

6.5.2 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.

7.0 Land Use Compatibility

Industrial and sensitive land uses are commonly separated by LUPAs in their official plans and zoning by-laws. When these types of land use occur near each other there is a potential for conflict due to contaminants such as noise from the industrial land use. While industrial facilities are required to limit their impacts on surrounding sensitive land uses and are often designed with mitigation measures

intended to address existing neighbors, the introduction of new sensitive receptors can lead to increased complaints, and more stringent mitigation requirements for existing facilities.

7.1 Regulatory Background

7.1.1 Provincial Policy Statement

The *Provincial Policy Statement, 2020 Under the Planning Act* (PPS), published by the government of Ontario came into effect on May 1, 2020. Section 1.2.6 of the PPS reads as follows:

1.2.6.1 Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.

1.2.6.2 Where avoidance is not possible in accordance with policy 1.2.6.1, planning authorities shall protect the long-term viability of existing or planned industrial, manufacturing or other uses that are vulnerable to encroachment by ensuring that the planning and development of proposed adjacent sensitive land uses are only permitted if the following are demonstrated in accordance with provincial guidelines, standards and procedures:

- a) there is an identified need for the proposed use;*
- b) alternative locations for the proposed use have been evaluated and there are no reasonable alternative locations;*
- c) adverse effects to the proposed sensitive land use are minimized and mitigated; and*
- d) potential impacts to industrial, manufacturing or other uses are minimized and mitigated.*

Ontario's *Planning Act* requires that land use planning decisions "shall be consistent" with the Provincial Policy Statement.

7.1.2 Growth Plan

The *A Place to Grow, Growth Plan for the Greater Golden Horseshoe Office Consolidation 2020* (GP), published by the government of Ontario in August 2020 identifies the following instructions regarding land use compatibility:

Section 2.2.5: 7. Municipalities will plan for all employment areas within settlement areas by:

- a) prohibiting residential uses and prohibiting or limiting other sensitive land uses that are not ancillary to the primary employment use;*
- b) prohibiting major retail uses or establishing a size or scale threshold for any major retail uses that are permitted and prohibiting any major retail uses that would exceed that threshold; and*
- c) providing an appropriate interface between employment areas and adjacent non-employment areas to maintain land use compatibility.*

Ontario's *Places to Grow Act* requires that land use planning decisions "shall conform" with the relevant Growth Plan.

7.1.3 Environmental Protection Act

Section 9 of Ontario’s Environmental Protection Act (EPA) requires that industrial facilities obtain an approval to operate from the MECP.

Approval, plant or production process

9 (1) No person shall, except under and in accordance with an environmental compliance approval,

(a) use, operate, construct, alter, extend or replace any plant, structure, equipment, apparatus, mechanism or thing that may discharge or from which may be discharged a contaminant into any part of the natural environment other than water; or

(b) alter a process or rate of production with the result that a contaminant may be discharged into any part of the natural environment other than water or the rate or manner of discharge of a contaminant into any part of the natural environment other than water may be altered.

In order to obtain and maintain this approval, industrial facilities are required to demonstrate that their emissions (including noise emissions) are within applicable limits at nearby sensitive receptors.

7.2 Recommended Setbacks

The *D-6 Compatibility Between Industrial Facilities* (D6) guideline published by the MECP was last revised in July 1995, and sets out potential influence areas, as well as minimum recommended separation distances for industrial facilities from sensitive land uses.

The D6 guidelines are generally accepted as applicable screening standards for demonstrating compliance with the PPS and GP requirements for land use compatibility. In cases where a sensitive land use would be located within the identified minimum recommended separation distance, additional consideration and mitigation is typically recommended in order to ensure that the sensitive land use is not subject to adverse effects, and the industrial facility is not unreasonably limited in its operations.

The separation distances may be determined from different points on the properties depending on the site conditions; however, the typical measurement is based on the property lines. Table 15 provides the potential influence area and recommended minimum separation distance from the industrial facility to the sensitive land use and Table 16 shows the criteria for the categorization of the industrial facilities.

Table 15: D-6 Separation Distances for Industry Classes

Category	Potential Influence Area	Recommended Minimum Separation Distance
Class I	70m	20m
Class II	300m	70m
Class III	1000m	300m

Table 16: D-6 Industrial Categorization Criteria

Category	Outputs	Scale	Process	Operation/Intensity
Class I	<ul style="list-style-type: none"> - Sound not audible off property - No ground borne vibration on plant property - Infrequent and not intense dust and/or odour 	<ul style="list-style-type: none"> - No outside storage - Small scale plant or scale is irrelevant in relation to all other criteria for this Class 	<ul style="list-style-type: none"> - Self-contained plant or building which produces/stores a packaged product - Low probability of fugitive emissions 	<ul style="list-style-type: none"> - Daytime operations only - Infrequent movement of products and/or heavy trucks
Class II	<ul style="list-style-type: none"> - Sound occasionally audible off property - Possible ground borne vibration, but cannot be perceived off property - Frequent and occasionally intense dust and/or odour 	<ul style="list-style-type: none"> - Outside storage permitted - Medium level of production allowed 	<ul style="list-style-type: none"> - Open process - Periodic outputs of minor annoyance - Low probability of fugitive emissions 	<ul style="list-style-type: none"> - Shift operations permitted - Frequent movement of products and/or heavy trucks with the majority of movements during daytime hours
Class III	<ul style="list-style-type: none"> - Sound frequently audible off property - Ground borne vibration can frequently be perceived off property - Persistent and/or intense dust and/or odour. 	<ul style="list-style-type: none"> - Outside storage of raw and finished products - Large production levels 	<ul style="list-style-type: none"> - Open process - Frequent outputs of major annoyances - High probability of fugitive emissions 	<ul style="list-style-type: none"> - Continuous movement of products and employees - Daily shift operations permitted

The D6 guideline also states that: *“When a change in land use is proposed for either industrial or sensitive land use, less than the minimum separation distance ... may be acceptable subject to either the municipality or the proponent providing a justifying impact assessment (i.e. a use specific evaluation of the industrial processes and the potential for off-site impacts on existing and proposed sensitive land uses). Mitigation is the key to dealing with less than the minimum to the greatest extent possible.”*

7.3 Surrounding Industrial Facilities

Based on a review of satellite imagery, zoning maps, and existing MECP approvals in the vicinity of the Project as well as a field inspection of the surrounding area, TT has identified the actual or potential industrial (or similar) facilities listed in Table 17 for consideration.

Table 17: Actual or Potential Industrial Facilities Surrounding the Project

Category	Name	Location	Distance	Description
Class I	Hospitality Fallsview Holdings Inc.	6361 Fallsview Boulevard	150m	OLG Stage at Fallsview Casino, operating under ECA #8749-ACBLYS
Class I	Falls Management Company	6380 Fallsview Boulevard	275m	Fallsview Casino Resort, operating under CofA #3297-5PYLHD
Class II	Ontario Power Generation Inc.	5900 Murray Street	75m	Niagara Transformer Station, operating under CofA #5178-4YKSSM

7.4 Facilities within Potential Influence Area

Based on the information reviewed, the only potentially significant industrial facility in the vicinity of the Project is the Ontario Power Generation Inc. Niagara Transformer Station.

This facility currently operates under Certificate of Approval #5178-4YKSSM, which includes one small baghouse dust collector serving a carpentry shop.

There are existing noise sensitive land uses (residential) as close or closer to the industrial facility than the Project Site, and based on TT’s measurements described in Section 2.4.1, the sound emissions from the transformer station are low. Therefore, as the facility is already required to meet applicable noise limits at closer receptors, and appears to have low overall noise emissions, the Project is not anticipated to be subject to significant noise impacts, or to impair the ability of the facility to maintain its approval.

7.5 Facilities within Recommended Separation Distance

No existing industrial facilities have been identified within a recommended separation distance of the Project.

7.6 Project Design Recommendations

As noted in the Provincial Policy Statement and Growth Plan, land use planning decisions are required to avoid potential adverse effects, particularly in relation to adjacent properties, and to provide an appropriate interface between industrial facilities and sensitive land uses. The simplest method to achieve this is through separation distance, as described in the MECP’s D-6 guidance documents.

7.6.1 Noise Impacts

In order to minimize the potential for impacts from the adjacent facilities at the Project, TT recommends the following general design principles:

- Communal outdoor living areas should be located on the opposite side of the Project building(s) from the transformer station and Fallsview Casino and/or screened from these properties so that there is no unobstructed line of sight.

The proposed Project plan generally complies with these recommendations, as the rooftop amenity area will be shielded from the transformer station and lower areas of the nearby casinos by the building façade and safety parapet.

7.6.2 Odour & Dust Impacts

Unlike noise which is assessed at the nearest sensitive receptor, emission limits for odour and dust typically apply at all property boundaries. Therefore, the Project is not expected to have a significant impact on the ability of the existing surrounding facilities to maintain their approvals with respect to odour, dust, or other air emissions.

Nearby roads may be a potential source of nuisance odour and dust. In order to minimize the potential for impacts from these and other similar sources TT recommends the following general design principles:

- Air intakes for HVAC equipment on the Project Site should be fitted with appropriate air filters to remove dust and fine particulate matter.

8.0 Concluding Comments

Noise impacts associated with the proposed development at 6285 & 6289 Main Street are expected to be able to meet all applicable LUPA noise requirements with the inclusion of noise control measures and warning clauses as summarized in Figure 6 and presented in Section 5.5 of this report for transportation noise sources and Section 6.5 of this report for stationary noise sources. The proposed development should therefore be approved.

As described in Section 6.4.1, the Project is not considered to be sensitive to its own stationary noise sources, and impacts from these sources to the Project have not been assessed as part of this report. Although NPC-300 does not require these sources to be assessed for land use planning purposes, TT recommends that they be considered under separate cover, such as an architectural acoustics report.

As the design of the development proceeds, and mechanical equipment is selected, acoustical modelling of the impacts of this equipment should be confirmed in order to evaluate compliance with applicable sound limits at surrounding sensitive receptors, and confirm that impacts to the Project itself will be acceptable.

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

Yours Truly,

Thornton Tomasetti



Farhad Mirhosseini, P.Eng.
Senior Acoustic Engineer

Reviewed by:

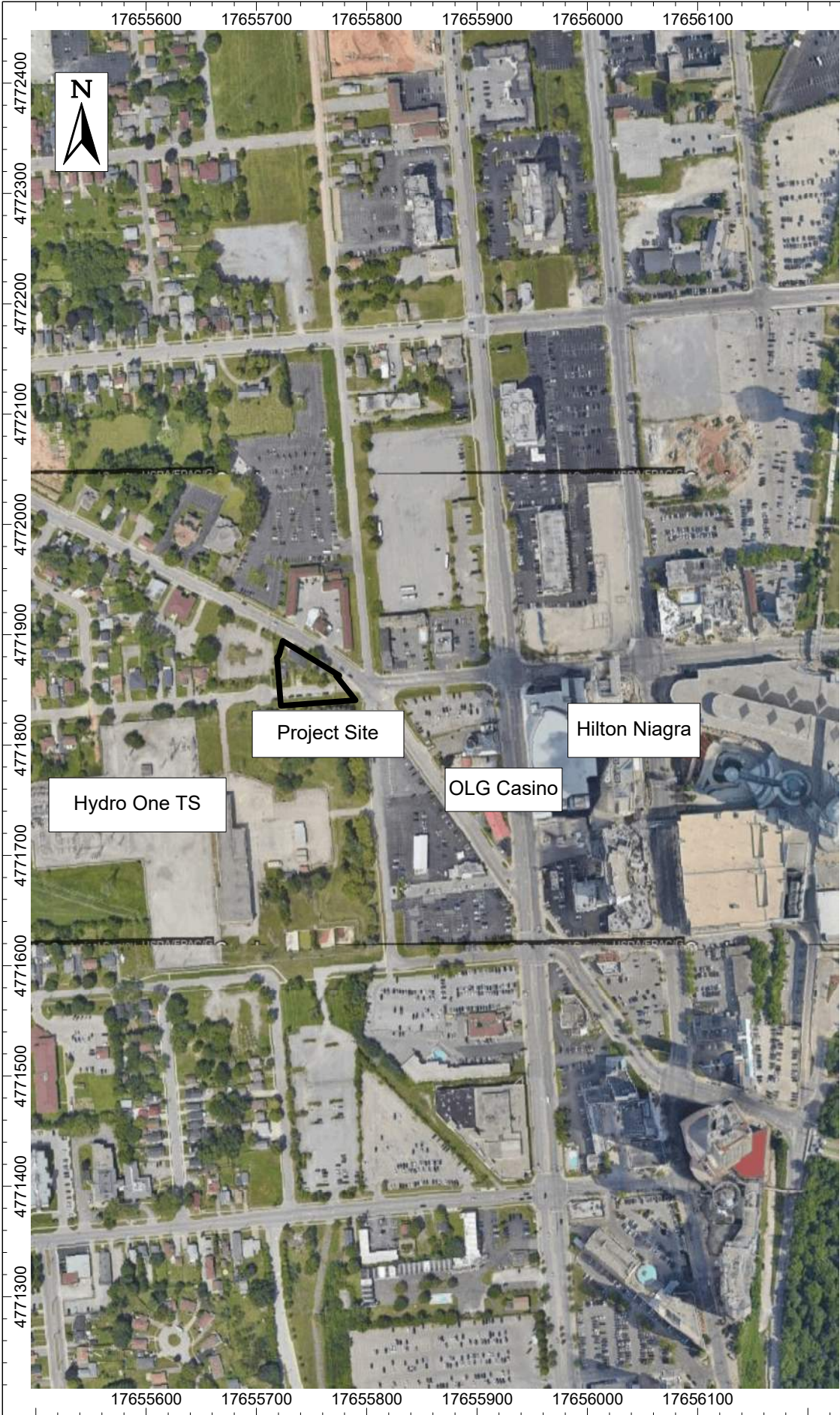
Robert Fuller, P.Eng.
Project Engineer

Disclaimer

Achieving the required noise control requirements relies on correct incorporation of noise control recommendations into Architectural and Mechanical drawings and specifications, as well as correct installation during construction. On Request, TT will conduct drawing reviews and onsite reviews of noise control measures and provide observations 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 noise control measures stated in this report.

Appendix A: Figures

- Figure 1: Project Location & Surroundings
- Figure 2: Zoning Map
- Figure 3: Project Site Plan
- Figure 4: Transportation Noise PORs & Sources
- Figure 5: Stationary Noise PORs & Sources
- Figure 6: Recommended Mitigation Measures



**Thornton
Tomasetti**

Client Name
Main-Murray

Project Name
Noise Impact Assessmnet
6285 Main St



Hydro One TS

Project Site

OLG Casino

Hilton Niagara

Figure Title
Location & Surrounding

Produced By
Farhad Mirhosseini

TT Project #
SW23295.00

Date
10/27/2023

Figure #
1

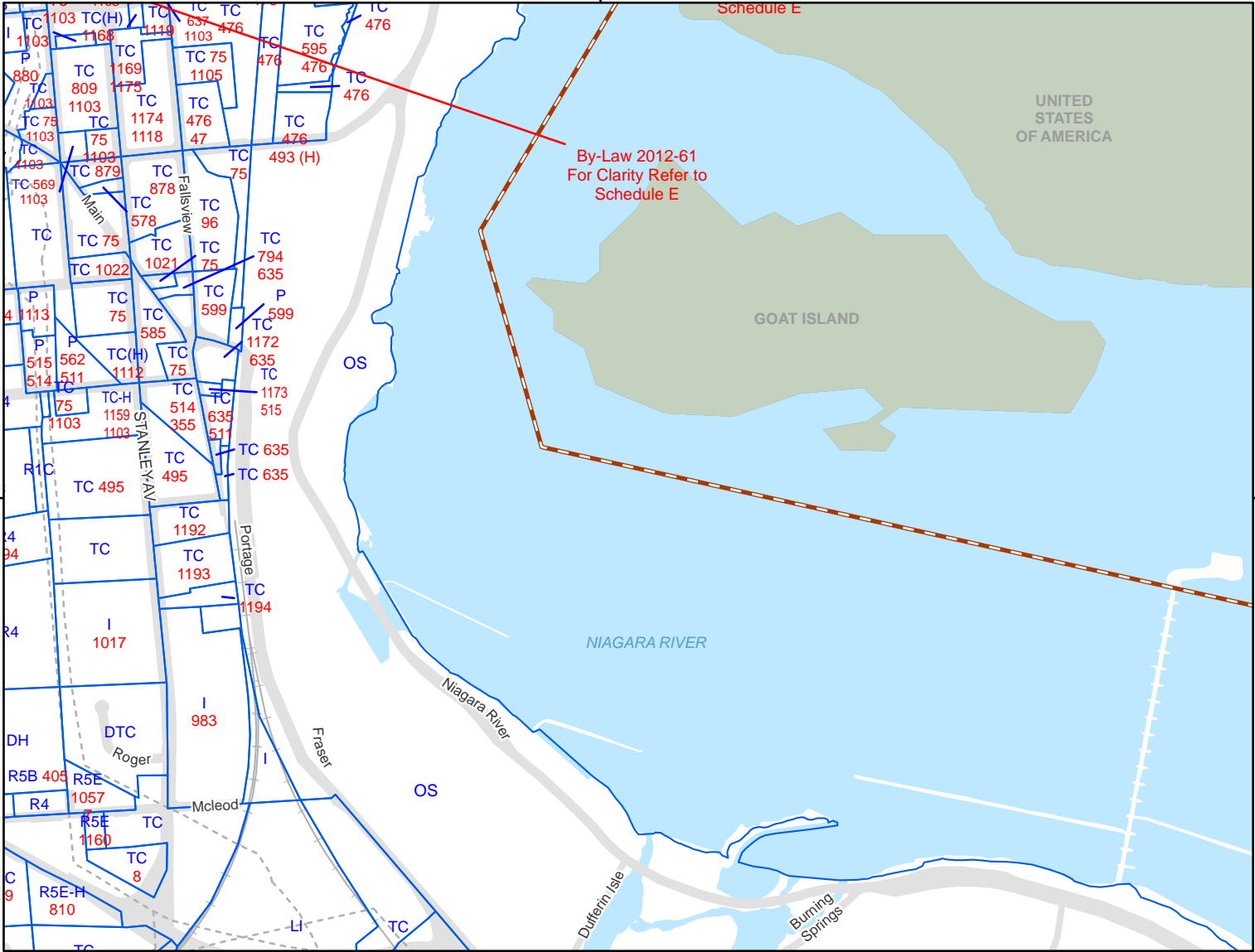
ZONING BY-LAW 79-200



— ZONE LINES

EXCEPTIONS & SPECIAL PROVISION NO.
SEE SECTION 19

- 98-157 07-195 22-007
- 99-117 07-154 22-063
- 99-272 08-011 22-068
- 00-103 08-039 22-093
- 01-090 09-075 22-099
- 01-149 09-139 22-100
- 01-185 10-120 22-101
- 02-066 12-062 22-103
- 02-110 12-080
- 02-135 12-081
- 02-136 12-082
- 02-210 13-077
- 03-009 13-108
- 03-046 13-109
- 02-202 13-110
- 03-164 15-139
- 04-017 16-049
- 04-073 16-053
- 04-117 17-062
- 04-126 19-083
- 05-014 19-133
- 07-001 20-045
- 07-022 22-004

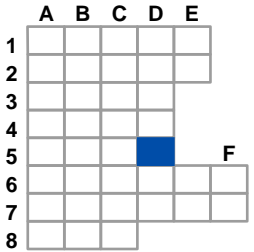


By-Law 2012-61
For Clarity Refer to
Schedule E

CITY OF NIAGARA FALLS
Planning & Development Department



Scale 1:13,000



CONSOLIDATION
DECEMBER 2022

SHEET D5

NO.	ISSUED	DATE
6	CLIENT REVIEW	2022-02-28
7	CLIENT REVIEW	2022-08-09
8	PRE-CON	2022-09-02
9	PRE-CON REVISION	2022-09-07
10	CLIENT REVIEW	2023-02-28
11	CLIENT REVIEW	2023-03-08
12	CLIENT REVIEW	2023-06-20
13	CLIENT REVIEW	2023-09-03
14	CLIENT REVIEW	2023-07-10
16	REZONING APPLICATION	2023-12-08

UNIT ROOM MIX %				
Name	Area	Count	%	
1 BR	546 ft² ... 588 ft²	95	51%	
1 BR ACC	596 ft² ... 597 ft²	19	10%	
2 BR	739 ft² ... 777 ft²	56	30%	
2 BR ACC	813 ft²	18	10%	
		188	100%	

UNIT ROOM MIX % - ACCESSIBLE				
Name	Area	Count	%	
1 BR ACC	596 ft² ... 597 ft²	19	10%	
2 BR ACC	813 ft²	18	10%	
		37	20%	

NON-ACCESSIBLE				
Name	Area	Count	%	
1 BR	546 ft² ... 588 ft²	95	51%	
2 BR	739 ft² ... 777 ft²	56	30%	
		151	80%	
		188	100%	

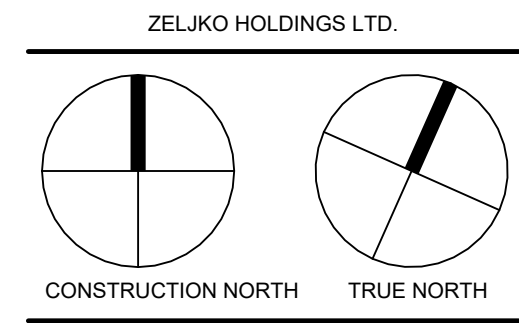
SITE PLAN LEGEND

- PROPERTY LINE
- BUILDING SETBACK LINE
- ROW/EASEMENT LINE
- U/G PARKING LINE
- BUILDING ABOVE
- LANDSCAPED AREA
REFER TO LANDSCAPE DRAWINGS
- CONCRETE SIDEWALK / WALKWAY / CURB
- ASPHALT PAVING
REFER TO CIVIL DRAWINGS
- DECORATIVE PAVING STONE
- BUILDING FOOTPRINT
- BUILDING FOOTPRINT
- FIRE ROUTE
- 100 mm WIDE PAINTED LINES
AT 400 mm O.C. / COLOUR TO BE WHITE
- MAIN ENTRANCE
- SECONDARY ENTRANCE

DO NOT SCALE DRAWINGS. USE ONLY DRAWINGS MARKED "ISSUED FOR CONSTRUCTION". VERIFY CONFIGURATIONS AND DIMENSIONS ON SITE BEFORE BEGINNING WORK. NOTIFY ARCHITECT IMMEDIATELY OF ANY ERRORS, OMISSIONS OR DISCREPANCIES.

CHAMBERLAIN ARCHITECT SERVICES LIMITED AND CHAMBERLAIN CONSTRUCTION SERVICES LIMITED HAVE SIMILAR OWNERSHIP.

CHAMBERLAIN ARCHITECT SERVICES LIMITED HAS COPYRIGHT. CONSTRUCTING A SUBSTANTIALLY SIMILAR BUILDING WITHOUT PERMISSION MAY VIOLATE THE COPYRIGHT OWNER'S RIGHTS. MAKING MINOR CHANGES TO PLANS DOES NOT NECESSARILY AVOID COPYRIGHT INFRINGEMENT. INNOCENT INFRINGEMENT IS NOT A DEFENSE TO COPYRIGHT INFRINGEMENT. © SEAL



6285 & 6289 MAIN ST.

NIAGARA FALLS, ON

SHEET NAME

GROUND FLOOR PLAN (SITE)

START DATE: OCTOBER 2019
 DRAWN BY: HK/SS/AS/SR
 CHECKED BY: JM/CMC
 SCALE: As indicated
 PROJECT NO.: 119051

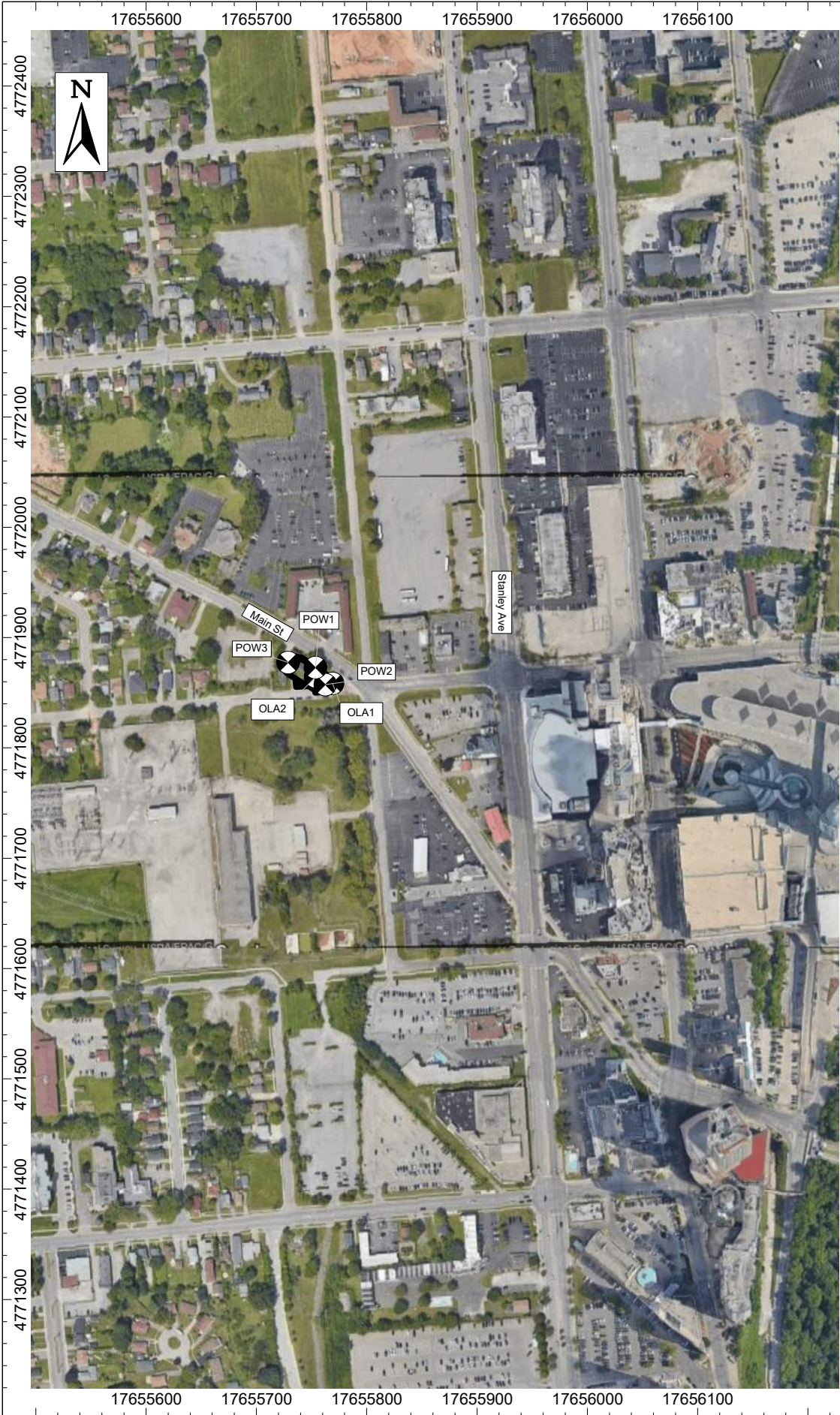
DRAWING



GROUND FLOOR PLAN
A-101 1 : 150

A.101

C:\Users\sharmad\Documents\119051 - Niagara Falls Condo - Building RVT2024 (0225-11-30) - InPlan\NPP\FVT



**Thornton
Tomasetti**

Client Name

Main-Murray

Project Name

Noise Impact Assessment
6285 Main St

Legend

-  Building
-  Receiver

Figure Title

Transportation Noise
PORs & Sources

Produced By

Farhad Mirhosseini

TT Project #

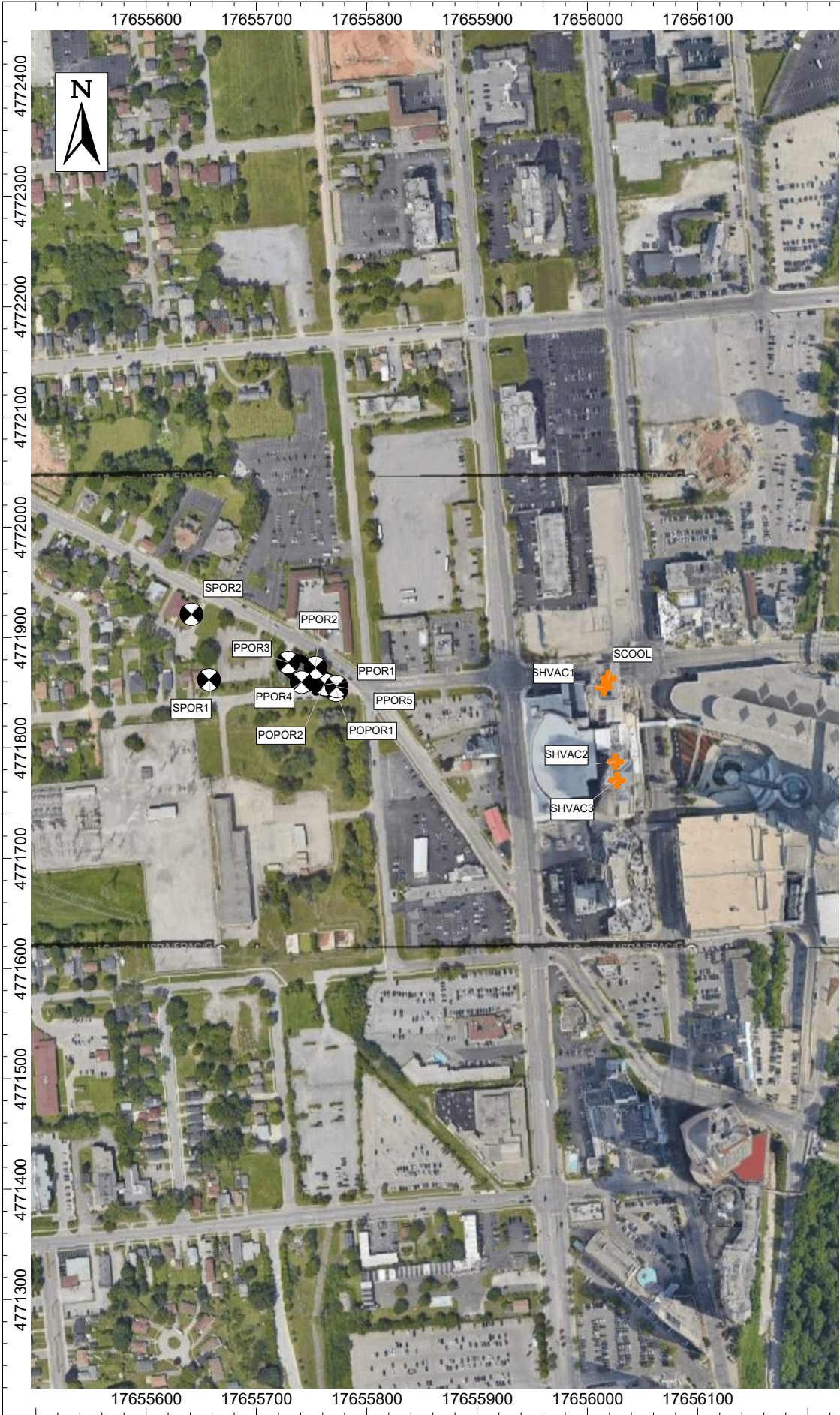
SW23295.00

Figure #

4

Date

10/27/2023



Client Name
Main-Murray

Project Name
Noise Impact Assessment
6285 Main St

Legend
 Point Source
 Building
 Receiver

Figure Title
Site Location Plan

Produced By
Farhad Mirhosseini

TT Project #
SW23295.00

Figure #

Date
10/27/2023

5



**Thornton
Tomasetti**

Client Name
Main-Murray

Project Name
Noise Impact Assessment
6285 Main St

1.8 m Tall Noise Wall

2.0 m Tall Noise Wall



Legend
 Building
 Barrier

Figure Title
Recommended Mitigation Measures

Produced By
Farhad Mirhosseini

TT Project #
SW23295.00

Figure #

Date
10/27/2023

6

Appendix B: Traffic Data

Prepared For: City of Niagara Falls
 Prepared By: *PYRAMID Traffic Inc.*
 Location: Main St, btwn Allendale Ave & Stanley Ave
 Start Date: Wednesday Jul 14, 2021

Site ID: 4322
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary	Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	0	2		12:15	1	21	88
0:30	2	1		12:30	0	21	84
0:45	1	6		12:45	0	20	88
1:00	0	3	15	13:00	1	17	81
1:15	0	0	13	13:15	1	26	86
1:30	0	2	12	13:30	2	14	81
1:45	0	1	6	13:45	1	24	86
2:00	1	3	7	14:00	2	22	92
2:15	0	0	7	14:15	3	23	91
2:30	0	0	5	14:30	3	19	97
2:45	0	0	4	14:45	3	17	92
3:00	0	2	2	15:00	0	26	94
3:15	0	1	3	15:15	1	27	96
3:30	0	1	4	15:30	3	25	102
3:45	0	0	4	15:45	0	22	104
4:00	0	1	3	16:00	2	21	101
4:15	0	0	2	16:15	1	16	90
4:30	0	3	4	16:30	1	17	80
4:45	0	2	6	16:45	0	24	82
5:00	0	2	7	17:00	3	31	93
5:15	0	3	10	17:15	1	18	95
5:30	0	1	8	17:30	3	22	102
5:45	0	2	8	17:45	12	21	111
6:00	0	2	8	18:00	2	25	104
6:15	0	8	13	18:15	0	25	110
6:30	0	9	21	18:30	1	22	108
6:45	0	18	37	18:45	4	13	92
7:00	0	6	41	19:00	1	17	83
7:15	2	3	38	19:15	3	17	78
7:30	1	9	39	19:30	1	14	70
7:45	0	19	40	19:45	3	18	74
8:00	0	16	50	20:00	3	15	74
8:15	0	18	63	20:15	0	16	70
8:30	0	9	62	20:30	0	9	64
8:45	1	21	65	20:45	4	8	55
9:00	2	9	60	21:00	2	11	50
9:15	0	11	53	21:15	1	3	38
9:30	1	9	54	21:30	0	12	41
9:45	1	14	47	21:45	2	7	38
10:00	2	11	49	22:00	0	4	29
10:15	0	15	53	22:15	2	9	36
10:30	2	12	57	22:30	1	11	36
10:45	0	12	54	22:45	1	5	33
11:00	0	15	56	23:00	4	7	40
11:15	2	9	52	23:15	2	7	38
11:30	1	24	63	23:30	1	6	33
11:45	2	14	67	23:45	3	4	34
12:00	0	25	77	0:00	2	2	27

AM Peak: 77

PM Peak: 111

24 HR VOLUME: 1243

Prepared For: City of Niagara Falls
 Prepared By: *PYRAMID Traffic Inc.*
 Location: Main St, btwn Allendale Ave & Symmes St
 Start Date: Wednesday Jul 21, 2021

Site ID: 4323
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	9	6	
0:30	21	6	
0:45	13	4	
1:00	7	2	68
1:15	8	7	68
1:30	3	2	46
1:45	3	1	33
2:00	6	5	35
2:15	4	3	27
2:30	4	1	27
2:45	1	1	25
3:00	4	3	21
3:15	2	2	18
3:30	2	4	19
3:45	0	0	17
4:00	3	0	13
4:15	4	2	15
4:30	3	3	15
4:45	3	3	21
5:00	3	2	23
5:15	3	2	22
5:30	10	8	34
5:45	13	11	52
6:00	12	7	66
6:15	11	14	86
6:30	17	19	104
6:45	29	36	145
7:00	19	22	167
7:15	16	11	169
7:30	10	17	160
7:45	29	39	163
8:00	21	27	170
8:15	19	14	176
8:30	23	22	194
8:45	23	32	181
9:00	23	15	171
9:15	15	17	170
9:30	18	29	172
9:45	29	28	174
10:00	24	32	192
10:15	18	29	207
10:30	19	15	194
10:45	33	35	205
11:00	27	29	205
11:15	18	23	199
11:30	30	42	237
11:45	22	34	225
12:00	29	32	230

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
12:15	28	32	249
12:30	23	31	231
12:45	20	31	226
13:00	18	31	214
13:15	31	40	225
13:30	15	26	212
13:45	15	36	212
14:00	20	25	208
14:15	24	37	198
14:30	27	45	229
14:45	25	45	248
15:00	30	44	277
15:15	30	36	282
15:30	28	42	280
15:45	38	37	285
16:00	46	37	294
16:15	34	35	297
16:30	25	32	284
16:45	51	53	313
17:00	29	28	287
17:15	35	49	302
17:30	43	8	296
17:45	46	17	255
18:00	31	43	272
18:15	25	29	242
18:30	31	32	254
18:45	21	32	244
19:00	31	29	230
19:15	19	31	226
19:30	26	25	214
19:45	39	31	231
20:00	22	24	217
20:15	23	21	211
20:30	24	26	210
20:45	22	21	183
21:00	28	21	186
21:15	23	17	182
21:30	19	19	170
21:45	18	6	151
22:00	13	0	115
22:15	20	0	95
22:30	25	11	93
22:45	14	14	97
23:00	24	23	131
23:15	15	16	142
23:30	11	10	127
23:45	23	16	138
0:00	13	12	116

AM Peak: **237**

PM Peak: **313**

24 HR VOLUME: **3908**

Prepared For: City of Niagara Falls
 Prepared By: *PYRAMID Traffic Inc.*
 Location: Murray St, btwn Allendale Ave & Stanley Ave
 Start Date: Wednesday Jul 21, 2021

Site ID: 4332
 Interval: 15 min.

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary	Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
0:15	7	4		12:15	19	18	147
0:30	8	4		12:30	20	21	152
0:45	7	4		12:45	14	11	138
1:00	3	3	40	13:00	13	17	133
1:15	2	2	33	13:15	23	13	132
1:30	0	5	26	13:30	13	12	116
1:45	5	3	23	13:45	10	15	116
2:00	4	1	22	14:00	18	9	113
2:15	3	2	23	14:15	24	10	111
2:30	3	3	24	14:30	16	17	119
2:45	1	1	18	14:45	17	22	133
3:00	3	1	17	15:00	19	15	140
3:15	1	0	13	15:15	26	22	154
3:30	1	2	10	15:30	16	19	156
3:45	0	0	8	15:45	19	19	155
4:00	2	0	6	16:00	29	21	171
4:15	2	0	7	16:15	23	14	160
4:30	0	0	4	16:30	20	11	156
4:45	0	2	6	16:45	32	25	175
5:00	1	1	6	17:00	16	8	149
5:15	2	0	6	17:15	23	16	151
5:30	3	4	13	17:30	21	23	164
5:45	4	6	21	17:45	28	11	146
6:00	5	4	28	18:00	17	24	163
6:15	4	4	34	18:15	12	14	150
6:30	3	11	41	18:30	21	17	144
6:45	9	19	59	18:45	11	16	132
7:00	9	14	73	19:00	18	13	122
7:15	9	10	84	19:15	15	20	131
7:30	7	8	85	19:30	21	12	126
7:45	6	16	79	19:45	22	15	136
8:00	13	14	83	20:00	17	16	138
8:15	18	6	88	20:15	19	13	135
8:30	13	12	98	20:30	14	18	134
8:45	15	17	108	20:45	17	14	128
9:00	14	15	110	21:00	18	17	130
9:15	10	10	106	21:15	15	12	125
9:30	12	13	106	21:30	16	7	116
9:45	18	19	111	21:45	14	15	114
10:00	12	11	105	22:00	10	15	104
10:15	11	16	112	22:15	16	6	99
10:30	7	13	107	22:30	23	16	115
10:45	23	14	107	22:45	15	11	112
11:00	29	18	131	23:00	13	11	111
11:15	13	11	128	23:15	11	8	108
11:30	18	18	144	23:30	13	6	88
11:45	19	20	146	23:45	11	7	80
12:00	20	15	134	0:00	7	8	71

AM Peak: 146

PM Peak: 175

24 HR VOLUME: 2300

Prepared For: City of Niagara Falls
 Prepared By: *PYRAMID Traffic Inc.*
 Location: Murray St, btwn Finlay Ave & Wentworth Ave
 Start Date: Wednesday Jul 7, 2021

Site ID: 4336
 Interval: 15 min.

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary	Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
0:15	0	0		12:15	1	1	8
0:30	1	1		12:30	6	2	15
0:45	2	1		12:45	2	0	14
1:00	0	0	5	13:00	6	2	20
1:15	0	0	5	13:15	3	2	23
1:30	0	0	3	13:30	0	0	15
1:45	2	3	5	13:45	3	0	16
2:00	0	1	6	14:00	4	0	12
2:15	0	0	6	14:15	2	0	9
2:30	0	0	6	14:30	1	1	11
2:45	0	0	1	14:45	2	1	11
3:00	1	0	1	15:00	3	2	12
3:15	1	1	3	15:15	1	1	12
3:30	0	1	4	15:30	3	0	13
3:45	0	0	4	15:45	5	1	16
4:00	0	0	3	16:00	0	1	12
4:15	0	0	1	16:15	2	4	16
4:30	0	0	0	16:30	3	0	16
4:45	1	0	1	16:45	2	2	14
5:00	0	0	1	17:00	3	1	17
5:15	0	1	2	17:15	2	0	13
5:30	0	0	2	17:30	2	1	13
5:45	1	0	2	17:45	4	4	17
6:00	0	0	2	18:00	5	3	21
6:15	0	0	1	18:15	1	0	20
6:30	1	0	2	18:30	4	1	22
6:45	1	1	3	18:45	1	3	18
7:00	1	2	6	19:00	3	0	13
7:15	0	1	7	19:15	3	0	15
7:30	4	1	11	19:30	3	2	15
7:45	0	4	13	19:45	3	1	15
8:00	2	2	14	20:00	3	1	16
8:15	1	1	15	20:15	3	2	18
8:30	0	1	11	20:30	3	2	18
8:45	0	0	7	20:45	2	1	17
9:00	4	3	10	21:00	0	0	13
9:15	1	0	9	21:15	1	0	9
9:30	0	2	10	21:30	1	1	6
9:45	2	0	12	21:45	0	1	4
10:00	1	2	8	22:00	3	2	9
10:15	0	1	8	22:15	3	0	11
10:30	4	1	11	22:30	0	1	10
10:45	3	0	12	22:45	0	0	9
11:00	0	0	9	23:00	0	0	4
11:15	0	1	9	23:15	0	0	1
11:30	0	1	5	23:30	1	0	1
11:45	1	2	5	23:45	0	0	1
12:00	2	0	7	0:00	0	0	1

AM Peak: 15

PM Peak: 23

24 HR VOLUME: 222

Appendix C: Transportation Noise Predictions

Filename: stan3.te Time Period: Day/Night 16/8 hours
Description: 2nd Floor Outdoor Amenity

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

Car traffic volume : 17091/1899 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 589/65 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): 13220
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 3.33
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Stanley Ave (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 156.00 / 156.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 8.82 m
Reference angle : 0.00

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

Car traffic volume : 4038/449 veh/TimePeriod *
Medium truck volume : 232/26 veh/TimePeriod *
Heavy truck volume : 371/41 veh/TimePeriod *
Posted speed limit : 40 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): 3908
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 5.00
Heavy Truck % of Total Volume : 8.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Main St (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 17.00 / 16.50 m
 Receiver height : 1.50 / 1.50 m
 Topography : 3 (Elevated; no barrier)
 Elevation : 8.82 m
 Reference angle : 0.00

Results segment # 1: Stanley Ave (day)

Source height = 1.35 m

ROAD (0.00 + 57.21 + 0.00) = 57.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.38	0.00	-10.17	0.00	0.00	0.00	0.00	57.21

Segment Leq : 57.21 dBA

Results segment # 2: Main St (day)

Source height = 1.68 m

ROAD (0.00 + 62.72 + 0.00) = 62.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.27	0.00	-0.54	0.00	0.00	0.00	0.00	62.72

Segment Leq : 62.72 dBA

Total Leq All Segments: 63.80 dBA

Results segment # 1: Stanley Ave (night)

Source height = 1.35 m

ROAD (0.00 + 50.66 + 0.00) = 50.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.83	0.00	-10.17	0.00	0.00	0.00	0.00	50.66

Segment Leq : 50.66 dBA

Results segment # 2: Main St (night)

Source height = 1.68 m

ROAD (0.00 + 56.30 + 0.00) = 56.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.83	0.00	-10.17	0.00	0.00	0.00	0.00	50.66

-90 90 0.00 56.72 0.00 -0.41 0.00 0.00 0.00 0.00 56.30

Segment Leq : 56.30 dBA

Total Leq All Segments: 57.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.80
 (NIGHT): 57.35

Filename: stan4.te Time Period: Day/Night 16/8 hours
Description: 2nd Floor Outdoor Amenity Mitigated

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

Car traffic volume : 17091/1899 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 589/65 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): 13220
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 3.33
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Stanley Ave (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 156.00 / 156.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 2.00 m
Elevation : 8.82 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation : 0.00 m
Receiver elevation : 8.82 m
Barrier elevation : 10.32 m
Reference angle : 0.00

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

Car traffic volume : 4038/449 veh/TimePeriod *
Medium truck volume : 232/26 veh/TimePeriod *
Heavy truck volume : 371/41 veh/TimePeriod *
Posted speed limit : 40 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): 3908
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 5.00

Heavy Truck % of Total Volume : 8.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Main St (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 17.00 / 16.50 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
 Barrier height : 2.00 m
 Elevation : 8.82 m
 Barrier receiver distance : 4.00 / 3.50 m
 Source elevation : 0.00 m
 Receiver elevation : 10.32 m
 Barrier elevation : 8.82 m
 Reference angle : 0.00

Results segment # 1: Stanley Ave (day)

 Source height = 1.35 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.35	1.50	-0.29	10.03

ROAD (0.00 + 45.68 + 0.00) = 45.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.38	0.00	-10.17	0.00	0.00	0.00	-11.53	45.68

Segment Leq : 45.68 dBA

Results segment # 2: Main St (day)

 Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.68	1.50	0.61	9.43

ROAD (0.00 + 53.60 + 0.00) = 53.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.27	0.00	-0.54	0.00	0.00	0.00	-9.12	53.60

Segment Leq : 53.60 dBA

Total Leq All Segments: 54.25 dBA

Barrier table for segment # 1: Stanley Ave (day)

Barrier Height	Elev of Barr Top!	Road dBA	Tot Leq dBA
3.50	13.82	42.57	42.57
4.00	14.32	41.76	41.76
4.50	14.82	41.29	41.29
5.00	15.32	40.83	40.83
5.50	15.82	40.46	40.46
6.00	16.32	40.14	40.14
6.50	16.82	39.88	39.88
7.00	17.32	39.66	39.66
7.50	17.82	39.46	39.46
8.00	18.32	39.30	39.30

Barrier table for segment # 2: Main St (day)

Barrier Height	Elev of Barr Top!	Road dBA	Tot Leq dBA
3.50	12.32	49.02	49.02
4.00	12.82	47.85	47.85
4.50	13.32	47.01	47.01
5.00	13.82	46.34	46.34
5.50	14.32	45.82	45.82
6.00	14.82	45.42	45.42
6.50	15.32	45.09	45.09
7.00	15.82	44.83	44.83
7.50	16.32	44.61	44.61
8.00	16.82	44.43	44.43

Results segment # 1: Stanley Ave (night)

Source height = 1.35 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.35	1.50	-0.29	10.03

ROAD (0.00 + 39.12 + 0.00) = 39.12 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.83	0.00	-10.17	0.00	0.00	0.00	-11.53	39.12

Segment Leq : 39.12 dBA

Results segment # 2: Main St (night)

Source height = 1.68 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
 1.68 ! 1.50 ! 0.85 ! 9.67

ROAD (0.00 + 47.87 + 0.00) = 47.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.72	0.00	-0.41	0.00	0.00	0.00	-8.44	47.87

Segment Leq : 47.87 dBA

Total Leq All Segments: 48.41 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.25
(NIGHT): 48.41

Filename: stan6.te Time Period: Day/Night 16/8 hours
Description: East Facade POW

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

Car traffic volume : 17091/1899 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 589/65 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): 13220
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 3.33
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Stanley Ave (day/night)

Angle1 Angle2 : -49.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 165.00 / 165.00 m
Receiver height : 65.18 / 65.18 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 4038/449 veh/TimePeriod *
Medium truck volume : 232/26 veh/TimePeriod *
Heavy truck volume : 371/41 veh/TimePeriod *
Posted speed limit : 40 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): 3908
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 5.00
Heavy Truck % of Total Volume : 8.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Main St (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 : 15.00 / 15.00 m
 Receiver height : 65.18 / 65.18 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Stanley Ave (day)

Source height = 1.35 m

ROAD (0.00 + 55.84 + 0.00) = 55.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	90	0.00	67.38	0.00	-10.41	-1.12	0.00	0.00	0.00	55.84

Segment Leq : 55.84 dBA

Results segment # 2: Main St (day)

Source height = 1.68 m

ROAD (0.00 + 60.25 + 0.00) = 60.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.27	0.00	0.00	-3.01	0.00	0.00	0.00	60.25

Segment Leq : 60.25 dBA

Total Leq All Segments: 61.59 dBA

Results segment # 1: Stanley Ave (night)

Source height = 1.35 m

ROAD (0.00 + 49.29 + 0.00) = 49.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	90	0.00	60.83	0.00	-10.41	-1.12	0.00	0.00	0.00	49.29

Segment Leq : 49.29 dBA

Results segment # 2: Main St (night)

Source height = 1.68 m

ROAD (0.00 + 53.71 + 0.00) = 53.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	56.72	0.00	0.00	-3.01	0.00	0.00	0.00	53.71

Segment Leq : 53.71 dBA

Total Leq All Segments: 55.05 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.59
(NIGHT): 55.05

Filename: stan.te Time Period: Day/Night 16/8 hours
Description: North Facade Plane of window

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

Car traffic volume : 17091/1899 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 589/65 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): 13220
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 3.33
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Stanley Ave (day/night)

Angle1 Angle2 : -90.00 deg 37.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 165.00 / 165.00 m
Receiver height : 65.18 / 65.18 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 4038/449 veh/TimePeriod *
Medium truck volume : 232/26 veh/TimePeriod *
Heavy truck volume : 371/41 veh/TimePeriod *
Posted speed limit : 40 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): 3908
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 5.00
Heavy Truck % of Total Volume : 8.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Main St (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)

Segment Leq : 56.72 dBA

Total Leq All Segments: 57.38 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.93
(NIGHT): 57.38

Filename: stan2.te Time Period: Day/Night 16/8 hours
Description: Rooftop Amenity OLA

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

Car traffic volume : 17091/1899 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 589/65 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): 13220
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 3.33
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Stanley Ave (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 166.00 / 166.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 67.00 m
Reference angle : 0.00

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

Car traffic volume : 4038/449 veh/TimePeriod *
Medium truck volume : 232/26 veh/TimePeriod *
Heavy truck volume : 371/41 veh/TimePeriod *
Posted speed limit : 40 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): 3908
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 5.00
Heavy Truck % of Total Volume : 8.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Main St (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 16.50 / 16.50 m
 Receiver height : 1.50 / 1.50 m
 Topography : 3 (Elevated; no barrier)
 Elevation : 67.00 m
 Reference angle : 0.00

Results segment # 1: Stanley Ave (day)

Source height = 1.35 m

ROAD (0.00 + 56.94 + 0.00) = 56.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.38	0.00	-10.44	0.00	0.00	0.00	0.00	56.94

Segment Leq : 56.94 dBA

Results segment # 2: Main St (day)

Source height = 1.68 m

ROAD (0.00 + 62.85 + 0.00) = 62.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.27	0.00	-0.41	0.00	0.00	0.00	0.00	62.85

Segment Leq : 62.85 dBA

Total Leq All Segments: 63.84 dBA

Results segment # 1: Stanley Ave (night)

Source height = 1.35 m

ROAD (0.00 + 50.39 + 0.00) = 50.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.83	0.00	-10.44	0.00	0.00	0.00	0.00	50.39

Segment Leq : 50.39 dBA

Results segment # 2: Main St (night)

Source height = 1.68 m

ROAD (0.00 + 56.30 + 0.00) = 56.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.83	0.00	-10.44	0.00	0.00	0.00	0.00	56.30

-90 90 0.00 56.72 0.00 -0.41 0.00 0.00 0.00 0.00 56.30

Segment Leq : 56.30 dBA

Total Leq All Segments: 57.29 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.84
 (NIGHT): 57.29

Filename: stan5.te Time Period: Day/Night 16/8 hours
Description: Rooftop OLA Mitigated

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

Car traffic volume : 17091/1899 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 589/65 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): 13220
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 3.33
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Stanley Ave (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 166.00 / 166.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 1.80 m
Elevation : 67.00 m
Barrier receiver distance : 3.00 / 1.63 m
Source elevation : 0.00 m
Receiver elevation : 68.50 m
Barrier elevation : 67.00 m
Reference angle : 0.00

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

Car traffic volume : 4038/449 veh/TimePeriod *
Medium truck volume : 232/26 veh/TimePeriod *
Heavy truck volume : 371/41 veh/TimePeriod *
Posted speed limit : 40 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): 3908
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 5.00

Heavy Truck % of Total Volume : 8.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Main St (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 16.50 / 16.50 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
 Barrier height : 1.80 m
 Elevation : 67.00 m
 Barrier receiver distance : 3.00 / 3.00 m
 Source elevation : 0.00 m
 Receiver elevation : 68.50 m
 Barrier elevation : 67.00 m
 Reference angle : 0.00

Results segment # 1: Stanley Ave (day)

 Source height = 1.35 m

Barrier height for grazing incidence

 Source ! Receiver ! Barrier ! Elevation of
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
 -----+-----+-----+-----
 1.35 ! 1.50 ! 1.76 ! 68.76

ROAD (0.00 + 51.93 + 0.00) = 51.93 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -90 90 0.00 67.38 0.00 -10.44 0.00 0.00 0.00 -5.01 51.93

Segment Leq : 51.93 dBA

Results segment # 2: Main St (day)

 Source height = 1.68 m

Barrier height for grazing incidence

 Source ! Receiver ! Barrier ! Elevation of
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
 -----+-----+-----+-----
 1.68 ! 1.50 ! -9.42 ! 57.58

ROAD (0.00 + 48.08 + 0.00) = 48.08 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -90 90 0.00 63.27 0.00 -0.41 0.00 0.00 0.00 -14.77 48.08

Segment Leq : 48.08 dBA

Total Leq All Segments: 53.43 dBA

Barrier table for segment # 1: Stanley Ave (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
3.30	70.30	46.49	46.49
3.80	70.80	44.76	44.76
4.30	71.30	43.32	43.32
4.80	71.80	42.10	42.10
5.30	72.30	41.24	41.24
5.80	72.80	40.58	40.58
6.30	73.30	40.08	40.08
6.80	73.80	39.70	39.70
7.30	74.30	39.39	39.39
7.80	74.80	39.14	39.14

Barrier table for segment # 2: Main St (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
3.30	70.30	46.27	46.27
3.80	70.80	45.82	45.82
4.30	71.30	45.43	45.43
4.80	71.80	45.12	45.12
5.30	72.30	44.85	44.85
5.80	72.80	44.64	44.64
6.30	73.30	44.46	44.46
6.80	73.80	44.31	44.31
7.30	74.30	44.18	44.18
7.80	74.80	44.07	44.07

Results segment # 1: Stanley Ave (night)

Source height = 1.35 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.35	1.50	2.33	69.33

ROAD (0.00 + 50.39 + 0.00) = 50.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.83	0.00	-10.44	0.00	0.00	0.00	-2.21	48.18*
-90	90	0.00	60.83	0.00	-10.44	0.00	0.00	0.00	0.00	50.39

* Bright Zone !

Segment Leq : 50.39 dBA

Results segment # 2: Main St (night)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.68 !	1.50 !	-9.42 !	57.58

ROAD (0.00 + 41.53 + 0.00) = 41.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.72	0.00	-0.41	0.00	0.00	0.00	-14.77	41.53

Segment Leq : 41.53 dBA

Total Leq All Segments: 50.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.43
(NIGHT): 50.92

Appendix D: Measured Sound Levels

Weather Conditions

Prevailing weather conditions at the time of sound level measurements were as follows, based on information recorded at the St. Catharines/Niagara District A weather station operated by NAVCAN, obtained by TT from Environment and Climate Change Canada’s *Historical Data* portal.

Parameter	Conditions (October 18, 2023)
Wind Direction	Northeast
Wind Speed	5 km/h
Relative Humidity	64%
Pressure	100.87 kPa
Temperature	12 °C
Cloud Cover	Cloudy
Precipitation	None

Instrumentation

Measurements were conducted using a Larson Davis model SoundExpert LxT Sound Level Meter / Analyzer, serial number 0005007 fitted with a PCB Piezotronics model 377B02 free-field microphone transducer, serial number 169669.

A wind screen was used for all outdoor measurements. All equipment was within its laboratory calibration window and was field calibrated before and after measurements using a Type 4230 calibrator, serial number 1274906.

Measurement Methodology

Measurement methodology was based on the procedures identified in NPC-103 and NPC-300, specifically:

Steady Noise Sources:

NPC-103 defines a steady noise as having a maximum difference of 6 dB between the lowest and highest observed sound levels.

NPC-103 requires that measurements of steady noise to be conducted using slow response, and A-weighting, with a minimum of six (6) 15 second observations of the minimum, average, and maximum sound level. The one-hour equivalent sound level (Leq) to be reported is the arithmetic average of the observed average sound pressure level readings.

TT’s sound level meter was configured to log 15 second readings for a period of 2 minutes (8 readings). The logged data included slow response maximum and minimum values in 1/3 octave bands and dBA broadband, as well as Leq values in 1/3 octave bands and dBA broadband. The values used for the purposes of modelling noise impacts were the arithmetic average of Leq results from each reading, in each 1/3 octave band.

Varying Noise Sources:

NPC-103 defines a steady noise as having a difference of 6 dB or more between the lowest and highest observed sound levels.

NPC-103 requires that measurements of varying noise to be conducted over a period of at least twenty (20) minutes. The one hour equivalent (Leq) sound level is to be reported.

TT's sound level meter was configured to log a single reading for a period of 20 minutes. The logged data included Leq values in 1/3 octave bands and dBA broadband.

Measurement Results

The following table provides a summary of the reported results from each sound level measurement.

Reading ID	Start Time	Description	Sound Pressure Level (dBA)
Reading 01	2023/10/18 10:29	20-min Traffic Measurement	62
Reading 02	2023/10/18 11:33	Hydro One Transformer Station	46

Appendix E: Manufacturer Specifications

Capacity ratings (cont)



SOUND RATINGS TABLE

48HC UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60 HZ								
		A-WEIGHTED	63	125	250	500	1000	2000	4000	8000
A04	1	76	78.2	78.0	74.2	73.3	70.6	66.0	62.4	56.9
A05	1	78	84.7	83.6	77.1	74.6	72.3	68.3	64.7	60.9
A06	1	77	87.5	82.5	76.1	73.6	71.3	67.1	64.1	60.0
A07	1	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
D07	2	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
D08	2	82	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7
D09	2	82	88.6	85.0	81.6	79.5	77.4	74.1	71.0	66.3
D11	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
D12	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
D14	2	83	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5

LEGEND

dB — Decibel

NOTES:

1. Outdoor sound data is measured in accordance with AHRI.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A-weighted measurements for Carrier units are taken in accordance with AHRI.

Appendix F: CadnaA Calculation Output

Noise Impact Study

Receiver

Name: 2nd Floor Outdoor Amenity

ID: POPOR1

X: 17655772.30 m

Y: 4771852.09 m

Z: 10.32 m

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SCOOL"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
1	17656018.94	4771862.93	161.00	0	D	25	-49.5	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-106.7
1	17656018.94	4771862.93	161.00	0	D	32	-44.2	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-101.4
1	17656018.94	4771862.93	161.00	0	D	40	-39.4	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-96.6
1	17656018.94	4771862.93	161.00	0	D	50	72.0	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	14.8
1	17656018.94	4771862.93	161.00	0	D	63	76.0	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	18.8
1	17656018.94	4771862.93	161.00	0	D	80	79.7	0.0	0.0	0.0	0.0	60.2	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	22.5
1	17656018.94	4771862.93	161.00	0	D	100	83.1	0.0	0.0	0.0	0.0	60.2	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	25.2
1	17656018.94	4771862.93	161.00	0	D	125	86.1	0.0	0.0	0.0	0.0	60.2	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	28.2
1	17656018.94	4771862.93	161.00	0	D	160	88.8	0.0	0.0	0.0	0.0	60.2	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	30.8
1	17656018.94	4771862.93	161.00	0	D	200	91.3	0.0	0.0	0.0	0.0	60.2	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	33.3
1	17656018.94	4771862.93	161.00	0	D	250	93.6	0.0	0.0	0.0	0.0	60.2	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	35.5
1	17656018.94	4771862.93	161.00	0	D	315	95.6	0.0	0.0	0.0	0.0	60.2	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	37.4
1	17656018.94	4771862.93	161.00	0	D	400	91.4	0.0	0.0	0.0	0.0	60.2	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	33.1
1	17656018.94	4771862.93	161.00	0	D	500	93.0	0.0	0.0	0.0	0.0	60.2	0.6	-2.4	0.0	0.0	0.0	0.0	0.0	34.6
1	17656018.94	4771862.93	161.00	0	D	630	94.3	0.0	0.0	0.0	0.0	60.2	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	35.8
1	17656018.94	4771862.93	161.00	0	D	800	91.4	0.0	0.0	0.0	0.0	60.2	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	32.8
1	17656018.94	4771862.93	161.00	0	D	1000	92.2	0.0	0.0	0.0	0.0	60.2	1.1	-2.4	0.0	0.0	0.0	0.0	0.0	33.3
1	17656018.94	4771862.93	161.00	0	D	1250	92.8	0.0	0.0	0.0	0.0	60.2	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	33.6
1	17656018.94	4771862.93	161.00	0	D	1600	88.2	0.0	0.0	0.0	0.0	60.2	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	28.5
1	17656018.94	4771862.93	161.00	0	D	2000	88.4	0.0	0.0	0.0	0.0	60.2	2.8	-2.4	0.0	0.0	0.0	0.0	0.0	27.8
1	17656018.94	4771862.93	161.00	0	D	2500	88.5	0.0	0.0	0.0	0.0	60.2	4.1	-2.4	0.0	0.0	0.0	0.0	0.0	26.6
1	17656018.94	4771862.93	161.00	0	D	3150	83.4	0.0	0.0	0.0	0.0	60.2	6.2	-2.4	0.0	0.0	0.0	0.0	0.0	19.4
1	17656018.94	4771862.93	161.00	0	D	4000	83.2	0.0	0.0	0.0	0.0	60.2	9.5	-2.4	0.0	0.0	0.0	0.0	0.0	15.9
1	17656018.94	4771862.93	161.00	0	D	5000	82.7	0.0	0.0	0.0	0.0	60.2	14.5	-2.4	0.0	0.0	0.0	0.0	0.0	10.4
1	17656018.94	4771862.93	161.00	0	D	6300	79.1	0.0	0.0	0.0	0.0	60.2	22.2	-2.4	0.0	0.0	0.0	0.0	0.0	-0.9
1	17656018.94	4771862.93	161.00	0	D	8000	78.1	0.0	0.0	0.0	0.0	60.2	33.8	-2.4	0.0	0.0	0.0	0.0	0.0	-13.5
1	17656018.94	4771862.93	161.00	0	D	10000	76.7	0.0	0.0	0.0	0.0	60.2	50.7	-2.4	0.0	0.0	0.0	0.0	0.0	-31.7
1	17656018.94	4771862.93	161.00	0	N	25	-49.5	0.0	-3.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-109.7
1	17656018.94	4771862.93	161.00	0	N	32	-44.2	0.0	-3.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-104.4
1	17656018.94	4771862.93	161.00	0	N	40	-39.4	0.0	-3.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-99.6
1	17656018.94	4771862.93	161.00	0	N	50	72.0	0.0	-3.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	11.8
1	17656018.94	4771862.93	161.00	0	N	63	76.0	0.0	-3.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	15.8
1	17656018.94	4771862.93	161.00	0	N	80	79.7	0.0	-3.0	0.0	0.0	60.2	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	19.4
1	17656018.94	4771862.93	161.00	0	N	100	83.1	0.0	-3.0	0.0	0.0	60.2	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	22.2
1	17656018.94	4771862.93	161.00	0	N	125	86.1	0.0	-3.0	0.0	0.0	60.2	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	25.2
1	17656018.94	4771862.93	161.00	0	N	160	88.8	0.0	-3.0	0.0	0.0	60.2	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	27.8
1	17656018.94	4771862.93	161.00	0	N	200	91.3	0.0	-3.0	0.0	0.0	60.2	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	30.3
1	17656018.94	4771862.93	161.00	0	N	250	93.6	0.0	-3.0	0.0	0.0	60.2	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	32.5
1	17656018.94	4771862.93	161.00	0	N	315	95.6	0.0	-3.0	0.0	0.0	60.2	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	34.4
1	17656018.94	4771862.93	161.00	0	N	400	91.4	0.0	-3.0	0.0	0.0	60.2	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	30.1
1	17656018.94	4771862.93	161.00	0	N	500	93.0	0.0	-3.0	0.0	0.0	60.2	0.6	-2.4	0.0	0.0	0.0	0.0	0.0	31.6
1	17656018.94	4771862.93	161.00	0	N	630	94.3	0.0	-3.0	0.0	0.0	60.2	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	32.8
1	17656018.94	4771862.93	161.00	0	N	800	91.4	0.0	-3.0	0.0	0.0	60.2	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	29.8
1	17656018.94	4771862.93	161.00	0	N	1000	92.2	0.0	-3.0	0.0	0.0	60.2	1.1	-2.4	0.0	0.0	0.0	0.0	0.0	30.3
1	17656018.94	4771862.93	161.00	0	N	1250	92.8	0.0	-3.0	0.0	0.0	60.2	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	30.6
1	17656018.94	4771862.93	161.00	0	N	1600	88.2	0.0	-3.0	0.0	0.0	60.2	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	25.4
1	17656018.94	4771862.93	161.00	0	N	2000	88.4	0.0	-3.0	0.0	0.0	60.2	2.8	-2.4	0.0	0.0	0.0	0.0	0.0	24.8
1	17656018.94	4771862.93	161.00	0	N	2500	88.5	0.0	-3.0	0.0	0.0	60.2	4.1	-2.4	0.0	0.0	0.0	0.0	0.0	23.6
1	17656018.94	4771862.93	161.00	0	N	3150	83.4	0.0	-3.0	0.0	0.0	60.2	6.2	-2.4	0.0	0.0	0.0	0.0	0.0	16.4
1	17656018.94	4771862.93	161.00	0	N	4000	83.2	0.0	-3.0	0.0	0.0	60.2	9.5	-2.4	0.0	0.0	0.0	0.0	0.0	12.9
1	17656018.94	4771862.93	161.00	0	N	5000	82.7	0.0	-3.0	0.0	0.0	60.2	14.5	-2.4	0.0	0.0	0.0	0.0	0.0	7.4
1	17656018.94	4771862.93	161.00	0	N	6300	79.1	0.0	-3.0	0.0	0.0	60.2	22.2	-2.4	0.0	0.0	0.0	0.0	0.0	-3.9
1	17656018.94	4771862.93	161.00	0	N	8000	78.1	0.0	-3.0	0.0	0.0	60.2	33.8	-2.4	0.0	0.0	0.0	0.0	0.0	-16.5
1	17656018.94	4771862.93	161.00	0	N	10000	76.7	0.0	-3.0	0.0	0.0	60.2	50.7	-2.4	0.0	0.0	0.0	0.0	0.0	-34.8
1	17656018.94	4771862.93	161.00	0	E	25	-49.5	0.0	-188.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-294.7
1	17656018.94	4771862.93	161.00	0	E	32	-44.2	0.0	-188.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-289.4
1	17656018.94	4771862.93	161.00	0	E	40	-39.4	0.0	-188.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-284.6
6285	Main Street	4771862.93	161.00	0	E	50	72.0	0.0	-188.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-173.2

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SCOOL"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
1	17656018.94	4771862.93	161.00	0	E	63	76.0	0.0	-188.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-169.2
1	17656018.94	4771862.93	161.00	0	E	80	79.7	0.0	-188.0	0.0	0.0	60.2	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-165.5
1	17656018.94	4771862.93	161.00	0	E	100	83.1	0.0	-188.0	0.0	0.0	60.2	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-162.8
1	17656018.94	4771862.93	161.00	0	E	125	86.1	0.0	-188.0	0.0	0.0	60.2	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-159.8
1	17656018.94	4771862.93	161.00	0	E	160	88.8	0.0	-188.0	0.0	0.0	60.2	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-157.2
1	17656018.94	4771862.93	161.00	0	E	200	91.3	0.0	-188.0	0.0	0.0	60.2	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-154.7
1	17656018.94	4771862.93	161.00	0	E	250	93.6	0.0	-188.0	0.0	0.0	60.2	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	-152.5
1	17656018.94	4771862.93	161.00	0	E	315	95.6	0.0	-188.0	0.0	0.0	60.2	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	-150.6
1	17656018.94	4771862.93	161.00	0	E	400	91.4	0.0	-188.0	0.0	0.0	60.2	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	-154.9
1	17656018.94	4771862.93	161.00	0	E	500	93.0	0.0	-188.0	0.0	0.0	60.2	0.6	-2.4	0.0	0.0	0.0	0.0	0.0	-153.4
1	17656018.94	4771862.93	161.00	0	E	630	94.3	0.0	-188.0	0.0	0.0	60.2	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	-152.2
1	17656018.94	4771862.93	161.00	0	E	800	91.4	0.0	-188.0	0.0	0.0	60.2	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	-155.2
1	17656018.94	4771862.93	161.00	0	E	1000	92.2	0.0	-188.0	0.0	0.0	60.2	1.1	-2.4	0.0	0.0	0.0	0.0	0.0	-154.7
1	17656018.94	4771862.93	161.00	0	E	1250	92.8	0.0	-188.0	0.0	0.0	60.2	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	-154.4
1	17656018.94	4771862.93	161.00	0	E	1600	88.2	0.0	-188.0	0.0	0.0	60.2	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	-159.5
1	17656018.94	4771862.93	161.00	0	E	2000	88.4	0.0	-188.0	0.0	0.0	60.2	2.8	-2.4	0.0	0.0	0.0	0.0	0.0	-160.2
1	17656018.94	4771862.93	161.00	0	E	2500	88.5	0.0	-188.0	0.0	0.0	60.2	4.1	-2.4	0.0	0.0	0.0	0.0	0.0	-161.4
1	17656018.94	4771862.93	161.00	0	E	3150	83.4	0.0	-188.0	0.0	0.0	60.2	6.2	-2.4	0.0	0.0	0.0	0.0	0.0	-168.6
1	17656018.94	4771862.93	161.00	0	E	4000	83.2	0.0	-188.0	0.0	0.0	60.2	9.5	-2.4	0.0	0.0	0.0	0.0	0.0	-172.1
1	17656018.94	4771862.93	161.00	0	E	5000	82.7	0.0	-188.0	0.0	0.0	60.2	14.5	-2.4	0.0	0.0	0.0	0.0	0.0	-177.6
1	17656018.94	4771862.93	161.00	0	E	6300	79.1	0.0	-188.0	0.0	0.0	60.2	22.2	-2.4	0.0	0.0	0.0	0.0	0.0	-188.9
1	17656018.94	4771862.93	161.00	0	E	8000	78.1	0.0	-188.0	0.0	0.0	60.2	33.8	-2.4	0.0	0.0	0.0	0.0	0.0	-201.5
1	17656018.94	4771862.93	161.00	0	E	10000	76.7	0.0	-188.0	0.0	0.0	60.2	50.7	-2.4	0.0	0.0	0.0	0.0	0.0	-219.7

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC1"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
2	17656014.75	4771854.73	158.00	0	D	25	-49.5	0.0	0.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-106.5
2	17656014.75	4771854.73	158.00	0	D	32	-44.2	0.0	0.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-101.2
2	17656014.75	4771854.73	158.00	0	D	40	-39.4	0.0	0.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-96.4
2	17656014.75	4771854.73	158.00	0	D	50	55.1	0.0	0.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-2.0
2	17656014.75	4771854.73	158.00	0	D	63	59.1	0.0	0.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	2.0
2	17656014.75	4771854.73	158.00	0	D	80	62.8	0.0	0.0	0.0	0.0	60.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	5.7
2	17656014.75	4771854.73	158.00	0	D	100	58.7	0.0	0.0	0.0	0.0	60.1	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	1.0
2	17656014.75	4771854.73	158.00	0	D	125	61.7	0.0	0.0	0.0	0.0	60.1	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	3.9
2	17656014.75	4771854.73	158.00	0	D	160	64.4	0.0	0.0	0.0	0.0	60.1	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	6.6
2	17656014.75	4771854.73	158.00	0	D	200	65.3	0.0	0.0	0.0	0.0	60.1	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	7.4
2	17656014.75	4771854.73	158.00	0	D	250	67.6	0.0	0.0	0.0	0.0	60.1	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	9.7
2	17656014.75	4771854.73	158.00	0	D	315	69.6	0.0	0.0	0.0	0.0	60.1	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	11.6
2	17656014.75	4771854.73	158.00	0	D	400	69.8	0.0	0.0	0.0	0.0	60.1	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	11.7
2	17656014.75	4771854.73	158.00	0	D	500	71.4	0.0	0.0	0.0	0.0	60.1	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	13.2
2	17656014.75	4771854.73	158.00	0	D	630	72.7	0.0	0.0	0.0	0.0	60.1	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	14.4
2	17656014.75	4771854.73	158.00	0	D	800	71.4	0.0	0.0	0.0	0.0	60.1	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	13.0
2	17656014.75	4771854.73	158.00	0	D	1000	72.2	0.0	0.0	0.0	0.0	60.1	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	13.5
2	17656014.75	4771854.73	158.00	0	D	1250	72.8	0.0	0.0	0.0	0.0	60.1	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	13.8
2	17656014.75	4771854.73	158.00	0	D	1600	69.2	0.0	0.0	0.0	0.0	60.1	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	9.7
2	17656014.75	4771854.73	158.00	0	D	2000	69.4	0.0	0.0	0.0	0.0	60.1	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	9.0
2	17656014.75	4771854.73	158.00	0	D	2500	69.5	0.0	0.0	0.0	0.0	60.1	4.1	-2.4	0.0	0.0	0.0	0.0	0.0	7.8
2	17656014.75	4771854.73	158.00	0	D	3150	66.8	0.0	0.0	0.0	0.0	60.1	6.1	-2.4	0.0	0.0	0.0	0.0	0.0	3.1
2	17656014.75	4771854.73	158.00	0	D	4000	66.6	0.0	0.0	0.0	0.0	60.1	9.3	-2.4	0.0	0.0	0.0	0.0	0.0	-0.3
2	17656014.75	4771854.73	158.00	0	D	5000	66.1	0.0	0.0	0.0	0.0	60.1	14.3	-2.4	0.0	0.0	0.0	0.0	0.0	-5.8
2	17656014.75	4771854.73	158.00	0	D	6300	61.8	0.0	0.0	0.0	0.0	60.1	21.8	-2.4	0.0	0.0	0.0	0.0	0.0	-17.7
2	17656014.75	4771854.73	158.00	0	D	8000	60.8	0.0	0.0	0.0	0.0	60.1	33.2	-2.4	0.0	0.0	0.0	0.0	0.0	-30.0
2	17656014.75	4771854.73	158.00	0	D	10000	59.4	0.0	0.0	0.0	0.0	60.1	49.7	-2.4	0.0	0.0	0.0	0.0	0.0	-48.0
2	17656014.75	4771854.73	158.00	0	N	25	-49.5	0.0	-3.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-109.6
2	17656014.75	4771854.73	158.00	0	N	32	-44.2	0.0	-3.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-104.3
2	17656014.75	4771854.73	158.00	0	N	40	-39.4	0.0	-3.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-99.5
2	17656014.75	4771854.73	158.00	0	N	50	55.1	0.0	-3.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-5.0
2	17656014.75	4771854.73	158.00	0	N	63	59.1	0.0	-3.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-1.0
2	17656014.75	4771854.73	158.00	0	N	80	62.8	0.0	-3.0	0.0	0.0	60.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	2.7
2	17656014.75	4771854.73	158.00	0	N	100	58.7	0.0	-3.0	0.0	0.0	60.1	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-2.0
2	17656014.75	4771854.73	158.00	0	N	125	61.7	0.0	-3.0	0.0	0.0	60.1	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	0.9
2	17656014.75	4771854.73	158.00	0	N	160	64.4	0.0	-3.0	0.0	0.0	60.1	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	3.6
2	17656014.75	4771854.73	158.00	0	N	200	65.3	0.0	-3.0	0.0	0.0	60.1	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	4.4
2	17656014.75	4771854.73	158.00	0	N	250	67.6	0.0	-3.0	0.0	0.0	60.1	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	6.7
2	17656014.75	4771854.73	158.00	0	N	315	69.6	0.0	-3.0	0.0	0.0	60.1	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	8.6
2	17656014.75	4771854.73	158.00	0	N</															

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC1"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
2	17656014.75	4771854.73	158.00	0	N	630	72.7	0.0	-3.0	0.0	0.0	60.1	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	11.4
2	17656014.75	4771854.73	158.00	0	N	800	71.4	0.0	-3.0	0.0	0.0	60.1	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	9.9
2	17656014.75	4771854.73	158.00	0	N	1000	72.2	0.0	-3.0	0.0	0.0	60.1	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	10.5
2	17656014.75	4771854.73	158.00	0	N	1250	72.8	0.0	-3.0	0.0	0.0	60.1	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	10.8
2	17656014.75	4771854.73	158.00	0	N	1600	69.2	0.0	-3.0	0.0	0.0	60.1	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	6.6
2	17656014.75	4771854.73	158.00	0	N	2000	69.4	0.0	-3.0	0.0	0.0	60.1	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	6.0
2	17656014.75	4771854.73	158.00	0	N	2500	69.5	0.0	-3.0	0.0	0.0	60.1	4.1	-2.4	0.0	0.0	0.0	0.0	0.0	4.8
2	17656014.75	4771854.73	158.00	0	N	3150	66.8	0.0	-3.0	0.0	0.0	60.1	6.1	-2.4	0.0	0.0	0.0	0.0	0.0	0.1
2	17656014.75	4771854.73	158.00	0	N	4000	66.6	0.0	-3.0	0.0	0.0	60.1	9.3	-2.4	0.0	0.0	0.0	0.0	0.0	-3.3
2	17656014.75	4771854.73	158.00	0	N	5000	66.1	0.0	-3.0	0.0	0.0	60.1	14.3	-2.4	0.0	0.0	0.0	0.0	0.0	-8.8
2	17656014.75	4771854.73	158.00	0	N	6300	61.8	0.0	-3.0	0.0	0.0	60.1	21.8	-2.4	0.0	0.0	0.0	0.0	0.0	-20.7
2	17656014.75	4771854.73	158.00	0	N	8000	60.8	0.0	-3.0	0.0	0.0	60.1	33.2	-2.4	0.0	0.0	0.0	0.0	0.0	-33.0
2	17656014.75	4771854.73	158.00	0	N	10000	59.4	0.0	-3.0	0.0	0.0	60.1	49.7	-2.4	0.0	0.0	0.0	0.0	0.0	-51.0
2	17656014.75	4771854.73	158.00	0	E	25	-49.5	0.0	-188.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-294.5
2	17656014.75	4771854.73	158.00	0	E	32	-44.2	0.0	-188.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-289.2
2	17656014.75	4771854.73	158.00	0	E	40	-39.4	0.0	-188.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-284.4
2	17656014.75	4771854.73	158.00	0	E	50	55.1	0.0	-188.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-190.0
2	17656014.75	4771854.73	158.00	0	E	63	59.1	0.0	-188.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-186.0
2	17656014.75	4771854.73	158.00	0	E	80	62.8	0.0	-188.0	0.0	0.0	60.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-182.3
2	17656014.75	4771854.73	158.00	0	E	100	58.7	0.0	-188.0	0.0	0.0	60.1	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-187.0
2	17656014.75	4771854.73	158.00	0	E	125	61.7	0.0	-188.0	0.0	0.0	60.1	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-184.1
2	17656014.75	4771854.73	158.00	0	E	160	64.4	0.0	-188.0	0.0	0.0	60.1	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-181.4
2	17656014.75	4771854.73	158.00	0	E	200	65.3	0.0	-188.0	0.0	0.0	60.1	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-180.6
2	17656014.75	4771854.73	158.00	0	E	250	67.6	0.0	-188.0	0.0	0.0	60.1	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	-178.3
2	17656014.75	4771854.73	158.00	0	E	315	69.6	0.0	-188.0	0.0	0.0	60.1	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	-176.4
2	17656014.75	4771854.73	158.00	0	E	400	69.8	0.0	-188.0	0.0	0.0	60.1	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	-176.3
2	17656014.75	4771854.73	158.00	0	E	500	71.4	0.0	-188.0	0.0	0.0	60.1	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	-174.8
2	17656014.75	4771854.73	158.00	0	E	630	72.7	0.0	-188.0	0.0	0.0	60.1	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	-173.6
2	17656014.75	4771854.73	158.00	0	E	800	71.4	0.0	-188.0	0.0	0.0	60.1	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	-175.0
2	17656014.75	4771854.73	158.00	0	E	1000	72.2	0.0	-188.0	0.0	0.0	60.1	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	-174.5
2	17656014.75	4771854.73	158.00	0	E	1250	72.8	0.0	-188.0	0.0	0.0	60.1	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	-174.2
2	17656014.75	4771854.73	158.00	0	E	1600	69.2	0.0	-188.0	0.0	0.0	60.1	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	-178.3
2	17656014.75	4771854.73	158.00	0	E	2000	69.4	0.0	-188.0	0.0	0.0	60.1	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	-179.0
2	17656014.75	4771854.73	158.00	0	E	2500	69.5	0.0	-188.0	0.0	0.0	60.1	4.1	-2.4	0.0	0.0	0.0	0.0	0.0	-180.2
2	17656014.75	4771854.73	158.00	0	E	3150	66.8	0.0	-188.0	0.0	0.0	60.1	6.1	-2.4	0.0	0.0	0.0	0.0	0.0	-184.9
2	17656014.75	4771854.73	158.00	0	E	4000	66.6	0.0	-188.0	0.0	0.0	60.1	9.3	-2.4	0.0	0.0	0.0	0.0	0.0	-188.3
2	17656014.75	4771854.73	158.00	0	E	5000	66.1	0.0	-188.0	0.0	0.0	60.1	14.3	-2.4	0.0	0.0	0.0	0.0	0.0	-193.8
2	17656014.75	4771854.73	158.00	0	E	6300	61.8	0.0	-188.0	0.0	0.0	60.1	21.8	-2.4	0.0	0.0	0.0	0.0	0.0	-205.7
2	17656014.75	4771854.73	158.00	0	E	8000	60.8	0.0	-188.0	0.0	0.0	60.1	33.2	-2.4	0.0	0.0	0.0	0.0	0.0	-218.0
2	17656014.75	4771854.73	158.00	0	E	10000	59.4	0.0	-188.0	0.0	0.0	60.1	49.7	-2.4	0.0	0.0	0.0	0.0	0.0	-236.0

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC2"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
3	17656025.13	4771787.46	104.00	0	D	25	-49.5	0.0	0.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-106.3
3	17656025.13	4771787.46	104.00	0	D	32	-44.2	0.0	0.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-101.0
3	17656025.13	4771787.46	104.00	0	D	40	-39.4	0.0	0.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-96.2
3	17656025.13	4771787.46	104.00	0	D	50	43.2	0.0	0.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-13.7
3	17656025.13	4771787.46	104.00	0	D	63	47.2	0.0	0.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-9.7
3	17656025.13	4771787.46	104.00	0	D	80	50.9	0.0	0.0	0.0	0.0	59.9	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-6.0
3	17656025.13	4771787.46	104.00	0	D	100	54.1	0.0	0.0	0.0	0.0	59.9	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-3.4
3	17656025.13	4771787.46	104.00	0	D	125	57.1	0.0	0.0	0.0	0.0	59.9	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-0.5
3	17656025.13	4771787.46	104.00	0	D	160	59.8	0.0	0.0	0.0	0.0	59.9	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	2.2
3	17656025.13	4771787.46	104.00	0	D	200	58.5	0.0	0.0	0.0	0.0	59.9	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	0.8
3	17656025.13	4771787.46	104.00	0	D	250	60.8	0.0	0.0	0.0	0.0	59.9	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	3.1
3	17656025.13	4771787.46	104.00	0	D	315	62.8	0.0	0.0	0.0	0.0	59.9	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	5.0
3	17656025.13	4771787.46	104.00	0	D	400	63.7	0.0	0.0	0.0	0.0	59.9	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	5.8
3	17656025.13	4771787.46	104.00	0	D	500	65.3	0.0	0.0	0.0	0.0	59.9	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	7.3
3	17656025.13	4771787.46	104.00	0	D	630	66.6	0.0	0.0	0.0	0.0	59.9	0.6	-2.4	0.0	0.0	0.0	0.0	0.0	8.5
3	17656025.13	4771787.46	104.00	0	D	800	65.0	0.0	0.0	0.0	0.0	59.9	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	6.8
3	17656025.13	4771787.46	104.00	0	D	1000	65.8	0.0	0.0	0.0	0.0	59.9	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	7.4
3	17656025.13	4771787.46	104.00	0	D	1250	66.4	0.0	0.0	0.0	0.0	59.9	1.3	-2.4	0.0	0.0	0.0	0.0	0.0	7.6
3	17656025.13	4771787.46	104.00	0	D	1600	62.2	0.0	0.0	0.0	0.0	59.9	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	2.9
3	17656025.13	4771787.46	104.00	0	D	2000	62.4	0.0	0.0	0.0	0.0	59.9	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	2.3
3	17656025.13	4771787.46	104.00	0	D	2500	62.5	0.0	0.0	0.0	0.0	59.9	4.0	-2.4	0.0	0.0	0.0	0.0	0.0	1.1
3	17656025.13	4771787.46	104.00	0	D	3150	58.8	0.0	0.0	0.0	0.0	59.9	6.0	-2.4	0.0	0.0	0.0	0.0	0.0	-4.6
3	17656025.13	4771787.46																		

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC2"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahours (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
3	17656025.13	4771787.46	104.00	0	D	6300	52.0	0.0	0.0	0.0	0.0	59.9	21.3	-2.4	0.0	0.0	0.0	0.0	0.0	-26.8
3	17656025.13	4771787.46	104.00	0	D	8000	51.0	0.0	0.0	0.0	0.0	59.9	32.4	-2.4	0.0	0.0	0.0	0.0	0.0	-38.8
3	17656025.13	4771787.46	104.00	0	D	10000	49.6	0.0	0.0	0.0	0.0	59.9	48.6	-2.4	0.0	0.0	0.0	0.0	0.0	-56.4
3	17656025.13	4771787.46	104.00	0	N	25	-49.5	0.0	-3.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-109.3
3	17656025.13	4771787.46	104.00	0	N	32	-44.2	0.0	-3.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-104.0
3	17656025.13	4771787.46	104.00	0	N	40	-39.4	0.0	-3.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-99.3
3	17656025.13	4771787.46	104.00	0	N	50	43.2	0.0	-3.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-16.7
3	17656025.13	4771787.46	104.00	0	N	63	47.2	0.0	-3.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-12.7
3	17656025.13	4771787.46	104.00	0	N	80	50.9	0.0	-3.0	0.0	0.0	59.9	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-9.0
3	17656025.13	4771787.46	104.00	0	N	100	54.1	0.0	-3.0	0.0	0.0	59.9	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-6.4
3	17656025.13	4771787.46	104.00	0	N	125	57.1	0.0	-3.0	0.0	0.0	59.9	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-3.5
3	17656025.13	4771787.46	104.00	0	N	160	59.8	0.0	-3.0	0.0	0.0	59.9	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-0.8
3	17656025.13	4771787.46	104.00	0	N	200	58.5	0.0	-3.0	0.0	0.0	59.9	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-2.2
3	17656025.13	4771787.46	104.00	0	N	250	60.8	0.0	-3.0	0.0	0.0	59.9	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	0.1
3	17656025.13	4771787.46	104.00	0	N	315	62.8	0.0	-3.0	0.0	0.0	59.9	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	2.0
3	17656025.13	4771787.46	104.00	0	N	400	63.7	0.0	-3.0	0.0	0.0	59.9	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	2.8
3	17656025.13	4771787.46	104.00	0	N	500	65.3	0.0	-3.0	0.0	0.0	59.9	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	4.3
3	17656025.13	4771787.46	104.00	0	N	630	66.6	0.0	-3.0	0.0	0.0	59.9	0.6	-2.4	0.0	0.0	0.0	0.0	0.0	5.5
3	17656025.13	4771787.46	104.00	0	N	800	65.0	0.0	-3.0	0.0	0.0	59.9	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	3.8
3	17656025.13	4771787.46	104.00	0	N	1000	65.8	0.0	-3.0	0.0	0.0	59.9	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	4.3
3	17656025.13	4771787.46	104.00	0	N	1250	66.4	0.0	-3.0	0.0	0.0	59.9	1.3	-2.4	0.0	0.0	0.0	0.0	0.0	4.6
3	17656025.13	4771787.46	104.00	0	N	1600	62.2	0.0	-3.0	0.0	0.0	59.9	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	-0.1
3	17656025.13	4771787.46	104.00	0	N	2000	62.4	0.0	-3.0	0.0	0.0	59.9	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	-0.7
3	17656025.13	4771787.46	104.00	0	N	2500	62.5	0.0	-3.0	0.0	0.0	59.9	4.0	-2.4	0.0	0.0	0.0	0.0	0.0	-1.9
3	17656025.13	4771787.46	104.00	0	N	3150	58.8	0.0	-3.0	0.0	0.0	59.9	6.0	-2.4	0.0	0.0	0.0	0.0	0.0	-7.6
3	17656025.13	4771787.46	104.00	0	N	4000	58.6	0.0	-3.0	0.0	0.0	59.9	9.1	-2.4	0.0	0.0	0.0	0.0	0.0	-10.9
3	17656025.13	4771787.46	104.00	0	N	5000	58.1	0.0	-3.0	0.0	0.0	59.9	13.9	-2.4	0.0	0.0	0.0	0.0	0.0	-16.3
3	17656025.13	4771787.46	104.00	0	N	6300	52.0	0.0	-3.0	0.0	0.0	59.9	21.3	-2.4	0.0	0.0	0.0	0.0	0.0	-29.8
3	17656025.13	4771787.46	104.00	0	N	8000	51.0	0.0	-3.0	0.0	0.0	59.9	32.4	-2.4	0.0	0.0	0.0	0.0	0.0	-41.8
3	17656025.13	4771787.46	104.00	0	N	10000	49.6	0.0	-3.0	0.0	0.0	59.9	48.6	-2.4	0.0	0.0	0.0	0.0	0.0	-59.4
3	17656025.13	4771787.46	104.00	0	E	25	-49.5	0.0	-188.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-294.3
3	17656025.13	4771787.46	104.00	0	E	32	-44.2	0.0	-188.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-289.0
3	17656025.13	4771787.46	104.00	0	E	40	-39.4	0.0	-188.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-284.2
3	17656025.13	4771787.46	104.00	0	E	50	43.2	0.0	-188.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-201.7
3	17656025.13	4771787.46	104.00	0	E	63	47.2	0.0	-188.0	0.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-197.7
3	17656025.13	4771787.46	104.00	0	E	80	50.9	0.0	-188.0	0.0	0.0	59.9	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-194.0
3	17656025.13	4771787.46	104.00	0	E	100	54.1	0.0	-188.0	0.0	0.0	59.9	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-191.4
3	17656025.13	4771787.46	104.00	0	E	125	57.1	0.0	-188.0	0.0	0.0	59.9	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-188.5
3	17656025.13	4771787.46	104.00	0	E	160	59.8	0.0	-188.0	0.0	0.0	59.9	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-185.8
3	17656025.13	4771787.46	104.00	0	E	200	58.5	0.0	-188.0	0.0	0.0	59.9	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-187.2
3	17656025.13	4771787.46	104.00	0	E	250	60.8	0.0	-188.0	0.0	0.0	59.9	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	-184.9
3	17656025.13	4771787.46	104.00	0	E	315	62.8	0.0	-188.0	0.0	0.0	59.9	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	-183.0
3	17656025.13	4771787.46	104.00	0	E	400	63.7	0.0	-188.0	0.0	0.0	59.9	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	-182.2
3	17656025.13	4771787.46	104.00	0	E	500	65.3	0.0	-188.0	0.0	0.0	59.9	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	-180.7
3	17656025.13	4771787.46	104.00	0	E	630	66.6	0.0	-188.0	0.0	0.0	59.9	0.6	-2.4	0.0	0.0	0.0	0.0	0.0	-179.5
3	17656025.13	4771787.46	104.00	0	E	800	65.0	0.0	-188.0	0.0	0.0	59.9	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	-181.2
3	17656025.13	4771787.46	104.00	0	E	1000	65.8	0.0	-188.0	0.0	0.0	59.9	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	-180.6
3	17656025.13	4771787.46	104.00	0	E	1250	66.4	0.0	-188.0	0.0	0.0	59.9	1.3	-2.4	0.0	0.0	0.0	0.0	0.0	-180.4
3	17656025.13	4771787.46	104.00	0	E	1600	62.2	0.0	-188.0	0.0	0.0	59.9	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	-185.1
3	17656025.13	4771787.46	104.00	0	E	2000	62.4	0.0	-188.0	0.0	0.0	59.9	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	-185.7
3	17656025.13	4771787.46	104.00	0	E	2500	62.5	0.0	-188.0	0.0	0.0	59.9	4.0	-2.4	0.0	0.0	0.0	0.0	0.0	-186.9
3	17656025.13	4771787.46	104.00	0	E	3150	58.8	0.0	-188.0	0.0	0.0	59.9	6.0	-2.4	0.0	0.0	0.0	0.0	0.0	-192.6
3	17656025.13	4771787.46	104.00	0	E	4000	58.6	0.0	-188.0	0.0	0.0	59.9	9.1	-2.4	0.0	0.0	0.0	0.0	0.0	-195.9
3	17656025.13	4771787.46	104.00	0	E	5000	58.1	0.0	-188.0	0.0	0.0	59.9	13.9	-2.4	0.0	0.0	0.0	0.0	0.0	-201.3
3	17656025.13	4771787.46	104.00	0	E	6300	52.0	0.0	-188.0	0.0	0.0	59.9	21.3	-2.4	0.0	0.0	0.0	0.0	0.0	-214.8
3	17656025.13	4771787.46	104.00	0	E	8000	51.0	0.0	-188.0	0.0	0.0	59.9	32.4	-2.4	0.0	0.0	0.0	0.0	0.0	-226.8
3	17656025.13	4771787.46	104.00	0	E	10000	49.6	0.0	-188.0	0.0	0.0	59.9	48.6	-2.4	0.0	0.0	0.0	0.0	0.0	-244.4

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC3"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahours (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
4	17656026.58	4771770.42	104.00	0	D	25	-49.5	0.0	0.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-106.5
4	17656026.58	4771770.42	104.00	0	D	32	-44.2	0.0	0.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-101.2
4	17656026.58	4771770.42	104.00	0	D	40	-39.4	0.0	0.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-96.4
4	17656026.58	4771770.42	104.00	0	D	50	43.2	0.0	0.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-13.8
4	17656026.58	4771770.42	104.00	0	D	63	47.2	0.0	0.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-9.8
4	17656026.58	4771770.42																		

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC3"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(A)
4	17656026.58	4771770.42	104.00	0	D	125	57.1	0.0	0.0	0.0	0.0	60.0	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-0.6
4	17656026.58	4771770.42	104.00	0	D	160	59.8	0.0	0.0	0.0	0.0	60.0	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	2.0
4	17656026.58	4771770.42	104.00	0	D	200	58.5	0.0	0.0	0.0	0.0	60.0	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	0.7
4	17656026.58	4771770.42	104.00	0	D	250	60.8	0.0	0.0	0.0	0.0	60.0	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	2.9
4	17656026.58	4771770.42	104.00	0	D	315	62.8	0.0	0.0	0.0	0.0	60.0	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	4.8
4	17656026.58	4771770.42	104.00	0	D	400	63.7	0.0	0.0	0.0	0.0	60.0	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	5.6
4	17656026.58	4771770.42	104.00	0	D	500	65.3	0.0	0.0	0.0	0.0	60.0	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	7.1
4	17656026.58	4771770.42	104.00	0	D	630	66.6	0.0	0.0	0.0	0.0	60.0	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	8.3
4	17656026.58	4771770.42	104.00	0	D	800	65.0	0.0	0.0	0.0	0.0	60.0	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	6.6
4	17656026.58	4771770.42	104.00	0	D	1000	65.8	0.0	0.0	0.0	0.0	60.0	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	7.2
4	17656026.58	4771770.42	104.00	0	D	1250	66.4	0.0	0.0	0.0	0.0	60.0	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	7.4
4	17656026.58	4771770.42	104.00	0	D	1600	62.2	0.0	0.0	0.0	0.0	60.0	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	2.7
4	17656026.58	4771770.42	104.00	0	D	2000	62.4	0.0	0.0	0.0	0.0	60.0	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	2.1
4	17656026.58	4771770.42	104.00	0	D	2500	62.5	0.0	0.0	0.0	0.0	60.0	4.0	-2.4	0.0	0.0	0.0	0.0	0.0	0.9
4	17656026.58	4771770.42	104.00	0	D	3150	58.8	0.0	0.0	0.0	0.0	60.0	6.1	-2.4	0.0	0.0	0.0	0.0	0.0	-4.9
4	17656026.58	4771770.42	104.00	0	D	4000	58.6	0.0	0.0	0.0	0.0	60.0	9.3	-2.4	0.0	0.0	0.0	0.0	0.0	-8.3
4	17656026.58	4771770.42	104.00	0	D	5000	58.1	0.0	0.0	0.0	0.0	60.0	14.2	-2.4	0.0	0.0	0.0	0.0	0.0	-13.7
4	17656026.58	4771770.42	104.00	0	D	6300	52.0	0.0	0.0	0.0	0.0	60.0	21.8	-2.4	0.0	0.0	0.0	0.0	0.0	-27.4
4	17656026.58	4771770.42	104.00	0	D	8000	51.0	0.0	0.0	0.0	0.0	60.0	33.1	-2.4	0.0	0.0	0.0	0.0	0.0	-39.7
4	17656026.58	4771770.42	104.00	0	D	10000	49.6	0.0	0.0	0.0	0.0	60.0	49.6	-2.4	0.0	0.0	0.0	0.0	0.0	-57.6
4	17656026.58	4771770.42	104.00	0	N	25	-49.5	0.0	-3.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-109.5
4	17656026.58	4771770.42	104.00	0	N	32	-44.2	0.0	-3.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-104.2
4	17656026.58	4771770.42	104.00	0	N	40	-39.4	0.0	-3.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-99.4
4	17656026.58	4771770.42	104.00	0	N	50	43.2	0.0	-3.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-16.8
4	17656026.58	4771770.42	104.00	0	N	63	47.2	0.0	-3.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-12.9
4	17656026.58	4771770.42	104.00	0	N	80	50.9	0.0	-3.0	0.0	0.0	60.0	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-9.2
4	17656026.58	4771770.42	104.00	0	N	100	54.1	0.0	-3.0	0.0	0.0	60.0	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-6.6
4	17656026.58	4771770.42	104.00	0	N	125	57.1	0.0	-3.0	0.0	0.0	60.0	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-3.7
4	17656026.58	4771770.42	104.00	0	N	160	59.8	0.0	-3.0	0.0	0.0	60.0	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-1.0
4	17656026.58	4771770.42	104.00	0	N	200	58.5	0.0	-3.0	0.0	0.0	60.0	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-2.3
4	17656026.58	4771770.42	104.00	0	N	250	60.8	0.0	-3.0	0.0	0.0	60.0	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	-0.1
4	17656026.58	4771770.42	104.00	0	N	315	62.8	0.0	-3.0	0.0	0.0	60.0	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	1.8
4	17656026.58	4771770.42	104.00	0	N	400	63.7	0.0	-3.0	0.0	0.0	60.0	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	2.6
4	17656026.58	4771770.42	104.00	0	N	500	65.3	0.0	-3.0	0.0	0.0	60.0	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	4.1
4	17656026.58	4771770.42	104.00	0	N	630	66.6	0.0	-3.0	0.0	0.0	60.0	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	5.3
4	17656026.58	4771770.42	104.00	0	N	800	65.0	0.0	-3.0	0.0	0.0	60.0	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	3.6
4	17656026.58	4771770.42	104.00	0	N	1000	65.8	0.0	-3.0	0.0	0.0	60.0	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	4.1
4	17656026.58	4771770.42	104.00	0	N	1250	66.4	0.0	-3.0	0.0	0.0	60.0	1.4	-2.4	0.0	0.0	0.0	0.0	0.0	4.4
4	17656026.58	4771770.42	104.00	0	N	1600	62.2	0.0	-3.0	0.0	0.0	60.0	1.9	-2.4	0.0	0.0	0.0	0.0	0.0	-0.3
4	17656026.58	4771770.42	104.00	0	N	2000	62.4	0.0	-3.0	0.0	0.0	60.0	2.7	-2.4	0.0	0.0	0.0	0.0	0.0	-1.0
4	17656026.58	4771770.42	104.00	0	N	2500	62.5	0.0	-3.0	0.0	0.0	60.0	4.0	-2.4	0.0	0.0	0.0	0.0	0.0	-2.2
4	17656026.58	4771770.42	104.00	0	N	3150	58.8	0.0	-3.0	0.0	0.0	60.0	6.1	-2.4	0.0	0.0	0.0	0.0	0.0	-7.9
4	17656026.58	4771770.42	104.00	0	N	4000	58.6	0.0	-3.0	0.0	0.0	60.0	9.3	-2.4	0.0	0.0	0.0	0.0	0.0	-11.3
4	17656026.58	4771770.42	104.00	0	N	5000	58.1	0.0	-3.0	0.0	0.0	60.0	14.2	-2.4	0.0	0.0	0.0	0.0	0.0	-16.7
4	17656026.58	4771770.42	104.00	0	N	6300	52.0	0.0	-3.0	0.0	0.0	60.0	21.8	-2.4	0.0	0.0	0.0	0.0	0.0	-30.4
4	17656026.58	4771770.42	104.00	0	N	8000	51.0	0.0	-3.0	0.0	0.0	60.0	33.1	-2.4	0.0	0.0	0.0	0.0	0.0	-42.7
4	17656026.58	4771770.42	104.00	0	N	10000	49.6	0.0	-3.0	0.0	0.0	60.0	49.6	-2.4	0.0	0.0	0.0	0.0	0.0	-60.6
4	17656026.58	4771770.42	104.00	0	E	25	-49.5	0.0	-188.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-294.5
4	17656026.58	4771770.42	104.00	0	E	32	-44.2	0.0	-188.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-289.2
4	17656026.58	4771770.42	104.00	0	E	40	-39.4	0.0	-188.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-284.4
4	17656026.58	4771770.42	104.00	0	E	50	43.2	0.0	-188.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-201.8
4	17656026.58	4771770.42	104.00	0	E	63	47.2	0.0	-188.0	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-197.8
4	17656026.58	4771770.42	104.00	0	E	80	50.9	0.0	-188.0	0.0	0.0	60.0	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	-194.2
4	17656026.58	4771770.42	104.00	0	E	100	54.1	0.0	-188.0	0.0	0.0	60.0	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-191.6
4	17656026.58	4771770.42	104.00	0	E	125	57.1	0.0	-188.0	0.0	0.0	60.0	0.1	-2.4	0.0	0.0	0.0	0.0	0.0	-188.6
4	17656026.58	4771770.42	104.00	0	E	160	59.8	0.0	-188.0	0.0	0.0	60.0	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-186.0
4	17656026.58	4771770.42	104.00	0	E	200	58.5	0.0	-188.0	0.0	0.0	60.0	0.2	-2.4	0.0	0.0	0.0	0.0	0.0	-187.3
4	17656026.58	4771770.42	104.00	0	E	250	60.8	0.0	-188.0	0.0	0.0	60.0	0.3	-2.4	0.0	0.0	0.0	0.0	0.0	-185.1
4	17656026.58	4771770.42	104.00	0	E	315	62.8	0.0	-188.0	0.0	0.0	60.0	0.4	-2.4	0.0	0.0	0.0	0.0	0.0	-183.2
4	17656026.58	4771770.42	104.00	0	E	400	63.7	0.0	-188.0	0.0	0.0	60.0	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	-182.4
4	17656026.58	4771770.42	104.00	0	E	500	65.3	0.0	-188.0	0.0	0.0	60.0	0.5	-2.4	0.0	0.0	0.0	0.0	0.0	-180.9
4	17656026.58	4771770.42	104.00	0	E	630	66.6	0.0	-188.0	0.0	0.0	60.0	0.7	-2.4	0.0	0.0	0.0	0.0	0.0	-179.7
4	17656026.58	4771770.42	104.00	0	E	800	65.0	0.0	-188.0	0.0	0.0	60.0	0.8	-2.4	0.0	0.0	0.0	0.0	0.0	-181.4
4	17656026.58	4771770.42	104.00	0	E	1000	65.8	0.0	-188.0	0.0	0.0	60.0	1.0	-2.4	0.0	0.0	0.0	0.0	0.0	-180.8
4	17656026.58	4771770.42	104.00</																	

Point Source, ISO 9613, Name: "Rooftop HVAC", ID: "SHVAC3"

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)	
4	17656026.58	4771770.42	104.00	0	E	3150	58.8	0.0	-188.0	0.0	0.0	60.0	6.1	-2.4	0.0	0.0	0.0	0.0	0.0	0.0	-192.9
4	17656026.58	4771770.42	104.00	0	E	4000	58.6	0.0	-188.0	0.0	0.0	60.0	9.3	-2.4	0.0	0.0	0.0	0.0	0.0	0.0	-196.3
4	17656026.58	4771770.42	104.00	0	E	5000	58.1	0.0	-188.0	0.0	0.0	60.0	14.2	-2.4	0.0	0.0	0.0	0.0	0.0	0.0	-201.7
4	17656026.58	4771770.42	104.00	0	E	6300	52.0	0.0	-188.0	0.0	0.0	60.0	21.8	-2.4	0.0	0.0	0.0	0.0	0.0	0.0	-215.4
4	17656026.58	4771770.42	104.00	0	E	8000	51.0	0.0	-188.0	0.0	0.0	60.0	33.1	-2.4	0.0	0.0	0.0	0.0	0.0	0.0	-227.7
4	17656026.58	4771770.42	104.00	0	E	10000	49.6	0.0	-188.0	0.0	0.0	60.0	49.6	-2.4	0.0	0.0	0.0	0.0	0.0	0.0	-245.6