

Environmental Noise Feasibility Study

Black Creek Road Subdivision

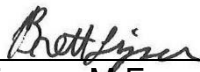
Proposed Residential Development Town of Fort Erie

December 14, 2021
Project: 121-0059

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Version History

Version #	Date	Comments
1.0	December 14, 2021	Final – Issued to Client

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Proposed Residential Development Town of Fort Erie

EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study for the proposed residential development in support of the Zoning By-law Amendment (ZBA) and Draft Plan of Subdivision application submissions to the Town of Fort Erie and the Regional Municipality of Niagara. The proposed residential development consists of 13 townhouse blocks, 54 lots for detached dwellings, 8 blocks for semi-detached dwellings, a block for 16 block town units (Block 74) and a block for up to 80 apartment units (Block 75). All townhouses detached and semi-detached dwellings will have grade-level rear yard outdoor amenity space.

The significant transportation noise source in the vicinity is road traffic on the QEW, the QEW westbound offramp, Netherby Road, Baker Road and Black Creek Road.

The sound levels on site have been determined and compared with the applicable Ministry of the Environment, Conservation and Parks (MECP) noise guideline limits to determine the need for noise mitigation.

To meet the applicable transportation noise source guideline limits:

- Dwelling units on Blocks 53 to 62, on Lots 1 to 14 and in the apartment building on Block 75 require mandatory air conditioning to allow windows to remain closed for noise control purposes;
- Dwelling units on Blocks 63 to 65 and 70, on Lots 15 to 18, 31 to 38, and 41 to 54 and the stacked townhouse units on Block 75 require the provision for adding air conditioning;
- Exterior wall construction meeting Sound Transmission Class (STC) 54 and exterior windows with ratings up to STC 31 are recommended for the dwelling units on Blocks 53 to 62 and on Lots 1 to 14;
- Exterior wall construction meeting STC 45 and exterior windows with ratings up to STC 28 are recommended for the apartment building on Block 75;

- Exterior wall construction meeting STC 37 and exterior windows with ratings up to STC 26 are required at all remaining dwelling units; and
- These sound barriers are required (See Figure 2A):
 - 2.8 m in height along the rear property line of Blocks 55 and 56;
 - 2.6 m in height along the rear property line of Blocks 57 to 64 and Lots 1 to 14; and
 - 2.4 m in height along the rear property line of Blocks 53 and 54 including a return along the east property line of Block 53.

Final noise mitigation requirements should be checked when detailed architectural and grading plans are available.

The significant stationary source in the vicinity is the Faith Reformed Church to the north of the site. With the proposed development layout, sound emissions from the Church are predicted to comply with the MECP noise guideline limits at the proposed development. Thus, additional noise mitigation measures are not required.

1.0 INTRODUCTION

VCL was retained to prepare an Environmental Noise Feasibility Study for the proposed residential development in support of the ZBA and Draft Plan of Subdivision application submissions to the Town of Fort Erie and the Regional Municipality of Niagara.

The predicted sound levels and noise mitigation measures needed for the proposed development to comply with noise guidelines of the MECP are outlined herein.

1.1 THE SITE AND SURROUNDING AREA

The proposed development is located in the northeast quadrant of the Netherby Road and QEW intersection, in the Town of Fort Erie. The site is bounded by:

- The existing Faith Reformed Church, Black Creek Community Association and Baker Road with existing single-family dwellings and vacant land beyond, to the north;
- Netherby Road and the QEW westbound offramp, with existing agricultural land beyond, to the west;
- The QEW westbound offramp to the south; and
- Black Creek Road, with existing detached residential dwellings beyond, to the east.

A Key Plan is included as Figure 1.

The study was completed using the Draft Plan of Subdivision prepared by Upper Canada Consultants, dated December 6, 2021 as well the Conceptual Draft Plan, dated August 27, 2021 (specifically for the design of Blocks 74 and 75). The Draft Plan of Subdivision and Conceptual Draft Plan for Blocks 74 and 75 are shown as Figures 2A and 2B, respectively.

1.2 THE PROPOSED DEVELOPMENT

The proposed development consists of 13 townhouse blocks, 54 lots for detached dwellings, 8 blocks for semi-detached dwellings, a block for 16 block town units (Block 74) and a block for up to 80 apartment units (Block 75). All townhouses detached and semi-detached dwellings will have grade-level rear yard outdoor amenity space.

2.0 NOISE SOURCES

2.1 TRANSPORTATION NOISE SOURCES

The transportation noise source with potential to impact the proposed development is road traffic on the QEW, QEW westbound offramp, Netherby Road, Baker Road and Black Creek Road. Traffic volumes on other surrounding roadways are anticipated to be minor and no significant noise impact on the subject site is expected.

Ultimate traffic volumes for the QEW were obtained from the Ministry of Transportation (MTO). Both ultimate AADT and SADT were provided. As recommended by the MTO, the higher SADT volume was used in the analysis. A day/night split of 67%/33% was assumed. Heavy and medium trucks were assumed to be 75% and 25% of the total truck volume, as recommended by the MTO for freeways.

Ultimate road traffic data for the westbound QEW offramp was calculated this procedure:

- The latest (2016) AADT for the section of the QEW to the east and west of the Netherby Road interchange were obtained from the MTO Traffic Volume Library.
- The 2016 AADT volumes for the QEW to the west and east of Netherby Road are 22,000 and 25,700, respectively.
- The difference of 3,700 vehicles were assumed to exit the QEW using the westbound offramp.
- The traffic volume on the ramp was scaled to the ultimate condition using a factor of 1.9, which is the increase from the 2016 AADT to the ultimate SADT volumes on the QEW.
- The truck percentages and day/night split were assumed to be the same as for the QEW.

The year 2019 24-hour traffic volume for Netherby Road was provided by the Region of Niagara in the form of 24-hour automatic traffic recorder (ATR) reports. The future (year 2041) traffic volume was calculated by escalating the 2019 volume at a growth rate of 2%, compounded annually. The future traffic volume of 968 vehicles/day (vpd) is considered acoustically insignificant. Thus, Netherby Road was not considered further in this assessment.

The year 2010 traffic data for Baker Road and Black Creek Road was provided by the Town of Fort Erie. Future (year 2041) traffic volumes were calculated by escalating the 2010 volume at a growth rate of 2%, compounded annually. The future traffic volumes of 2670 vpd and 817 vpd for Baker Road and Black Creek Road, respectively, are considered acoustically insignificant recognizing the separation distance to Baker Road. Thus, Baker Road and Black Creek Road were not considered further in this assessment.

The traffic data is shown in Appendix A and summarized in Table 1.

2.2 STATIONARY NOISE SOURCES

There are two stationary noise sources in the area that have the potential to impact the proposed residential development:

- The Faith Reformed Church located at 3605 Black Creek Road; and
- The Black Creek Community Association located at 2959 Baker Road.

The Faith Reformed Church is located immediately north of the subject site. The noise sources at the Church with the potential to impact the subject site are the rooftop mechanical units. Sound measurements at this facility were done by VCL staff on March 25, 2021. A detailed stationary source analysis was completed and is discussed in Section 5.0.

The existing Black Creek Community Association is located approximately 140 m north of the closest proposed building at the proposed development site. The potential noise sources that could impact the subject site are the mechanical units. Using satellite imagery and confirmed during a visit by VCL staff, there are no large mechanical units at this facility with the potential to impact the subject site. Thus, noise from this facility is not considered further.

3.0 ENVIRONMENTAL NOISE GUIDELINES

3.1 MECP PUBLICATION NPC-300

The applicable noise guidelines for new residential development are those in MECP Publication NPC-300, “Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning”.

The environmental noise guidelines of the MECP, as provided in Publication NPC-300, are discussed briefly below and summarized in Appendix B.

3.1.1 Transportation Noise Sources

3.1.1.1 Architectural Elements

In the daytime, the indoor criterion for road noise is $L_{eq\ Day}^{(1)}$ of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night, the indoor criterion for road noise is $L_{eq\ Night}^{(2)}$ of 45 dBA for sensitive spaces such as living/dining rooms and dens and 40 dBA for bedrooms.

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to mitigate the future outdoor sound levels to achieve these indoor sound level limits.

3.1.1.2 Ventilation

In accordance with the MECP noise guideline for road traffic sources, if the daytime sound level, $L_{eq\ Day}$, at the exterior face of a noise sensitive window is greater than 65 dBA, means must be

(1) 16-hour energy equivalent sound level (0700-2300 hours).

(2) 8-hour energy equivalent sound level (2300-0700 hours).

provided so that windows can be kept closed for noise control purposes and central air conditioning is required. For daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning. A warning clause advising the occupant of the potential interference with some activities is also required. At nighttime, air conditioning would be required when the sound level exceeds 60 dBA ($L_{eq\ Night}$) at a noise sensitive window (provision for adding air conditioning is required when greater than 50 dBA).

3.1.1.3 Outdoors

For outdoor amenity areas (“Outdoor Living Areas” - OLA’s), the guideline objective is 55 dBA $L_{eq\ Day}$ (0700 to 2300 hours) with an excess not exceeding 5 dBA considered acceptable if it is technically not practicable to achieve the 55 dBA objective, providing warning clauses are registered on title.

3.1.2 Stationary Noise Sources

The site and area are Class 1; i.e., an area where the ambient sound environment is dominated by “urban hum”, primarily traffic noise, during the daytime, evening and nighttime.

The MECP requires a “predictable worst case” one-hour operating scenario be analyzed. This occurs when the difference between the guideline limit and the noise generated by the stationary noise sources is at a maximum.

The guideline limits apply at the outdoor plane of window to habitable spaces such as living/dining/family rooms and sleep areas as well as at locations amenable for use outdoors. No indoor sound level guidelines are provided for stationary sources.

MECP Publication NPC-300 states that the guideline limits are the higher of the ambient sound level, due to road traffic noise, or the minimum exclusion limits. For a Class 1 area, the minimum exclusion limits at a noise sensitive plane of window are 50 dBA in the daytime (0700 to 1900 hours) and evening (1900 to 2300 hours) and 45 dBA in the nighttime (2300 to 0700 hours). The minimum exclusion limit at an outdoor point of reception (OPOR) is 50 dBA in the daytime and evening. There is no sound level limit at an OPOR at night.

3.2 NIAGARA REGION

The Niagara Region noise guidelines are contained in the Public Works Department Policy Manual, Regional Road Traffic Noise Control, dated November 9, 2006 (Reference 6).

The noise requirements for new developments are essentially the same as the MECP requirements described above. The only difference is that Niagara Region requires traffic volumes to be projected a minimum of 20 years into the future.

4.0 NOISE IMPACT ASSESSMENT – TRANSPORTATION SOURCES

4.1 METHOD

Using the road traffic data in Table 1, the daytime and nighttime sound levels ($L_{eq\ Day}$ and $L_{eq\ Night}$) were determined using STAMSON V5.04 – ORNAMENT, the computerized road traffic noise prediction model of the MECP.

It is understood that the detached and semi-detached dwellings will be up to 2 storeys in height, the townhouse blocks may be up to 3 storeys in height and the apartment building may be up to 4 storeys in height.

The daytime and nighttime sound levels at the building facades were assessed at heights of:

- 4.5 m for the detached and semi-detached dwellings;
- 7.5 m for the townhouse blocks; and
- 10.5 m for the apartment building.

These heights represent the top floor (worst case) locations where the highest sound levels are predicted due to reduced ground effect.

The daytime OLA sound levels were calculated at a height of 1.5 m above grade, 3 m from and in line with the midpoint of the rear facade of the dwelling unit.

Inherent acoustical screening of the building due to its orientation to the noise source was taken into account. To be conservative, screening from the neighbouring buildings was not included.

4.2 RESULTS

The highest unmitigated daytime and nighttime sound level of 67 dBA is predicted to occur on the west facade of the dwelling on Block 56. The highest unmitigated daytime sound level at an OLA is 67 dBA and is also predicted to occur at Block 56.

Table 2 summarizes the unmitigated daytime and nighttime sound level predictions. Sample sound level calculations are included as Appendix C.

4.3 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which can be treated separately for the most part:

- a) Architectural elements to achieve acceptable indoor noise guidelines;
- b) Design features to protect the OLA's.

Noise abatement requirements are summarized on Figures 2A and 2B and in Table 3 along with the notes to Table 3.

4.3.1 Indoors

4.3.1.1 Architectural Elements

The indoor noise level guidelines can be achieved by using appropriate construction for exterior walls, windows and doors.

To determine the worst-case architectural sound isolation requirements for the detached, semi-detached and townhouse dwelling units, wall and window areas were assumed to be 80% and 30%, respectively, of the associated floor area, on each facade of a corner room. For the

apartment dwelling units, wall and window areas were assumed to be 20% and 80%, respectively, of the associated floor area.

To mitigate the predicted sound levels, the sound isolation requirements are:

- Exterior wall construction meeting STC 54 and exterior windows with ratings up to STC 31 at the dwelling units on Blocks 53 to 62 and Lots 1 to 14;
- Exterior wall construction meeting STC 45 and exterior windows with ratings up to STC 28 at the apartment building; and
- Exterior wall construction meeting STC 37 and exterior windows meeting STC 26 at all remaining dwelling units.

It is expected that typical exterior wall construction meeting the minimum non-acoustical requirements of the OBC will meet the STC 37 requirement. Windows meeting the minimum non-acoustical requirements of the OBC would be expected to achieve the STC 28 requirement.

Note, the window frames themselves must also be designed to ensure that the overall sound isolation performance for the entire window unit meets the sound isolation requirement. This should be confirmed by the window manufacturer through the submission of acoustical test data.

The final sound isolation requirements should be reviewed when detailed architectural plans are developed. Wall and window constructions should also be reviewed at this point to ensure that they will meet the required sound isolation performance. This is typically required by the Town at the building permit application stage

4.3.1.2 Ventilation Requirements

Based on the predicted sound levels, the ventilation requirements are:

- Dwelling units on Blocks 53 to 62 and Lots 1 to 14 require mandatory air conditioning to allow windows to remain closed for noise control purposes; and
- Dwelling units on Blocks 63 to 65 and 70, on Lots 15 to 18, 31 to 38, and 41 to 54 as well as the apartment and stacked townhouse buildings on Block 75 require the provision for adding air conditioning. This typically takes the form of a ducted, forced air heating system, suitably sized to accommodate central air conditioning.

For multi-family buildings such as the apartment building, the provision for adding air conditioning is typically not practical to implement. Thus, the requirement has been changed to mandatory air conditioning, which exceeds the minimum requirement.

There are no special ventilation requirements for noise control purposes for the remaining lots.

4.3.2 **Outdoors**

The unmitigated OLA sound levels for the dwelling units with exposure to the QEW offramp are predicted to exceed 55 dBA. Thus, sound barriers are required.

These sound barriers would mitigate the daytime OLA sound levels to the 55 dBA design objective:

- Up to 7.5 m high at the rear yards of Blocks 53 to 60 and Lots 1 to 14; and
- Up to 3.3 m high at the rear yards of Blocks 61 to 64.

The Draft Plan of Subdivision shows a 2.4 m high sound barrier along the rear property lines of Blocks 53 and 54, a 2.8 m high sound barrier for the rear property lines of Blocks 55 and 56, and a 2.6 m high sound barrier along the western property line of the subject site (from Block 57 to 64). This will mitigate the daytime OLA sound levels to:

- 60 dBA and below for Blocks 53 to 60 and Lots 1 to 14; and
- 58 and below for Blocks 61 to 64.

These sound levels are within the 5 dBA leeway permitted under MECP guidelines provided warning clauses are registered on title. Thus, the sound barriers shown on the Draft Plan are recommended. The locations of the recommended sound barriers are shown on Figure 2A.

The sound barrier requirements should be checked once the grading plan becomes available.

The sound barriers must be of solid construction with no gaps, cracks or holes (except for small openings required for water drainage) and must have a minimum surface weight of 20 kg/m². A variety of materials are available, including concrete, masonry, glass, wood, specialty composite materials, or a combination of the above.

4.3.3 Warning Clauses

Warning clauses are a tool to inform prospective owners/occupants of potential annoyance due to existing noise sources. Where the guideline sound level limits are exceeded, appropriate warning clauses should be registered on title or included in the development agreement that is registered on title. The warning clauses should also be included in agreements of Offers of Purchase and Sale and lease/rental agreements to make future occupants aware of the potential noise situation. Locations requiring warning clauses and the appropriate wording are given in Table 3 and in the notes to Table 3, respectively.

5.0 NOISE IMPACT ASSESSMENT – STATIONARY SOURCES

5.1 NOISE SOURCES AND OPERATING SCENARIOS

The stationary noise source in the vicinity with the potential for significant impact at the subject site is the Faith Reformed Church. The noise sources at the church with the potential for impact at the subject site are the rooftop mechanical units. Sound measurements were done at this facility by VCL staff on March 25, 2021.

The reference source sound power data used in the assessment is shown in Appendix D. The locations of the noise sources are shown on Figure 3.

5.1.1 Operating Scenarios

Two operating scenarios were considered, according to the criterion periods: daytime/evening (0700 to 2300 hours) and nighttime (2300 to 0700 hours).

The scenarios analysed are:

- Daytime/Evening Scenario
 - All rooftop units, air conditioning (A/C) units and exhaust fans operate continuously for the full hour.
- Nighttime Scenario
 - All rooftop units and A/C units operate for 30 minutes of the hour.
 - All exhaust fans do not operate.

5.2 ANALYSIS METHOD

A 3-D acoustic model of the proposed development and surrounding area was developed using CadnaA V2020 MR1 environmental noise modeling software, which follows the protocol of ISO Standard 9613-2, “Acoustics – Attenuation of Sound During Propagation Outdoors”, to predict sound levels at each of the receptor locations. Accounting for distance, atmospheric absorption and ground attenuation, the sound level from all the relevant noise sources (hourly L_{eq}) was determined for each receptor position, for each of the operating scenarios.

Hard ground ($G = 0$) was used for the paved areas and soft ground ($G = 1$) was used elsewhere. Two orders of sound reflection were included in the model.

The assessment was done using the building evaluation feature in CadnaA, where the sound level is calculated at several points around the building facade for each storey. The OPOR's were assessed as discrete receptors, at a height of 1.5 m above grade.

Sample calculations are found in Appendix D.

5.3 ASSESSMENT RESULTS

The predicted sound levels at the proposed development are shown on Figure 3. The number in the octagons surrounding the building represents the highest sound level at the corresponding point along the facade, at any storey.

The sound levels from the church are predicted to meet the noise guideline limits at all assessment receptors. Thus, noise mitigation measures are not required.

6.0 CONCLUSIONS

With appropriate acoustical design of the development, a suitable acoustical environment can be provided and the applicable MECP noise guideline requirements met.

The approvals and administrative procedures are available to ensure that the acoustical requirements are implemented.

7.0 REFERENCES

1. PC STAMSON 5.04, "Computer Program for Road Traffic Noise Assessment", Ontario Ministry of the Environment and Climate Change.
2. Building Practice Note No. 56: "Controlling Sound Transmission into Buildings", by J. D. Quirt, Division of Building Research, National Council of Canada, September 1985.
3. "Environmental Noise Assessment in Land-Use Planning 1987", Ontario Ministry of the Environment, February 1987, ISBN 0-7729-2804-5.
4. "Road and Rail Noise: Effects on Housing", Canada Mortgage and Housing Corporation, Publication NHA 5156, 81/10.
5. "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, October 2013.
6. "Public Works Department Policy Manual", Niagara Region, Publication PW5.NO1.0, November 9, 2006.

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TABLE 1 ROAD TRAFFIC DATA

Roadway	Year	SADT ⁽¹⁾	% Trucks		Day/Night Split (%)	Speed Limit (kph)
			Medium	Heavy		
QEW ⁽²⁾	Ultimate	48 750	4.75	14.25	67/33	100
QEW Westbound Offramp ⁽³⁾	Ultimate	8 199	4.75	14.25	67/33	60

Notes:

- (1) Summer Average Daily Traffic.
- (2) Ultimate traffic data for the QEW was obtained from the MTO. The medium and heavy trucks were assumed to be 25% and 75% of the total truck volume, respectively, as recommended by the MTO for freeways. The day/night split was assumed to be 67%/33%, as recommended by the MECP for freeways.
- (3) Ultimate traffic volumes were estimated using the year 2016 AADT values from MTO's Traffic Volume Library. The volume on the ramp was estimated to be the difference between the traffic volumes on the QEW to the north and south of the site. The volume was then escalated to the ultimate condition using a factor of 1.9, representing the traffic volume increase on the QEW between year 2016 and the ultimate condition. Truck percentages and day/night split were assumed to be the same as the through lanes of the QEW.

**TABLE 2 PREDICTED UNMITIGATED TRANSPORTATION SOUND LEVELS
OUTDOORS**

Location ⁽¹⁾	Source	Distance (m) ⁽²⁾	L _{eq} Day (dBA)	L _{eq} Night (dBA)
Lot 11 (Southwest Facade)	QEW (Westbound)	208	58	58
	QEW (Eastbound)	224	58	58
	QEW Offramp	38	61	61
	TOTAL	-	64	64
Lot 30 (South Facade)	QEW (Westbound)	300	46	46
	QEW (Eastbound)	316	46	46
	QEW Offramp	116	44	44
	TOTAL	-	50	50
Lot 31 (South Facade)	QEW (Westbound)	291	48	48
	QEW (Eastbound)	308	48	48
	QEW Offramp	108	46	46
	TOTAL	-	52	52
Lot 39 (South Facade)	QEW (Westbound)	310	47	47
	QEW (Eastbound)	327	47	47
	QEW Offramp	217	40	40
	TOTAL	-	50	50
Lot 43 (West Facade)	QEW (Westbound)	260	51	51
	QEW (Eastbound)	277	50	50
	QEW Offramp	50	50	50
	TOTAL	-	55	55
Block 54 (South Facade)	QEW (Westbound)	133	61	61
	QEW (Eastbound)	149	60	60
	QEW Offramp ⁽³⁾	108	51	51
	QEW Offramp ⁽³⁾	64	54	54
	TOTAL	-	64	64
Block 55 (Southwest Facade)	QEW (Westbound)	119	62	62
	QEW (Eastbound)	135	61	61
	QEW Offramp	35	60	60
	TOTAL	-	66	66
Block 56 (West Facade)	QEW (Westbound)	117	61	61
	QEW (Eastbound)	134	61	61
	QEW Offramp	25	64	64
	TOTAL	-	67	67
Block 63 Southwest Corner (West Facade)	QEW (Westbound)	276	57	57
	QEW (Eastbound)	292	56	56
	TOTAL	-	60	60

.../cont'd

**TABLE 2 PREDICTED UNMITIGATED TRANSPORTATION SOUND LEVELS
OUTDOORS (continued)**

Location ⁽¹⁾	Source	Distance (m) ⁽²⁾	L _{eq} Day (dBA)	L _{eq} Night (dBA)
Block 66 Northwest Corner (North Facade)	QEW (Westbound)	360	47	47
	QEW (Eastbound)	376	47	47
	TOTAL	-	50	50
Block 75 Apartment Building Southwest Corner (West Facade)	QEW (Westbound)	338	57	57
	QEW (Eastbound)	354	57	57
	TOTAL	-	60	60
Lot 13 (OLA)	QEW (Westbound)	207	57	-
	QEW (Eastbound)	223	57	-
	QEW Offramp	41	60	-
	TOTAL	-	63	-
Block 54 - West Unit (OLA)	QEW (Westbound)	134	60	-
	QEW (Eastbound)	150	59	-
	QEW Offramp ⁽³⁾	109	50	-
	QEW Offramp ⁽³⁾	69	53	-
	TOTAL	-	63	-
Block 55 – West Unit (OLA)	QEW (Westbound)	117	61	-
	QEW (Eastbound)	133	60	-
	QEW Offramp	37	60	-
	TOTAL	-	66	-
Block 56 – South Unit (OLA)	QEW (Westbound)	122	61	-
	QEW (Eastbound)	138	60	-
	QEW Offramp	23	64	-
	TOTAL	-	67	-
Block 61 – Southernmost Unit (OLA)	QEW (Westbound)	227	56	-
	QEW (Eastbound)	243	56	-
	QEW Offramp	35	58	-
	TOTAL	-	62	-
Block 62 – Southernmost Unit (OLA)	QEW (Westbound)	251	55	-
	QEW (Eastbound)	267	55	-
	TOTAL	-	58	-

Notes:

- (1) See Figures 2A and 2B.
(2) Distance indicated is from the centreline of the noise source to the point of reception.
(3) The QEW westbound offramp was modelled as two segments to account for the curve in the roadway.


TABLE 3 NOISE ABATEMENT MEASURES

Location	Air Conditioning ⁽¹⁾	Exterior Wall ⁽²⁾	Exterior Window ⁽³⁾	Sound Barrier ⁽⁴⁾	Warning Clauses ⁽⁵⁾
Blocks 55 and 56	Mandatory	STC 54	Up to STC 31	2.8 m High	A + B
Blocks 57 to 62 Lots 1 to 14	Mandatory	STC 54	Up to STC 31	2.6 m High	A + B
Blocks 53 and 54	Mandatory	STC 54	Up to STC 31	2.4 m High	A + B
Blocks 63 and 64	Provision for Adding	STC 37	STC 26	2.6 m High	A + C
Blocks 65 and 70 Lots 15 to 18, 31 to 38, and 41 to 54 Block 75 Stacked Townhouse Building	Provision for Adding	STC 37	STC 26	None	A + C
Block 75 Apartment Building	Mandatory	STC 45	STC 28	None	A + B + D
All remaining Dwelling Units	None	STC 37	STC 26	None	None

Notes:

- (1) Where means must be provided to allow windows to remain closed for road noise control purposes, a commonly used technique is that of air central conditioning.
- (2) STC - Sound Transmission Class Rating (Reference ASTM-E413).
Requirements were based upon the assumption that all wall and window areas are as indicated in Section 4.3.1.1 of text. Requirements should be checked once floor plans are available.
- (3) STC - Sound Transmission Class Rating (Reference ASTM-E413). A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.
Requirements were based upon the assumption that all wall and window areas are as indicated in Section 4.3.1.1 of text. Requirements should be checked once floor plans are available.
- (4) Sound barriers must be of solid construction having a minimum face density of 20 kg/m² with no gaps or cracks. The acoustic fence height shown is taken relative to grade.
- (5) Warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:
 - A. "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound level may exceed the noise criteria of the Ministry of the Environment, Conservation and Parks and/or the municipality."
 - B. "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."
 - C. "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."
 - D. "Purchasers/tenants are advised that due to the proximity of the nearby church and community centre, sound levels from these facilities may at times be audible."
- (6) All exterior doors shall be fully weather-stripped.

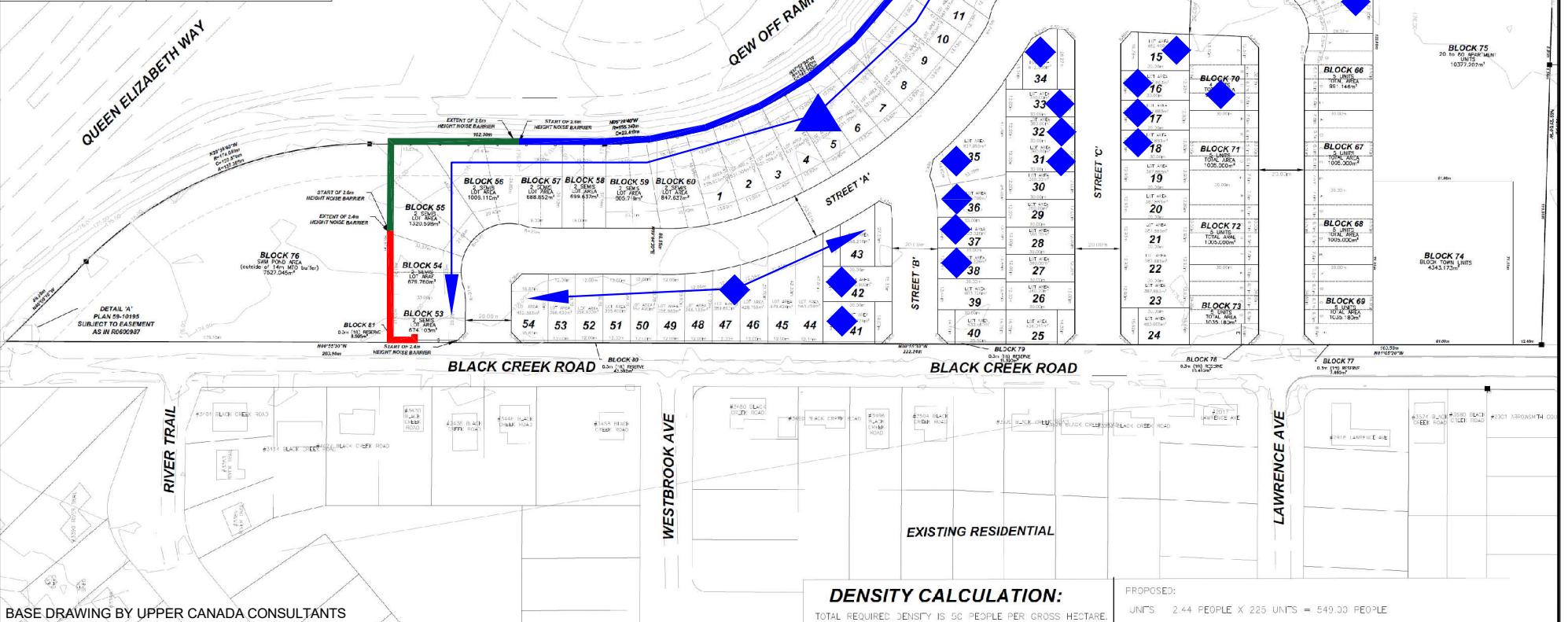


	 30 Wertheim Court, Unit 25 Richmond Hill, Ontario Canada L4B 1B9 solutions@valcoustics.com Phone: (905) 764-5223 Fax: (905) 764-6813	Title Key Plan	Project No. 121-0059	Date Nov. 19, 2021
		Project Name Black Creek Road Subdivision, Fort Erie	Scale N.T.S.	Figure 1
No.	Revision/Issue			

LEGEND

- ▲ Mandatory Air Conditioning
- ◆ Provision for Adding Air Conditioning
- 2.8 m High Sound Barrier
- 2.6 m High Sound Barrier
- 2.4 m High Sound Barrier

A = 591.762m ² B = 205.431m ² C = 387.503m ²	D = 228.000m ² E = 165.000m ² F = 183.000m ² G = 183.000m ² H = 228.000m ²
BLOCK 101AL AREA = 991.146m ² A = 215.657m ² B = 181.489m ² C = 183.000m ² D = 183.000m ² E = 228.000m ²	BLOCK 72 OIAL AREA = 1005.000m ² UNIT A = 228.000m ² B = 183.000m ² C = 183.000m ² D = 183.000m ² E = 228.000m ²



BASE DRAWING BY UPPER CANADA CONSULTANTS



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Title
 Draft Plan of Subdivision

Project Name
 Black Creek Road
 Subdivision, Fort Erie

Project No.
 121-0059

Scale
 N.T.S.

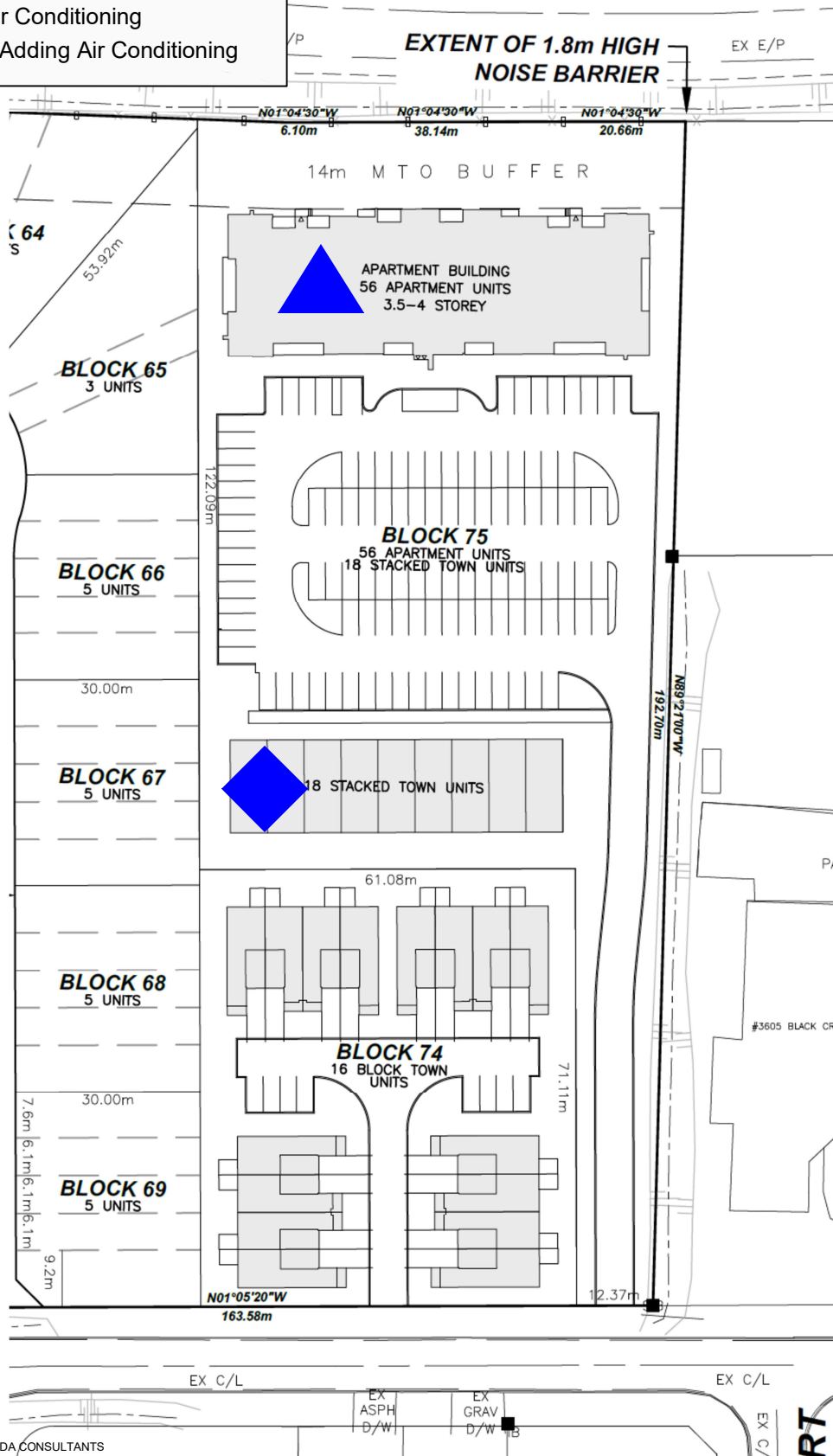
Date
 Dec. 9, 2021

Figure
 2A


No.	Revision/Issue	Date

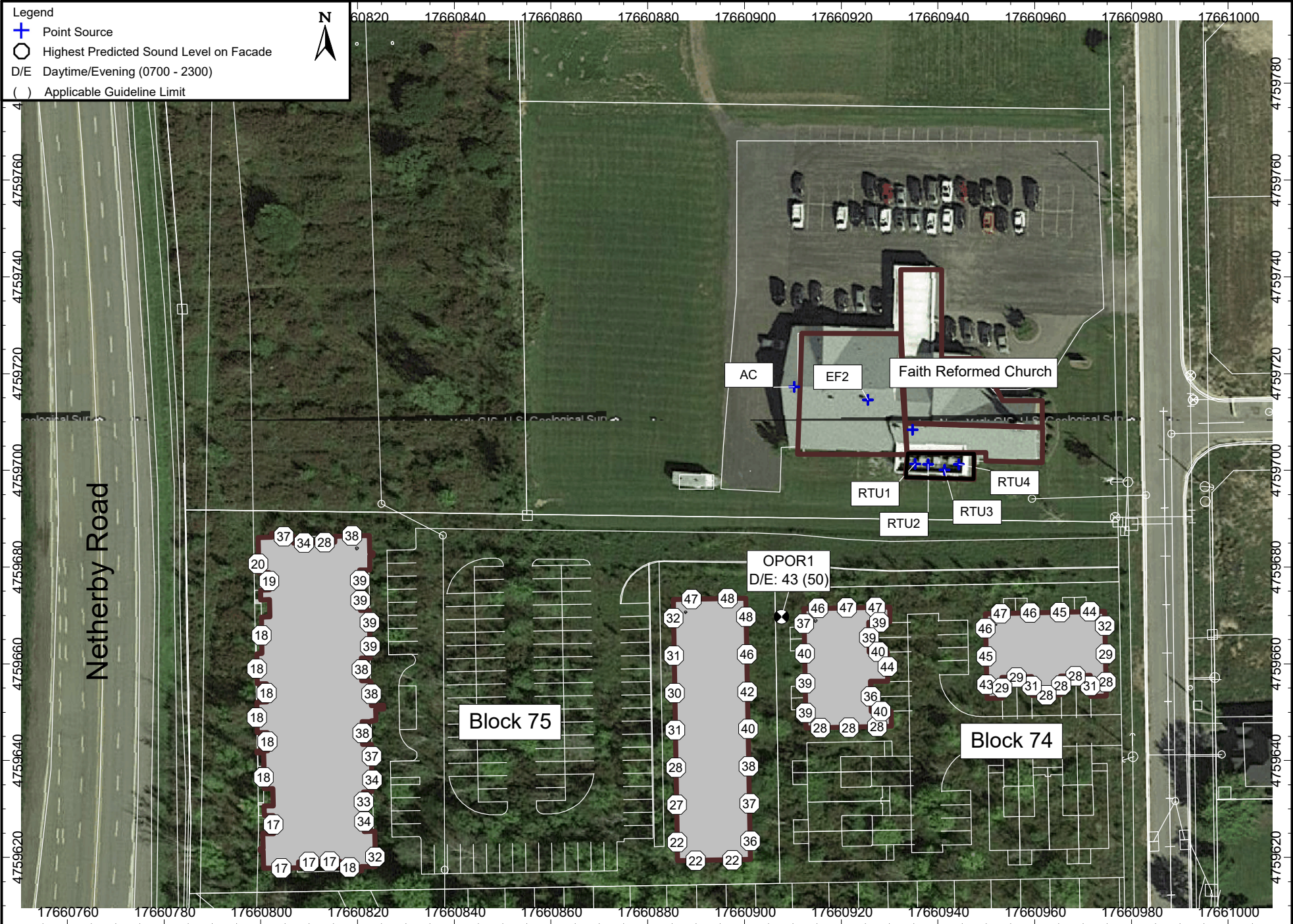
LEGEND

- ▲ Mandatory Air Conditioning
- ◆ Provision for Adding Air Conditioning



BASE DRAWING BY UPPER CANADA CONSULTANTS


			<div><p>30 Wertheim Court, Unit 25 Richmond Hill, Ontario Canada L4B 1B9 Tel: 905-764-5223 Fax: 905-764-6813 solutions@valcoustics.com</p></div>	<div>Title</div> <div>Conceptual Draft Plan - Blocks 74 and 75</div>	<div>Project No.</div> <div>121-0059</div>	<div>Date</div> <div>Nov. 29, 2021</div>
				<div>Project Name</div> <div>Black Creek Road Subdivision, Fort Erie</div>	<div>Scale</div> <div>N.T.S.</div>	<div>Figure</div> <div>2B</div>
No.	Revision/Issue	Date				



Daytime/Evening Scenario (0700 to 2300)



Nighttime Scenario (2300 to 0700)

	Title	Date	Figure 3
	Predicted Unmitigated Sound Levels due to Faith Reformed Church (dBA)	Nov. 19, 2021	
	Project Name	Project No.	
	Black Creek Road Subdivision, Fort Erie	1210059	

APPENDIX A

ROAD TRAFFIC DATA

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Fort Erie
Street: Baker Rd

A study of vehicle traffic was conducted with the device having serial number 003273. The study was done in the EB-btwn Net & BC lane at Baker Rd in Fort Erie, ON in Canada county. The study began on 05/17/2010 at 01:00 PM and concluded on 05/24/2010 at 01:00 PM, lasting a total of 168.00 hours. Traffic statistics were recorded in 60 minute time periods. The total recorded volume showed 4,862 vehicles passed through the location with a peak volume of 106 on 05/17/2010 at [04:00 PM-05:00 PM] and a minimum volume of 0 on 05/20/2010 at [03:00 AM-04:00 AM]. The AADT count for this study was 695.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 40 - 50 KPH range or lower. The average speed for all classified vehicles was 51 KPH with 48.65% vehicles exceeding the posted speed of 50 KPH. 2.90% percent of the total vehicles were traveling in excess of 89 KPH. The mode speed for this traffic study was 40KPH and the 85th percentile was 60.23 KPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to >
20	132	396	1615	1407	397	123	47	38	18	10	9	0	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Vans & Pickups. The number of Passenger Vehicles in the study was 0 which represents 0 percent of the total classified vehicles. The number of Vans & Pickups in the study was 3986 which represents 95 percent of the total classified vehicles. The number of Busses & Trucks in the study was 148 which represents 4 percent of the total classified vehicles. The number of Tractor Trailers in the study was 77 which represents 2 percent of the total classified vehicles.

< to 6.3	6.4 to 8.4	8.5 to 12.1	12.2 to 15.1	15.2 to 18.2	18.3 to 21.2	21.3 to 29.8	29.9 to >							
3986	148	60	9	5	3	0	1							

CHART 2

HEADWAY

During the peak traffic period, on 05/17/2010 at [04:00 PM-05:00 PM] the average headway between vehicles was 33.645 seconds. During the slowest traffic period, on 05/20/2010 at [03:00 AM-04:00 AM] the average headway between vehicles was 3600 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 29.00 and 61.00 degrees C. The roadway surface was Dry 100.00% of the time.

**MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Fort Erie
Street: Baker Rd**

A study of vehicle traffic was conducted with the device having serial number 005289. The study was done in the WB-btwn Net & BC lane at Baker Rd in Fort Erie, ON in Canada county. The study began on 05/17/2010 at 01:00 PM and concluded on 05/24/2010 at 01:00 PM, lasting a total of 168.00 hours. Traffic statistics were recorded in 60 minute time periods. The total recorded volume showed 5,250 vehicles passed through the location with a peak volume of 92 on 05/19/2010 at [08:00 AM-09:00 AM] and a minimum volume of 0 on 05/18/2010 at [01:00 AM-02:00 AM]. The AADT count for this study was 750.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 40 - 50 KPH range or lower. The average speed for all classified vehicles was 48 KPH with 40.55% vehicles exceeding the posted speed of 50 KPH. 0.65% percent of the total vehicles were traveling in excess of 89 KPH. The mode speed for this traffic study was 40KPH and the 85th percentile was 57.70 KPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to >
33	181	553	2181	1645	284	50	9	8	7	3	5	0	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Vans & Pickups. The number of Passenger Vehicles in the study was 0 which represents 0 percent of the total classified vehicles. The number of Vans & Pickups in the study was 4756 which represents 96 percent of the total classified vehicles. The number of Busses & Trucks in the study was 128 which represents 3 percent of the total classified vehicles. The number of Tractor Trailers in the study was 75 which represents 2 percent of the total classified vehicles.

< to 6.3	6.4 to 8.4	8.5 to 12.1	12.2 to 15.1	15.2 to 18.2	18.3 to 21.2	21.3 to 29.8	29.9 to >							
4756	128	59	12	3	1	0	0							

CHART 2

HEADWAY

During the peak traffic period, on 05/19/2010 at [08:00 AM-09:00 AM] the average headway between vehicles was 38.71 seconds. During the slowest traffic period, on 05/18/2010 at [01:00 AM-02:00 AM] the average headway between vehicles was 3600 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 28.00 and 61.00 degrees C. The roadway surface was Dry 100.00% of the time.

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Fort Erie
Street: Black Creek Rd

A study of vehicle traffic was conducted with the device having serial number 005712. The study was done in the NB-btwn Law & WB lane at Black Creek Rd in Fort Erie, ON in Canada county. The study began on 05/17/2010 at 01:00 PM and concluded on 05/24/2010 at 01:00 PM, lasting a total of 168.00 hours. Traffic statistics were recorded in 60 minute time periods. The total recorded volume showed 1,412 vehicles passed through the location with a peak volume of 30 on 05/18/2010 at [07:00 AM-08:00 AM] and a minimum volume of 0 on 05/17/2010 at [11:00 PM-12:00 AM]. The AADT count for this study was 202.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 50 - 60 KPH range or lower. The average speed for all classified vehicles was 53 KPH with 57.10% vehicles exceeding the posted speed of 50 KPH. 4.34% percent of the total vehicles were traveling in excess of 89 KPH. The mode speed for this traffic study was 50KPH and the 85th percentile was 66.48 KPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to >
8	70	132	334	395	213	61	31	16	5	3	0	0	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Vans & Pickups. The number of Passenger Vehicles in the study was 0 which represents 0 percent of the total classified vehicles. The number of Vans & Pickups in the study was 1185 which represents 93 percent of the total classified vehicles. The number of Busses & Trucks in the study was 31 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 52 which represents 4 percent of the total classified vehicles.

< to 6.3	6.4 to 8.4	8.5 to 12.1	12.2 to 15.1	15.2 to 18.2	18.3 to 21.2	21.3 to 29.8	29.9 to >							
1185	31	36	13	3	0	0	0							

CHART 2

HEADWAY

During the peak traffic period, on 05/18/2010 at [07:00 AM-08:00 AM] the average headway between vehicles was 116.129 seconds. During the slowest traffic period, on 05/17/2010 at [11:00 PM-12:00 AM] the average headway between vehicles was 3600 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 28.00 and 62.00 degrees C. The roadway surface was Dry 100.00% of the time.

**MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Fort Erie
Street: Black Creek Rd**

A study of vehicle traffic was conducted with the device having serial number 001902. The study was done in the SB-btwn Law & WB lane at Black Creek Rd in Fort Erie, ON in Canada county. The study began on 05/17/2010 at 01:00 PM and concluded on 05/23/2010 at 05:00 PM, lasting a total of 148.00 hours. Traffic statistics were recorded in 60 minute time periods. The total recorded volume showed 1,478 vehicles passed through the location with a peak volume of 31 on 05/17/2010 at [04:00 PM-05:00 PM] and a minimum volume of 0 on 05/18/2010 at [02:00 AM-03:00 AM]. The AADT count for this study was 240.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 50 - 60 KPH range or lower. The average speed for all classified vehicles was 55 KPH with 65.08% vehicles exceeding the posted speed of 50 KPH. 3.75% percent of the total vehicles were traveling in excess of 89 KPH. The mode speed for this traffic study was 50KPH and the 85th percentile was 67.28 KPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 119	120 to 129	130 to 139	140 to 149	150 to >
2	17	77	351	463	243	79	26	13	3	5	1	0	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Vans & Pickups. The number of Passenger Vehicles in the study was 0 which represents 0 percent of the total classified vehicles. The number of Vans & Pickups in the study was 1207 which represents 94 percent of the total classified vehicles. The number of Busses & Trucks in the study was 42 which represents 3 percent of the total classified vehicles. The number of Tractor Trailers in the study was 31 which represents 2 percent of the total classified vehicles.

< to 6.3	6.4 to 8.4	8.5 to 12.1	12.2 to 15.1	15.2 to 18.2	18.3 to 21.2	21.3 to 29.8	29.9 to >							
1207	42	21	7	3	0	0	0							

CHART 2

HEADWAY

During the peak traffic period, on 05/17/2010 at [04:00 PM-05:00 PM] the average headway between vehicles was 112.5 seconds. During the slowest traffic period, on 05/18/2010 at [02:00 AM-03:00 AM] the average headway between vehicles was 3600 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 28.00 and 62.00 degrees C. The roadway surface was Dry 100.00% of the time.

Time/Class Report

Device ID: 400181		Location: 7545		Raw Count: 319	
Operator: MD		Lane: EB		AADT Count: 319	
Begin: 03-26-2019 12:00 AM		Street: 610705 - EB		AADT Factor: 1	
End: 03-27-2019 12:00 AM		City: Niagara Region		Speed Limit: 60	
Hours: 24.00		County:			
Period (min): 15		State: ON			

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[00:00-00:15]	1	1	0	0	0	0	0	0	2
[00:15-00:30]	0	0	0	0	0	0	0	0	0
[00:30-00:45]	0	0	0	0	0	0	0	0	0
[00:45-01:00]	0	0	0	0	0	0	0	0	0
	1	1	0	0	0	0	0	0	2
[01:00-01:15]	0	0	0	0	0	0	0	0	0
[01:15-01:30]	0	0	0	0	0	0	0	0	0
[01:30-01:45]	0	0	0	0	0	0	0	0	0
[01:45-02:00]	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
[02:00-02:15]	0	0	0	0	0	0	0	0	0
[02:15-02:30]	0	0	0	0	0	0	0	0	0
[02:30-02:45]	0	0	0	0	0	0	0	0	0
[02:45-03:00]	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
[03:00-03:15]	0	0	0	0	0	0	0	0	0
[03:15-03:30]	0	1	0	0	0	0	0	0	1
[03:30-03:45]	0	0	0	0	0	0	0	0	0
[03:45-04:00]	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	1
[04:00-04:15]	0	0	0	0	0	0	0	0	0
[04:15-04:30]	0	0	0	0	0	0	0	0	0
[04:30-04:45]	0	0	0	0	0	0	0	0	0
[04:45-05:00]	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
[05:00-05:15]	0	0	0	0	0	0	0	0	0
[05:15-05:30]	0	0	0	0	0	0	0	0	0
[05:30-05:45]	0	0	0	0	0	0	0	0	0
[05:45-06:00]	0	1	0	0	0	0	0	0	1
	0	1	0	0	0	0	0	0	1
[06:00-06:15]	0	1	0	0	0	0	0	0	1
[06:15-06:30]	2	0	0	0	0	0	0	0	2
[06:30-06:45]	1	0	0	0	0	0	0	0	1
[06:45-07:00]	0	0	0	0	0	0	0	0	0
	3	1	0	0	0	0	0	0	4
[07:00-07:15]	0	1	0	1	0	0	0	0	2
[07:15-07:30]	0	4	0	0	0	0	0	0	4
[07:30-07:45]	0	2	0	0	0	0	0	0	2

Time/Class Report

Device ID: 400181		Location: 7545		Raw Count: 319	
Operator: MD		Lane: EB		AADT Count: 319	
Begin: 03-26-2019 12:00 AM		Street: 610705 - EB		AADT Factor: 1	
End: 03-27-2019 12:00 AM		City: Niagara Region		Speed Limit: 60	
Hours: 24.00		County:			
Period (min): 15		State: ON			

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[07:45-08:00]	2	4	0	0	1	0	0	0	7
	2	11	0	1	1	0	0	0	15
[08:00-08:15]	5	2	0	0	0	0	0	0	7
[08:15-08:30]	1	6	0	0	1	0	0	0	8
[08:30-08:45]	0	1	0	0	0	0	0	0	1
[08:45-09:00]	1	5	0	0	0	0	0	0	6
	7	14	0	0	1	0	0	0	22
[09:00-09:15]	2	1	0	1	0	0	0	0	4
[09:15-09:30]	1	0	0	0	0	0	0	0	1
[09:30-09:45]	3	3	0	0	0	0	1	0	7
[09:45-10:00]	2	3	0	0	0	0	0	0	5
	8	7	0	1	0	0	1	0	17
[10:00-10:15]	3	4	0	0	0	0	0	0	7
[10:15-10:30]	1	2	0	0	0	0	0	0	3
[10:30-10:45]	2	2	0	0	0	0	0	0	4
[10:45-11:00]	1	2	0	0	0	0	0	0	3
	7	10	0	0	0	0	0	0	17
[11:00-11:15]	0	5	0	0	0	0	0	0	5
[11:15-11:30]	2	3	0	0	0	0	0	0	5
[11:30-11:45]	1	3	1	0	0	0	0	0	5
[11:45-12:00]	2	4	0	0	1	0	0	0	7
	5	15	1	0	1	0	0	0	22
[12:00-12:15]	2	3	0	1	0	0	0	0	6
[12:15-12:30]	2	0	0	0	0	0	0	0	2
[12:30-12:45]	1	3	0	0	0	0	0	0	4
[12:45-13:00]	2	2	0	0	0	0	0	0	4
	7	8	0	1	0	0	0	0	16
[13:00-13:15]	0	2	0	0	0	0	0	0	2
[13:15-13:30]	1	5	0	0	0	0	0	0	6
[13:30-13:45]	3	5	0	1	0	0	0	0	9
[13:45-14:00]	2	2	0	0	0	0	0	0	4
	6	14	0	1	0	0	0	0	21
[14:00-14:15]	3	4	0	0	0	0	0	0	7
[14:15-14:30]	2	4	0	1	0	0	0	0	7
[14:30-14:45]	1	6	0	0	0	0	0	0	7
[14:45-15:00]	1	7	0	0	1	0	0	0	9
	7	21	0	1	1	0	0	0	30

Time/Class Report

Device ID: 400181		Location: 7545		Raw Count: 319	
Operator: MD		Lane: EB		AADT Count: 319	
Begin: 03-26-2019 12:00 AM		Street: 610705 - EB		AADT Factor: 1	
End: 03-27-2019 12:00 AM		City: Niagara Region		Speed Limit: 60	
Hours: 24.00		County:			
Period (min): 15		State: ON			

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[15:00-15:15]	2	2	0	0	0	0	0	0	4
[15:15-15:30]	2	1	0	0	0	0	0	0	3
[15:30-15:45]	2	4	0	0	0	0	0	0	6
[15:45-16:00]	2	4	1	0	0	0	0	0	7
	8	11	1	0	0	0	0	0	20
[16:00-16:15]	0	4	0	0	0	0	0	0	4
[16:15-16:30]	3	9	0	0	0	0	0	0	12
[16:30-16:45]	7	6	0	0	0	0	0	0	13
[16:45-17:00]	1	2	0	0	0	0	0	0	3
	11	21	0	0	0	0	0	0	32
[17:00-17:15]	4	5	0	0	0	0	0	0	9
[17:15-17:30]	3	4	0	1	0	0	0	0	8
[17:30-17:45]	2	5	0	0	0	0	0	0	7
[17:45-18:00]	1	7	0	0	0	0	0	0	8
	10	21	0	1	0	0	0	0	32
[18:00-18:15]	3	5	0	0	0	0	0	0	8
[18:15-18:30]	1	2	0	0	0	0	0	0	3
[18:30-18:45]	0	1	0	0	0	0	0	0	1
[18:45-19:00]	1	3	0	0	0	0	0	0	4
	5	11	0	0	0	0	0	0	16
[19:00-19:15]	1	0	0	0	0	0	0	0	1
[19:15-19:30]	0	3	0	1	0	0	0	0	4
[19:30-19:45]	3	2	0	0	0	0	0	0	5
[19:45-20:00]	1	2	0	0	0	0	0	0	3
	5	7	0	1	0	0	0	0	13
[20:00-20:15]	1	2	0	0	0	0	0	0	3
[20:15-20:30]	6	1	0	0	0	0	0	0	7
[20:30-20:45]	4	4	0	0	0	0	0	0	8
[20:45-21:00]	1	0	0	0	0	0	0	0	1
	12	7	0	0	0	0	0	0	19
[21:00-21:15]	0	1	0	0	0	0	0	0	1
[21:15-21:30]	1	1	0	0	0	0	0	0	2
[21:30-21:45]	1	1	0	0	0	0	0	0	2
[21:45-22:00]	1	2	0	0	0	0	0	0	3
	3	5	0	0	0	0	0	0	8
[22:00-22:15]	0	0	0	0	0	0	0	0	0
[22:15-22:30]	0	0	0	0	0	0	0	0	0
[22:30-22:45]	0	0	0	0	0	0	0	0	0

Time/Class Report

Device ID: 400181 Operator: MD Begin: 03-26-2019 12:00 AM End: 03-27-2019 12:00 AM Hours: 24.00 Period (min): 15			Location: 7545 Lane: EB Street: 610705 - EB City: Niagara Region County: State: ON			Raw Count: 319 AADT Count: 319 AADT Factor: 1 Speed Limit: 60			
Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[22:45-23:00]	1	1	0	0	0	0	0	0	2
	1	1	0	0	0	0	0	0	2
[23:00-23:15]	0	0	0	0	0	0	0	0	0
[23:15-23:30]	1	0	0	0	0	0	0	0	1
[23:30-23:45]	0	0	0	0	0	0	0	0	0
[23:45-00:00]	0	1	0	0	0	0	0	0	1
	1	1	0	0	0	0	0	0	2
03-26-2019 12:00 AM									
03-27-2019 12:00 AM	109	189	2	7	4	0	1	0	312

Brett Lipson

From: Caimano, Riccardo (MTO) <Riccardo.Caimano@ontario.ca>
Sent: May 7, 2021 4:13 PM
To: Brett Lipson; Alam, Ahsan (MTO)
Cc: Sami Rahman
Subject: RE: Traffic Data Request (1210059)

Follow Up Flag: Follow up
Flag Status: Completed

Hi Brett,

For the segment east of Netherby Rd, the previous data near Thompson Rd does not apply. In response to your request please find below the information available from this office for Queen Elizabeth Way east of Netherby Rd.

2016 AADT = 25,700
2016 SADT = 31,400
Number of through lanes = 4
Ultimate AADT = 39,900
Ultimate SADT = 48,750
Ultimate number of through lanes = 4
Posted Speed = 100 km/hr
Percentage of Trucks = 19%

Please note that the above information is estimated based upon our current knowledge of the area, which may be subject to change in the future. Other information related to ROW and gradient will be available from Central Region Traffic Office.

If you require further information, please don't hesitate to contact me.

Have a great weekend!

Regards,
Riccardo Caimano, EIT (he/him) | Planner
Systems Analysis and Forecasting Office
Ministry of Transportation Ontario

From: Brett Lipson <blipson@valcoustics.com>

Sent: May 7, 2021 2:01 PM

To: Caimano, Riccardo (MTO) <Riccardo.Caimano@ontario.ca>; Alam, Ahsan (MTO) <Ahsan.Alam@ontario.ca>

Cc: Sami Rahman <sami@valcoustics.com>

Subject: Traffic Data Request (1210059)

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hello,

We are currently working on a noise report for a development located at the northeast corner of the QEW and Netherby Road in Fort Erie. We recently received ultimate traffic data for the QEW at Thompson Road in Fort Erie (see attached). Can you please let us know if this data applies to this site as well? If not, can you please provide us with Ultimate traffic data for the QEW and the on/off ramps as well (if available)?

Thank you,

Brett Lipson, M.Eng., EIT



30 Wertheim Court, Unit 25
Richmond Hill, Ontario
Canada L4B 1B9
Tel: 905-764-5223 ext. 249
Fax: 905-764-6813
solutions@valcoustics.com

Time/Class Report

Device ID: 403611		Location: 7545		Raw Count: 320					
Operator: MD		Lane: WB		AADT Count: 320					
Begin: 03-26-2019 12:00 AM		Street: 610705 - WB		AADT Factor: 1					
End: 03-27-2019 12:00 AM		City: Niagara Region		Speed Limit: 60					
Hours: 24.00		County:							
Period (min): 15		State: ON							
Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[00:00-00:15]	0	0	0	0	0	0	0	0	0
[00:15-00:30]	0	0	0	0	0	0	0	0	0
[00:30-00:45]	0	0	0	0	0	0	0	0	0
[00:45-01:00]	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
[01:00-01:15]	0	0	0	0	0	0	0	0	0
[01:15-01:30]	0	0	0	0	0	0	0	0	0
[01:30-01:45]	0	0	0	0	0	0	0	0	0
[01:45-02:00]	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
[02:00-02:15]	0	0	0	0	0	0	0	0	0
[02:15-02:30]	0	0	0	0	0	0	0	0	0
[02:30-02:45]	0	0	0	0	0	0	0	0	0
[02:45-03:00]	1	0	0	0	0	0	0	0	1
	1	0	0	0	0	0	0	0	1
[03:00-03:15]	0	0	0	0	0	0	0	0	0
[03:15-03:30]	0	0	0	0	0	0	0	0	0
[03:30-03:45]	0	0	0	0	0	0	0	0	0
[03:45-04:00]	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
[04:00-04:15]	0	0	0	0	0	0	0	0	0
[04:15-04:30]	0	0	0	0	0	0	0	0	0
[04:30-04:45]	0	0	0	0	0	0	0	0	0
[04:45-05:00]	1	0	0	0	0	0	0	0	1
	1	0	0	0	0	0	0	0	1
[05:00-05:15]	0	0	0	0	0	0	0	0	0
[05:15-05:30]	0	1	0	0	0	0	0	0	1
[05:30-05:45]	2	0	0	0	0	0	0	0	2
[05:45-06:00]	0	0	0	0	0	0	0	0	0
	2	1	0	0	0	0	0	0	3
[06:00-06:15]	0	1	0	0	0	0	0	0	1
[06:15-06:30]	2	1	0	0	0	0	0	0	3
[06:30-06:45]	3	0	0	0	0	0	0	0	3
[06:45-07:00]	2	1	0	1	0	0	0	0	4
	7	3	0	1	0	0	0	0	11
[07:00-07:15]	3	5	0	0	0	0	0	0	8
[07:15-07:30]	6	2	0	0	0	0	0	0	8
[07:30-07:45]	2	0	0	1	0	0	0	0	3

Time/Class Report

Device ID: 403611		Location: 7545		Raw Count: 320					
Operator: MD		Lane: WB		AADT Count: 320					
Begin: 03-26-2019 12:00 AM		Street: 610705 - WB		AADT Factor: 1					
End: 03-27-2019 12:00 AM		City: Niagara Region		Speed Limit: 60					
Hours: 24.00		County:							
Period (min): 15		State: ON							
Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[07:45-08:00]	5	3	0	0	0	0	0	0	8
	16	10	0	1	0	0	0	0	27
[08:00-08:15]	5	1	0	0	0	0	0	0	6
[08:15-08:30]	4	4	0	0	0	0	0	0	8
[08:30-08:45]	5	0	0	0	0	0	0	0	5
[08:45-09:00]	4	1	0	0	0	0	0	0	5
	18	6	0	0	0	0	0	0	24
[09:00-09:15]	3	2	0	0	0	0	0	0	5
[09:15-09:30]	1	2	0	0	0	0	0	0	3
[09:30-09:45]	4	3	0	0	0	0	0	0	7
[09:45-10:00]	3	1	1	0	0	0	0	0	5
	11	8	1	0	0	0	0	0	20
[10:00-10:15]	1	3	0	0	0	1	0	0	5
[10:15-10:30]	1	2	0	0	0	0	0	0	3
[10:30-10:45]	2	1	0	0	0	0	0	0	3
[10:45-11:00]	3	1	0	1	0	0	0	0	5
	7	7	0	1	0	1	0	0	16
[11:00-11:15]	3	1	0	1	0	0	0	0	5
[11:15-11:30]	3	2	0	0	0	0	0	0	5
[11:30-11:45]	5	0	0	0	0	0	0	0	5
[11:45-12:00]	3	4	0	0	0	0	0	0	7
	14	7	0	1	0	0	0	0	22
[12:00-12:15]	2	3	0	0	1	0	0	0	6
[12:15-12:30]	4	4	0	0	1	0	0	0	9
[12:30-12:45]	3	4	0	1	0	0	0	0	8
[12:45-13:00]	3	3	0	0	0	0	0	0	6
	12	14	0	1	2	0	0	0	29
[13:00-13:15]	2	1	0	0	0	0	0	0	3
[13:15-13:30]	5	0	0	0	0	0	0	0	5
[13:30-13:45]	3	2	0	0	0	0	0	0	5
[13:45-14:00]	1	2	0	0	0	0	0	0	3
	11	5	0	0	0	0	0	0	16
[14:00-14:15]	3	1	0	0	0	0	0	0	4
[14:15-14:30]	1	2	0	1	1	0	0	0	5
[14:30-14:45]	3	4	0	0	0	0	0	0	7
[14:45-15:00]	0	4	0	0	0	0	0	0	4
	7	11	0	1	1	0	0	0	20

Time/Class Report

Device ID: 403611		Location: 7545		Raw Count: 320					
Operator: MD		Lane: WB		AADT Count: 320					
Begin: 03-26-2019 12:00 AM		Street: 610705 - WB		AADT Factor: 1					
End: 03-27-2019 12:00 AM		City: Niagara Region		Speed Limit: 60					
Hours: 24.00		County:							
Period (min): 15		State: ON							
Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[15:00-15:15]	1	1	0	0	0	0	0	0	2
[15:15-15:30]	6	3	0	0	0	0	0	0	9
[15:30-15:45]	3	8	1	0	0	0	0	0	12
[15:45-16:00]	4	3	0	0	0	0	0	0	7
	14	15	1	0	0	0	0	0	30
[16:00-16:15]	8	2	0	0	0	0	0	0	10
[16:15-16:30]	3	2	0	0	0	0	0	0	5
[16:30-16:45]	4	6	1	0	0	0	0	0	11
[16:45-17:00]	3	1	0	1	0	0	0	0	5
	18	11	1	1	0	0	0	0	31
[17:00-17:15]	4	2	0	0	0	0	0	0	6
[17:15-17:30]	4	1	0	0	0	0	0	0	5
[17:30-17:45]	2	4	0	0	0	0	0	0	6
[17:45-18:00]	3	4	0	0	0	0	0	0	7
	13	11	0	0	0	0	0	0	24
[18:00-18:15]	1	3	0	0	0	0	0	0	4
[18:15-18:30]	2	1	0	0	0	0	0	0	3
[18:30-18:45]	4	2	0	0	0	0	0	0	6
[18:45-19:00]	2	1	0	0	0	0	0	0	3
	9	7	0	0	0	0	0	0	16
[19:00-19:15]	3	2	0	0	0	0	0	0	5
[19:15-19:30]	2	0	0	0	0	0	0	0	2
[19:30-19:45]	2	1	0	0	0	0	0	0	3
[19:45-20:00]	3	1	0	0	0	0	0	0	4
	10	4	0	0	0	0	0	0	14
[20:00-20:15]	1	0	0	0	0	0	0	0	1
[20:15-20:30]	1	0	0	0	0	0	0	0	1
[20:30-20:45]	1	0	0	0	0	0	0	0	1
[20:45-21:00]	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	3
[21:00-21:15]	0	1	0	0	0	0	0	0	1
[21:15-21:30]	0	0	0	0	0	0	0	0	0
[21:30-21:45]	0	0	0	0	0	0	0	0	0
[21:45-22:00]	0	1	0	0	0	0	0	0	1
	0	2	0	0	0	0	0	0	2
[22:00-22:15]	1	0	0	0	0	0	0	0	1
[22:15-22:30]	0	0	0	0	0	0	0	0	0
[22:30-22:45]	1	0	0	0	0	0	0	0	1

Time/Class Report

Device ID: 403611			Location: 7545					Raw Count: 320	
Operator: MD			Lane: WB					AADT Count: 320	
Begin: 03-26-2019 12:00 AM			Street: 610705 - WB					AADT Factor: 1	
End: 03-27-2019 12:00 AM			City: Niagara Region					Speed Limit: 60	
Hours: 24.00			County:						
Period (min): 15			State: ON						
Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 71	72 to >	Total
Tue,03-26-2019									
[22:45-23:00]	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	2
[23:00-23:15]	0	0	0	0	0	0	0	0	0
[23:15-23:30]	0	1	0	0	0	0	0	0	1
[23:30-23:45]	0	0	0	0	0	0	0	0	0
[23:45-00:00]	0	0	1	0	0	0	0	0	1
	0	1	1	0	0	0	0	0	2
03-26-2019 12:00 AM									
03-27-2019 12:00 AM	176	123	4	7	3	1	0	0	314

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP)

Reference: MECP Publication NPC-300, October 2013: “*Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning*”.

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30 [#]
	Stationary Source		
	Class 1 Area	07:00 to 19:00 ⁽¹⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽¹⁾	50 ⁺ dBA
	Class 2 Area	07:00 to 19:00 ⁽²⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽²⁾	45 ⁺ dBA
	Class 3 Area	07:00 to 19:00 ⁽³⁾	45 ⁺ dBA
		19:00 to 23:00 ⁽³⁾	40 ⁺ dBA
	Class 4 Area	07:00 to 19:00 ⁽⁴⁾	55 ⁺ dBA
		19:00 to 23:00 ⁽⁴⁾	55 ⁺ dBA

..../cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source Class 1 Area	07:00 to 19:00 ⁽¹⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽¹⁾	50 ⁺ dBA
		23:00 to 07:00 ⁽¹⁾	45 ⁺ dBA
	Class 2 Area	07:00 to 19:00 ⁽²⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽²⁾	50 ⁺ dBA
		23:00 to 07:00 ⁽²⁾	45 ⁺ dBA
	Class 3 Area	07:00 to 19:00 ⁽³⁾	45 ⁺ dBA
		19:00 to 23:00 ⁽³⁾	45 ⁺ dBA
		23:00 to 07:00 ⁽³⁾	40 ⁺ dBA
	Class 4 Area	07:00 to 19:00 ⁽⁴⁾	60 ⁺ dBA
		19:00 to 23:00 ⁽⁴⁾	60 ⁺ dBA
		23:00 to 07:00 ⁽⁴⁾	55 ⁺ dBA

- # may not apply to in-fill or re-development.
 * or the minimum hourly background sound exposure $L_{eq(1)}$, due to road traffic, if higher.
 (1) Class 1 Area: Urban.
 (2) Class 2 Area: Urban during day; rural-like evening and night.
 (3) Class 3 Area: Rural.
 (4) Class 4 Area: Subject to land use planning authority's approval.

Reference: MECP Publication ISBN 0-7729-2804-5, 1987: "Environmental Noise Assessment in Land-Use Planning".

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

APPENDIX C

SAMPLE STAMSON CALCULATION

STAMSON 5.04 NORMAL REPORT Date: 09-12-2021 16:16:10
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS/ NOISE ASSESSMENT

Filename: 56_wf.te Time Period: Day/Night 16/8 hours
Description: **Block 56 - West Facade**

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

Car traffic volume : 13163/6581 veh/TimePeriod *
Medium truck volume : 772/386 veh/TimePeriod *
Heavy truck volume : 2316/1158 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24375
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 4.75
Heavy Truck % of Total Volume : 14.25
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 1: QEW NWB (day/night)

Angle1 Angle2 : -45.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 117.00 / 117.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 13163/6581 veh/TimePeriod *
Medium truck volume : 772/386 veh/TimePeriod *
Heavy truck volume : 2316/1158 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24375
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 4.75
Heavy Truck % of Total Volume : 14.25
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 2: QEW SEB (day/night)

Angle1 Angle2 : -45.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 134.00 / 134.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 4428/2214 veh/TimePeriod *
Medium truck volume : 260/130 veh/TimePeriod *
Heavy truck volume : 779/389 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8199
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 4.75
Heavy Truck % of Total Volume : 14.25
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 3: QEW Offramp (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 24.00 / 24.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: QEW NWB (day)

Source height = 1.94 m

ROAD (0.00 + 61.42 + 0.00) = 61.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	90	0.56	77.47	0.00	-13.89	-2.16	0.00	0.00	0.00	61.42

Segment Leq : 61.42 dBA

Results segment # 2: QEW SEB (day)

Source height = 1.94 m

ROAD (0.00 + 60.50 + 0.00) = 60.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	90	0.56	77.47	0.00	-14.80	-2.16	0.00	0.00	0.00	60.50

Segment Leq : 60.50 dBA

Results segment # 3: QEW Offramp (day)

Source height = 1.94 m

ROAD (0.00 + 64.46 + 0.00) = 64.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.56	68.92	0.00	-3.18	-1.28	0.00	0.00	0.00	64.46

Segment Leq : 64.46 dBA

Total Leq All Segments: 67.24 dBA

Results segment # 1: QEW NWB (night)

Source height = 1.94 m

ROAD (0.00 + 61.42 + 0.00) = 61.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	90	0.56	77.47	0.00	-13.89	-2.16	0.00	0.00	0.00	61.42

Segment Leq : 61.42 dBA

Results segment # 2: QEW SEB (night)

Source height = 1.94 m

ROAD (0.00 + 60.50 + 0.00) = 60.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	90	0.56	77.47	0.00	-14.80	-2.16	0.00	0.00	0.00	60.50

Segment Leq : 60.50 dBA

Results segment # 3: QEW Offramp (night)

Source height = 1.94 m

ROAD (0.00 + 64.46 + 0.00) = 64.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.56	68.92	0.00	-3.18	-1.28	0.00	0.00	0.00	64.46

Segment Leq : 64.46 dBA

Total Leq All Segments: 67.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.24
(NIGHT): 67.24

APPENDIX D

STATIONARY SOURCE CALCULATION DETAILS

1210059 - Black Creek Road Subdivision, Fort Erie

Receiver Table

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height	Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)
		OPOR1	43.4	43.4	39.8	0.0	0.0	0.0		x	Total	1.50	17660907.70	4759669.70	1.50

Point Sources

Name	M.	ID	Result. PWL			Lw / Li		Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height	Coordinates			
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night		(Hz)		(m)	X	Y	Z
			(dBA)	(dBA)	(dBA)		dB(A)		dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)			(m)	(m)	(m)	(m)
York D6CG060		RTU1	86.7	86.7	86.7	Lw	RTU1		0.0	0.0	0.0				60.00	60.00	30.00	0.0		(none)	1.00	g17660935.24	4759701.32	4.60
York D6CG060		RTU2	88.0	88.0	88.0	Lw	RTU2		0.0	0.0	0.0				60.00	60.00	30.00	0.0		(none)	1.00	g17660937.99	4759701.27	4.60
York D6CG048		RTU3	87.4	87.4	87.4	Lw	RTU3		0.0	0.0	0.0				60.00	60.00	30.00	0.0		(none)	1.00	g17660941.35	4759700.15	4.60
York D6CG060		RTU4	85.7	85.7	85.7	Lw	RTU4		0.0	0.0	0.0				60.00	60.00	30.00	0.0		(none)	1.00	g17660944.32	4759701.24	4.60
		EF1	78.1	78.1	78.1	Lw	EF1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)	5.80	a17660934.71	4759708.37	5.80
		EF2	72.8	72.8	72.8	Lw	EF2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)	7.20	a17660925.56	4759714.59	7.20
		AC	79.8	79.8	79.8	Lw	AC		0.0	0.0	0.0				60.00	60.00	30.00	0.0		(none)	1.00	r17660910.25	4759717.23	1.00

Sound Level Library

Name	ID	Type	Oktave Spectrum (dB)											Source	
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
	RTU1	Lw		99.3	92.7	89.7	85.4	85.6	79.9	77.5	74.1	71.1	86.7	100.8	Sound Measurements 2021-03-25
	RTU2	Lw		100.3	93.6	88.5	90.2	85.6	82.2	78.3	73.3	68.2	88.0	101.8	Sound Measurements 2021-03-25
	RTU3	Lw		98.8	90.7	87.8	85.9	84.4	83.5	78.1	73.8	68.9	87.4	100.2	Sound Measurements 2021-03-25
	RTU4	Lw		102.8	95.7	89.8	85.6	83.8	80.2	75.8	70.8	66.1	85.7	103.9	Sound Measurements 2021-03-25
	AC	Lw		84.5	82.2	73.2	72.9	75.2	75.0	74.8	65.1	57.3	79.8	87.7	Sound Measurements 2021-03-25
	EF1	Lw		96.4	87.5	81.6	77.9	76.1	73.4	67.6	59.4	55.1	78.1	97.2	Sound Measurements 2021-03-25
	EF2	Lw		91.9	81.4	82.3	73.9	68.6	66.6	62.5	55.6	48.6	72.8	92.8	Sound Measurements 2021-03-25

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00

Configuration	
Parameter	Value
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature #(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	1.00
Wind Speed for Dir. #(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver

Name: (untitled)

ID: OPOR1

X: 17660907.70 m

Y: 4759669.70 m

Z: 1.50 m

Point Source, ISO 9613, Name: "York D6CG060", ID: "RTU2"

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	17660937.99	4759701.27	4.60	0	D	32	60.9	0.0	0.0	0.0	0.0	43.8	0.0	-3.0	0.0	0.0	3.5	0.0	0.0	16.6
1	17660937.99	4759701.27	4.60	0	D	63	67.4	0.0	0.0	0.0	0.0	43.8	0.0	-3.0	0.0	0.0	3.8	0.0	0.0	22.7
1	17660937.99	4759701.27	4.60	0	D	125	72.4	0.0	0.0	0.0	0.0	43.8	0.0	0.9	0.0	0.0	2.5	0.0	0.0	25.2
1	17660937.99	4759701.27	4.60	0	D	250	81.6	0.0	0.0	0.0	0.0	43.8	0.0	2.9	0.0	0.0	1.8	0.0	0.0	33.0
1	17660937.99	4759701.27	4.60	0	D	500	82.4	0.0	0.0	0.0	0.0	43.8	0.1	1.4	0.0	0.0	4.0	0.0	0.0	33.0
1	17660937.99	4759701.27	4.60	0	D	1000	82.2	0.0	0.0	0.0	0.0	43.8	0.2	-0.5	0.0	0.0	7.0	0.0	0.0	31.7
1	17660937.99	4759701.27	4.60	0	D	2000	79.5	0.0	0.0	0.0	0.0	43.8	0.4	-0.8	0.0	0.0	9.3	0.0	0.0	26.7
1	17660937.99	4759701.27	4.60	0	D	4000	74.3	0.0	0.0	0.0	0.0	43.8	1.4	-0.8	0.0	0.0	11.7	0.0	0.0	18.0
1	17660937.99	4759701.27	4.60	0	D	8000	67.1	0.0	0.0	0.0	0.0	43.8	5.1	-0.8	0.0	0.0	14.4	0.0	0.0	4.5
1	17660937.99	4759701.27	4.60	0	N	32	60.9	0.0	-3.0	0.0	0.0	43.8	0.0	-3.0	0.0	0.0	3.5	0.0	0.0	13.6
1	17660937.99	4759701.27	4.60	0	N	63	67.4	0.0	-3.0	0.0	0.0	43.8	0.0	-3.0	0.0	0.0	3.8	0.0	0.0	19.7
1	17660937.99	4759701.27	4.60	0	N	125	72.4	0.0	-3.0	0.0	0.0	43.8	0.0	0.9	0.0	0.0	2.5	0.0	0.0	22.2
1	17660937.99	4759701.27	4.60	0	N	250	81.6	0.0	-3.0	0.0	0.0	43.8	0.0	2.9	0.0	0.0	1.8	0.0	0.0	30.0
1	17660937.99	4759701.27	4.60	0	N	500	82.4	0.0	-3.0	0.0	0.0	43.8	0.1	1.4	0.0	0.0	4.0	0.0	0.0	30.0
1	17660937.99	4759701.27	4.60	0	N	1000	82.2	0.0	-3.0	0.0	0.0	43.8	0.2	-0.5	0.0	0.0	7.0	0.0	0.0	28.7
1	17660937.99	4759701.27	4.60	0	N	2000	79.5	0.0	-3.0	0.0	0.0	43.8	0.4	-0.8	0.0	0.0	9.3	0.0	0.0	23.7
1	17660937.99	4759701.27	4.60	0	N	4000	74.3	0.0	-3.0	0.0	0.0	43.8	1.4	-0.8	0.0	0.0	11.7	0.0	0.0	15.0
1	17660937.99	4759701.27	4.60	0	N	8000	67.1	0.0	-3.0	0.0	0.0	43.8	5.1	-0.8	0.0	0.0	14.4	0.0	0.0	1.5
1	17660937.99	4759701.27	4.60	0	E	32	60.9	0.0	0.0	0.0	0.0	43.8	0.0	-3.0	0.0	0.0	3.5	0.0	0.0	16.6
1	17660937.99	4759701.27	4.60	0	E	63	67.4	0.0	0.0	0.0	0.0	43.8	0.0	-3.0	0.0	0.0	3.8	0.0	0.0	22.7
1	17660937.99	4759701.27	4.60	0	E	125	72.4	0.0	0.0	0.0	0.0	43.8	0.0	0.9	0.0	0.0	2.5	0.0	0.0	25.2
1	17660937.99	4759701.27	4.60	0	E	250	81.6	0.0	0.0	0.0	0.0	43.8	0.0	2.9	0.0	0.0	1.8	0.0	0.0	33.0
1	17660937.99	4759701.27	4.60	0	E	500	82.4	0.0	0.0	0.0	0.0	43.8	0.1	1.4	0.0	0.0	4.0	0.0	0.0	33.0
1	17660937.99	4759701.27	4.60	0	E	1000	82.2	0.0	0.0	0.0	0.0	43.8	0.2	-0.5	0.0	0.0	7.0	0.0	0.0	31.7
1	17660937.99	4759701.27	4.60	0	E	2000	79.5	0.0	0.0	0.0	0.0	43.8	0.4	-0.8	0.0	0.0	9.3	0.0	0.0	26.7
1	17660937.99	4759701.27	4.60	0	E	4000	74.3	0.0	0.0	0.0	0.0	43.8	1.4	-0.8	0.0	0.0	11.7	0.0	0.0	18.0
1	17660937.99	4759701.27	4.60	0	E	8000	67.1	0.0	0.0	0.0	0.0	43.8	5.1	-0.8	0.0	0.0	14.4	0.0	0.0	4.5
2	17660937.99	4759701.27	4.60	1	D	4000	74.3	0.0	0.0	0.0	0.0	57.2	6.7	-1.7	0.0	0.0	26.7	0.0	2.0	-16.6
2	17660937.99	4759701.27	4.60	1	D	8000	67.1	0.0	0.0	0.0	0.0	57.2	23.7	-1.7	0.0	0.0	26.7	0.0	2.0	-40.8
2	17660937.99	4759701.27	4.60	1	N	4000	74.3	0.0	-3.0	0.0	0.0	57.2	6.7	-1.7	0.0	0.0	26.7	0.0	2.0	-19.6
2	17660937.99	4759701.27	4.60	1	N	8000	67.1	0.0	-3.0	0.0	0.0	57.2	23.7	-1.7	0.0	0.0	26.7	0.0	2.0	-43.8
2	17660937.99	4759701.27	4.60	1	E	4000	74.3	0.0	0.0	0.0	0.0	57.2	6.7	-1.7	0.0	0.0	26.7	0.0	2.0	-16.6
2	17660937.99	4759701.27	4.60	1	E	8000	67.1	0.0	0.0	0.0	0.0	57.2	23.7	-1.7	0.0	0.0	26.7	0.0	2.0	-40.8
3	17660937.99	4759701.27	4.60	2	D	8000	67.1	0.0	0.0	0.0	0.0	57.5	24.8	-1.3	0.0	0.0	26.3	0.0	4.0	-44.3
3	17660937.99	4759701.27	4.60	2	N	8000	67.1	0.0	-3.0	0.0	0.0	57.5	24.8	-1.3	0.0	0.0	26.3	0.0	4.0	-47.3
3	17660937.99	4759701.27	4.60	2	E	8000	67.1	0.0	0.0	0.0	0.0	57.5	24.8	-1.3	0.0	0.0	26.3	0.0	4.0	-44.3
4	17660937.99	4759701.27	4.60	2	D	1000	82.2	0.0	0.0	0.0	0.0	51.0	0.4	-0.2	0.0	0.0	7.1	0.0	4.0	20.0
4	17660937.99	4759701.27	4.60	2	D	2000	79.5	0.0	0.0	0.0	0.0	51.0	1.0	-0.7	0.0	0.0	8.9	0.0	4.0	15.3
4	17660937.99	4759701.27	4.60	2	D	4000	74.3	0.0	0.0	0.0	0.0	51.0	3.3	-0.7	0.0	0.0	10.9	0.0	4.0	5.8
4	17660937.99	4759701.27	4.60	2	D	8000	67.1	0.0	0.0	0.0	0.0	51.0	11.6	-0.7	0.0	0.0	13.2	0.0	4.0	-12.0
4	17660937.99	4759701.27	4.60	2	N	1000	82.2	0.0	-3.0	0.0	0.0	51.0	0.4	-0.2	0.0	0.0	7.1	0.0	4.0	17.0
4	17660937.99	4759701.27	4.60	2	N	2000	79.5	0.0	-3.0	0.0	0.0	51.0	1.0	-0.7	0.0	0.0	8.9	0.0	4.0	12.3
4	17660937.99	4759701.27	4.60	2	N	4000	74.3	0.0	-3.0	0.0	0.0	51.0	3.3	-0.7	0.0	0.0	10.9	0.0	4.0	2.8
4	17660937.99	4759701.27	4.60	2	N	8000	67.1	0.0	-3.0	0.0	0.0	51.0	11.6	-0.7	0.0	0.0	13.2	0.0	4.0	-15.1
4	17660937.99	4759701.27	4.60	2	E	1000	82.2	0.0	0.0	0.0	0.0	51.0	0.4	-0.2	0.0	0.0	7.1	0.0	4.0	20.0
4	17660937.99	4759701.27	4.60	2	E	2000	79.5	0.0	0.0	0.0	0.0	51.0	1.0	-0.7	0.0	0.0	8.9	0.0	4.0	15.3
4	17660937.99	4759701.27	4.60	2	E	4000	74.3	0.0	0.0	0.0	0.0	51.0	3.3	-0.7	0.0	0.0	10.9	0.0	4.0	5.8
4	17660937.99	4759701.27	4.60	2	E	8000	67.1	0.0	0.0	0.0	0.0	51.0	11.6	-0.7	0.0	0.0	13.2	0.0	4.0	-12.0

Point Source, ISO 9613, Name: "York D6CG048", ID: "RTU3"																				
Nr.	X	Y	Z	Ref.	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)
5	17660941.35	4759700.15	4.60	0	D	32	59.4	0.0	0.0	0.0	0.0	44.2	0.0	-3.0	0.0	0.0	4.7	0.0	0.0	13.6
5	17660941.35	4759700.15	4.60	0	D	63	64.5	0.0	0.0	0.0	0.0	44.2	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	17.7
5	17660941.35	4759700.15	4.60	0	D	125	71.7	0.0	0.0	0.0	0.0	44.2	0.0	1.0	0.0	0.0	3.6	0.0	0.0	23.0
5	17660941.35	4759700.15	4.60	0	D	250	77.3	0.0	0.0	0.0	0.0	44.2	0.0	3.1	0.0	0.0	2.5	0.0	0.0	27.5
5	17660941.35	4759700.15	4.60	0	D	500	81.2	0.0	0.0	0.0	0.0	44.2	0.1	1.6	0.0	0.0	4.9	0.0	0.0	30.4
5	17660941.35	4759700.15	4.60	0	D	1000	83.5	0.0	0.0	0.0	0.0	44.2	0.2	-0.4	0.0	0.0	8.3	0.0	0.0	31.3
5	17660941.35	4759700.15	4.60	0	D	2000	79.3	0.0	0.0	0.0	0.0	44.2	0.4	-0.7	0.0	0.0	10.5	0.0	0.0	24.9
5	17660941.35	4759700.15	4.60	0	D	4000	74.8	0.0	0.0	0.0	0.0	44.2	1.5	-0.7	0.0	0.0	12.9	0.0	0.0	16.9
5	17660941.35	4759700.15	4.60	0	D	8000	67.8	0.0	0.0	0.0	0.0	44.2	5.3	-0.7	0.0	0.0	15.5	0.0	0.0	3.5
5	17660941.35	4759700.15	4.60	0	N	32	59.4	0.0	-3.0	0.0	0.0	44.2	0.0	-3.0	0.0	0.0	4.7	0.0	0.0	10.6
5	17660941.35	4759700.15	4.60	0	N	63	64.5	0.0	-3.0	0.0	0.0	44.2	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	14.7
5	17660941.35	4759700.15	4.60	0	N	125	71.7	0.0	-3.0	0.0	0.0	44.2	0.0	1.0	0.0	0.0	3.6	0.0	0.0	20.0
5	17660941.35	4759700.15	4.60	0	N	250	77.3	0.0	-3.0	0.0	0.0	44.2	0.0	3.1	0.0	0.0	2.5	0.0	0.0	24.5
5	17660941.35	4759700.15	4.60	0	N	500	81.2	0.0	-3.0	0.0	0.0	44.2	0.1	1.6	0.0	0.0	4.9	0.0	0.0	27.4
5	17660941.35	4759700.15	4.60	0	N	1000	83.5	0.0	-3.0	0.0	0.0	44.2	0.2	-0.4	0.0	0.0	8.3	0.0	0.0	28.3
5	17660941.35	4759700.15	4.60	0	N	2000	79.3	0.0	-3.0	0.0	0.0	44.2	0.4	-0.7	0.0	0.0	10.5	0.0	0.0	21.9
5	17660941.35	4759700.15	4.60	0	N	4000	74.8	0.0	-3.0	0.0	0.0	44.2	1.5	-0.7	0.0	0.0	12.9	0.0	0.0	13.9
5	17660941.35	4759700.15	4.60	0	N	8000	67.8	0.0	-3.0	0.0	0.0	44.2	5.3	-0.7	0.0	0.0	15.5	0.0	0.0	0.5
5	17660941.35	4759700.15	4.60	0	E	32	59.4	0.0	0.0	0.0	0.0	44.2	0.0	-3.0	0.0	0.0	4.7	0.0	0.0	13.6
5	17660941.35	4759700.15	4.60	0	E	63	64.5	0.0	0.0	0.0	0.0	44.2	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	17.7
5	17660941.35	4759700.15	4.60	0	E	125	71.7	0.0	0.0	0.0	0.0	44.2	0.0	1.0	0.0	0.0	3.6	0.0	0.0	23.0
5	17660941.35	4759700.15	4.60	0	E	250	77.3	0.0	0.0	0.0	0.0	44.2	0.0	3.1	0.0	0.0	2.5	0.0	0.0	27.5
5	17660941.35	4759700.15	4.60	0	E	500	81.2	0.0	0.0	0.0	0.0	44.2	0.1	1.6	0.0	0.0	4.9	0.0	0.0	30.4
5	17660941.35	4759700.15	4.60	0	E	1000	83.5	0.0	0.0	0.0	0.0	44.2	0.2	-0.4	0.0	0.0	8.3	0.0	0.0	31.3
5	17660941.35	4759700.15	4.60	0	E	2000	79.3	0.0	0.0	0.0	0.0	44.2	0.4	-0.7	0.0	0.0	10.5	0.0	0.0	24.9
5	17660941.35	4759700.15	4.60	0	E	4000	74.8	0.0	0.0	0.0	0.0	44.2	1.5	-0.7	0.0	0.0	12.9	0.0	0.0	16.9
5	17660941.35	4759700.15	4.60	0	E	8000	67.8	0.0	0.0	0.0	0.0	44.2	5.3	-0.7	0.0	0.0	15.5	0.0	0.0	3.5
6	17660941.35	4759700.15	4.60	1	D	4000	74.8	0.0	0.0	0.0	0.0	57.3	6.8	-1.9	0.0	0.0	26.9	0.0	2.0	-16.3
6	17660941.35	4759700.15	4.60	1	D	8000	67.8	0.0	0.0	0.0	0.0	57.3	24.1	-1.9	0.0	0.0	26.9	0.0	2.0	-40.6
6	17660941.35	4759700.15	4.60	1	N	4000	74.8	0.0	-3.0	0.0	0.0	57.3	6.8	-1.9	0.0	0.0	26.9	0.0	2.0	-19.3
6	17660941.35	4759700.15	4.60	1	N	8000	67.8	0.0	-3.0	0.0	0.0	57.3	24.1	-1.9	0.0	0.0	26.9	0.0	2.0	-43.7
6	17660941.35	4759700.15	4.60	1	E	4000	74.8	0.0	0.0	0.0	0.0	57.3	6.8	-1.9	0.0	0.0	26.9	0.0	2.0	-16.3
6	17660941.35	4759700.15	4.60	1	E	8000	67.8	0.0	0.0	0.0	0.0	57.3	24.1	-1.9	0.0	0.0	26.9	0.0	2.0	-40.6
7	17660941.35	4759700.15	4.60	2	D	8000	67.8	0.0	0.0	0.0	0.0	57.7	25.2	-1.4	0.0	0.0	26.4	0.0	4.0	-44.1
7	17660941.35	4759700.15	4.60	2	N	8000	67.8	0.0	-3.0	0.0	0.0	57.7	25.2	-1.4	0.0	0.0	26.4	0.0	4.0	-47.1
7	17660941.35	4759700.15	4.60	2	E	8000	67.8	0.0	0.0	0.0	0.0	57.7	25.2	-1.4	0.0	0.0	26.4	0.0	4.0	-44.1

Point Source, ISO 9613, Name: "York D6CG060", ID: "RTU1"																				
Nr.	X	Y	Z	Ref.	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)
8	17660935.24	4759701.32	4.60	0	D	32	59.9	0.0	0.0	0.0	0.0	43.5	0.0	-3.0	0.0	0.0	7.9	0.0	0.0	11.4
8	17660935.24	4759701.32	4.60	0	D	63	66.5	0.0	0.0	0.0	0.0	43.5	0.0	-3.0	0.0	0.0	8.1	0.0	0.0	18.0
8	17660935.24	4759701.32	4.60	0	D	125	73.6	0.0	0.0	0.0	0.0	43.5	0.0	0.8	0.0	0.0	4.6	0.0	0.0	24.7
8	17660935.24	4759701.32	4.60	0	D	250	76.8	0.0	0.0	0.0	0.0	43.5	0.0	2.8	0.0	0.0	3.2	0.0	0.0	27.3
8	17660935.24	4759701.32	4.60	0	D	500	82.4	0.0	0.0	0.0	0.0	43.5	0.1	1.4	0.0	0.0	5.5	0.0	0.0	32.0
8	17660935.24	4759701.32	4.60	0	D	1000	79.9	0.0	0.0	0.0	0.0	43.5	0.2	-0.5	0.0	0.0	8.8	0.0	0.0	28.0
8	17660935.24	4759701.32	4.60	0	D	2000	78.7	0.0	0.0	0.0	0.0	43.5	0.4	-0.8	0.0	0.0	11.0	0.0	0.0	24.6
8	17660935.24	4759701.32	4.60	0	D	4000	75.1	0.0	0.0	0.0	0.0	43.5	1.4	-0.8	0.0	0.0	13.3	0.0	0.0	17.7
8	17660935.24	4759701.32	4.60	0	D	8000	70.0	0.0	0.0	0.0	0.0	43.5	4.9	-0.8	0.0	0.0	15.9	0.0	0.0	6.4
8	17660935.24	4759701.32	4.60	0	N	32	59.9	0.0	-3.0	0.0	0.0	43.5	0.0	-3.0	0.0	0.0	7.9	0.0	0.0	8.4
8	17660935.24	4759701.32	4.60	0	N	63	66.5	0.0	-3.0	0.0	0.0	43.5	0.0	-3.0	0.0	0.0	8.1	0.0	0.0	14.9
8	17660935.24	4759701.32	4.60	0	N	125	73.6	0.0	-3.0	0.0	0.0	43.5	0.0	0.8	0.0	0.0	4.6	0.0	0.0	21.7
8	17660935.24	4759701.32	4.60	0	N	250	76.8	0.0	-3.0	0.0	0.0	43.5	0.0	2.8	0.0	0.0	3.2	0.0	0.0	24.3
8	17660935.24	4759701.32	4.60	0	N	500	82.4	0.0	-3.0	0.0	0.0	43.5	0.1	1.4	0.0	0.0	5.5	0.0	0.0	28.9
8	17660935.24	4759701.32	4.60	0	N	1000	79.9	0.0	-3.0	0.0	0.0	43.5	0.2	-0.5	0.0	0.0	8.8	0.0	0.0	25.0
8	17660935.24	4759701.32	4.60	0	N	2000	78.7	0.0	-3.0	0.0	0.0	43.5	0.4	-0.8	0.0	0.0	11.0	0.0	0.0	21.6
8	17660935.24	4759701.32	4.60	0	N	4000	75.1	0.0	-3.0	0.0	0.0	43.5	1.4	-0.8	0.0	0.0	13.3	0.0	0.0	14.7
8	17660935.24	4759701.32	4.60	0	N	8000	70.0	0.0	-3.0	0.0	0.0	43.5	4.9	-0.8	0.0	0.0	15.9	0.0	0.0	3.4
8	17660935.24	4759701.32	4.60	0	E	32	59.9	0.0	0.0	0.0	0.0	43.5	0.0	-3.0	0.0	0.0	7.9	0.0	0.0	11.4
8	17660935.24	4759701.32	4.60	0	E	63	66.5	0.0	0.0	0.0	0.0	43.5	0.0	-3.0	0.0	0.0	8.1	0.0	0.0	18.0
8	17660935.24	4759701.32	4.60	0	E	125	73.6	0.0	0.0	0.0	0.0	43.5	0.0	0.8	0.0	0.0	4.6	0.0	0.0	24.7
8	17660935.24	4759701.32	4.60	0	E	250	76.8	0.0	0.0	0.0	0.0	43.5	0.0	2.8	0.0	0.0	3.2	0.0	0.0	27.3
8	17660935.24	4759701.32	4.60	0	E	500	82.4	0.0	0.0	0.0	0.0	43.5	0.1	1.4	0.0	0.0	5.5	0.0	0.0	32.0

Point Source, ISO 9613, Name: "York D6CG060", ID: "RTU1"																				
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahou	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB				(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
8	17660935.24	4759701.32	4.60	0	E	1000	79.9	0.0	0.0	0.0	0.0	43.5	0.2	-0.5	0.0	0.0	8.8	0.0	0.0	28.0
8	17660935.24	4759701.32	4.60	0	E	2000	78.7	0.0	0.0	0.0	0.0	43.5	0.4	-0.8	0.0	0.0	11.0	0.0	0.0	24.6
8	17660935.24	4759701.32	4.60	0	E	4000	75.1	0.0	0.0	0.0	0.0	43.5	1.4	-0.8	0.0	0.0	13.3	0.0	0.0	17.7
8	17660935.24	4759701.32	4.60	0	E	8000	70.0	0.0	0.0	0.0	0.0	43.5	4.9	-0.8	0.0	0.0	15.9	0.0	0.0	6.4
9	17660935.24	4759701.32	4.60	1	D	4000	75.1	0.0	0.0	0.0	0.0	57.0	6.6	-1.7	0.0	0.0	26.7	0.0	2.0	-15.5
9	17660935.24	4759701.32	4.60	1	D	8000	70.0	0.0	0.0	0.0	0.0	57.0	23.4	-1.7	0.0	0.0	26.7	0.0	2.0	-37.5
9	17660935.24	4759701.32	4.60	1	N	4000	75.1	0.0	-3.0	0.0	0.0	57.0	6.6	-1.7	0.0	0.0	26.7	0.0	2.0	-18.5
9	17660935.24	4759701.32	4.60	1	N	8000	70.0	0.0	-3.0	0.0	0.0	57.0	23.4	-1.7	0.0	0.0	26.7	0.0	2.0	-40.5
9	17660935.24	4759701.32	4.60	1	E	4000	75.1	0.0	0.0	0.0	0.0	57.0	6.6	-1.7	0.0	0.0	26.7	0.0	2.0	-15.5
9	17660935.24	4759701.32	4.60	1	E	8000	70.0	0.0	0.0	0.0	0.0	57.0	23.4	-1.7	0.0	0.0	26.7	0.0	2.0	-37.5
10	17660935.24	4759701.32	4.60	2	D	1000	79.9	0.0	0.0	0.0	0.0	50.9	0.4	-0.2	0.0	0.0	7.1	0.0	4.0	17.7
10	17660935.24	4759701.32	4.60	2	D	2000	78.7	0.0	0.0	0.0	0.0	50.9	1.0	-0.7	0.0	0.0	9.0	0.0	4.0	14.5
10	17660935.24	4759701.32	4.60	2	D	4000	75.1	0.0	0.0	0.0	0.0	50.9	3.2	-0.7	0.0	0.0	10.9	0.0	4.0	6.7
10	17660935.24	4759701.32	4.60	2	D	8000	70.0	0.0	0.0	0.0	0.0	50.9	11.6	-0.7	0.0	0.0	13.2	0.0	4.0	-9.0
10	17660935.24	4759701.32	4.60	2	N	1000	79.9	0.0	-3.0	0.0	0.0	50.9	0.4	-0.2	0.0	0.0	7.1	0.0	4.0	14.7
10	17660935.24	4759701.32	4.60	2	N	2000	78.7	0.0	-3.0	0.0	0.0	50.9	1.0	-0.7	0.0	0.0	9.0	0.0	4.0	11.5
10	17660935.24	4759701.32	4.60	2	N	4000	75.1	0.0	-3.0	0.0	0.0	50.9	3.2	-0.7	0.0	0.0	10.9	0.0	4.0	3.7
10	17660935.24	4759701.32	4.60	2	N	8000	70.0	0.0	-3.0	0.0	0.0	50.9	11.6	-0.7	0.0	0.0	13.2	0.0	4.0	-12.1
10	17660935.24	4759701.32	4.60	2	E	1000	79.9	0.0	0.0	0.0	0.0	50.9	0.4	-0.2	0.0	0.0	7.1	0.0	4.0	17.7
10	17660935.24	4759701.32	4.60	2	E	2000	78.7	0.0	0.0	0.0	0.0	50.9	1.0	-0.7	0.0	0.0	9.0	0.0	4.0	14.5
10	17660935.24	4759701.32	4.60	2	E	4000	75.1	0.0	0.0	0.0	0.0	50.9	3.2	-0.7	0.0	0.0	10.9	0.0	4.0	6.7
10	17660935.24	4759701.32	4.60	2	E	8000	70.0	0.0	0.0	0.0	0.0	50.9	11.6	-0.7	0.0	0.0	13.2	0.0	4.0	-9.0

Point Source, ISO 9613, Name: "York D6CG060", ID: "RTU4"																				
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahou	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB				(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
11	17660944.32	4759701.24	4.60	0	D	32	63.4	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	4.6	0.0	0.0	17.1
11	17660944.32	4759701.24	4.60	0	D	63	69.5	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	22.2
11	17660944.32	4759701.24	4.60	0	D	125	73.7	0.0	0.0	0.0	0.0	44.7	0.0	0.9	0.0	0.0	3.6	0.0	0.0	24.5
11	17660944.32	4759701.24	4.60	0	D	250	77.0	0.0	0.0	0.0	0.0	44.7	0.1	3.1	0.0	0.0	2.3	0.0	0.0	26.8
11	17660944.32	4759701.24	4.60	0	D	500	80.6	0.0	0.0	0.0	0.0	44.7	0.1	1.6	0.0	0.0	4.6	0.0	0.0	29.6
11	17660944.32	4759701.24	4.60	0	D	1000	80.2	0.0	0.0	0.0	0.0	44.7	0.2	-0.4	0.0	0.0	7.9	0.0	0.0	27.9
11	17660944.32	4759701.24	4.60	0	D	2000	77.0	0.0	0.0	0.0	0.0	44.7	0.5	-0.8	0.0	0.0	10.0	0.0	0.0	22.6
11	17660944.32	4759701.24	4.60	0	D	4000	71.8	0.0	0.0	0.0	0.0	44.7	1.6	-0.8	0.0	0.0	12.3	0.0	0.0	14.0
11	17660944.32	4759701.24	4.60	0	D	8000	65.0	0.0	0.0	0.0	0.0	44.7	5.7	-0.8	0.0	0.0	14.8	0.0	0.0	0.6
11	17660944.32	4759701.24	4.60	0	N	32	63.4	0.0	-3.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	4.6	0.0	0.0	14.1
11	17660944.32	4759701.24	4.60	0	N	63	69.5	0.0	-3.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	19.2
11	17660944.32	4759701.24	4.60	0	N	125	73.7	0.0	-3.0	0.0	0.0	44.7	0.0	0.9	0.0	0.0	3.6	0.0	0.0	21.5
11	17660944.32	4759701.24	4.60	0	N	250	77.0	0.0	-3.0	0.0	0.0	44.7	0.1	3.1	0.0	0.0	2.3	0.0	0.0	23.8
11	17660944.32	4759701.24	4.60	0	N	500	80.6	0.0	-3.0	0.0	0.0	44.7	0.1	1.6	0.0	0.0	4.6	0.0	0.0	26.5
11	17660944.32	4759701.24	4.60	0	N	1000	80.2	0.0	-3.0	0.0	0.0	44.7	0.2	-0.4	0.0	0.0	7.9	0.0	0.0	24.9
11	17660944.32	4759701.24	4.60	0	N	2000	77.0	0.0	-3.0	0.0	0.0	44.7	0.5	-0.8	0.0	0.0	10.0	0.0	0.0	19.6
11	17660944.32	4759701.24	4.60	0	N	4000	71.8	0.0	-3.0	0.0	0.0	44.7	1.6	-0.8	0.0	0.0	12.3	0.0	0.0	11.0
11	17660944.32	4759701.24	4.60	0	N	8000	65.0	0.0	-3.0	0.0	0.0	44.7	5.7	-0.8	0.0	0.0	14.8	0.0	0.0	-2.5
11	17660944.32	4759701.24	4.60	0	E	32	63.4	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	4.6	0.0	0.0	17.1
11	17660944.32	4759701.24	4.60	0	E	63	69.5	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	22.2
11	17660944.32	4759701.24	4.60	0	E	125	73.7	0.0	0.0	0.0	0.0	44.7	0.0	0.9	0.0	0.0	3.6	0.0	0.0	24.5
11	17660944.32	4759701.24	4.60	0	E	250	77.0	0.0	0.0	0.0	0.0	44.7	0.1	3.1	0.0	0.0	2.3	0.0	0.0	26.8
11	17660944.32	4759701.24	4.60	0	E	500	80.6	0.0	0.0	0.0	0.0	44.7	0.1	1.6	0.0	0.0	4.6	0.0	0.0	29.6
11	17660944.32	4759701.24	4.60	0	E	1000	80.2	0.0	0.0	0.0	0.0	44.7	0.2	-0.4	0.0	0.0	7.9	0.0	0.0	27.9
11	17660944.32	4759701.24	4.60	0	E	2000	77.0	0.0	0.0	0.0	0.0	44.7	0.5	-0.8	0.0	0.0	10.0	0.0	0.0	22.6
11	17660944.32	4759701.24	4.60	0	E	4000	71.8	0.0	0.0	0.0	0.0	44.7	1.6	-0.8	0.0	0.0	12.3	0.0	0.0	14.0
11	17660944.32	4759701.24	4.60	0	E	8000	65.0	0.0	0.0	0.0	0.0	44.7	5.7	-0.8	0.0	0.0	14.8	0.0	0.0	0.6
12	17660944.32	4759701.24	4.60	1	D	8000	65.0	0.0	0.0	0.0	0.0	57.4	24.5	-1.9	0.0	0.0	26.9	0.0	2.0	-43.9
12	17660944.32	4759701.24	4.60	1	N	8000	65.0	0.0	-3.0	0.0	0.0	57.4	24.5	-1.9	0.0	0.0	26.9	0.0	2.0	-46.9
12	17660944.32	4759701.24	4.60	1	E	8000	65.0	0.0	0.0	0.0	0.0	57.4	24.5	-1.9	0.0	0.0	26.9	0.0	2.0	-43.9
13	17660944.32	4759701.24	4.60	2	D	8000	65.0	0.0	0.0	0.0	0.0	57.8	25.5	-1.4	0.0	0.0	26.4	0.0	4.0	-47.4
13	17660944.32	4759701.24	4.60	2	N	8000	65.0	0.0	-3.0	0.0	0.0	57.8	25.5	-1.4	0.0	0.0	26.4	0.0	4.0	-50.4
13	17660944.32	4759701.24	4.60	2	E	8000	65.0	0.0	0.0	0.0	0.0	57.8	25.5	-1.4	0.0	0.0	26.4	0.0	4.0	-47.4

Point Source, ISO 9613, Name: "", ID: "AC"																				
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)
14	17660910.25	4759717.23	1.00	0	D	32	45.1	0.0	0.0	0.0	0.0	44.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	3.5
14	17660910.25	4759717.23	1.00	0	D	63	56.0	0.0	0.0	0.0	0.0	44.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	14.4
14	17660910.25	4759717.23	1.00	0	D	125	57.1	0.0	0.0	0.0	0.0	44.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	12.4
14	17660910.25	4759717.23	1.00	0	D	250	64.3	0.0	0.0	0.0	0.0	44.6	0.0	7.1	0.0	0.0	0.0	0.0	0.0	12.6
14	17660910.25	4759717.23	1.00	0	D	500	72.0	0.0	0.0	0.0	0.0	44.6	0.1	6.5	0.0	0.0	0.0	0.0	0.0	20.9
14	17660910.25	4759717.23	1.00	0	D	1000	75.0	0.0	0.0	0.0	0.0	44.6	0.2	0.8	0.0	0.0	0.0	0.0	0.0	29.4
14	17660910.25	4759717.23	1.00	0	D	2000	76.0	0.0	0.0	0.0	0.0	44.6	0.5	-0.5	0.0	0.0	0.0	0.0	0.0	31.5
14	17660910.25	4759717.23	1.00	0	D	4000	66.1	0.0	0.0	0.0	0.0	44.6	1.6	-0.5	0.0	0.0	0.0	0.0	0.0	20.5
14	17660910.25	4759717.23	1.00	0	D	8000	56.2	0.0	0.0	0.0	0.0	44.6	5.6	-0.5	0.0	0.0	0.0	0.0	0.0	6.6
14	17660910.25	4759717.23	1.00	0	N	32	45.1	0.0	-3.0	0.0	0.0	44.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.5
14	17660910.25	4759717.23	1.00	0	N	63	56.0	0.0	-3.0	0.0	0.0	44.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	11.4
14	17660910.25	4759717.23	1.00	0	N	125	57.1	0.0	-3.0	0.0	0.0	44.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	9.4
14	17660910.25	4759717.23	1.00	0	N	250	64.3	0.0	-3.0	0.0	0.0	44.6	0.0	7.1	0.0	0.0	0.0	0.0	0.0	9.6
14	17660910.25	4759717.23	1.00	0	N	500	72.0	0.0	-3.0	0.0	0.0	44.6	0.1	6.5	0.0	0.0	0.0	0.0	0.0	17.9
14	17660910.25	4759717.23	1.00	0	N	1000	75.0	0.0	-3.0	0.0	0.0	44.6	0.2	0.8	0.0	0.0	0.0	0.0	0.0	26.4
14	17660910.25	4759717.23	1.00	0	N	2000	76.0	0.0	-3.0	0.0	0.0	44.6	0.5	-0.5	0.0	0.0	0.0	0.0	0.0	28.5
14	17660910.25	4759717.23	1.00	0	N	4000	66.1	0.0	-3.0	0.0	0.0	44.6	1.6	-0.5	0.0	0.0	0.0	0.0	0.0	17.5
14	17660910.25	4759717.23	1.00	0	N	8000	56.2	0.0	-3.0	0.0	0.0	44.6	5.6	-0.5	0.0	0.0	0.0	0.0	0.0	3.6
14	17660910.25	4759717.23	1.00	0	E	32	45.1	0.0	0.0	0.0	0.0	44.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	3.5
14	17660910.25	4759717.23	1.00	0	E	63	56.0	0.0	0.0	0.0	0.0	44.6	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	14.4
14	17660910.25	4759717.23	1.00	0	E	125	57.1	0.0	0.0	0.0	0.0	44.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	12.4
14	17660910.25	4759717.23	1.00	0	E	250	64.3	0.0	0.0	0.0	0.0	44.6	0.0	7.1	0.0	0.0	0.0	0.0	0.0	12.6
14	17660910.25	4759717.23	1.00	0	E	500	72.0	0.0	0.0	0.0	0.0	44.6	0.1	6.5	0.0	0.0	0.0	0.0	0.0	20.9
14	17660910.25	4759717.23	1.00	0	E	1000	75.0	0.0	0.0	0.0	0.0	44.6	0.2	0.8	0.0	0.0	0.0	0.0	0.0	29.4
14	17660910.25	4759717.23	1.00	0	E	2000	76.0	0.0	0.0	0.0	0.0	44.6	0.5	-0.5	0.0	0.0	0.0	0.0	0.0	31.5
14	17660910.25	4759717.23	1.00	0	E	4000	66.1	0.0	0.0	0.0	0.0	44.6	1.6	-0.5	0.0	0.0	0.0	0.0	0.0	20.5
14	17660910.25	4759717.23	1.00	0	E	8000	56.2	0.0	0.0	0.0	0.0	44.6	5.6	-0.5	0.0	0.0	0.0	0.0	0.0	6.6

Point Source, ISO 9613, Name: "", ID: "EF1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
15	17660934.71	4759708.37	5.80	0	D	32	57.0	0.0	0.0	0.0	0.0	44.5	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	15.5
15	17660934.71	4759708.37	5.80	0	D	63	61.3	0.0	0.0	0.0	0.0	44.5	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	19.8
15	17660934.71	4759708.37	5.80	0	D	125	65.5	0.0	0.0	0.0	0.0	44.5	0.0	0.6	0.0	0.0	0.0	0.0	0.0	20.3
15	17660934.71	4759708.37	5.80	0	D	250	69.3	0.0	0.0	0.0	0.0	44.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	22.4
15	17660934.71	4759708.37	5.80	0	D	500	72.9	0.0	0.0	0.0	0.0	44.5	0.1	1.3	0.0	0.0	0.0	0.0	0.0	27.0
15	17660934.71	4759708.37	5.80	0	D	1000	73.4	0.0	0.0	0.0	0.0	44.5	0.2	-0.6	0.0	0.0	0.0	0.0	0.0	29.3
15	17660934.71	4759708.37	5.80	0	D	2000	68.8	0.0	0.0	0.0	0.0	44.5	0.5	-0.9	0.0	0.0	0.0	0.0	0.0	24.7
15	17660934.71	4759708.37	5.80	0	D	4000	60.4	0.0	0.0	0.0	0.0	44.5	1.6	-0.9	0.0	0.0	0.0	0.0	0.0	15.2
15	17660934.71	4759708.37	5.80	0	D	8000	54.0	0.0	0.0	0.0	0.0	44.5	5.5	-0.9	0.0	0.0	0.0	0.0	0.0	4.8
15	17660934.71	4759708.37	5.80	0	N	32	57.0	0.0	-188.0	0.0	0.0	44.5	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-172.5
15	17660934.71	4759708.37	5.80	0	N	63	61.3	0.0	-188.0	0.0	0.0	44.5	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-168.2
15	17660934.71	4759708.37	5.80	0	N	125	65.5	0.0	-188.0	0.0	0.0	44.5	0.0	0.6	0.0	0.0	0.0	0.0	0.0	-167.7
15	17660934.71	4759708.37	5.80	0	N	250	69.3	0.0	-188.0	0.0	0.0	44.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	-165.6
15	17660934.71	4759708.37	5.80	0	N	500	72.9	0.0	-188.0	0.0	0.0	44.5	0.1	1.3	0.0	0.0	0.0	0.0	0.0	-161.0
15	17660934.71	4759708.37	5.80	0	N	1000	73.4	0.0	-188.0	0.0	0.0	44.5	0.2	-0.6	0.0	0.0	0.0	0.0	0.0	-158.7
15	17660934.71	4759708.37	5.80	0	N	2000	68.8	0.0	-188.0	0.0	0.0	44.5	0.5	-0.9	0.0	0.0	0.0	0.0	0.0	-163.3
15	17660934.71	4759708.37	5.80	0	N	4000	60.4	0.0	-188.0	0.0	0.0	44.5	1.6	-0.9	0.0	0.0	0.0	0.0	0.0	-172.8
15	17660934.71	4759708.37	5.80	0	N	8000	54.0	0.0	-188.0	0.0	0.0	44.5	5.5	-0.9	0.0	0.0	0.0	0.0	0.0	-183.2
15	17660934.71	4759708.37	5.80	0	E	32	57.0	0.0	0.0	0.0	0.0	44.5	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	15.5
15	17660934.71	4759708.37	5.80	0	E	63	61.3	0.0	0.0	0.0	0.0	44.5	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	19.8
15	17660934.71	4759708.37	5.80	0	E	125	65.5	0.0	0.0	0.0	0.0	44.5	0.0	0.6	0.0	0.0	0.0	0.0	0.0	20.3
15	17660934.71	4759708.37	5.80	0	E	250	69.3	0.0	0.0	0.0	0.0	44.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	22.4
15	17660934.71	4759708.37	5.80	0	E	500	72.9	0.0	0.0	0.0	0.0	44.5	0.1	1.3	0.0	0.0	0.0	0.0	0.0	27.0
15	17660934.71	4759708.37	5.80	0	E	1000	73.4	0.0	0.0	0.0	0.0	44.5	0.2	-0.6	0.0	0.0	0.0	0.0	0.0	29.3
15	17660934.71	4759708.37	5.80	0	E	2000	68.8	0.0	0.0	0.0	0.0	44.5	0.5	-0.9	0.0	0.0	0.0	0.0	0.0	24.7
15	17660934.71	4759708.37	5.80	0	E	4000	60.4	0.0	0.0	0.0	0.0	44.5	1.6	-0.9	0.0	0.0	0.0	0.0	0.0	15.2
15	17660934.71	4759708.37	5.80	0	E	8000	54.0	0.0	0.0	0.0	0.0	44.5	5.5	-0.9	0.0	0.0	0.0	0.0	0.0	4.8
16	17660934.71	4759708.37	5.80	1	D	4000	60.4	0.0	0.0	0.0	0.0	57.1	6.6	-1.6	0.0	0.0	26.6	0.0	2.0	-30.3
16	17660934.71	4759708.37	5.80	1	D	8000	54.0	0.0	0.0	0.0	0.0	57.1	23.5	-1.6	0.0	0.0	26.6	0.0	2.0	-53.6
16	17660934.71	4759708.37	5.80	1	N	4000	60.4	0.0	-188.0	0.0	0.0	57.1	6.6	-1.6	0.0	0.0	26.6	0.0	2.0	-218.3
16	17660934.71	4759708.37	5.80	1	N	8000	54.0	0.0	-188.0	0.0	0.0	57.1	23.5	-1.6	0.0	0.0	26.6	0.0	2.0	-241.6
16	17660934.71	4759708.37	5.80	1	E	4000	60.4	0.0	0.0	0.0	0.0	57.1	6.6	-1.6	0.0	0.0	26.6	0.0	2.0	-30.3

Point Source, ISO 9613, Name: "", ID: "EF1"																				
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)
16	17660934.71	4759708.37	5.80	1	E	8000	54.0	0.0	0.0	0.0	0.0	57.1	23.5	-1.6	0.0	0.0	26.6	0.0	2.0	-53.6
17	17660934.71	4759708.37	5.80	2	D	4000	60.4	0.0	0.0	0.0	0.0	57.5	6.9	-1.1	0.0	0.0	26.1	0.0	4.0	-33.0
17	17660934.71	4759708.37	5.80	2	D	8000	54.0	0.0	0.0	0.0	0.0	57.5	24.6	-1.1	0.0	0.0	26.1	0.0	4.0	-57.1
17	17660934.71	4759708.37	5.80	2	N	4000	60.4	0.0	-188.0	0.0	0.0	57.5	6.9	-1.1	0.0	0.0	26.1	0.0	4.0	-221.0
17	17660934.71	4759708.37	5.80	2	N	8000	54.0	0.0	-188.0	0.0	0.0	57.5	24.6	-1.1	0.0	0.0	26.1	0.0	4.0	-245.1
17	17660934.71	4759708.37	5.80	2	E	4000	60.4	0.0	0.0	0.0	0.0	57.5	6.9	-1.1	0.0	0.0	26.1	0.0	4.0	-33.0
17	17660934.71	4759708.37	5.80	2	E	8000	54.0	0.0	0.0	0.0	0.0	57.5	24.6	-1.1	0.0	0.0	26.1	0.0	4.0	-57.1
18	17660934.71	4759708.37	5.80	2	D	1000	73.4	0.0	0.0	0.0	0.0	51.5	0.4	-0.2	0.0	0.0	0.0	0.0	4.0	17.7
18	17660934.71	4759708.37	5.80	2	D	2000	68.8	0.0	0.0	0.0	0.0	51.5	1.0	-0.7	0.0	0.0	0.0	0.0	4.0	13.0
18	17660934.71	4759708.37	5.80	2	D	4000	60.4	0.0	0.0	0.0	0.0	51.5	3.5	-0.7	0.0	0.0	0.0	0.0	4.0	2.1
18	17660934.71	4759708.37	5.80	2	D	8000	54.0	0.0	0.0	0.0	0.0	51.5	12.3	-0.7	0.0	0.0	0.0	0.0	4.0	-13.2
18	17660934.71	4759708.37	5.80	2	N	1000	73.4	0.0	-188.0	0.0	0.0	51.5	0.4	-0.2	0.0	0.0	0.0	0.0	4.0	-170.3
18	17660934.71	4759708.37	5.80	2	N	2000	68.8	0.0	-188.0	0.0	0.0	51.5	1.0	-0.7	0.0	0.0	0.0	0.0	4.0	-175.0
18	17660934.71	4759708.37	5.80	2	N	4000	60.4	0.0	-188.0	0.0	0.0	51.5	3.5	-0.7	0.0	0.0	0.0	0.0	4.0	-185.9
18	17660934.71	4759708.37	5.80	2	N	8000	54.0	0.0	-188.0	0.0	0.0	51.5	12.3	-0.7	0.0	0.0	0.0	0.0	4.0	-201.2
18	17660934.71	4759708.37	5.80	2	E	1000	73.4	0.0	0.0	0.0	0.0	51.5	0.4	-0.2	0.0	0.0	0.0	0.0	4.0	17.7
18	17660934.71	4759708.37	5.80	2	E	2000	68.8	0.0	0.0	0.0	0.0	51.5	1.0	-0.7	0.0	0.0	0.0	0.0	4.0	13.0
18	17660934.71	4759708.37	5.80	2	E	4000	60.4	0.0	0.0	0.0	0.0	51.5	3.5	-0.7	0.0	0.0	0.0	0.0	4.0	2.1
18	17660934.71	4759708.37	5.80	2	E	8000	54.0	0.0	0.0	0.0	0.0	51.5	12.3	-0.7	0.0	0.0	0.0	0.0	4.0	-13.2

Point Source, ISO 9613, Name: "", ID: "EF2"																				
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)
19	17660925.56	4759714.59	7.20	0	D	32	52.5	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	10.8
19	17660925.56	4759714.59	7.20	0	D	63	55.2	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	13.4
19	17660925.56	4759714.59	7.20	0	D	125	66.2	0.0	0.0	0.0	0.0	44.7	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	21.7
19	17660925.56	4759714.59	7.20	0	D	250	65.3	0.0	0.0	0.0	0.0	44.7	0.1	1.6	0.0	0.0	0.0	0.0	0.0	19.0
19	17660925.56	4759714.59	7.20	0	D	500	65.4	0.0	0.0	0.0	0.0	44.7	0.1	0.7	0.0	0.0	0.0	0.0	0.0	19.9
19	17660925.56	4759714.59	7.20	0	D	1000	66.6	0.0	0.0	0.0	0.0	44.7	0.2	-0.9	0.0	0.0	0.0	0.0	0.0	22.6
19	17660925.56	4759714.59	7.20	0	D	2000	63.7	0.0	0.0	0.0	0.0	44.7	0.5	-1.2	0.0	0.0	0.0	0.0	0.0	19.6
19	17660925.56	4759714.59	7.20	0	D	4000	56.6	0.0	0.0	0.0	0.0	44.7	1.6	-1.2	0.0	0.0	0.0	0.0	0.0	11.4
19	17660925.56	4759714.59	7.20	0	D	8000	47.5	0.0	0.0	0.0	0.0	44.7	5.7	-1.2	0.0	0.0	0.0	0.0	0.0	-1.8
19	17660925.56	4759714.59	7.20	0	N	32	52.5	0.0	-188.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-177.2
19	17660925.56	4759714.59	7.20	0	N	63	55.2	0.0	-188.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-174.6
19	17660925.56	4759714.59	7.20	0	N	125	66.2	0.0	-188.0	0.0	0.0	44.7	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	-166.3
19	17660925.56	4759714.59	7.20	0	N	250	65.3	0.0	-188.0	0.0	0.0	44.7	0.1	1.6	0.0	0.0	0.0	0.0	0.0	-169.0
19	17660925.56	4759714.59	7.20	0	N	500	65.4	0.0	-188.0	0.0	0.0	44.7	0.1	0.7	0.0	0.0	0.0	0.0	0.0	-168.1
19	17660925.56	4759714.59	7.20	0	N	1000	66.6	0.0	-188.0	0.0	0.0	44.7	0.2	-0.9	0.0	0.0	0.0	0.0	0.0	-165.4
19	17660925.56	4759714.59	7.20	0	N	2000	63.7	0.0	-188.0	0.0	0.0	44.7	0.5	-1.2	0.0	0.0	0.0	0.0	0.0	-168.4
19	17660925.56	4759714.59	7.20	0	N	4000	56.6	0.0	-188.0	0.0	0.0	44.7	1.6	-1.2	0.0	0.0	0.0	0.0	0.0	-176.6
19	17660925.56	4759714.59	7.20	0	N	8000	47.5	0.0	-188.0	0.0	0.0	44.7	5.7	-1.2	0.0	0.0	0.0	0.0	0.0	-189.8
19	17660925.56	4759714.59	7.20	0	E	32	52.5	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	10.8
19	17660925.56	4759714.59	7.20	0	E	63	55.2	0.0	0.0	0.0	0.0	44.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	13.4
19	17660925.56	4759714.59	7.20	0	E	125	66.2	0.0	0.0	0.0	0.0	44.7	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	21.7
19	17660925.56	4759714.59	7.20	0	E	250	65.3	0.0	0.0	0.0	0.0	44.7	0.1	1.6	0.0	0.0	0.0	0.0	0.0	19.0
19	17660925.56	4759714.59	7.20	0	E	500	65.4	0.0	0.0	0.0	0.0	44.7	0.1	0.7	0.0	0.0	0.0	0.0	0.0	19.9
19	17660925.56	4759714.59	7.20	0	E	1000	66.6	0.0	0.0	0.0	0.0	44.7	0.2	-0.9	0.0	0.0	0.0	0.0	0.0	22.6
19	17660925.56	4759714.59	7.20	0	E	2000	63.7	0.0	0.0	0.0	0.0	44.7	0.5	-1.2	0.0	0.0	0.0	0.0	0.0	19.6
19	17660925.56	4759714.59	7.20	0	E	4000	56.6	0.0	0.0	0.0	0.0	44.7	1.6	-1.2	0.0	0.0	0.0	0.0	0.0	11.4
19	17660925.56	4759714.59	7.20	0	E	8000	47.5	0.0	0.0	0.0	0.0	44.7	5.7	-1.2	0.0	0.0	0.0	0.0	0.0	-1.8
20	17660925.56	4759714.59	7.20	2	D	1000	66.6	0.0	0.0	0.0	0.0	51.8	0.4	-0.2	0.0	0.0	0.0	0.0	4.0	10.6
20	17660925.56	4759714.59	7.20	2	D	2000	63.7	0.0	0.0	0.0	0.0	51.8	1.1	-0.7	0.0	0.0	0.0	0.0	4.0	7.5
20	17660925.56	4759714.59	7.20	2	D	4000	56.6	0.0	0.0	0.0	0.0	51.8	3.6	-0.7	0.0	0.0	0.0	0.0	4.0	-2.1
20	17660925.56	4759714.59	7.20	2	D	8000	47.5	0.0	0.0	0.0	0.0	51.8	12.9	-0.7	0.0	0.0	0.0	0.0	4.0	-20.5
20	17660925.56	4759714.59	7.20	2	N	1000	66.6	0.0	-188.0	0.0	0.0	51.8	0.4	-0.2	0.0	0.0	0.0	0.0	4.0	-177.4
20	17660925.56	4759714.59	7.20	2	N	2000	63.7	0.0	-188.0	0.0	0.0	51.8	1.1	-0.7	0.0	0.0	0.0	0.0	4.0	-180.5
20	17660925.56	4759714.59	7.20	2	N	4000	56.6	0.0	-188.0	0.0	0.0	51.8	3.6	-0.7	0.0	0.0	0.0	0.0	4.0	-190.1
20	17660925.56	4759714.59	7.20	2	N	8000	47.5	0.0	-188.0	0.0	0.0	51.8	12.9	-0.7	0.0	0.0	0.0	0.0	4.0	-208.5
20	17660925.56	4759714.59	7.20	2	E	1000	66.6	0.0	0.0	0.0	0.0	51.8	0.4	-0.2	0.0	0.0	0.0	0.0	4.0	10.6
20	17660925.56	4759714.59	7.20	2	E	2000	63.7	0.0	0.0	0.0	0.0	51.8	1.1	-0.7	0.0	0.0	0.0	0.0	4.0	7.5
20	17660925.56	4759714.59	7.20	2	E	4000	56.6	0.0	0.0	0.0	0.0	51.8	3.6	-0.7	0.0	0.0	0.0	0.0	4.0	-2.1
20	17660925.56	4759714.59	7.20	2	E	8000	47.5	0.0	0.0	0.0	0.0	51.8	12.9	-0.7	0.0	0.0	0.0	0.0	4.0	-20.5