

644 Garrison Road

Environmental Noise Study Fort Erie, ON

SLR Project No: 241.20299.00000
December 2021

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Environmental Noise Study
644 Garrison Road
Fort Erie, ON

SLR Project No.: 241.20299.00000, Version 1.0

Prepared by
SLR Consulting (Canada) Ltd.
150 Research Lane, Suite 105
Guelph, ON N1G 4T2

for

Ben Kooh
2350048 Ontario Ltd.

December 3, 2021

Prepared by:



Jason Dorssers, B.Eng.
Acoustics, Noise, and Vibration Scientist

Reviewed by:



Marcus Li, P.Eng.
Principal, Noise

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1. INTRODUCTION

SLR Consulting (Canada) Ltd. (“SLR”), was retained by 2350048 Ontario Ltd., to conduct an environmental noise assessment for their proposed 644 Garrison Road residential development in Fort Erie, Ontario (“the Project”). This assessment has been completed in support of the Zoning By-law Amendment with the City of Fort Erie in the Region of Niagara.

In assessing potential impacts of the environment on the proposed development (Phase 2), the focus of this report is to assess the potential for:

- Transportation noise impacts from the nearby roadways; and
- Stationary noise impacts from the surroundings, including the Phase 1 commercial buildings of the development.

2. DESCRIPTION OF DEVELOPMENT AND SURROUNDINGS

2.1 PROPOSED DEVELOPMENT

The subject property, 644 Garrison Road preliminary site plan will involve two (2) phases:

- Phase 1: a commercial development adjacent to Garrison Road including three (3) restaurant/drive-thrus (Starbucks, Taco Bell, and A&W); and
- Phase 2: a residential six (6)-storey development.

The Phase 1 buildings are labelled in this study from west to east, as Buildings A, B, and C for the Starbucks, Taco Bell, and A&W restaurants, respectively. Current drawings show the development at the north-east corner of Garrison Road (Regional Road 3) and Thompson Road (Regional Road 122).

The preliminary concept plans are provided in **Appendix A**.

2.2 SURROUNDINGS

The immediate surrounding lands include single family detached homes to the north and east. Further north at 500m from the property line is the Queen Elizabeth Way highway. To the east of the development, there are commercial properties including a RONA. Further east are two commercial properties (a balance treatment centre, and an Italian/Canadian club), residential detached homes are situated along Dipietro Street further to the east.

Directly south of the proposed development, across Garrison Road are commercial properties including Golden Nugget Gaming Centre. Towards the south-west, are residential homes along Garrison and small industrial properties along Helena Street. West of the proposed development is a commercial plaza including a physiotherapy office, a pharmacy, and laboratory services. Across Thompson Road is a bank and a Walmart Supercentre with associated parking lots.

A context plan of the site and surroundings are shown in **Figure 1**.

3. TRANSPORTATION NOISE IMPACTS

3.1 TRANSPORTATION NOISE SOURCES

Transportation noise sources of interest with the potential to produce noise at the proposed development are Garrison Road, Thompson Road and the QEW.

Sound exposure levels at the development have been predicted, and this information has been used to identify façade, ventilation, and warning clause requirements.

3.2 SURFACE TRANSPORTATION NOISE CRITERIA

3.2.1 MECP PUBLICATION NPC-300

Noise Sensitive Developments

Ministry of the Environment, Conservation & Parks (MECP) Publication NPC-300 provides sound level criteria for noise sensitive developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. **Table 1 to Table 4** below summarizes the applicable surface transportation (road and rail) criteria limits.

Location Specific Criteria

Table 1 summarizes criteria in terms of energy equivalent sound exposure (L_{eq}) levels for specific noise-sensitive locations. Both outdoor and indoor locations are identified, with the focus of outdoor areas being amenity spaces. Indoor criteria vary with sensitivity of the space. As a result, sleep areas have more stringent criteria than Living / Dining room space.

Table 1: MECP Publication NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Equivalent Sound Exposure Level – L_{eq} (dBA)		Assessment Location
		Road	Rail ^[1]	
Outdoor Living Area (OLA)	Daytime (0700-2300h)	55	55	Outdoors ^[2]
Living / Dining Room ^[3]	Daytime (0700-2300h)	45	40	Indoors ^[4]
	Night-time (2300-0700h)	45	40	Indoors ^[4]
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors ^[4]
	Night-time (2300-0700h)	40	35	Indoors ^[4]

Notes: [1] Whistle noise is excluded for OLA noise assessments and included for Living / Dining Room and Sleeping Quarter assessments.

[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.

[3] Residence area Dens, Hospitals, Nursing Homes, Schools, Daycares are also included. During the night-time period, Schools and Daycares are excluded.

[4] An assessment of indoor noise levels is required only if the criteria in **Table 4** are exceeded.

Outdoor Amenity Areas

Table 2 summarizes the noise mitigation requirements for outdoor amenity areas (“Outdoor Living Areas” or “OLAs”). This would include the ground level patios/backyards and raised terraces.

Table 2: MECP Publication NPC-300 Outdoor Living Area Mitigation Requirements

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Mitigation Requirements and Warning Clauses
Daytime (0700-2300h)	≤ 55	• None
	55 to 60 incl.	• Noise barrier OR Warning Clause A
	> 60	• Noise barrier to reduce noise to 55 dBA OR • Noise barrier to reduce noise to 60 dBA and Warning Clause B

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by road traffic sound levels.

Ventilation and Warning Clauses

Table 3 summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where required, if sound exposure levels exceed the guideline limits in **Table 1**, warning clauses advising future occupants of the potential excesses are required.

Warning clauses also apply to the OLA, where an excess of up to 5 dBA over the 55 dBA OLA limit is often acceptable to many, particularly in the context of an urban environment. Warning clauses are discussed further in **Section 3.3.3**.

Table 3: MECP Publication NPC-300 Ventilation & Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (dBA)		Ventilation and Warning Clause Requirements ^[2]
		Road	Rail ^[1]	
Outdoor Living Area	Daytime (0700-2300h)	56 to 60 incl.		Type A Warning Clause
Plane of Window	Daytime (0700-2300h)	≤ 55		None
		56 to 65 incl.		Forced Air Heating with provision to add air conditioning + Type C Warning Clause
		> 65		Central Air Conditioning + Type D Warning Clause
	Night-time (2300-0700h)	51 to 60 incl.		Forced Air Heating with provision to add air conditioning + Type C Warning Clause
		> 60		Central Air Conditioning + Type D Warning Clause

Notes: [1] Rail whistle noise is excluded.

[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Building Shell Requirements

Table 4 provides sound level thresholds which, if exceeded require the building shell and components (i.e., wall, windows) to be designed to ensure that the **Table 1** indoor sound criteria are met.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (dBA)		Component Requirements
		Road	Rail ^[1]	
Plane of Window	Daytime (0700-2300h)	> 65	> 60	Designed/ Selected to Meet Indoor Requirements ^[2]
	Night-time (2300-0700h)	> 60	> 55	

Notes: [1] Including whistle noise.

[2] Building component requirements are assessed separately for Road and Railway noise. The resultant sound isolation parameter is required to be combined to determine an overall acoustic parameter.

3.2.1 TRAFFIC DATA AND FUTURE PROJECTIONS

Road traffic data for Garrison Road and Thompson Road was provided by LEA Consulting Ltd., the traffic consultants for the project as turning movement counts. The roadways were grown at 2.0%/annum rate, based on information provided by the traffic consultants. Average annual daily traffic (AADT) volumes were then calculated for each roadway based on these counts.

QEW traffic data was obtained from the MTO. The SADT was applied as a worst-case traffic volume for the QEW. Based on a review of the previous 10 years of QEW traffic volumes (2011 and on), traffic growth varied significantly with both increases and decreases in volume. For this assessment, the highest SADT over the last 10 years was applied. No growth was applied to the highest volume, as no clear pattern of growth is shown in the MTO data. Truck percentages were obtained from the MTO iCorridor website.

Copies of applicable traffic data and calculations can be found in **Appendix B**. The following **Table 5** summarizes the road traffic volumes used in the analysis.

Table 5: Summary of Road Traffic Data Used in the Transportation Analysis

Roadway Link	2041 Traffic Levels (AADT)	% Day/ Night Volume Split ^[2]		Commercial Traffic Breakdown ^[3]		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
Garrison Road East	17,567	90	10	2.8	0.7	60
Garrison Road West	21,067	90	10	2.2	0.4	60
Thompson Road North	11,543	90	10	3.3	1.8	70
Thompson Road South	3,721	90	10	3.7	2.8	70
Queen Elizabeth Way Highway	23,800 ^[1]	67	33	2.6	16.4	100

Notes: [1] SADT was used as a conservative assessment for highway traffic volumes.

[2] The Day/Night split was determined from historic data at SLR for arterial roadways and provincial highways.

[3] Commercial Traffic Breakdowns were taken from the traffic counts provided by LEA Consulting Ltd and the MTO.

[4] The worst-case volumes were assumed based on provided turning movement counts.

3.3 PROJECTED FAÇADE SOUND LEVELS

A future year of 2041 was applied in the transportation modelling to meet the Niagara Region requirements. Traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software.

Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions were validated and are equivalent to those made using the MECP's ORNAMENT or STAMSON v5.04 road traffic noise models.

Sound levels were predicted along the façades of the proposed development using the “building evaluation” feature of Cadna/A. This feature allows for noise levels to be predicted across the entire façade of a structure.

Ground absorption was assessed as a reflective surface, as the majority of the intervening ground is paved.

3.3.1 FAÇADE SOUND LEVELS

Predicted worst-case façade sound levels, and glazing requirements are presented in **Table 6**. The façade maps of the development, showing predicted daytime, and night-time roadway impacts are shown in **Figure 2 and Figure 3**. An STAMSON validation file and associated traffic data is included in **Appendix B**.

All buildings/barriers were turned off when comparing the Cadna/a modelling output to the STAMSON results.

Table 6: Summary of Predicted Transportation Sound Levels

Component	L _{eq} Daytime ^[2]	L _{eq} Night-time ^[2]
North	58	57
East	56	54
South	57	51
West	58	55

Notes: [1] Façade locations are shown in Figures 2 and 3.
[2] The maximum sound level on the entire facade are shown.

As the predicted sound levels are below 65 dBA during the daytime and 60 dBA during the night-time, an assessment of building components is not required. Windows conforming to the minimum structural requirements of the Ontario Building Code (OBC) are predicted to be adequate on all façades throughout the development.

3.3.2 OUTDOOR LIVING AREAS

Private terraces and balconies are expected to be less than 4 m in depth, and do not meet the minimum requirements for inclusion under the definitions in NPC-300. Therefore, an assessment of outdoor living areas was not completed.

3.3.3 VENTILATION/WARNING CLAUSE REQUIREMENTS

The requirements regarding warning clauses are summarized in **Section 3.2.1**. Where required, the Warning Clauses should be included in agreements registered on Title for the residential units and

included in all agreements of purchase and sale or lease, and all rental agreements. Warning Clauses are summarized in **Appendix C**.

The façade sound levels due to the surrounding roadway, as shown in **Table 6**, are predicted to be between 60 and 51 dBA during the night-time for portions of the development. Therefore, a **Type C** warning clause, forced air heating and the provision for air conditioning are recommended for all units of the proposed development.

4. STATIONARY NOISE ASSESSMENT

4.1 SITE VISITS AND NOISE OBSERVATIONS

A site visit was conducted to the area on September 24th, 2021, by SLR personnel to identify significant sources of noise in the Project neighbourhood. The acoustic environment at the proposed development and surrounding area is dominated by noise from road traffic from Garrison Road and Thompson Road.

During the site visit, the RONA, Rossi Ltd. Construction, Hardscape Niagara and the 570 Garrison Communications Tower were identified. Stationary noise sources from RONA, and all other surrounding industries/commercial properties were inaudible at the site during the site visit.

Based on the above, significant stationary noise sources with the potential to impact the development include the RONA yard, the 570 Garrison communications tower, and the development's Phase 1 commercial buildings. Due to the close proximity of the listed sources, a stationary noise assessment was deemed necessary. The Phase 1 commercial building impacts on the development are assessed in **Part 2: Impacts of the Development on Itself**.

4.2 SOURCES OF INTEREST

Based on the above, further assessment of noise impacts from the RONA yard, and the 570 Garrison Road communications tower was completed. The sections below detail the modelling assumptions for each property.

All modelled surrounding stationary sources are included in **Figure 4**. Sound power levels for all equipment modelled are included in **Appendix D**.

4.2.1 RONA

Based on typical operations a forklift and loading activities are expected on-site within the RONA yard during the operational hours between 7AM and 5:30PM.

4.2.2 570 GARRISON ROAD

To the east of the proposed development, a generator was identified on the property of 570 Garrison Road. Based on SLR's previous experience with similar types of equipment, testing of the generator is expected to occur during the daytime between 7AM and 7PM for an hour.

A search of the MECP Access Environment data base did not identify a current Environmental Compliance Approval (ECA) or Environmental Sector Activity Registry (EASR) with the MECP. Therefore, it was assumed the emergency generator meets the exemption sound level requirement of 75 dBA at 7 m, indicated in Ontario Regulation 524/98 (dated Feb 3, 2017).

4.2.3 ROSSI CONSTRUCTION & HARDSCAPE NIAGARA

The Rossi Ltd. Construction and Hardscape Niagara property at 590 Garrison Road are expected to act as storage facilities. Based on observations made during the site visit, machinery and other equipment are not expected to operate. Therefore, additional modelling of noise impacts was not deemed necessary.

4.3 APPLICABLE GUIDELINE LIMITS

The applicable MECP noise guidelines for new sensitive land uses adjacent to existing industrial/commercial uses are provided in MECP Publication NPC-300. The guideline sets out noise limits for two main types of noise sources:

- Non-impulsive, “continuous” noise sources such as ventilation fans, mechanical equipment, and vehicles while moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound exposures (L_{eq} (1-hr) values), in dBA; and
- Impulsive noise, which is a “banging” type noise characterized by rapid rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (L_{LM}) of the impulses in a one-hour period, in dBA.

Furthermore, the guideline requires an assessment at, and provides separate guideline limits for:

- Outdoor points of reception (e.g., back yards, communal outdoor amenity areas); and
- Façade points of reception such as the plane of windows on the outdoor façade which connect onto noise sensitive spaces, such as living rooms, dens, eat-in kitchens, dining rooms and bedrooms.

The applicable noise limits at a point of reception are the higher of:

- The existing ambient sound level due to road traffic, or
- The exclusion limits set out in the guideline.

Based on review of the area by SLR personnel, only continuous noise sources were identified. An assessment of impulsive noise is not considered necessary and has not been discussed any further.

The site and surrounding area was reviewed by SLR personnel, and found to be dominated by noise from the surrounding roadways including Garrison Road, Thompson Road, and the QEW. Based on the level of commercialization in the area and the level of roadway noise in the area, the Class 1 guideline limits are considered applicable for the development site. The following tables set out the applicable exclusion limits:

Table 7: NPC-300 Exclusion Limits for Continuous Sounds

Time of Day	Class 1 Area	
	Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception
7 am to 7 pm	50	50
7 pm to 11 pm	50	50
11 pm to 7 am	45	n/a

Notes:

- Sound levels are L_{eq} (1-hr) sound levels, in dBA.

n/a Not Applicable. Outdoor points of reception are not considered to be noise sensitive during the overnight period.

Sound level limits for emergency equipment operating in non-emergency situations are 5 dB greater than the sound level limits otherwise applicable to other stationary sources, as outlined in NPC-300.

Additionally, emergency equipment operating in non-emergency situations is to be assessed

independently of all other stationary sources of noise. The following table summarizes the applicable guideline limits for the testing of emergency equipment.

Table 8: NPC-300 Exclusion Limits for Testing of Emergency Equipment

Location	Time Period	Default Class 1 Sound Level Limits (dBA)	Non-Emergency Allowance (dBA)	Applicable Guideline Limits (dBA)
Façade or OLA	07:00 - 19:00	50	+5	55
	19:00 - 23:00	50		55
	23:00 - 07:00	45		50

4.4 NOISE MODELLING AND RESULTS

Worst-case scenario noise levels from the surrounding industrial operations were modelled using Cadna/A, a computerized version of the internationally recognized ISO 9613-2 noise propagation algorithms. This is the preferred noise modelling methodology of the MECP. The ISO 9613 equations account for:

- Source to receiver geometry;
- Distance attenuation;
- Atmospheric absorption;
- Reflections off of the ground and ground absorption;
- Reflections off of vertical walls; and
- Screening effects of buildings, terrain, and purpose-built noise barriers (noise walls, berms, etc.).

The following additional parameters were used in the modelling, which are consistent with providing a conservative (worst-case assessment of noise levels):

- Temperature: 10°C;
- Relative Humidity: 70%;
- Ground Absorption G: G=1.0 (Absorptive), G=0.5 (Gravel/Dirt), G=0 (Paved Areas); and
- Reflection: An order of reflection of 1 was used (accounts for noise reflecting from buildings).

4.4.1 FAÇADE SOUND LEVELS

Predicted daytime façade sound levels on Phase 2 of the proposed development from existing stationary noise sources are shown in **Figure 5**, and **Figure 6** for continuous, and emergency equipment testing, respectively. Overall predicted sound levels are provided in the following Tables.

Table 9: Overall Surrounding Stationary Sound Levels - Continuous Noise

Component	Predicted Sound Levels ^[1]		Class 1 Guideline Limit		Meets Guideline?
	L _{eq} Day/Eve (dBA)	L _{eq} Night (dBA)	L _{eq} Day (dBA)	L _{eq} Night (dBA)	
North	40	N/A	50	45	Y
East	48	N/A			Y
South	41	N/A			Y
West	19	N/A			Y

Notes: [1] The sound levels presented are for the worst-case location on a façade.

Table 10: Overall Surrounding Stationary Sound Levels - Emergency Equipment

Component	Predicted Sound Levels ^[1]		Class 1 Guideline Limit		Meets Guideline?
	L _{eq} Day/Eve (dBA)	L _{eq} Night (dBA)	L _{eq} Day (dBA) ^[2]	L _{eq} Night (dBA)	
North	33	N/A	55	50	Y
East	51	N/A			Y
South	51	N/A			Y
West	23	N/A			Y

Notes: [1] The sound levels presented are for the worst-case exposed façade.

[2] An additional 5dB are added to the continuous NPC-300 exclusionary stationary limits for testing of emergency equipment.

Based on the above results, sounds levels are predicted to meet the applicable NPC-300 guideline limits at all façades for surrounding stationary noise sources and emergency generator testing. Therefore, additional noise mitigation measures are not required.

4.4.2 WARNING CLAUSE REQUIREMENTS

Due to the proximity of the RONA yard and the 570 Garrison communications tower generator, a **Type E** warning clause should be included for all residential units in Phase 2 of the development.

Where required, the Warning Clauses should be included in agreements registered on Title for the residential units and included in all agreements of purchase and sale or lease, and all rental agreements. Warning Clauses are summarized in **Appendix C**.

PART 2: IMPACTS OF THE DEVELOPMENT ON ITSELF

STATIONARY SOURCE NOISE IMPACTS ON THE DEVELOPMENT ITSELF

4.5 SITE VISITS AND OBSERVATIONS

The Phase 1 portion of the development includes a Starbucks, Taco Bell, and A&W, each with a drive thru. During the site visit on September 24, 2021, Phase 1 of the development was under construction and not in operation.

Due to the close proximity of the Phase 1 portion of the development, a stationary noise assessment was deemed necessary.

4.6 APPLICABLE GUIDELINE LIMITS

Noise impacts from all on-site mechanical equipment, including the Phase 1 portion of the development, are required to be in compliance with the MECP Publication of NPC-300 guideline limits on Phase 2 of the development.

As per the assessment of surrounding stationary noise sources on the development, noise impacts were assessed against the exclusionary NPC-300 Class 1 criteria outlined in **Section 4.3**.

4.7 PHASE 1 NOISE ASSESSMENT

Phase 1 includes a Starbucks, Taco Bell, and A&W, each with a drive thru. The significant stationary noise sources were identified based on historical data for similar drive-thru facilities on file at SLR:

- Numerous rooftop HVACs/make-up air units on Buildings A through C;
- Numerous rooftop exhaust fans/kitchen exhaust fans on Building B and C;
- A small cooler/chiller on Buildings B and C;
- Grade-level speaker boxes and idling cars at the drive-thru of Starbucks, Taco Bell, and A&W.

Noise emission data for the equipment/ activities were determined based on a combination of information provided and information from SLR's in-house database. Applicable penalties due to the nature of the noise source have been considered per MECP Publication NPC-103 and NPC-104 for the drive-thru speaker boxes.

Based on typical hours of operation for Starbucks, Taco Bell, and A&W, the Phase 1 facilities can operate during any hour of the day and may or may not all be in operation at the same time. For this assessment, the three (3) Phase 1 businesses were assumed to be open during all hours of the day. Rooftop equipment was assumed to be operating continuously (exhaust fans and HVAC units), where a 50% duty cycle was applied for the overnight period. Drive-thru activities were assessed based on full capacity during the daytime/evening hours and reduced volumes during the night-time (3 cars per drive-thru). Modelled sources in Phase 1 are showed in **Figure 7**. A summary of the sound data, operating times and assumptions are included **Appendix D**.

4.7.1 MODELLED NOISE IMPACTS

Noise impact modelling was completed, as outlined in **Section 4.4** above, using Cadna/A and applying the same ground factors and reflection order. Building evaluations were also used to predict noise impacts along the entire façade of the development.

Predicted daytime façade sound levels on Phase 2 of the proposed development are shown in **Figure 8** and **Figure 9** for the proposed development. Overall predicted sound levels are provided in the following Table.

Table 11: Overall Phase 1 Noise Impacts on Phase 2 - Normal Operations, Continuous Noise

Component	Predicted Sound Levels ^[1]		Class 1 Guideline Limit		Meets Guideline?
	L _{eq} Day/Eve (dBA)	L _{eq} Night (dBA)	L _{eq} Day (dBA)	L _{eq} Night (dBA)	
North	23	18	50	45	Y
East	36	31			Y
South	50	45			Y
West	47	43			Y

Notes: [1] The sound levels presented are for the worst-case exposed façade, in which totals may not correspond to the same location.

Façade sounds levels due to surrounding continuous stationary noise sources are predicted to meet the applicable NPC-300 guideline limits at all façades. Therefore, additional noise mitigation measures are not required for Phase 1 of the development.

4.7.2 WARNING CLAUSE REQUIREMENTS

Due to the proximity of the Phase 1 restaurants and drive-thrus, a **Type E** warning clause should be included for all residential units in Phase 2 of the development.

Where required, the Warning Clauses should be included in agreements registered on Title for the residential units and included in all agreements of purchase and sale or lease, and all rental agreements. Warning Clauses are summarized in **Appendix C**.

4.8 PHASE 2 NOISE ASSESSMENT

The building mechanical systems of the Phase 2 development (e.g., make-up air units, cooling units, and parking garage vents) have not been designed in detail at this stage. Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on the noise sensitive spaces within the development.

Therefore, the potential impacts should be assessed as part of the final building design. The criteria is expected to be met at all on-site receptors with the appropriate selection of mechanical equipment, by locating equipment to minimize noise impacts within the development, and by incorporating control measures (e.g., silencers, barriers) into the design.

It is recommended that the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

PART 3: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

STATIONARY SOURCE NOISE IMPACTS ON THE SURROUNDING AREA

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties.

The traffic related to the proposed development will be small relative to the existing traffic volumes within the area and is not of concern with respect to noise impact.

Other possible development noise sources with possible adverse impacts on the surrounding neighbourhood are mechanical equipment described in the previous section. Potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

5. CONCLUSIONS AND RECOMMENDATIONS

The potential for noise impacts on and from the proposed development have been assessed. Impacts of the environment on the development, the development on the surrounding area and the development on itself have been considered. Based on the results of our studies, the following conclusions have been reached:

5.1 TRANSPORTATION NOISE

- An assessment of transportation noise impacts from the surrounding roadways has been completed.
- Garrison Road, Thompson Road, and the Queen Elizabeth Way were assessed for roadway impacts on the Phase 2 portion of the development.
- Windows conforming to the minimum structural requirements of the Ontario Building Code (OBC) are predicted to be adequate on all façades throughout the development.
- A Type C warning clause, forced air heating and the provision for air conditioning are recommended for all units of the proposed development due to roadway sound levels exceeding 51 dBA during the night-time.

5.2 STATIONARY NOISE

- SLR staff completed a site visit on September 24th, 2021, to the development lands and surrounding area.
 - Stationary noise impacts were assessed against the MECP NPC-300 Class 1 Area criteria, as the ambient environment is dominated by roadway noise and level of commercialization in the area. As a conservative assessment of impacts, the NPC-300 Class 1 exclusionary guideline limits were used.
 - Stationary noise impacts from the surrounding industrial/commercial/retail noise and the Phase 1 portion (restaurants/drive-thru) of the development are predicted to meet NPC-300 Class 1 guideline limits on Phase 2 of the development. No additional noise mitigation measures are required.
 - A Type E Warning Clauses should be included in agreements registered on Title for the residential units, and included in agreements of purchase and sale, as outlined in **Section 4.4.2**.

5.3 OVERALL ASSESSMENT

- Impacts of the environment on Phase 2 of the development can be adequately controlled without upgraded glazing or noise barriers, without the inclusion of mitigation measures for surrounding stationary sources, with the inclusion of ventilation requirements/warning clauses, as outlined in **Part 1** of this report.
- Impacts from Phase 2 of the development on itself are not anticipated and can be adequately controlled by following the design guidance outlined in **Part 2** of this report.

-
- Impacts from Phase 1 of the development on the surroundings are expected to meet the applicable guideline limits and can be adequately controlled by following the design guidance outlined in **Part 3** of this report.
 - As the mechanical systems for Phase 1 of the development have not been designed at the time of this assessment, a review by an Acoustical Consultant should be completed as part of the final building design.

6. REFERENCES

International Organization for Standardization (ISO), 1996, *9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation*, Geneva, Switzerland, 1996.

Ontario Ministry of the Environment, Conservation & Parks (MECP), 1989, *ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation – Technical Document*.

Ontario Ministry of the Environment, Conservation & Parks (MECP), 2013, Publication NPC-300: *Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning*

7. STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for 2350048 Ontario Ltd, hereafter referred to as the “Client”. It is intended for the sole and exclusive use of the Client. The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted unless payment for the work has been made in full and express written permission has been obtained from SLR.

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for 2-sided printing purposes

 **FIGURES**

Environmental Noise Study
644 Garrison Road, Fort Erie, ON
2350048 Ontario Inc.
SLR Project No.: 211.30299.00000

Legend

- Property Line
- Phase Separation



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

SITE AND CONTEXT PLAN

True North



Scale: 1:7,000

Date: Oct 14, 2021 Rev 0.0

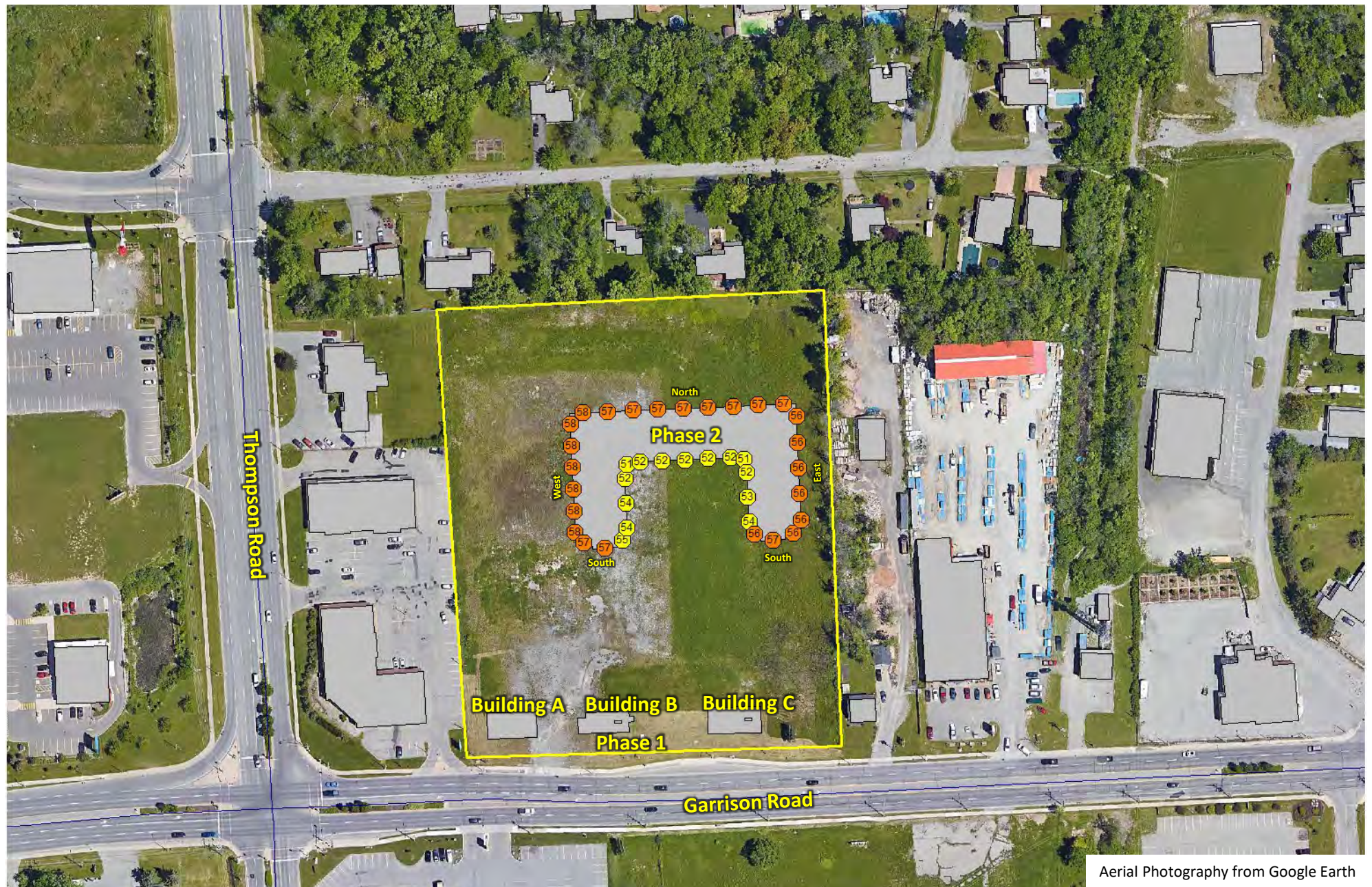
Project No. 241.30299.00000

METRES

Figure No.

1





Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

FAÇADE SOUND LEVELS – DAYTIME – ROADWAY

True North



Scale: 1:2,000

Date: Oct 14, 2021

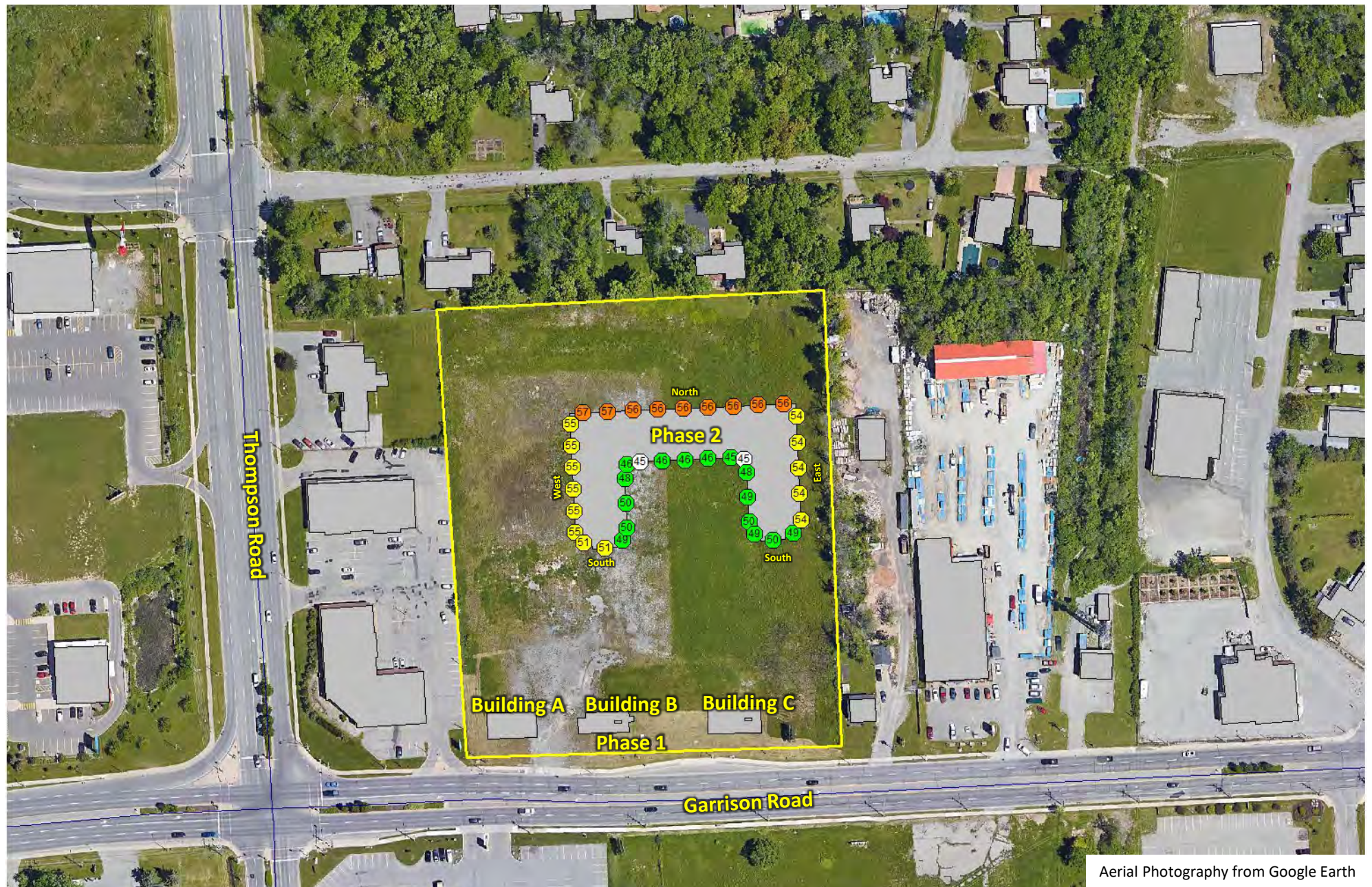
Rev 0.0

Project No. 241.30299.00000

METRES

Figure No.
2





Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

FAÇADE SOUND LEVELS – NIGHT-TIME – ROADWAY

True North



Scale: 1:2,000

Date: Oct 14, 2021

Rev 0.0



Project No. 241.30299.00000

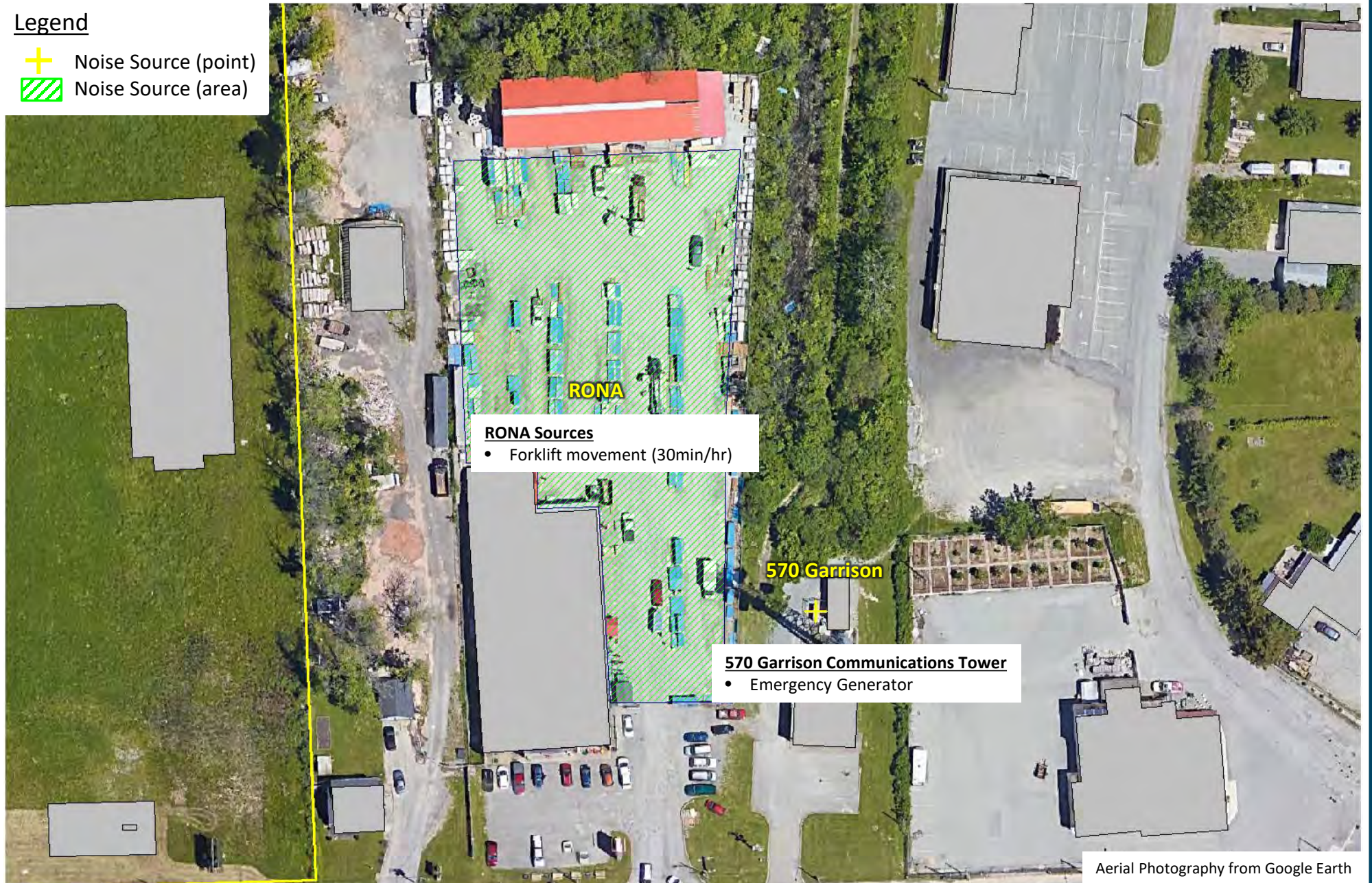
METRES

Figure No.
3



Legend

-  Noise Source (point)
-  Noise Source (area)



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

MODELLED STATIONARY NOISE SOURCES – SURROUNDING PROPERTIES

True North



Scale: 1:1,000

Date: Oct 14, 2021 Rev 0.0

Project No. 241.30299.00000

METRES

Figure No.

4



Legend

 Noise Source (area)



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

FAÇADE SOUND LEVELS – DAYTIME – SURROUNDING STATIONARY - CONTINUOUS

True North



Scale: 1:1,500

Date: Oct 14, 2021

Rev 0.0

Project No. 241.30299.00000

METRES

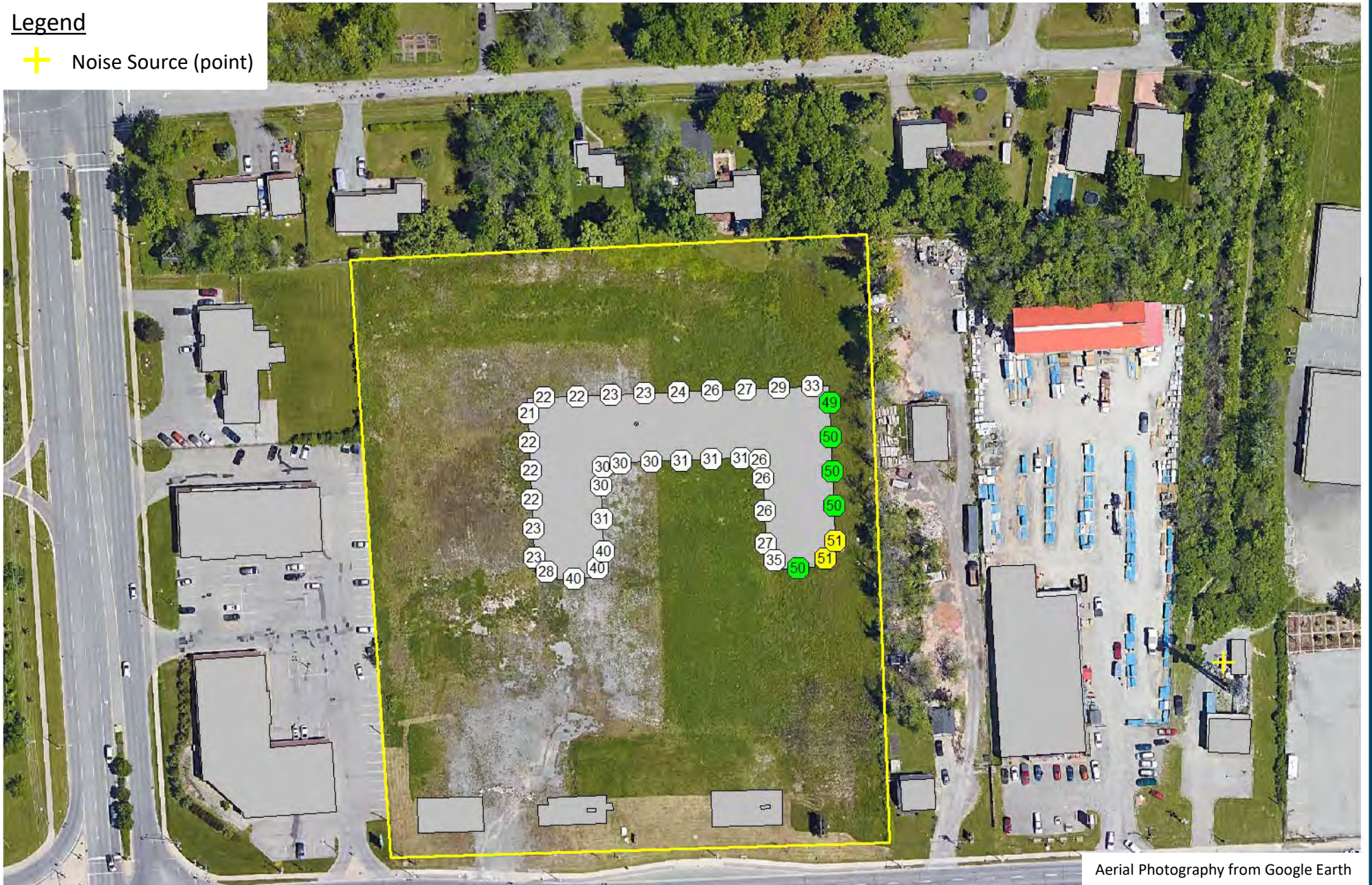
Figure No.

5



Legend

 Noise Source (point)



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

FAÇADE SOUND LEVELS – DAYTIME – SURROUNDING STATIONARY –
EMERGENCY EQUIPMENT

True North



Scale: 1:1,500

Date: Oct 14, 2021

Rev 0.0

Project No. 241.30299.00000

METRES

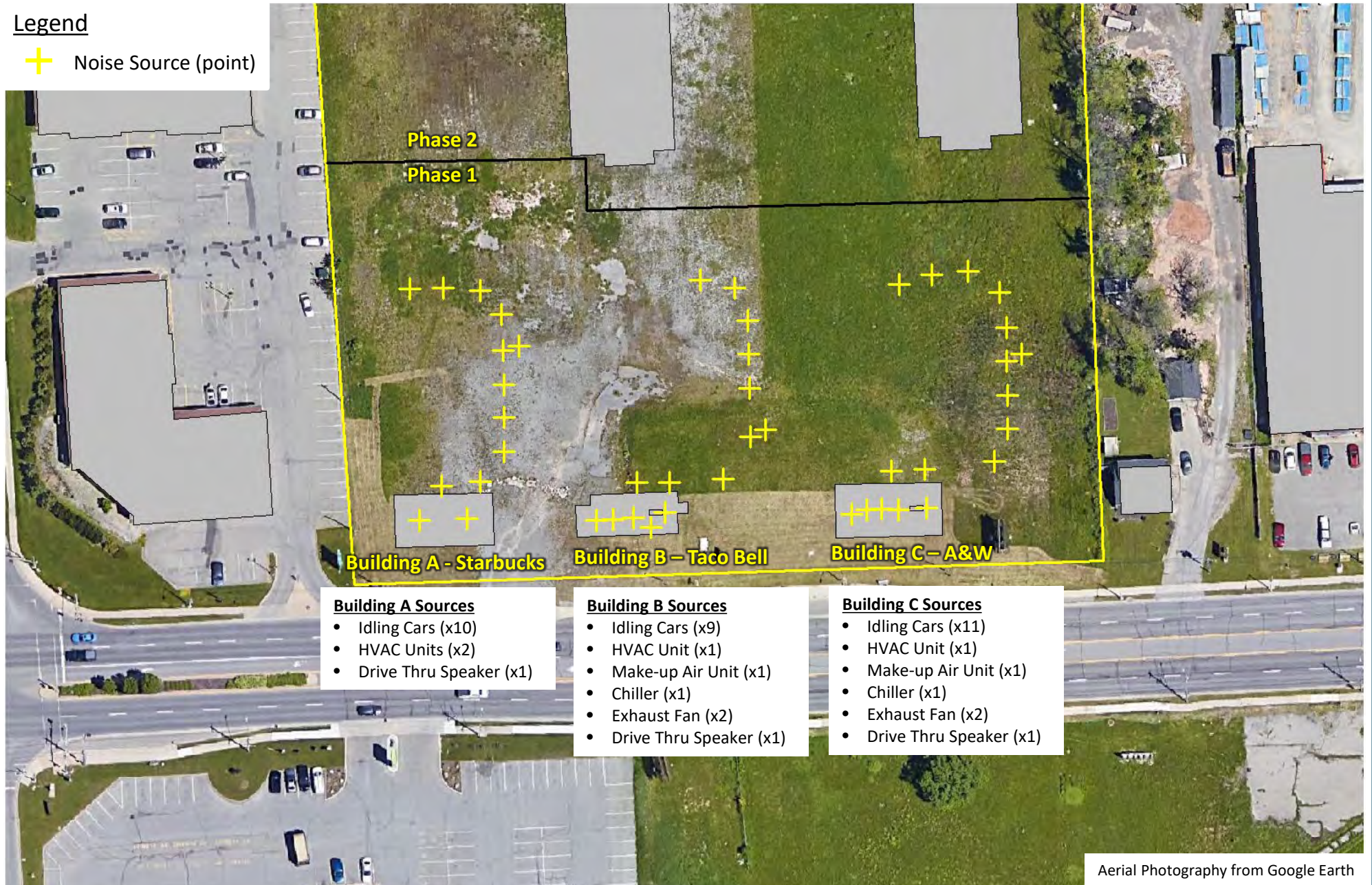
Figure No.

6



Legend

 Noise Source (point)



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

MODELLED STATIONARY NOISE SOURCES – PHASE 1

True North



Scale: 1:1,000

Date: Oct 14, 2021 Rev 0.0

Project No. 241.30299.00000

METRES

Figure No.

7



Legend

+ Noise Source (point)



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

FAÇADE SOUND LEVELS – DAYTIME/EVENING – PHASE 1 STATIONARY - CONTINUOUS

True North



Scale: 1:1,000

Date: Oct 14, 2021

Rev 0.0

Project No. 241.30299.00000

METRES

Figure No.
8



Legend

+ Noise Source (point)



Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

FAÇADE SOUND LEVELS – NIGHT-TIME – PHASE 1 STATIONARY - CONTINUOUS

True North



Scale: 1:1,000

Date: Oct 14, 2021

Rev 0.0

Project No. 241.30299.00000

METRES

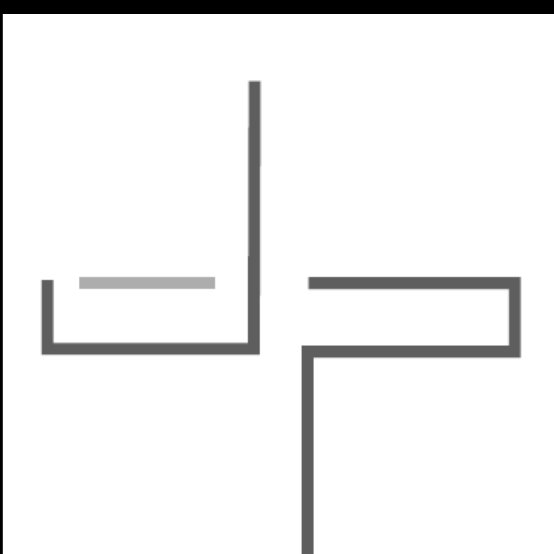
Figure No.

9



 **Appendix A**
Development Plans

Environmental Noise Study
644 Garrison Road, Fort Erie, ON
2350048 Ontario Inc.
SLR Project No.: 211.30299.00000



JASON PIZZICCOLA DESIGN - ARCHITECTS INC
 209 RIDGE ROAD N
 RIDGEWAY, ONTARIO, L0S 1N0
 T. 905-894-8300
 F. 905-894-8400
 e-mail: jpizziccola@jpdesign.ca
 CERTIFICATE OF PRACTICE : # 4053



④ NORTH - EAST 3D



③ NORTH 3D



② EAST ELEVATION
 1 : 120

T.O. ROOF 18.14
 6th FLOOR 15.11
 5th FLOOR 12.09
 4th FLOOR 9.07
 3rd FLOOR 6.05
 2nd FLOOR 3.02
 1st FLOOR 0.00



① NORTH ELEVATION
 1 : 120

T.O. ROOF 18.14
 6th FLOOR 15.11
 5th FLOOR 12.09
 4th FLOOR 9.07
 3rd FLOOR 6.05
 2nd FLOOR 3.02
 1st FLOOR 0.00

6 STOREY
 RESIDENTIAL
 BUILDING

644 GARRISON ROAD,
 FORT ERIE, ON

No.	Description	Date

CONCEPT

SHEET TITLE:

ELEVATIONS

DRAWN BY: <i>Author</i>	DATE: 10/12/20
SCALE: 1" = 10'-0"	JOB #: 20029
SHEET NO:	A202

 **Appendix B**
Traffic Data and Calculations

Environmental Noise Study
644 Garrison Road, Fort Erie, ON
2350048 Ontario Inc.
SLR Project No.: 211.30299.00000



Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018
Page No: 8

Turning Movement Peak Hour Data (4:00 PM)

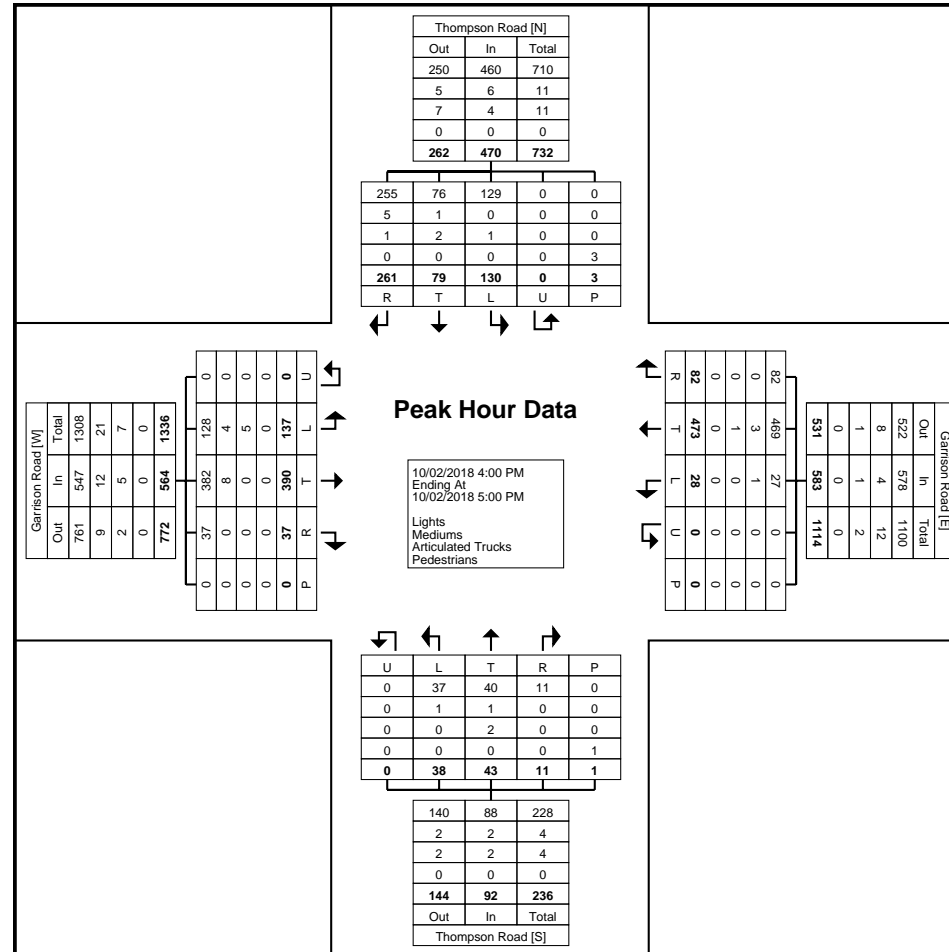
Start Time	Garrison Road Eastbound						Garrison Road Westbound						Thompson Road Northbound						Thompson Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	31	96	10	0	0	137	6	114	16	0	0	136	12	11	1	0	0	24	34	20	63	0	1	117	414
4:15 PM	36	98	5	0	0	139	5	123	16	0	0	144	9	10	3	0	0	22	30	24	57	0	1	111	416
4:30 PM	32	101	11	0	0	144	7	121	25	0	0	153	12	10	3	0	1	25	35	16	77	0	1	128	450
4:45 PM	38	95	11	0	0	144	10	115	25	0	0	150	5	12	4	0	0	21	31	19	64	0	0	114	429
Total	137	390	37	0	0	564	28	473	82	0	0	583	38	43	11	0	1	92	130	79	261	0	3	470	1709
Approach %	24.3	69.1	6.6	0.0	-	-	4.8	81.1	14.1	0.0	-	-	41.3	46.7	12.0	0.0	-	-	27.7	16.8	55.5	0.0	-	-	-
Total %	8.0	22.8	2.2	0.0	-	33.0	1.6	27.7	4.8	0.0	-	34.1	2.2	2.5	0.6	0.0	-	5.4	7.6	4.6	15.3	0.0	-	27.5	-
PHF	0.901	0.965	0.841	0.000	-	0.979	0.700	0.961	0.820	0.000	-	0.953	0.792	0.896	0.688	0.000	-	0.920	0.929	0.823	0.847	0.000	-	0.918	0.949
Lights	128	382	37	0	-	547	27	469	82	0	-	578	37	40	11	0	-	88	129	76	255	0	-	460	1673
% Lights	93.4	97.9	100.0	-	-	97.0	96.4	99.2	100.0	-	-	99.1	97.4	93.0	100.0	-	-	95.7	99.2	96.2	97.7	-	-	97.9	97.9
Mediums	4	8	0	0	-	12	1	3	0	0	-	4	1	1	0	0	-	2	0	1	5	0	-	6	24
% Mediums	2.9	2.1	0.0	-	-	2.1	3.6	0.6	0.0	-	-	0.7	2.6	2.3	0.0	-	-	2.2	0.0	1.3	1.9	-	-	1.3	1.4
Articulated Trucks	5	0	0	0	-	5	0	1	0	0	-	1	0	2	0	0	-	2	1	2	1	0	-	4	12
% Articulated Trucks	3.6	0.0	0.0	-	-	0.9	0.0	0.2	0.0	-	-	0.2	0.0	4.7	0.0	-	-	2.2	0.8	2.5	0.4	-	-	0.9	0.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			1996	IC	15,200	22,300	21,300	10,600	0.5
			1997	IC	15,800	17,900	16,900	14,200	0.0
			1998	IC	16,200	18,300	17,300	14,500	0.0
			1999	IC	16,800	19,000	18,000	15,000	0.0
			2000	IC	17,300	19,600	18,700	15,400	0.6
			2001	IC	17,900	23,100	20,600	14,500	0.3
			2002	IC	17,400	22,500	19,900	14,200	0.0
			2003	IC	17,700	23,000	20,400	14,300	0.8
			2004	IC	18,000	22,800	20,400	14,600	0.3
			2005	IC	17,800	20,200	19,300	16,100	0.0
			2006	IC	18,600	22,400	20,300	15,800	0.3
			2007	IC	18,400	22,300	22,200	15,600	0.1
			2008	IC	19,300	23,400	22,900	16,500	0.4
			2009	IC	19,600	24,300	21,900	16,000	0.1
			2010	IC	19,900	24,500	22,100	16,200	0.6
			2011	IC	15,800	18,800	18,500	13,400	N/A
			2012	IC	19,600	23,300	22,700	16,800	N/A
			2013	IC	16,300	19,800	20,500	13,800	N/A
			2014	IC	19,400	23,600	23,800	16,500	N/A
			2015	IC	17,100	19,000	18,800	15,200	N/A
			2016	IC	15,500	17,200	17,100	13,800	N/A
QEW	THOMPSON RD IC-2	2.4	1988	CTR	11,900	15,400	14,400	9,900	0.2
			1989	CTR	12,300	15,600	14,800	10,500	0.4
			1990	CTR	12,900	16,000	15,100	11,100	0.3
			1991	CTR	13,100	16,500	16,300	11,300	0.8
			1992	CTR	13,000	16,300	15,700	11,000	0.4
			1993	CTR	13,200	16,200	15,700	11,400	0.5
			1994	CTR	13,300	15,200	14,500	11,700	0.5
			1995	CTR	14,600	16,400	15,600	13,000	0.3
			1996	CTR	16,500	18,700	17,700	14,900	0.4
			1997	CTR	17,100	21,900	21,000	14,400	0.8
			1998	CTR	17,300	22,000	21,100	14,600	0.3
			1999	CTR	16,700	21,000	20,200	14,100	0.6

AASHTOWare Pavement ME Design Traffic Map

Private Member
Private Organization

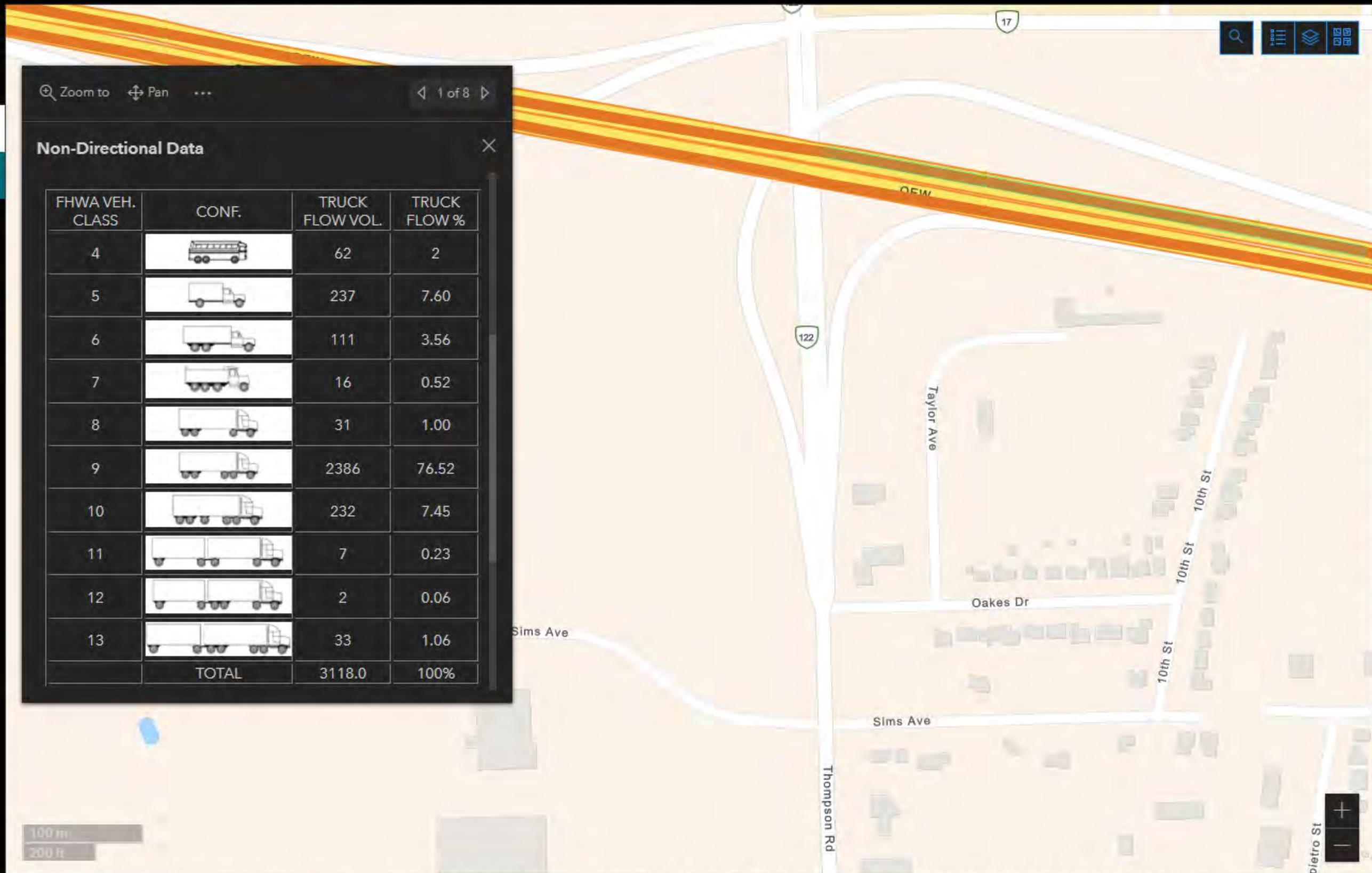
Summary

This provides input data for AASHTOWare Pavement ME (Mechanistic-Empirical) Design, which includes Traffic data input file in XML, Axle load spectrum file in ALF, and a summary file in CSV.

[View Full Details](#)

- Dashboard**
Dashboard
- June 8, 2021**
Date Updated
- August 12, 2019**
Published Date
- Public**
Anyone can see this content
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AASHTOWare Pavement ME Design Traffic Map MTO iCorridor



Zoom to Pan 1 of 8

Non-Directional Data

FHWA VEH. CLASS	CONF.	TRUCK FLOW VOL.	TRUCK FLOW %
4		62	2
5		237	7.60
6		111	3.56
7		16	0.52
8		31	1.00
9		2386	76.52
10		232	7.45
11		7	0.23
12		2	0.06
13		33	1.06
TOTAL		3118.0	100%

AASHTOWare Pavement ME Design Traffic Map

(AADT Year: 2006)
This provides input data for AASHTOWare Pavement ME Design, which includes Traffic data input file in XML, Axle load spectrum file in ALF, and a summary file in CSV.

Description
MEPDG web map provides site specific traffic data such as Annual Average Daily Truck Traffic (AADTT), vehicle class distribution, number of axles per truck, and axle load distribution for AASHTOWare Pavement ME Design. This program can generate the following three data files for any

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Please read the important legal disclaimers of warranty and liability set out below.

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ORNAMENT - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	PWL (dBA)	Source Height, s (m)
ThompN_avg	Thompson Road N	Daytime Impacts	70	16	10389	94.9%	3.3%	1.8%	9859	343	187	0	82.6	1.2
ThompN_avg	Thompson Road N	Nighttime Impacts	70	8	1154	94.9%	3.3%	1.8%	1095	38	21	0	76.1	1.2
ThompS_avg	Thompson Road S	Daytime Impacts	70	16	3349	93.5%	3.7%	2.8%	3132	124	94	0	78.5	1.3
ThompS_avg	Thompson Road S	Nighttime Impacts	70	8	372	93.5%	3.7%	2.8%	348	14	10	0	72.0	1.3
GarrisonW_avg	Garrison Road W	Daytime Impacts	60	16	18961	97.4%	2.2%	0.4%	18468	417	76	0	81.8	0.8
GarrisonW_avg	Garrison Road W	Nighttime Impacts	60	8	2107	97.4%	2.2%	0.4%	2052	46	8	0	75.3	0.8
GarrisonE_avg	Garrison Road E	Daytime Impacts	60	16	15810	96.5%	2.8%	0.7%	15257	443	111	0	81.6	0.9
GarrisonE_avg	Garrison Road E	Nighttime Impacts	60	8	1757	96.5%	2.8%	0.7%	1695	49	12	0	75.1	0.9
QEW_avg	QEW	Daytime Impacts	100	16	15946	81.0%	2.6%	16.4%	12917	414	2615	0	92.7	2.0
QEW_avg	QEW	Nighttime Impacts	100	8	7854	81.0%	2.6%	16.4%	6362	204	1288	0	92.6	2.0

Filename: garrison.te Time Period: 16 hours
Description: 1st Floor Receptor - West Facade - 644 Garrison

Road data, segment # 1: Thompson N

Car traffic volume : 9859 veh/TimePeriod
Medium truck volume : 343 veh/TimePeriod
Heavy truck volume : 187 veh/TimePeriod
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Thompson N

Angle1 Angle2 : -40.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 124.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Thompson S

Car traffic volume : 3132 veh/TimePeriod
Medium truck volume : 124 veh/TimePeriod
Heavy truck volume : 94 veh/TimePeriod
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Thompson S

Angle1 Angle2 : -90.00 deg -40.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 200.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 3: Garrison E

Car traffic volume : 15257 veh/TimePeriod
Medium truck volume : 443 veh/TimePeriod
Heavy truck volume : 111 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: Garrison E

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 149.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 4: Garrison W

Car traffic volume : 18468 veh/TimePeriod
Medium truck volume : 417 veh/TimePeriod
Heavy truck volume : 76 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: Garrison W

Angle1 Angle2 : 50.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 149.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 5: QEW

Car traffic volume : 12917 veh/TimePeriod
Medium truck volume : 414 veh/TimePeriod
Heavy truck volume : 2615 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 5: QEW

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Thompson N

Source height = 1.16 m

ROAD (0.00 + 56.94 + 0.00) = 56.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	90	0.00	67.52	0.00	-9.17	-1.41	0.00	0.00	0.00	56.94

Segment Leq : 56.94 dBA

↑

Results segment # 2: Thompson S

Source height = 1.29 m

ROAD (0.00 + 46.62 + 0.00) = 46.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-40	0.00	63.43	0.00	-11.25	-5.56	0.00	0.00	0.00	46.62

Segment Leq : 46.62 dBA

↑

Results segment # 3: Garrison E

Source height = 0.92 m

ROAD (0.00 + 51.02 + 0.00) = 51.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	66.55	0.00	-9.97	-5.56	0.00	0.00	0.00	51.02

Segment Leq : 51.02 dBA

↑

Results segment # 4: Garrison W

Source height = 0.80 m

ROAD (0.00 + 50.23 + 0.00) = 50.23 dBA

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

50	90	0.00	66.73	0.00	-9.97	-6.53	0.00	0.00	0.00	50.23
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Segment Leq : 50.23 dBA

↑

Results segment # 5: QEW

Source height = 2.01 m

ROAD (0.00 + 48.15 + 0.00) = 48.15 dBA

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

-90	0	0.64	77.64	0.00	-25.05	-4.44	0.00	0.00	0.00	48.15
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Segment Leq : 48.15 dBA

Total Leq All Segments: 59.23 dBA

↑

TOTAL Leq FROM ALL SOURCES: 59.23

↑

↑



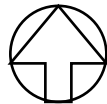
Aerial Photography from Google Earth

2350048 ONTARIO LTD.

644 GARRISON ROAD – FORT ERIE, ON

STAMSON VALIDATION VS CADNA/A RESULTS

True North



Scale: 1:1,000

Date: Oct 14, 2021

Rev 0.0

Project No. 241.30299.00000

METRES

Figure No.

B.1



 **Appendix C**

Warning Clause Text

Environmental Noise Study

644 Garrison Road, Fort Erie, ON

2350048 Ontario Inc.

SLR Project No.: 211.30299.00000

SUMMARY OF MITIGATION MEASURES AND WARNING CLAUSES

Mitigation Measures

Building Equipment

A preliminary review of the potential for noise impacts from Phase 1 mechanical systems on the Phase 2 residential building have been assessed. The criteria can be met by the appropriate selection of mechanical equipment and/or by incorporating control measures (e.g., silencers, acoustic barriers) into the design. As such, each equipment has been provided with a performance specification and assumed duty cycles, and provided in the table below.

Table 1: Equipment Performance Specification and Duty Cycles

Source	Maximum Allowable Sound Power Level (dBA)
Building A (Starbucks) – HVAC	81.7
Building B (Taco Bell) – HVAC	76.5
Building B (Taco Bell) - AMU	70.4
Building B (Taco Bell) - Fluid Cooler	75.4
Building B (Taco Bell) – Exhaust Fans (x2)	75.4
Building C (A&W) – HVAC	76.5
Building C (A&W) - AMU	70.4
Building C (A&W) - Fluid Cooler	75.4
Building C (A&W) – Exhaust Fans (x2)	75.4

The final maximum allowable sound power levels and locations each mechanical system may be modified but should be reviewed by an Acoustical Consultant during detailed design.

Warning Clauses & Ventilation Requirements

Warning Clauses may be used individually or in combination. The following Warning Clauses should be included in agreements registered on Title for the residential units, and included in all agreements of purchase and sale or lease, and all rental agreements:

Transportation Sources

MECP Type C Warning Clause (All Units)

“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.”

Industrial Sources

MECP Type E Warning Clause (All Units)

“Purchasers/tenants are advised that due to the proximity of adjacent facilities, noise from these facilities may at times be audible.”

Appendix D

Stationary Modelling Inputs

Environmental Noise Study

644 Garrison Road, Fort Erie, ON
2350048 Ontario Inc.

SLR Project No.: 211.30299.00000

Summary of Phase 1 Modelling Information

Source Description	Modelled Sound Power Level (dBA)	Notes
Drive-Thru - Buildings A, B, and C		
Drive-Thru Idling Car Queue	76	- based on average idling vehicle sound level for 2010+ model year cars, SUVs and pickup trucks. - max capacity of drive thru applied for 7 am to 11 pm period. - 3 cars per hour applied for night-time period (2 cars at window, 1 car at drive-thru speaker)
Drive Thru Speakers	83	- 5 dB tonal penalty included within PWL - minus (-) 13 dBA applied to rear of speaker, based on field measurements of Drive Thru Speakers. - 50% duty cycling included to allow for 2-way conversation
Building A (Starbucks)		
Rooftop HVACs	82	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Building B (Taco Bell)		
Rooftop AMU	70	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Rooftop HVAC	77	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Rooftop Fluid Cooler	75	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Rooftop Kitchen Exhaust Fan 1	75	- ASHRAE calculations based on available specifications - no duty cycling applied during daytime/evening/night
Rooftop Kitchen Exhaust Fan 2	75	- ASHRAE calculations based on available specifications - no duty cycling applied during daytime/evening/night
Building C (A&W)		
Rooftop AMU	70	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Rooftop HVAC	77	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Rooftop Fluid Cooler	75	- no duty cycling applied during daytime/evening - 30 min duty cycling applied for the night
Rooftop Kitchen Exhaust Fan 1	75	- ASHRAE calculations based on available specifications - no duty cycling applied during daytime/evening/night
Rooftop Kitchen Exhaust Fan 2	75	- ASHRAE calculations based on available specifications - no duty cycling applied during daytime/evening/night

Summary of Surrounding Sources Modelling Information

Source Description	Modelled Sound Power Level (dBA)	Notes
570 Garrison Road		
Generator	99.9	- based on sound level rating of 75 dBA at 7 m, meeting the MECP permit exclusion requirements. - 1hr emergency equipment testing
RONA		
Forklift Activity	100.2	- based on sound level data from other forklifts of similar size - 30 minutes/hour during the daytime period between 7AM-7PM