535-551 Brant Street Development
Burlington, Ontario

Environmental Noise Assessment

Version 2

Burlington, ON

SLR Project No: 241.18271.00000

March 2021

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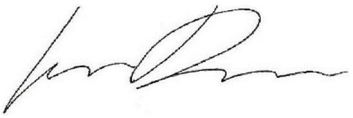
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PREVIOUS VERSIONS

Version	Date	Description
1	November 2020	First submission
2	March 2021	Revision to Address City Comments

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1. INTRODUCTION

SLR Consulting (Canada) Ltd. (SLR) was retained by Renimmob Properties Limited to conduct an environmental noise study for the proposed 535-551 Brant Street development in Burlington, Ontario. This report is in support of the Zoning By-law Approval (ZBA) application for the project.

Required noise mitigation measures and warning clauses are summarized in Appendix A.

1.1 FOCUS OF REPORT

In keeping with standard acoustical practices, this report examines the potential for:

- Impacts of the environment on the proposed development;
- Impacts of the proposed development on the environment; and
- Impacts of the proposed development on itself.

1.2 NATURE OF THE SUBJECT LANDS

The proposed development is located at 535-551 Brant Street, on the north side of the road between Caroline Street and Victoria Avenue. The site is currently occupied by low-rise commercial buildings. Figure 1 provides an aerial view and context plan of the immediate study area. The site plan and architectural drawings of the Site are provided in Appendix B. Excerpts from the site plan are provided in Figure 2.

The Development site is currently occupied by Scotia Bank, Ray's Food Mart Convenience Store, and Personal Auto Service.

The proposed development will consist of a 26-storey residential tower located atop a 3-storey mixed-use podium, with retail, lobbies and underground parking access at grade. Communal outdoor amenity areas will be located on the second, fourth and 26th floors.

1.3 NATURE OF THE SURROUNDINGS

Immediately surrounding the site are low-rise commercial developments to the north and southeast, with low-rise residential buildings to the south through west. In the remaining directions there are parking lots immediately surrounding the site. Beyond the immediate surroundings there are low-rise residential buildings to the north through east, the downtown core of Burlington with mid-rise and high-rise buildings is southeast, and there are low-rise residential buildings to the south through northwest. Lake Ontario is approximately 800 m to the southeast, beyond the downtown core.

The lands surrounding the proposed development include:

- Immediately to the northwest of the site is a low rise-commercial plaza including a No-Frills grocery store.
- Further south across Brant Street are dense residential areas.
- West of the site along Brant Street is the Burlington Central High School
- Beyond the immediate surroundings to the west are various commercial spaces.
- Further to the north is another dense residential area.

- Immediately to the east of the development site are various low-rise commercial, and adjacent parking lots.

There are no significant industrial uses within 1000 m of the development.

The topography of the area is mostly flat in nature.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

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

- Transportation noise impacts from the surrounding roadways and railways
- "Stationary" noise impacts from the surrounding commercial lands.

There are no significant sources of vibration near the development, and therefore a detailed vibration impact assessment is not required.

2. TRANSPORTATION NOISE IMPACTS

2.1 TRANSPORTATION NOISE SOURCES

Roadway and rail noise sources of interest with the potential to produce noise at the proposed development are:

- Brant Street; and
- Caroline Street.

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

2.2 SURFACE TRANSPORTATION NOISE CRITERIA

Noise Sensitive Developments

Ministry of the Environment, Conservation and 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. Tables 1 to 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 communal outdoor amenity areas ("Outdoor Living Areas" or "OLAs").

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by combining road and rail traffic sound levels (as applicable). Whistle noise due to railway trains is not included in the determination of levels.

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

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Ventilation Requirements
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

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 Tables 1, warning clauses advising future occupants of the potential excesses are required. Warning clauses also apply to OLAs.

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

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Claus 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 /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/ 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., walls, windows) to be designed and selected accordingly to ensure that the Table 3 and 4 indoor sound criteria are met.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (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 and overall acoustic parameter.

2.3 TRAFFIC DATA AND FUTURE PROJECTIONS

2.3.1 TRAFFIC DATA

The future (2032) road traffic volume for Brant and Caroline Street was calculated based on provided turning movement counts by the City of Burlington.

Available 2019 hourly counts were provided by City of Burlington and forecasted to 2032 based on 1.5% traffic growth per annum. This is consistent with the City of Burlington estimation for future traffic volumes based on correspondences with the City. An assumed day/night traffic volume split of 90/10 was used (default based on the MECP *Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT)* document). The commercial breakdown split into heavy and medium trucks

was calculated based on provided turning movement count data and historical Novus/SLR data for similar types of roadways.

Copies of applicable traffic data and calculations can be found in Appendix B. The following Table 1 summarizes the road traffic volumes used in the analysis.

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

Roadway Link	2032 Traffic Volumes (AADT)	% Day/ Night Volume Split [1]		Commercial Traffic Breakdown [2]		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
Brant Street N of Caroline	13655	90	10	5.2%	4.4%	50
Brant Street S of Caroline	9536	90	10	5.4%	4.6%	50
Caroline Street W of Brant	5518	90	10	4.0%	3.4%	50
Caroline Street E of Brant	5674	90	10	4.9%	4.1%	50

Notes: [1] A day/night split of 90%/10% was assumed for all roadways.
[2] Breakdown between medium and heavy trucks was calculated from total commercial percentage based on SLR's databased for similar roadway networks.

There are no railway lines or airports in the immediate vicinity of the proposed development, therefore, an assessment of rail and aircraft noise impacts is not required.

2.3.2 TRANSPORTATION IMPACT MODELLING

Future (2032) road and railway 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. Rail lines were modelled as line sources with sound emission rates calculated using the MECP STEAM algorithms. These predictions were validated and are equivalent to those made using the MECP's STAMSON v5.04 noise models. STAMSON validation calculation results are provided in Appendix B. The STAMSON calculation provided is representative of the worst-case location for traffic noise impacts (the northwest corner of the façade, with full exposure to Brant Street. Predicted future sound levels in this location are 67 dBA during the day and 60 dBA during the night.

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 "hard" acoustically reflective surface, as the majority of the intervening ground in the area are paved roads or parking lots.

2.3.3 FAÇADE SOUND LEVELS

Predicted worst-case façade sound levels are presented in Table 7. The transportation façade sound levels of the development, showing the ranges of predicted daytime and night-time sound levels are shown in Figure 3. In identifying facades, Brant Street is assumed to run north-south. Thus, the western façade has fill exposure to Brant Street, and has the highest predicted sound levels.

Table 6: Summary of Transportation Facade Sound Levels

Building Portion	Façade	Roadway Sound Levels [1]	
		L_{eq} Day, (dBA)	L_{eq} Night, (dBA)
Podium	N	63	56
	E	47	41
	S	62	56
	W	**67**	60
Tower	N	60	54
	E	49	43
	S	61	54
	W	64	58

2.3.4 OUTDOOR AMENITY SPACES

Predicted worst-case sound levels from adjacent roadways and railway are presented in Table 8 for the outdoor amenity spaces of the development. Assessment locations and resulting transportation sound levels are shown in Figure 3.

In estimating the sound levels on the 2nd floor and 4th floor amenity areas, the results are provided with and without the effects of the 1.8 m high glass wall which will be installed along the parapet edge of these locations to address wind comfort.

Table 7: Outdoor Living Area Sound Levels - Transportation

OLA Location	Transportation Impacts L_{eq} Day, (dBA)		Applicable Guideline Limit L_{eq} Day (dBA) [1]	Meets Criteria (Y/N?)
	Unmitigated	Wind Barrier		
2nd Floor, NE Corner	52	49	55	Y
4th Floor, NW Corner	51	49	55	Y
26th Floor, NE Corner	44	44	55	Y
26th Floor, NW Corner	44	44	55	Y
26th Floor, S Facade	47	47	55	Y

Notes: [1] Sound levels up to 60 dBA are allowed with the use of a Type A Warning Clause.

The predicted sound levels at the common amenity areas are predicted to be below 55 dBA. Noise mitigation and noise warning clauses are not required.

2.4 FAÇADE RECOMMENDATIONS

2.4.1 GLAZING REQUIREMENTS

An assessment of indoor noise levels is required providing the façade sound levels due to road traffic exceed 65 dBA during the daytime period. Indoor sound levels and required Sound Transmission Class (STC) ratings for façade components were estimated using the procedures outlined in the National

Research Council Building Practice Note BPN-56. This document provides corrections to estimate the STC ratings required based on either the roadway and railway noise. BPN-56 calculations are provided in Appendix B.

Detailed floor plates were provided at the time of this assessment. For the analysis, room dimensions for bedrooms and living/dining rooms have been considered. The following assumptions have been made:

- Window wall construction with glazing and glass spandrel panel elements;
- For kitchen/dining/living rooms 70% of the exterior wall area is vision glass / patio doors;
- For bedrooms 40% of the exterior wall area is vision glass;
- Non-glazing portions of the wall have an assumed STC rating of 40;
- Living rooms were assumed to be 3 m x 6 m in size and typically have a reflective level of acoustic absorption; and
- Bedrooms were assumed to be 3 m x 3 m in size and are very acoustically absorptive.

The results show that wall and window acoustical upgrades are not required. Wall and window constructions meeting the minimum thermal and structural requirements of the Ontario Building Code ("OBC") will be sufficient acoustically.

VENTILATION AND WARNING CLAUSE REQUIREMENTS

The requirements regarding warning clauses are summarized in Table 2. 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 A.

Mandatory central air-conditioning and a Type D Warning Clause are required for all units.

3. STATIONARY SOURCE NOISE IMPACTS

A review has been conducted for the potential impacts on the development from stationary commercial and institutional noise sources.

3.1 D-SERIES OF GUIDELINES

The D-series of guidelines were developed by the MECP in 1995 as a means to assess recommended separation distances and other control measures for land use planning proposals in an effort to prevent or minimize 'adverse effects' from the encroachment of incompatible land uses where a facility either exists or is proposed. D-series guidelines address sources including sewage treatment (Guideline D-2), gas and oil pipelines (Guideline D3), landfills (Guideline D-4), water services (Guideline D-5) and industries (Guideline D-6).

For this project, the applicable guideline is Guideline D-6 - *Compatibility between Industrial Facilities and Sensitive Land Uses*. The guideline specifically addresses issues of air quality, odour, dust, noise and litter.

To minimize the potential to cause an adverse effect, areas of influence and recommended minimum setback distances are included within the guidelines. The areas of influence and recommended separation distances from the guidelines are provided in the table below.

Table 8: Guideline D-6 - Potential Influence Areas and Recommended Minimum Setback Distances for Industrial Land Uses

Industry Classification	Area of Influence	Recommended Minimum Setback Distance
Class I – Light Industrial	70 m	20 m
Class II – Medium Industrial	300 m	70 m
Class III – Heavy Industrial	1000 m	300 m

Industrial categorization criteria are supplied in Guideline D-6-2, and are shown in the following table:

Table 9: Guideline D-6 - Industrial Categorization Criteria

Category	Outputs	Scale	Process	Operations / Intensity	Possible Examples
Class I Light Industry	• Noise: Sound not audible off-property • Dust: Infrequent and not intense • Odour: Infrequent and not intense • Vibration: No ground-borne vibration on plant property	• No outside storage • Small-scale plant or scale is irrelevant in relation to all other criteria for this Class	• Self-contained plant or building which produces/ stores a packaged product • Low probability of fugitive emissions	• Daytime operations only • Infrequent movement of products and/ or heavy trucks	• Electronics manufacturing and repair • Furniture repair and refinishing • Beverage bottling • Auto parts supply • Packaging and crafting services • Distribution of dairy products • Laundry and linen supply
Class II Medium Industry	• Noise: Sound occasionally heard off-property • Dust: Frequent and occasionally intense • Odour: Frequent and occasionally intense • Vibration: Possible ground-borne vibration, but cannot be perceived off-property	• Outside storage permitted • Medium level of production allowed	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Shift operations permitted • Frequent movements of products and/ or heavy trucks with the majority of movements during daytime hours	• Magazine printing • Paint spray booths • Metal command • Electrical production • Manufacturing of dairy products • Dry cleaning services • Feed packing plants

Category	Outputs	Scale	Process	Operations / Intensity	Possible Examples
Class III Heavy Industry	• Noise: Sound frequently audible off property • Dust: Persistent and/ or intense • Odour: Persistent and/ or intense • Vibration: Ground-borne vibration can frequently be perceived off-property	• Outside storage of raw and finished products • Large production levels	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions	• Continuous movement of products and employees • Daily shift operations permitted	• Paint and varnish manufacturing • Organic chemical manufacturing • Breweries • Solvent recovery plants • Soaps and detergent manufacturing • Metal refining and manufacturing

3.1.1 REQUIREMENTS FOR ASSESSMENTS

Guideline D-6 requires that studies be conducted to assess impacts where sensitive land uses are proposed within the potential area of influence of an industrial facility. This report is intended to fulfill this requirement.

The D-series guidelines reference previous versions of the air quality regulation (Regulation 346) and noise guidelines (Publications NPC-205 and LU-131). However, the D-Series of guidelines are still in force, still represent current MECP policy and are specifically referenced in numerous other current MECP policies. In applying the D-series guidelines, the current policies, regulations, standards and guidelines have been used (e.g., Regulation 419, Publication NPC-300).

3.1.2 REQUIREMENTS FOR MINIMUM SEPARATION DISTANCES

Guideline D-6 also *recommends* that no sensitive land use be placed within the Recommended Minimum Separation Distance. However, it should be noted that this is a recommendation only. Section 4.10 of the Guideline allows for development within the separation distance, in cases of redevelopment, infilling, and transitions to mixed use, provided that the appropriate studies are conducted and that the relevant air quality and noise guidelines are met.

3.1.3 GUIDELINE D-6 ASSESSMENT

Figure 4 provides a composite zoning map for the area showing the location of the Development and the surroundings. Figures 5a and 5b show the Guideline D-6 separation distances measured from the development property line.

There are no Class III Heavy Industries within 1 km of the development and there are no Class II Medium or Class I Light Industries within 300 m of the Development. There are no industrially zoned properties within 300 m of the Development.

As can be seen in Figure 5b, there are a number of light commercial land uses to the immediate area of the development. None of these are industrial land uses, and the requirements of Guideline D-6 do not technically apply. Under Guideline D-6, a detailed assessment of industrial noise impacts is not required. Nonetheless, a stationary noise impact assessment of the commercial operations has been conducted, as outlined below.

The key commercial uses in the area are:

- The Brant "No Frills" Plaza (561-593 Brant Street);
- Joe Dog's Gasbar (531 Brant Street);
- Culaccino Bar + Kitchen (527 Brant Street);
- BMO Bank of Montreal (519 Brant Street);
- Bell Canada (507 Brant Street); and
- TD Canada Trust Bank (510 Brant Street)

3.2 STATIONARY NOISE CRITERIA

3.2.1 MECP NPC-300 GUIDELINES FOR STATIONARY NOISE SOURCES

The applicable MECP noise guidelines for new sensitive land uses adjacent to existing industrial/ commercial uses are provided in MECP Publication NPC-300. NPC-300 revokes and replaces the previous noise assessment guideline, Publication LU-131 and Publication NPC-205, which was previously used for assessing noise impacts as part of Certificates of Approval / Environmental Compliance Approvals granted by the MECP for industries.

The new 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 dBAI.

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.

The following tables sets out the exclusion limits from the guideline for continuous noise sources. There are no significant impulsive noise sources in the area. Impulsive noise has not been considered further.

Table 10: NPC-300 Exclusion Limits for Non-Impulsive Sounds (L_{eq}(1-hr), dBA)

Time of Day	Class 1 Area		Class 4 Area	
	Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception	Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception
7 am to 7 pm	50	50	60	55
7 pm to 11 pm	50	50	60	55
11 pm to 7 am	45	n/a	55	n/a

The applicable guideline limits for infrequent events such as emergency generator set testing are +5 dB higher than the values above.

3.2.2 APPLICATION OF THE NPC-300 GUIDELINES

The stationary noise guidelines apply only to residential land uses and to noise-sensitive commercial and institutional uses, as defined in NPC-300 (e.g., schools, daycares, hotels). For the Project, the stationary noise guidelines only apply to the residential portions of the development, including:

- Individual residences;
- Communal indoor amenity areas; and
- Communal outdoor amenity areas.

All of the above have been considered as noise-sensitive points of reception in the analysis.

3.2.3 PROPOSED AREA CLASSIFICATION

Under MECP Publication NPC-300 noise guidelines, noise sensitive receptors are defined using area classifications. The receptor areas are classified as either:

- Class 1 – Urban areas
- Class 2 – Suburban / semi-rural areas
- Class 3 – Rural areas
- Class 4 – Redevelopment areas

Depending on the receptor area classification, different guideline limits apply. Classes 1, 2 and 3 were included in the predecessor guidelines to NPC-300, namely MECP Publications NPC-205, NPC-232, and LU-131. The Class 4 designation is a new designation, intended to allow for infill and redevelopment, whilst still protecting residences from undue noise.

Based on the nature of the area, the Class 1 area urban sound level limits apply. The area is urban in nature and dominated by man-made sounds, including road traffic noise and an “urban hum”, 24-hours per day. However, the redevelopment site meets the definition and requirements for a Class 4 area and it would be recommended and appropriate to issue a Class 4 designation for the development lands.

In NPC-300, a Class 4 area is defined as:

> “Class 4 area”
>
> means an area or specific site that would otherwise be defined as Class 1 or 2 and which:
> - is an area intended for development with new noise sensitive land use(s) that are not yet built;

- is in proximity to existing, lawfully established stationary source(s); and
- has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.

Additionally, areas with existing noise sensitive land use(s) cannot be classified as Class 4 areas." Section C4.4.2 of Publication NPC-300 further discusses the use of Class 4 areas:

> "Class 4 area classification is based on the principle of formal confirmation of the classification by the land use planning authority. Such confirmation would be issued at the discretion of the land use planning authority and under the procedures developed by the land use planning authority, in the exercise of its responsibility and authority under the Planning Act.
>
> The following considerations apply to new noise sensitive land uses proposed in a Class 4 area:
>
> - an appropriate noise impact assessment should be conducted for the land use planning authority as early as possible in the land use planning process that verifies that the applicable sound level limits will be met;
> - noise control measures may be required to ensure the stationary source complies with the applicable sound level limits at the new noise sensitive land use;
> - noise control measures may include receptor based noise control measures and/or source based noise control measures;
> - source based noise control measures may require an MECP approval;
> - receptor based noise control measures may require agreements for noise mitigation, as described in Part A of this guideline;
> - prospective purchasers should be informed that this dwelling is located in a Class 4 area through appropriate means and informed of the agreements for noise mitigation. Registration on title of the agreements for noise mitigation is recommended. Additionally, registration on title of an appropriate warning clause to notify purchasers that the applicable Class 4 area sound level limits for this dwelling are protective of indoor areas and are based on the assumption of closed windows, such as warning clause F in Section C8.3 is also recommended; and
> - any final agreements for noise mitigation as described in Part A of this guideline and all other relevant documentation are to be submitted to the MECP by the stationary source owner(s) when applying for an MECP approval. These agreements will be assessed during the review of the application for MECP approvals."

The Project meets the definitions and requirements for a Class 4 area listed above. It is therefore appropriate for the City to declare the development property as a Class 4 area, under their role as the land use planning authority, in the exercise of its responsibility and authority under the Planning Act.

It is important to note that the Class 4 designation only applies to the development lands. Existing noise-sensitive receptors in the area will remain as Class 1 areas. Therefore, the designation will not allow for industries to increase their noise impacts at existing residences.

3.2.4 APPLICATION OF THE NPC-300 GUIDELINES

Both the Class 1 and Class 4 guideline limits have been considered in this report.

3.2.5 CITY NOISE BYLAW

The City of Burlington's Nuisance and Noise Control By-law No. 19-2003, as amended ("the Noise Bylaw") applies to the operation of noise sources both on and off the development site. Applicable sections are discussed below:

> "Prohibitions
>
> 5. No person shall emit or cause or permit the emission of sound resulting: …
>
> (2) from any act listed in Schedule 2 - Time and Place Prohibitions, if clearly audible at a point of reception located in an area of the municipality specified within a prohibited time shown for such an area."

Excerpts From Schedule 2 – Time and Place Prohibitions

Applicable Prohibition	Time of Day
9. Loading, unloading, delivering, packing, unpacking, or otherwise handling any containers, produce, materials, or refuse whatsoever, unless necessary for the maintenance of essential services.	11:00 pm – 7:00 am
10. The operation of solid waste, refuse, or recyclable bulk lift or refuse compacting equipment.	9:00 pm – 7:00 am

There are numerous existing residences in the area of the proposed development. As such loading and unloading activities will be prohibited at the surrounding commercial uses (e.g., No-Frills) during the overnight period, and similarly the operation of trash compactors are already prohibited during the evening and night. The proposed development will not place any additional restrictions on these operations.

Future operations at the Development will be required to meet the same restrictions.

> "Limitations on Sound Emissions
>
> 6. No person shall emit or cause or permit the emission of any sound:
>
> (1) from a stationary source such that the level of resultant sound at a point of reception exceeds the applicable sound level limit prescribed in Schedule 4 – Publications, Publication NPC-205; …

Publication NPC-205 is the former version of MECP Publication NPC-300. Under the noise bylaw, noise from the existing commercial operations are obligated to meet the applicable limits in Table 10 above at the existing residences. Noise from Development mechanical equipment will need to be designed to meet the same limits.

3.3 NOISE SOURCES OF INTEREST

Based on the information obtained during the site visit, the significant sources of noise in the area of the development have been identified. Noise emission rates for the equipment were determined based on information from SLR's in-house database.

Figure 7 shows the location of all modelled sources. Noise emission data used in the assessment can be found in Appendix C.

It should be noted that typical noise emission data has been used for the assessment, based in the equipment types, with emission data obtained from SLR's inhouse database. Noise measurements were not conducted, due to COVID-19 related restrictions. The noise emission rates used in this assessment have been selected to be conservatively high. Noise measurements of the actual equipment would appropriately be conducted during later phases of the approval process, for example at Site Plan Approval.

3.4 NOISE MODELLING AND RESULTS

Worst-case scenario noise levels from the surrounding commercial/ 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=0.0 (Reflective);
- Reflection: An order of reflection of 1 was used (accounts for noise reflecting from walls); and
- Wall absorption coefficients: Set to 0.20 (20% of energy is absorbed, 80% reflected).

3.4.1 BRANT NO-FRILLS PLAZA

Predicted unmitigated sound levels from No-Frills Plaza operations are presented in **Figure 7a** and are summarized in the following table.

Table 11: Commercial Sound Levels – Brant No-Frills Plaza, Unmitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	50	46	**No**	Yes
	E	51	46	**No**	Yes
	S	30	24	Yes	Yes
	W	31	25	Yes	Yes
Tower	N	51	47	**No**	Yes
	E	50	47	**No**	Yes
	S	32	25	Yes	Yes
	W	34	28	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	44	n/a	Yes	Yes
	4th Floor, NW Corner	40	n/a	Yes	Yes
	26th Floor, NE Corner	35	n/a	Yes	Yes
	26th Floor, NW Corner	34	n/a	Yes	Yes
	26th Floor, S Facade	27	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

The Class 4 noise guideline limits are met at all locations.

Minor excesses of the Class 1 guideline limits are projected along portions of the north and east facades. Excesses of 1 dBA during the daytime, and 3 dBA at night are predicted. The Class 1 limits are met at all other locations.

We note that based on the noise modelling, excesses of the NPC-205/NPC-300 noise guidelines due to No-Frills operations would occur at the Halton Place and Wellington Avenue residences to the north of the site, resulting in existing non-compliance with Section 6 of the noise bylaw. Maximum predicted sound levels are 64 dBA in this location. Thus, No-Frills already has an obligation under the noise bylaw to mitigated sound levels from its operations. Mitigation to address this existing issue would likely also address potential impacts at the proposed Development, should the City enforce its bylaw.

Regardless, an initial investigation of mitigation measures to address noise impacts at the Development has been conducted. The dominant noise sources are air cooled condenser units located on the No-Frills roof, used as part of the refrigeration system. A 3.0 m tall noise barrier, located as shown in **Figure 7b**, is proposed.

Any noise wall must have a minimum surface face density (mass per unit area) of 10 kg/m^2 (approximately 2 lbs per sq. ft.) and should be free of gaps and cracks. There are a number of commercial products and designs which meet these requirements, including wood, steel, and plexiglass panels.

With such a noise barrier in place, the Class 1 guideline limits will be met at all locations, as shown in Figure 7c and summarized in the following table:

Table 12: Commercial Sound Levels – Brant No-Frills Plaza, Mitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	47	43	Yes	Yes
	E	49	44	Yes	Yes
	S	30	24	Yes	Yes
	W	31	24	Yes	Yes
Tower	N	49	45	Yes	Yes
	E	49	45	Yes	Yes
	S	31	25	Yes	Yes
	W	33	28	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	42	n/a	Yes	Yes
	4th Floor, NW Corner	38	n/a	Yes	Yes
	26th Floor, NE Corner	35	n/a	Yes	Yes
	26th Floor, NW Corner	34	n/a	Yes	Yes
	26th Floor, S Facade	37	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

Other noise mitigation measures may be feasible, individually and in combination, including but not limited to: the addition of silencers on the ventilation fans along with shorter localized screens; the use of "low noise" airfoil type fans on the units; replacement of the units with quieter types; or relocation of the units further to the north on the No Frills building. The final noise mitigation measure required can appropriately be determined later in the planning approval process, once the principle of development has been confirmed.

3.4.2 JOE DOG'S GASBAR GRILL

Predicted unmitigated sound levels from Joe Dog's Gasbar Grill operations are presented in Figure 8a and are summarized in the following table:

Table 13: Commercial Sound Levels – Joe Dog's Gasbar Grill, Unmitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	18	13	Yes	Yes
	E	34	28	Yes	Yes
	S	56	51	**No**	Yes
	W	35	30	Yes	Yes
Tower	N	20	15	Yes	Yes
	E	37	32	Yes	Yes
	S	52	47	**No**	Yes
	W	45	40	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	18	n/a	Yes	Yes
	4th Floor, NW Corner	19	n/a	Yes	Yes
	26th Floor, NE Corner	16	n/a	Yes	Yes
	26th Floor, NW Corner	16	n/a	Yes	Yes
	26th Floor, S Facade	26	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

The Class 4 noise guideline limits are met at all locations.

Excesses of the Class 1 guideline limits are projected along portions of the south facades. Excesses of 6 dBA during the daytime, and 6 dBA at night are predicted. The Class 1 limits are met at all other locations.

An initial investigation of mitigation measures has been conducted. The dominant noise sources are rooftop heating, ventilation and air conditioning ("HVAC") units and an exhaust fan. The following mitigation measures are proposed:

- A series of 3.0 m tall noise barriers, located as shown in Figure 8b, to shield the HVAC units; and
- The installation of a short silencer on the exhaust fan, capable of providing a minimum of 10 dB of attenuation. Such units are readily commercially available.

Any noise wall must have a minimum surface face density (mass per unit area) of 10 kg/m^2 (approximately 2 lbs per sq. ft.) and should be free of gaps and cracks. There are a number of commercial products and designs which meet these requirements, including wood, steel, and plexiglass panels.

With such a noise barrier in place, the Class 1 guideline limits will be met at all locations, as shown in Figure 8c and summarized in the following table:

Table 14: Commercial Sound Levels – Joe Dog's Gasbar Grill, Mitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	18	13	Yes	Yes
	E	30	24	Yes	Yes
	S	48	41	Yes	Yes
	W	42	23	Yes	Yes
Tower	N	20	15	Yes	Yes
	E	36	31	Yes	Yes
	S	50	45	Yes	Yes
	W	42	38	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	18	n/a	Yes	Yes
	4th Floor, NW Corner	18	n/a	Yes	Yes
	26th Floor, NE Corner	16	n/a	Yes	Yes
	26th Floor, NW Corner	16	n/a	Yes	Yes
	26th Floor, S Facade	26	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

Other noise mitigation measures may be feasible, individually and in combination, including but not limited to: the addition of silencers on the ventilation fans of the HVAC units along with shorter localized screens; the use of "low noise" airfoil type fans and compressor blankets on the units; replacement of the units with quieter types; or relocation of the units further to the south. The final noise mitigation measure required can appropriately be determined later in the planning approval process, once the principle of development has been confirmed.

3.4.3 CULACCINO BAR + KITCHEN

Predicted unmitigated sound levels from Culaccino Bar + Kitchen operations are presented in Figure 9 and are summarized in the following table:

Table 15: Commercial Sound Levels – Culaccino Bar + Kitchen, Unmitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	15	10	Yes	Yes
	E	30	24	Yes	Yes
	S	49	44	Yes	Yes
	W	33	27	Yes	Yes
Tower	N	17	12	Yes	Yes
	E	33	27	Yes	Yes
	S	47	42	Yes	Yes
	W	37	32	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	14	n/a	Yes	Yes
	4th Floor, NW Corner	16	n/a	Yes	Yes
	26th Floor, NE Corner	13	n/a	Yes	Yes
	26th Floor, NW Corner	13	n/a	Yes	Yes
	26th Floor, S Facade	24	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

The Class 1 and Class 4 noise guideline limits are met at all locations.

3.4.4 BMO BANK OF MONTREAL

Predicted unmitigated sound levels from BMO Bank of Montreal operations are presented in Figure 10 and are summarized in the following table:

Table 16: Commercial Sound Levels – BMO Bank of Montreal, Unmitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	16	9	Yes	Yes
	E	32	23	Yes	Yes
	S	45	39	Yes	Yes
	W	36	30	Yes	Yes
Tower	N	19	11	Yes	Yes
	E	34	26	Yes	Yes
	S	44	38	Yes	Yes
	W	38	32	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	14	n/a	Yes	Yes
	4th Floor, NW Corner	17	n/a	Yes	Yes
	26th Floor, NE Corner	15	n/a	Yes	Yes
	26th Floor, NW Corner	17	n/a	Yes	Yes
	26th Floor, S Facade	28	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

The Class 1 and Class 4 noise guideline limits are met at all locations.

3.4.5 BELL CANADA

Predicted unmitigated sound levels from Bell Canada operations are presented in **Figure 11** and are summarized in the following table:

Table 17: Commercial Sound Levels – Bell Canada, Unmitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	17	15	Yes	Yes
	E	40	38	Yes	Yes
	S	48	45	Yes	Yes
	W	34	32	Yes	Yes
Tower	N	20	18	Yes	Yes
	E	45	43	Yes	Yes
	S	47	44	Yes	Yes
	W	37	35	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	17	n/a	Yes	Yes
	4th Floor, NW Corner	18	n/a	Yes	Yes
	26th Floor, NE Corner	18	n/a	Yes	Yes
	26th Floor, NW Corner	17	n/a	Yes	Yes
	26th Floor, S Facade	31	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

The Class 1 and Class 4 noise guideline limits are met at all locations.

3.4.6 TD CANADA TRUST BANK

Predicted unmitigated sound levels from TD Canada Trust Bank operations are presented in Figure 12 and are summarized in the following table:

Table 18: Commercial Sound Levels – TD Canada Trust Bank, Unmitigated

Building Location	Façade	Predicted Sound Levels [1]		Meets Class 1 Guideline?	Meets Class 4 Guideline?
		Daytime (dBA)	Nighttime (dBA)		
Podium	N	12	7	Yes	Yes
	E	17	12	Yes	Yes
	S	36	31	Yes	Yes
	W	35	31	Yes	Yes
Tower	N	13	8	Yes	Yes
	E	18	13	Yes	Yes
	S	35	30	Yes	Yes
	W	34	30	Yes	Yes
Outdoor Amenity Areas	2nd Floor, NE Corner	5	n/a	Yes	Yes
	4th Floor, NW Corner	16	n/a	Yes	Yes
	26th Floor, NE Corner	7	n/a	Yes	Yes
	26th Floor, NW Corner	9	n/a	Yes	Yes
	26th Floor, S Facade	22	n/a	Yes	Yes

Notes: [1] All values are Leq (1-hr) sound levels

The Class 1 and Class 4 noise guideline limits are met at all locations.

3.5 SUMMARY

In SLR's opinion, a Class 4 designation is appropriate for the development lands. The Class 4 guideline limits have been set by the MECP to be protective and to ensure that adverse effects from noise do not occur. As the Class 4 limits are met at the proposed Development, adverse noise impacts are not predicted, and complaints related to noise are highly unlikely. Indeed, higher sound levels exceeding the Class 1 limits are already experienced at existing residences to the north, along Halton Place and Wellington Avenue, with no issues. Should the City provide a Class 4 Area designation for the property, then no additional noise mitigation would be required, other than mandatory air conditioning and Type D and Type F noise warning clauses.

Regardless, an initial investigation of mitigation measures has been completed, to show the potential to meet Class 1 limits. There are excesses of the Class 1 designation from two commercial operations: the Brant No Frills Plaza, and the Joe Dog's Gasbar restaurant. To address a Class 1 designation, we have identified mitigation measures which could be considered to result in compliance with the pertinent guideline limits. Other noise mitigation measures may be feasible, individually and in combination. The final noise mitigation measures required can appropriately be determined later in the planning approval process, once the principle of development has been confirmed. Under a Class 1 designation, a Type E noise warning clause is recommended.

Until such time as the principle of development and the overall massing of the building has been confirmed, additional investigation of noise mitigation measures at the surrounding commercial uses is not warranted. A detailed noise assessment is required through both the site plan review and through the Tarion Bulletin 19 processes. If it is determined at that time that modifications either on or off-site are required to address acoustic issues, this can and should be addressed at that time.

Warning Clauses are summarized in Appendix A.

PART 2: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

4. IMPACTS ON SURROUNDING PROPERTIES

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 potentially adverse impacts on the surrounding neighbourhood are the mechanical roof-top equipment (chillers, make up air units and generator). This equipment is required to meet MECP Publication NPC-300 requirements at the worst-case off-site noise sensitive receptors. Given the requirement for the systems to meet the applicable noise guideline at closer on-site receptors, off-site impacts are not anticipated. Similarly, the underground parking will be ventilated through exhaust shafts located at the northeast and southwest corners of the development property. These locations are well removed from any existing residential receptors.

Regardless, 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, barriers) into the design.

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

PART 3: IMPACTS OF THE DEVELOPMENT ON ITSELF

5. NOISE IMPACTS FROM THE DEVELOPMENT MECHANICAL SYSTEMS ON ITSELF

The building mechanical systems (e.g., cooling systems, emergency generator, 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.

It is recommended that the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment. This is appropriately done at the just prior to the Building Permit Application stage.

6. 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:

6.1 TRANSPORTATION NOISE

- An assessment of transportation noise impacts from surrounding roadways has been completed.
- Mandatory central air-conditioning, as well as a Type D warning clause are recommended for all units.

6.2 STATIONARY NOISE IMPACTS

- A detailed assessment of surrounding stationary noise was conducted. It is recommended that a Class 4 area designation for the development be obtained from the City. With a Class 4 designation no source-based noise mitigation is required to address surrounding stationary noise impacts.
- Regardless, should the City not provide a Class 4 designation, feasible mitigation measures have been identified which could be used to result in compliance with the Class 1 guideline limits. Other noise mitigation measures may be feasible, individually and in combination. The final noise mitigation measures required can appropriately be determined later in the planning approval process, once the principle of development has been confirmed.
- Mandatory noise warning clause are required for all units.

6.3 OVERALL ASSESSMENT

- Impacts of the environment on the proposed development can be adequately controlled through the feasible mitigation measures, façade designs, and warning clauses detailed in Part 1 of this report.
- Impacts of the proposed development on the surrounding area are anticipated to be negligible and can be adequately controlled by following the design guidance outlined in Part 2 of this report.
- Impacts of the proposed development on itself are anticipated to be negligible and can be adequately controlled by following the design guidance outlined in Part 3 of this report.
- As the mechanical systems for the proposed development have not been designed at the time of this assessment, the acoustical requirements above should be confirmed by an Acoustical Consultant as part of the final building design.

7. REFERENCES

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

National Research Council, (NRC, 1985). *Building Practice Note: Controlling Sound Transmission into Buildings, ISSN 0701-5216*

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

Ontario Ministry of the Environment, Conservation and Parks (MECP, 1996). *STAMSON v5.03: Road, Rail and Rapid Transit Noise Prediction Model*

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

8. 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 Renimmob Properties Limited, hereafter referred to as the "Client". It is intended for the sole and exclusive use of the Client and the City of Burlington in their review. 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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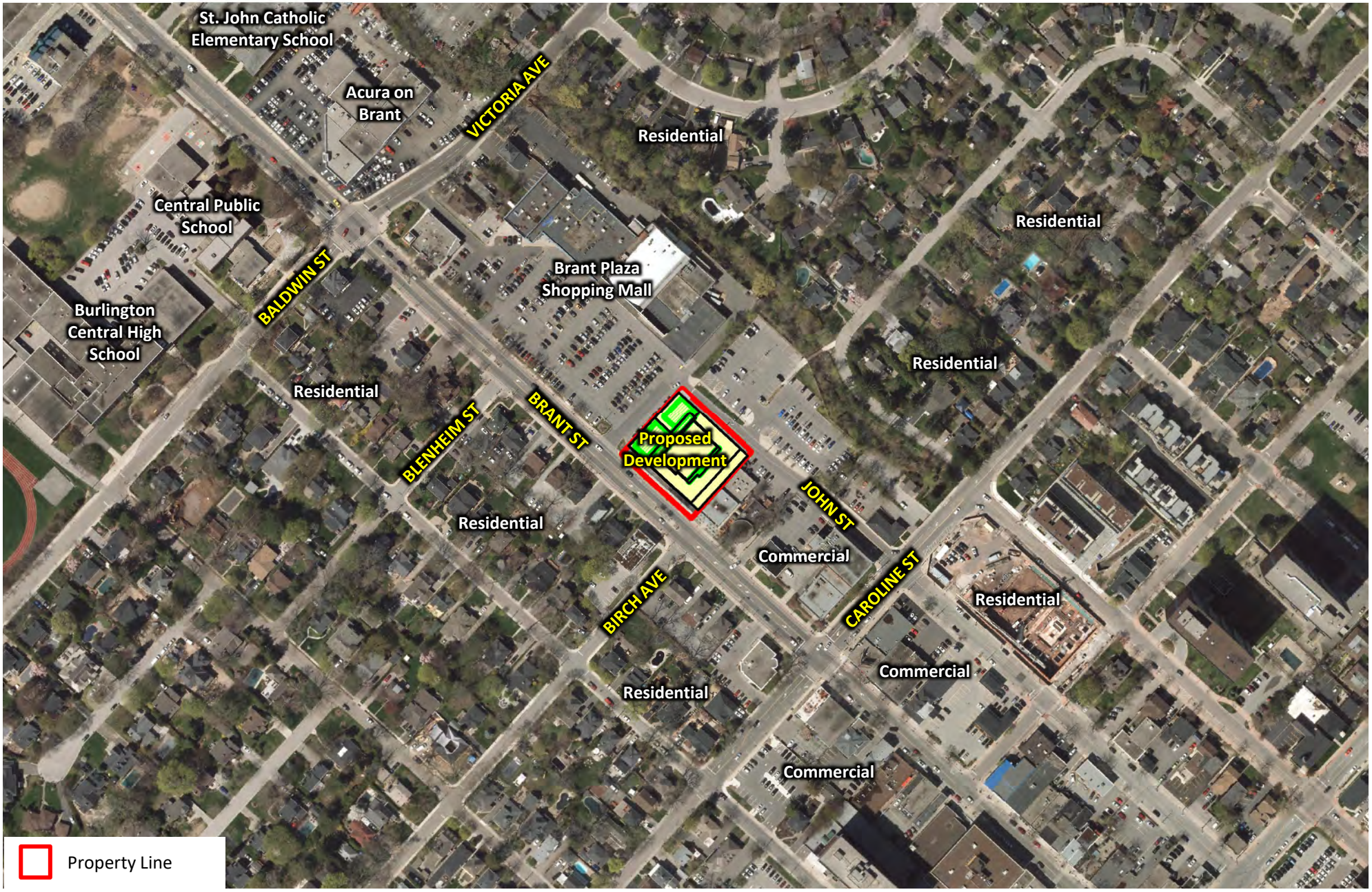
Opinions and recommendations contained in this report are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames and project parameters as outlined in the Scope or Work and agreement between SLR and the Client. The data reported, findings, observations and conclusions expressed are limited by the Scope of Work. SLR is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. SLR does not warranty the accuracy of information provided by third party sources.

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FIGURES

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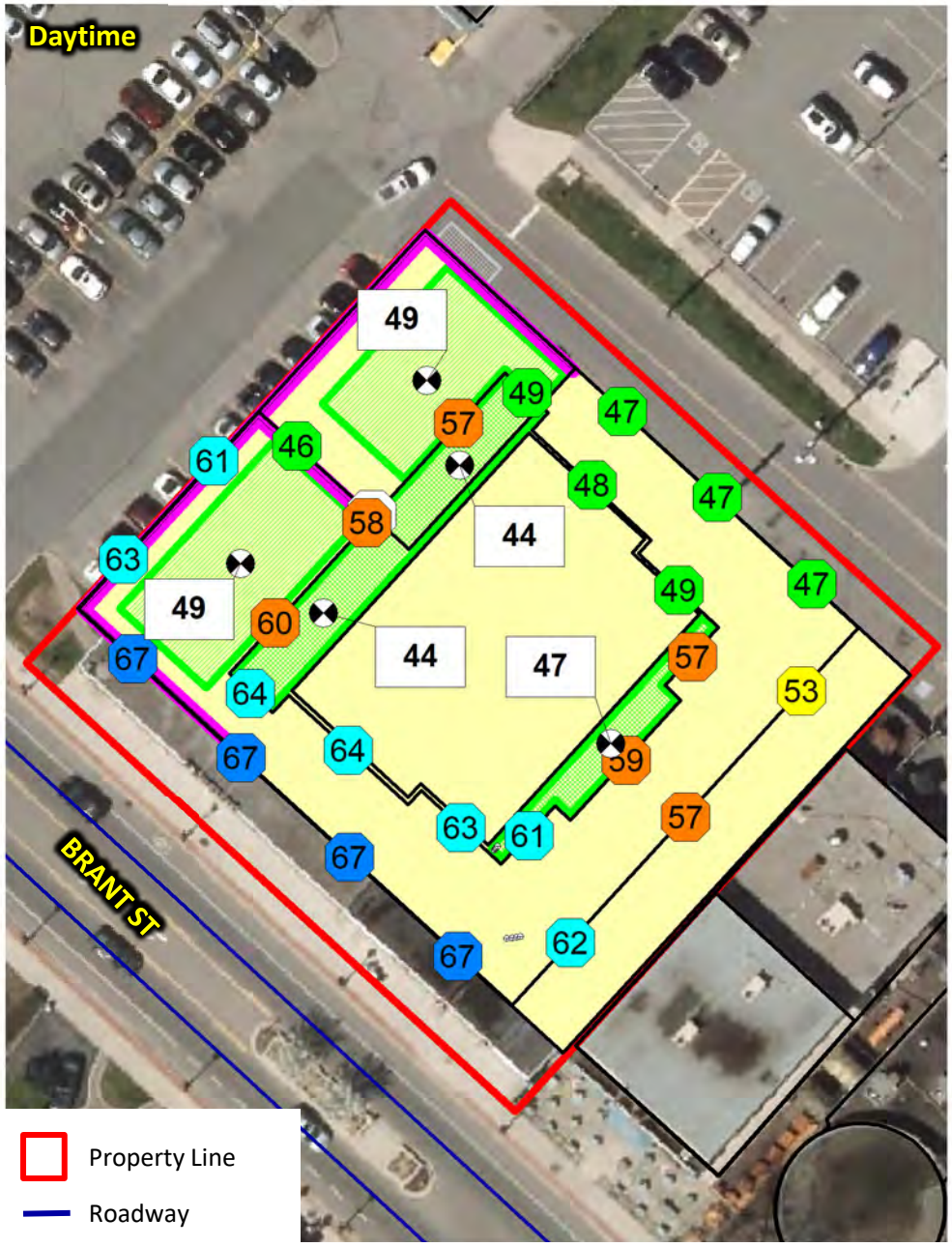


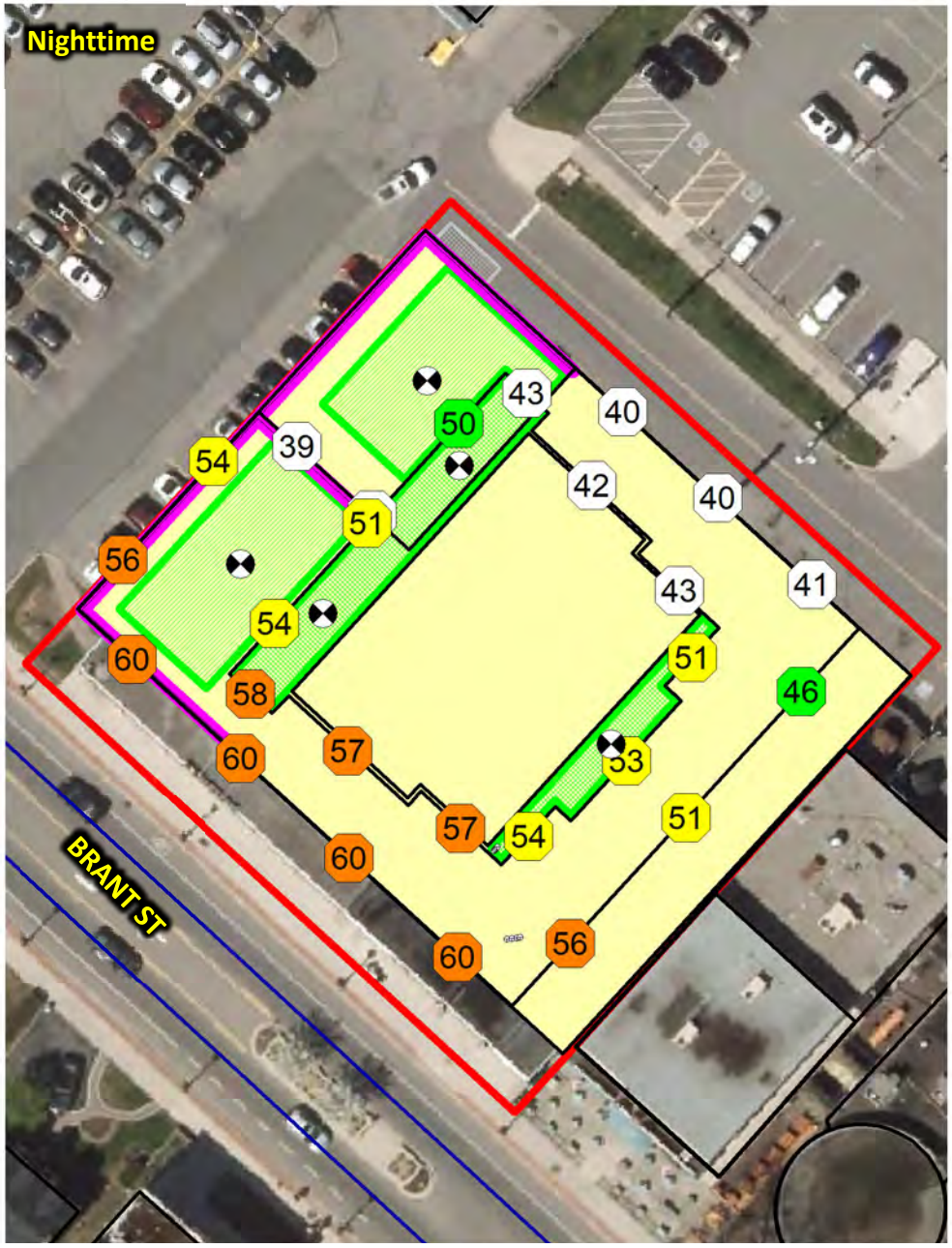
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535-551 BRANT STREET DEVELOPMENT		Date: Nov 12, 2020 Rev 0.0	Figure No. 1	
CONTEXT PLAN		Project No. 241.18271.00000		



RENIMMOB PROPERTIES LIMITED	True North	Scale: NTS	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Nov 12, 2020 Rev 0.0	Figure No. **2**
EXCERPTS FROM SITE PLAN (ORIGINAL FROM TURNER-FLEISCHER)		Project No. 241.18271.00000	

SLR global environmental solutions



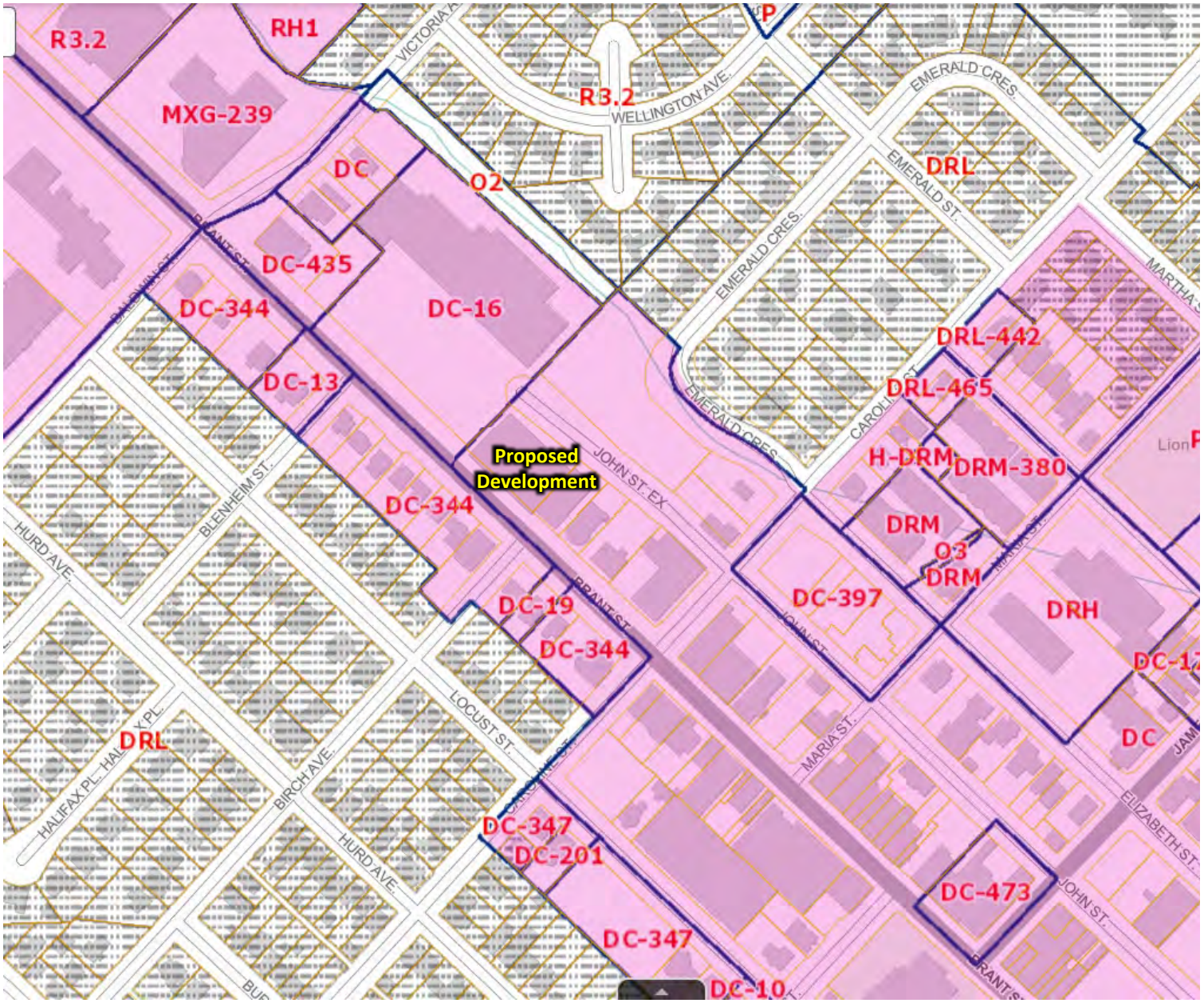


Property Line

Roadway

RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 1,250	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Nov 12, 2020 Rev 0.0	Figure No. **3**
TRANSPORTATION SOUND LEVELS		Project No. 241.18271.00000	

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NOTES:

- From https://burlington.maps.arcgis.com/apps/webappviewer/index.html?appid=5bfd88175dea4cc080f46140fd839567

True North

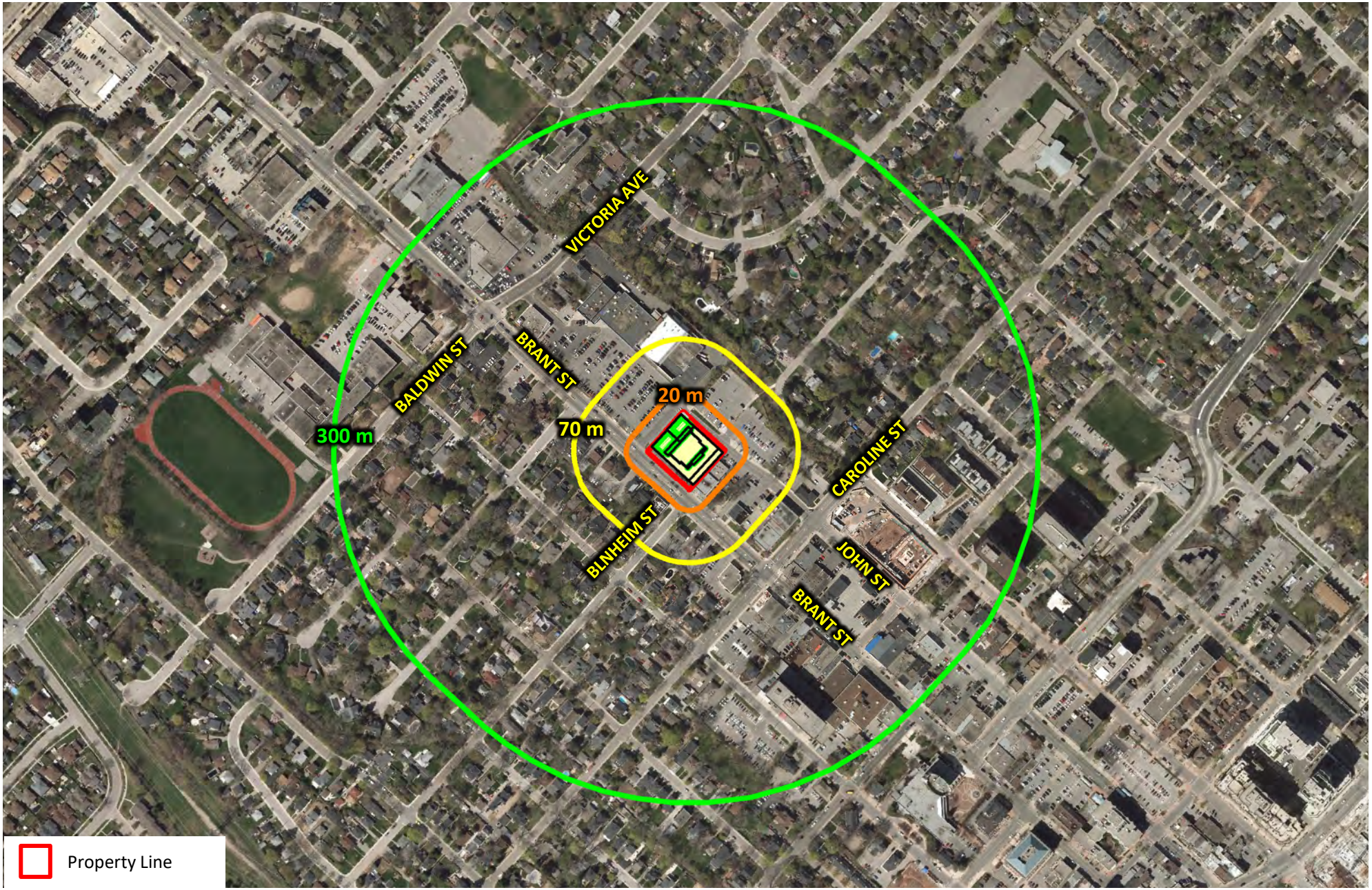
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535-551 BRANT STREET DEVELOPMENT

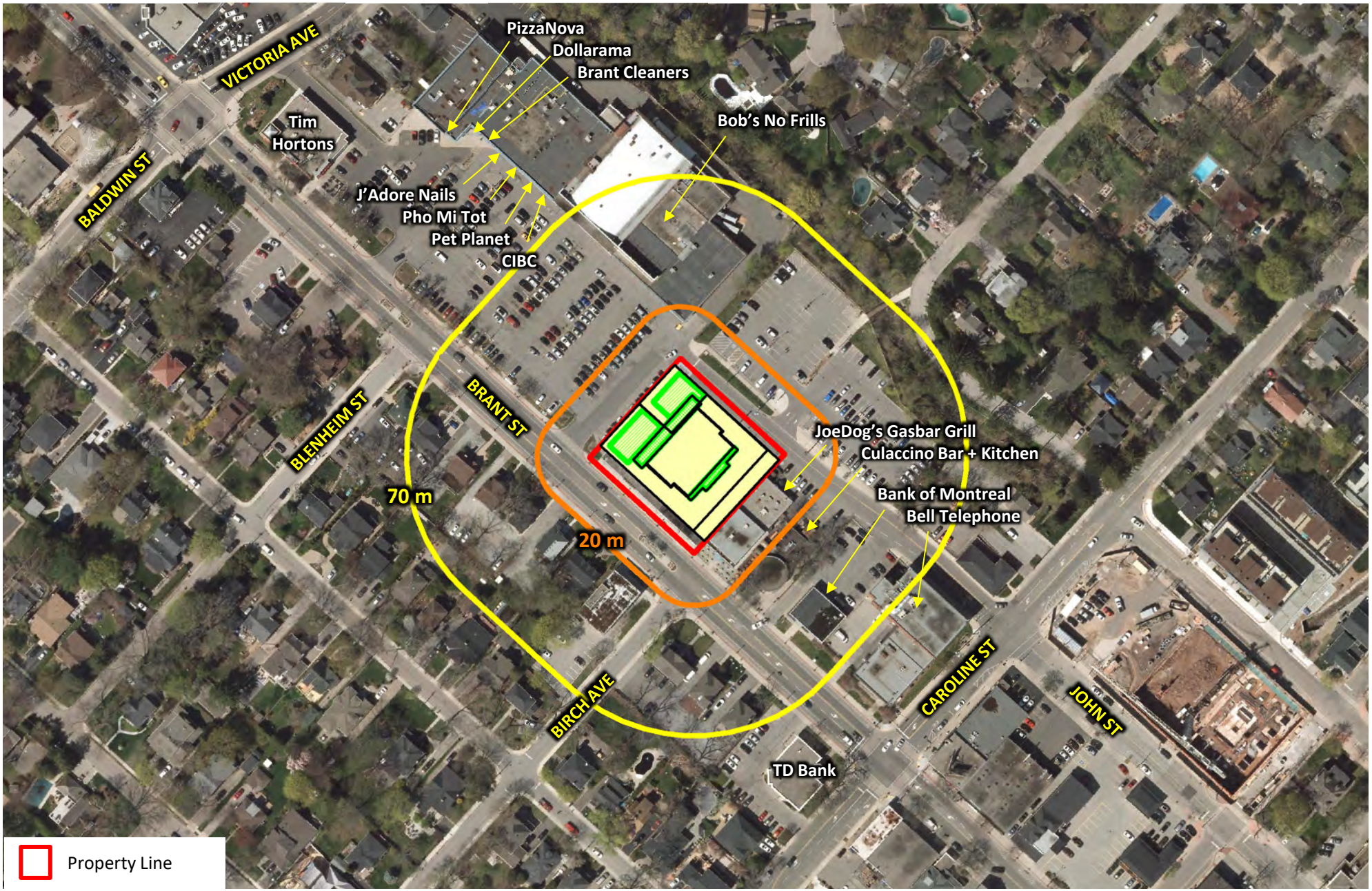
ZONING MAP

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Date: Nov 12, 2020	Rev 0.0	Figure No. 4
Project No. 241.18271.00000		

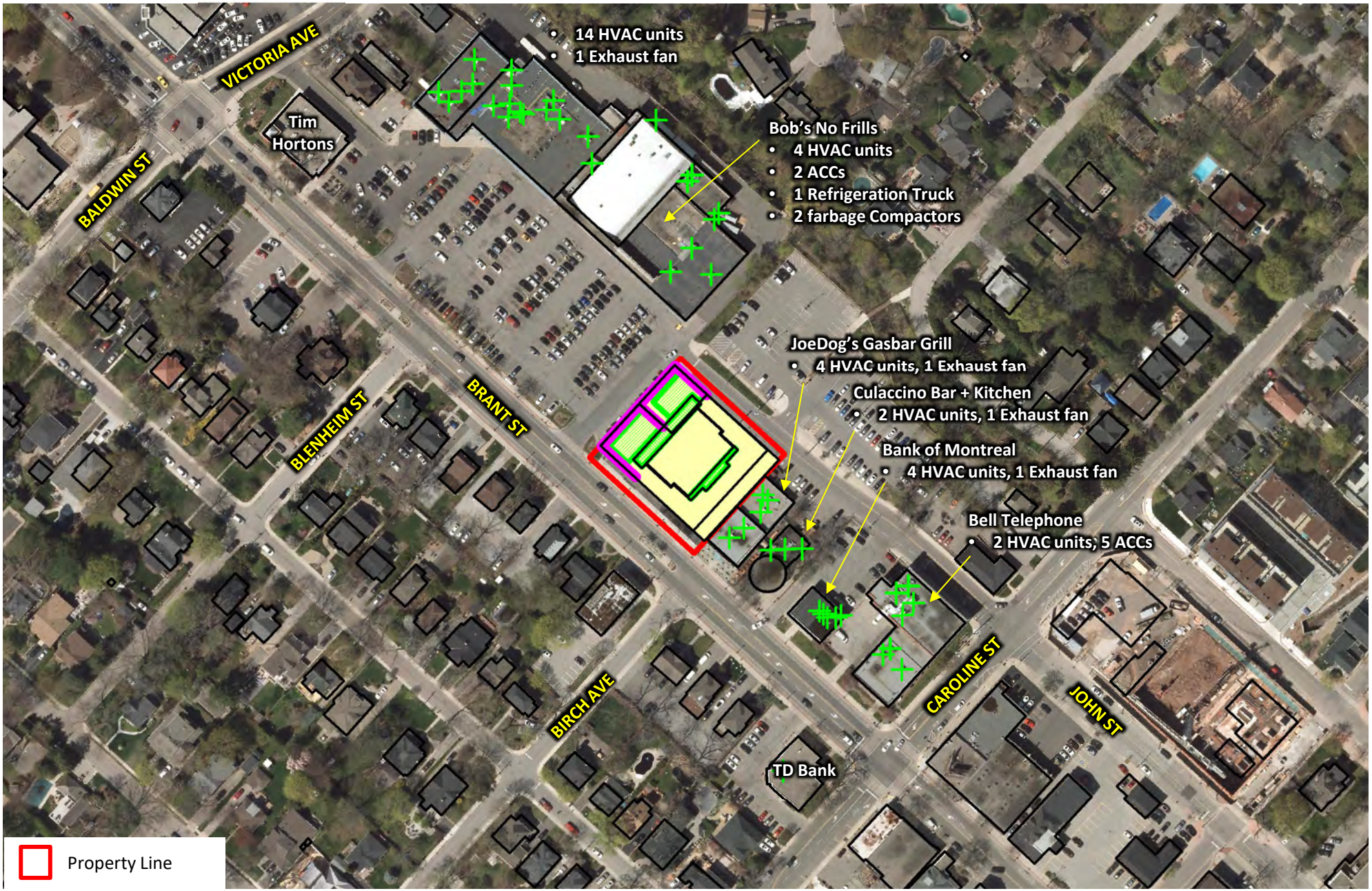
SLR global environmental solutions



RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 5000	METRES	SLR global environmental solutions
535-551 BRANT STREET DEVELOPMENT		Date: Nov 12, 2020 Rev 0.0	Figure No. **5a**	
MECP GUIDELINE D-6 SEPARATION DISTANCES FROM DEVELOPMENT		Project No. 241.18271.00000		

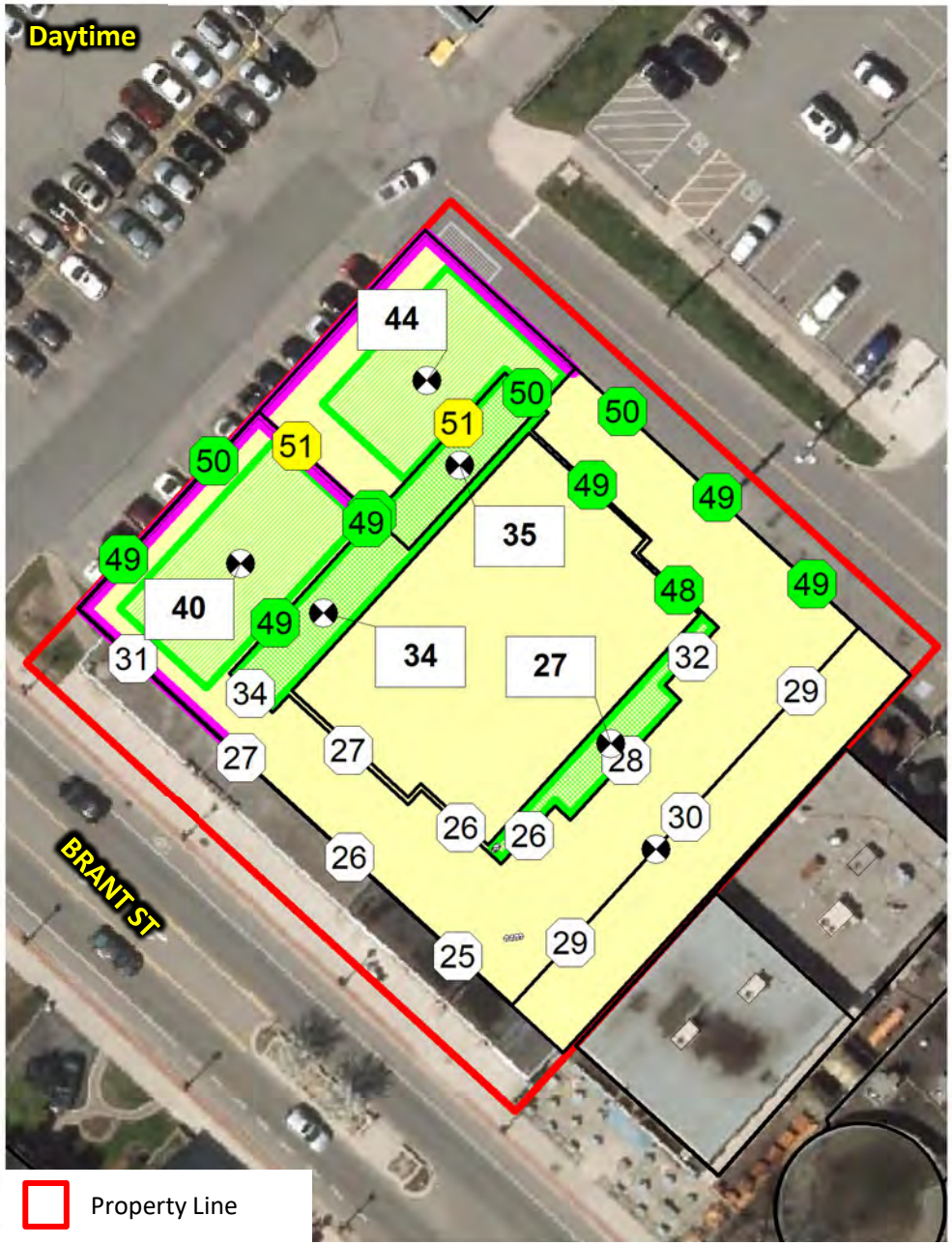


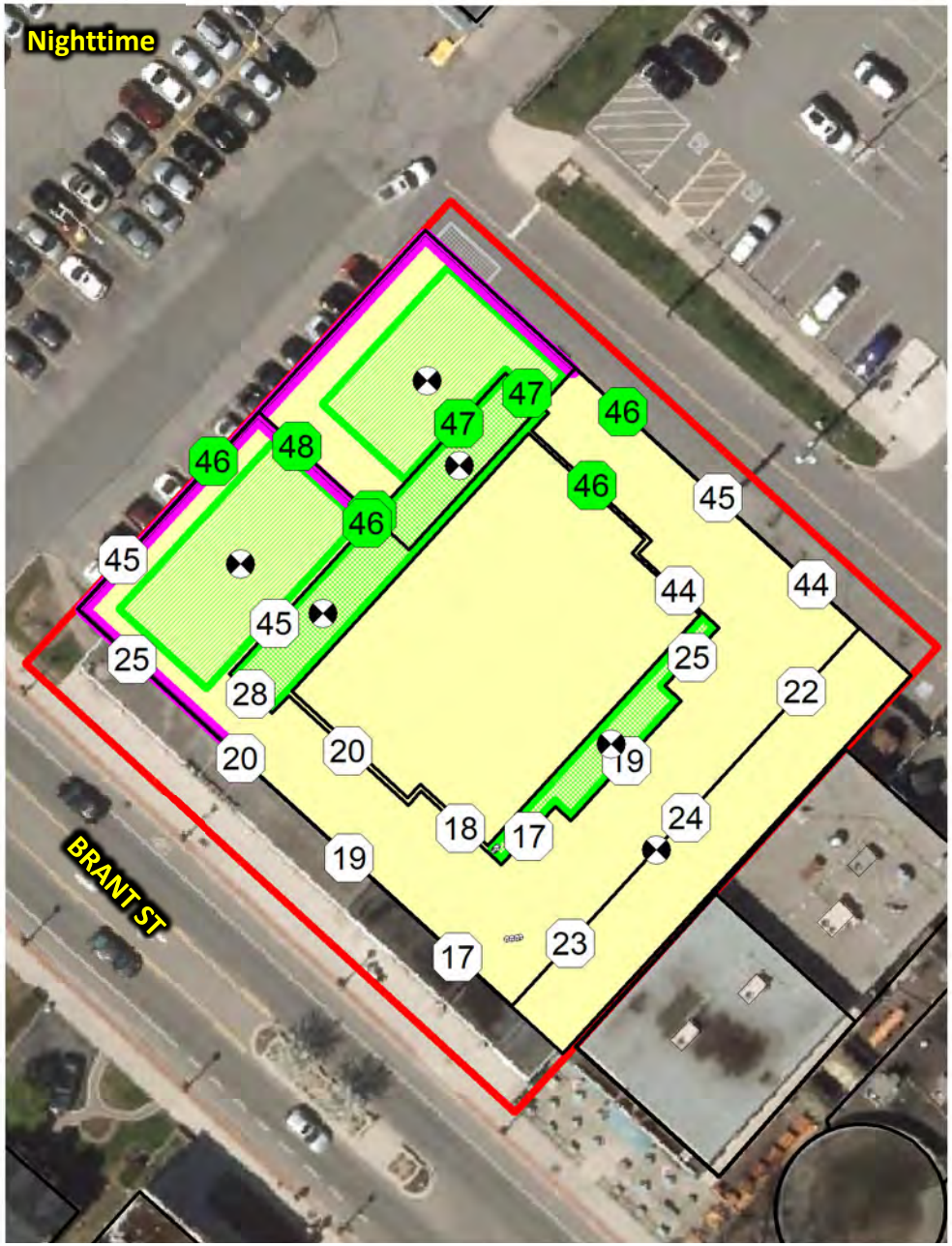
RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 2O00	METRES	
535-551 BRANT STREET DEVELOPMENT		Date: Nov 12, 2020 Rev 0.0	Figure No. **5b**	
MECP GUIDELINE D-6 SEPARATION DISTANCES FROM DEVELOPMENT		Project No. 241.18271.00000		SLR global environmental solutions



RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 2000	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Nov 12, 2020 Rev 0.0	Figure No. 6
MODELLED NOISE SOURCE LOCATIONS		Project No. 241.18271.00000	

SLR global environmental solutions

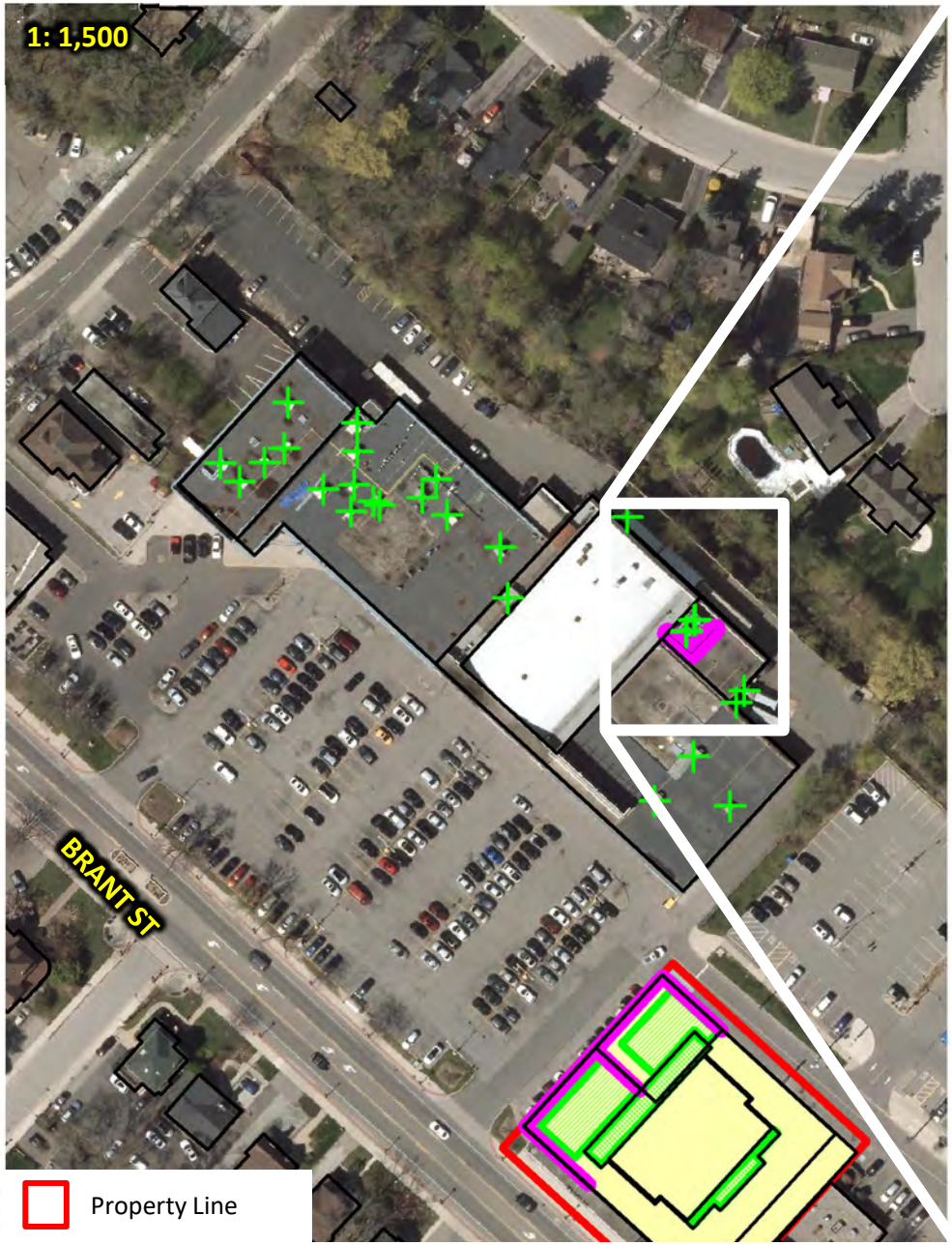


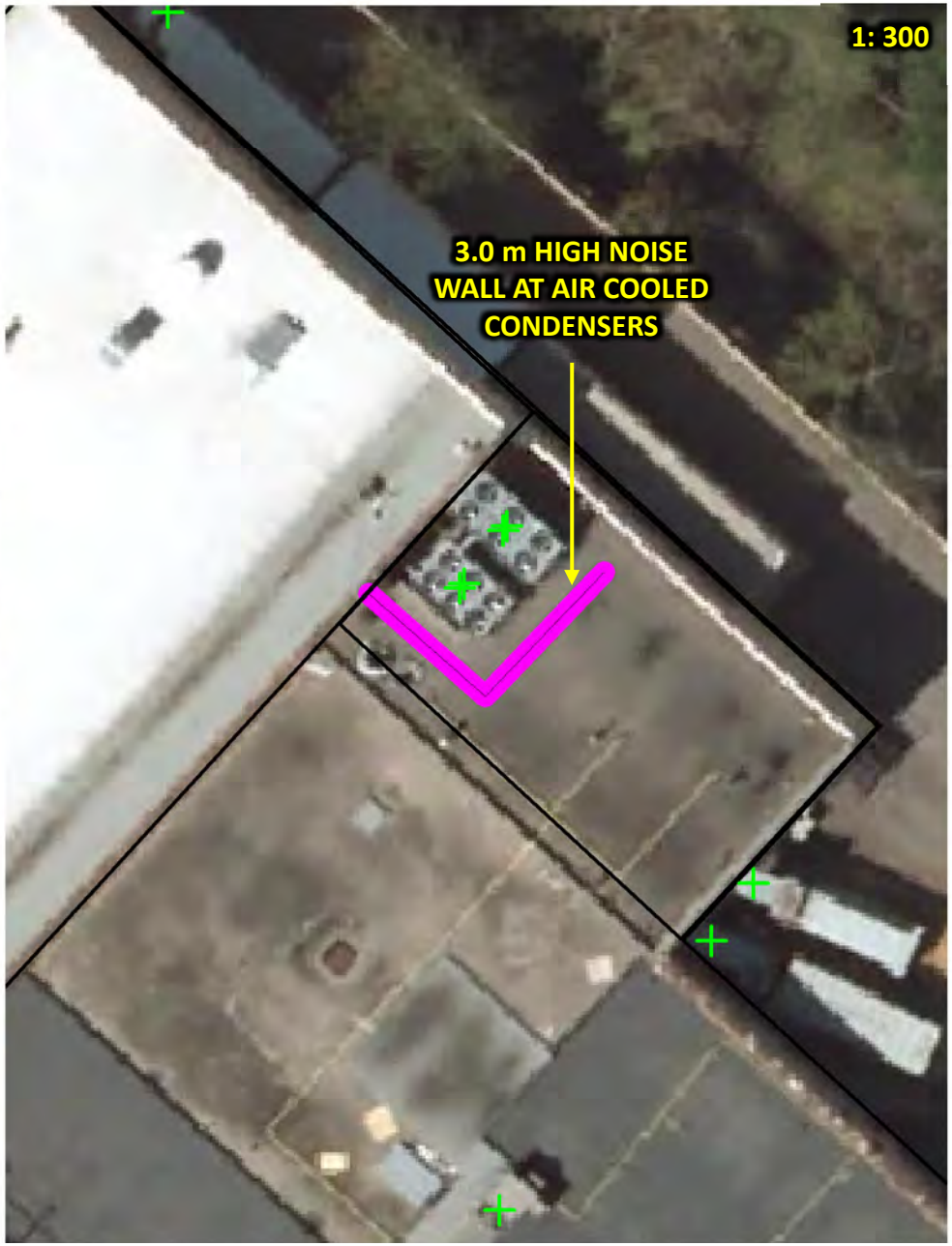


Property Line

RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **7a**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES NO FRILLS PLAZA, UNMITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions





RENIMMOB PROPERTIES LIMITED

535-551 BRANT STREET DEVELOPMENT

REQUIRED NOISE MITIGATION AT NO FRILLS PLAZA

True North

Scale: see inset

METRES

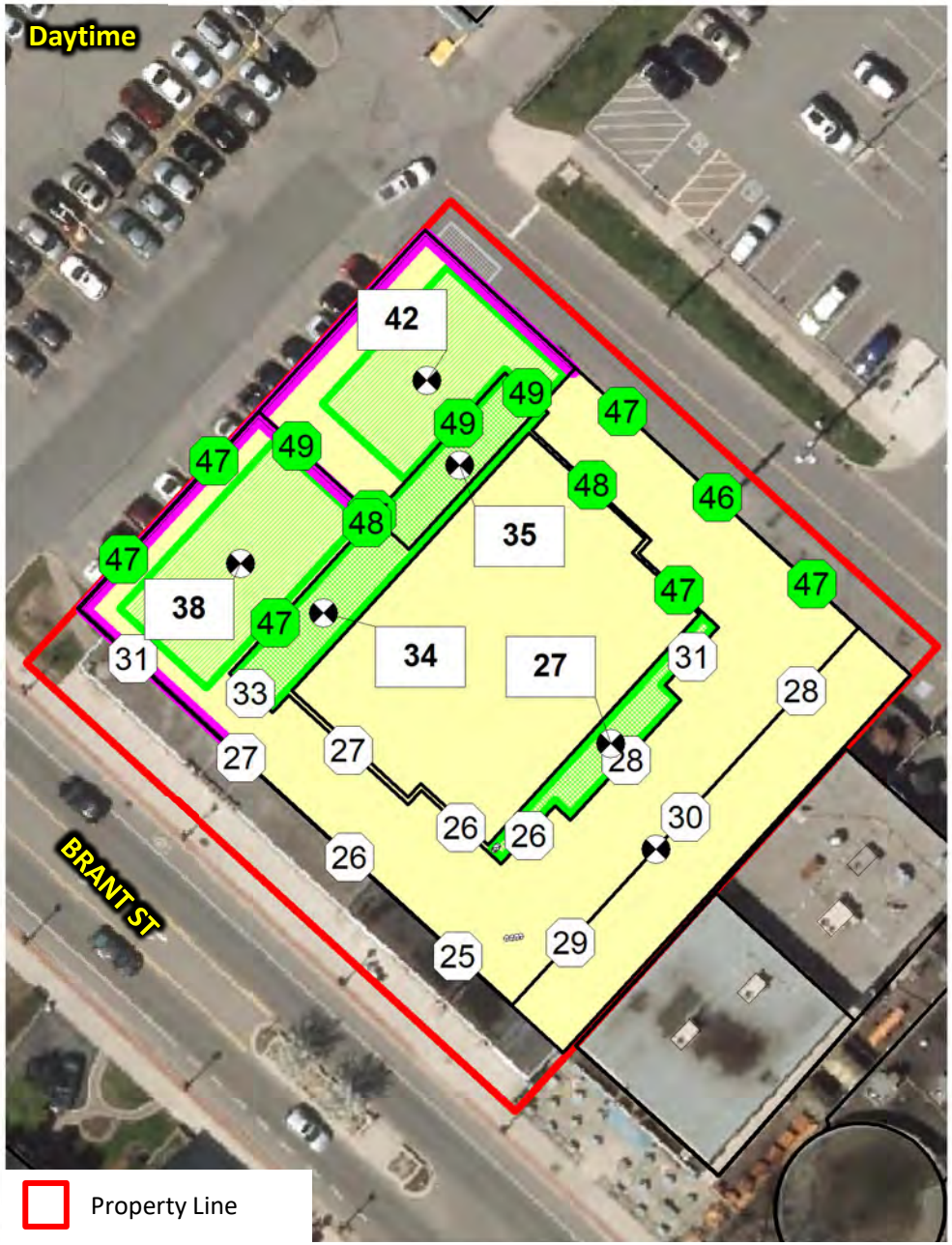
Date: Feb 26, 2021

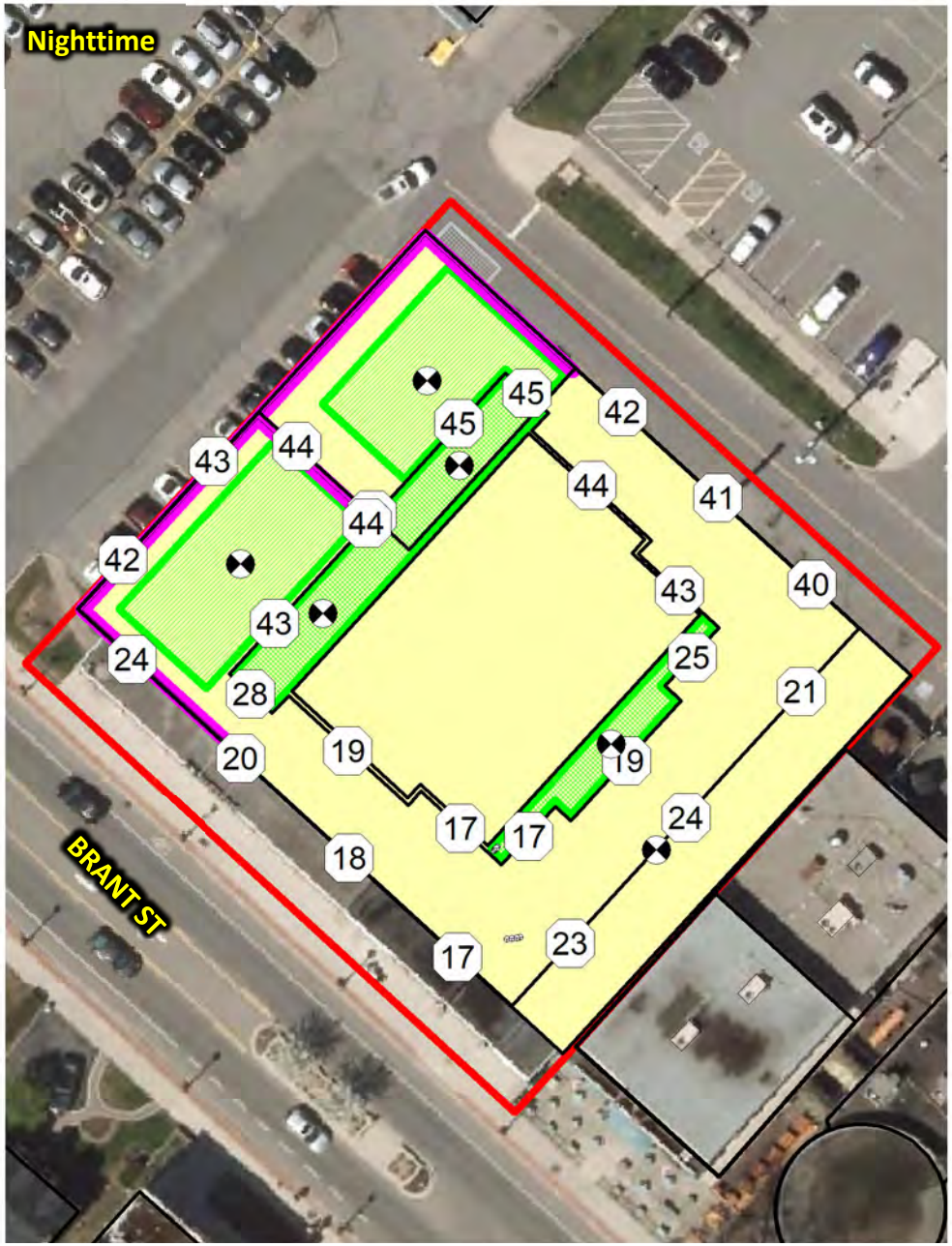
Rev 0.0

Figure No. **7b**

Project No. 241.18271.00000

SLR global environmental solutions

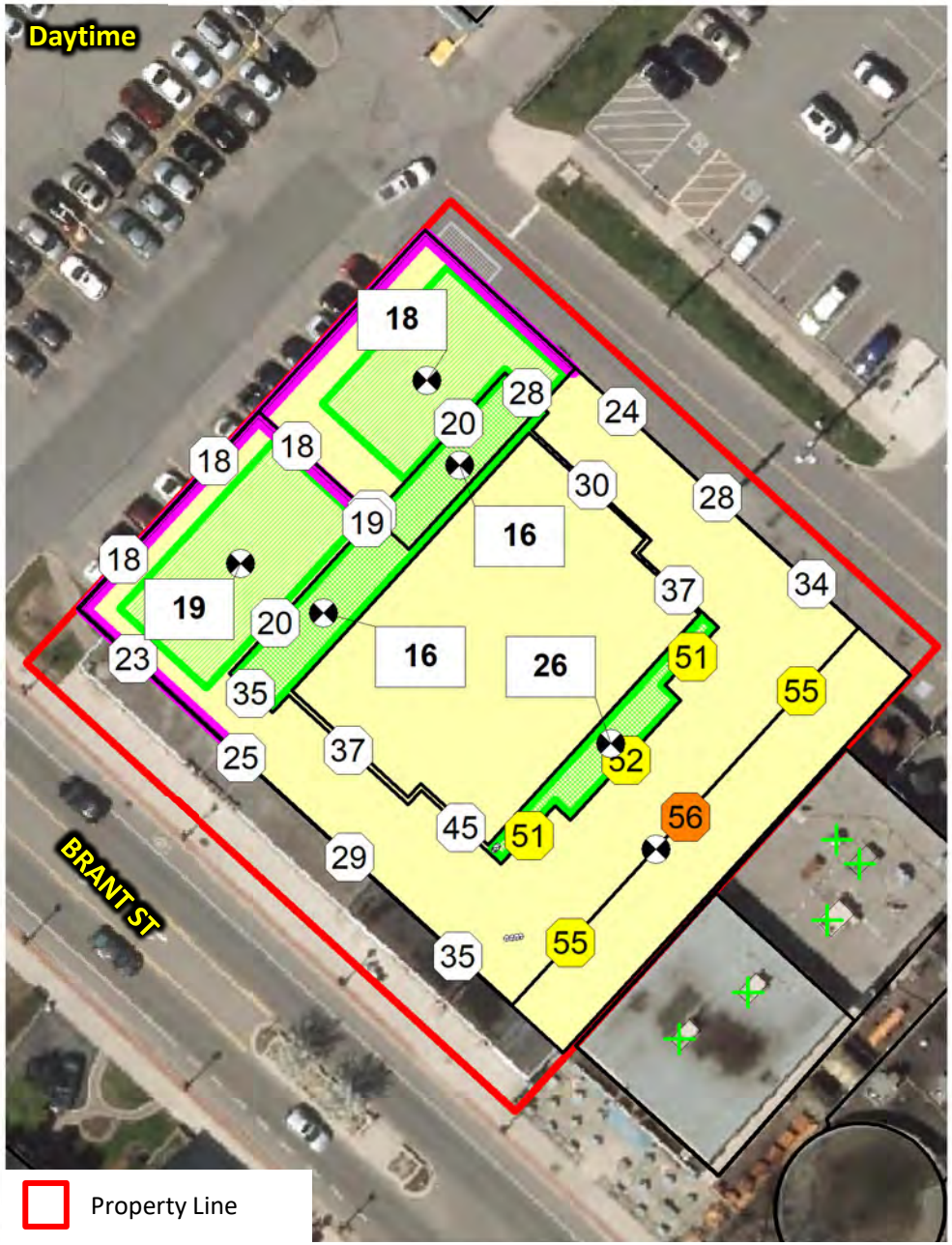


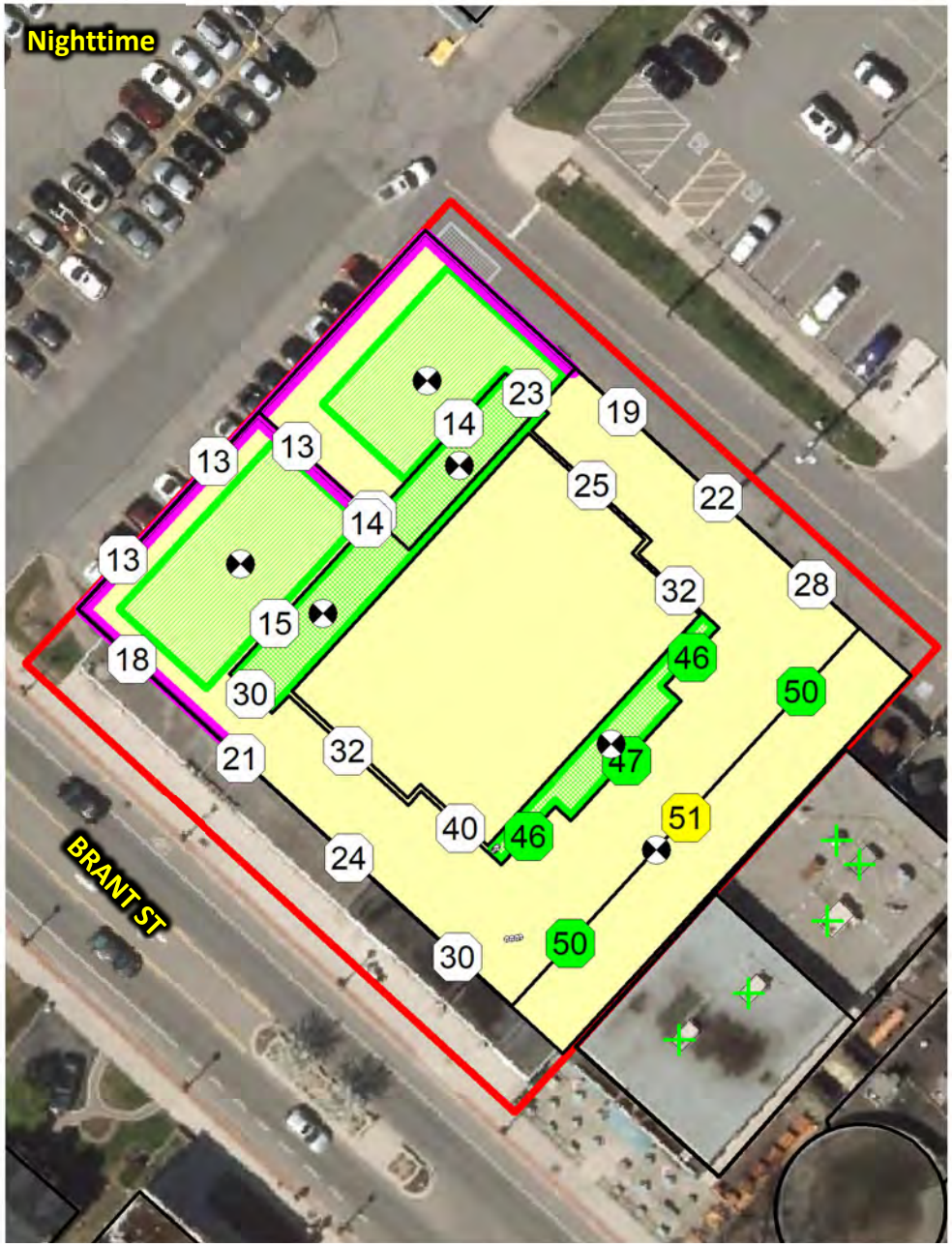


Property Line

RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **7c**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES NO FRILLS PLAZA, MITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions

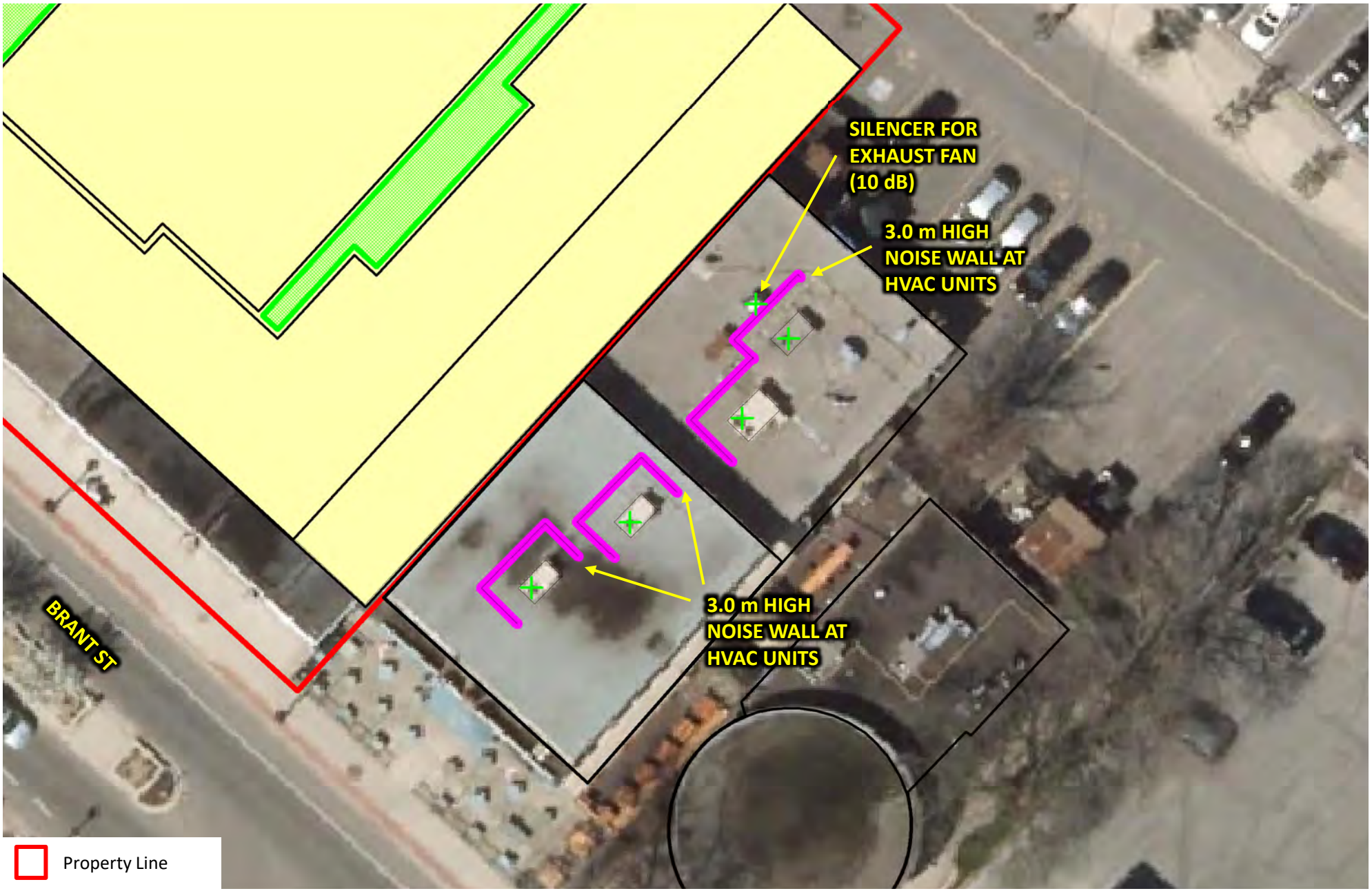




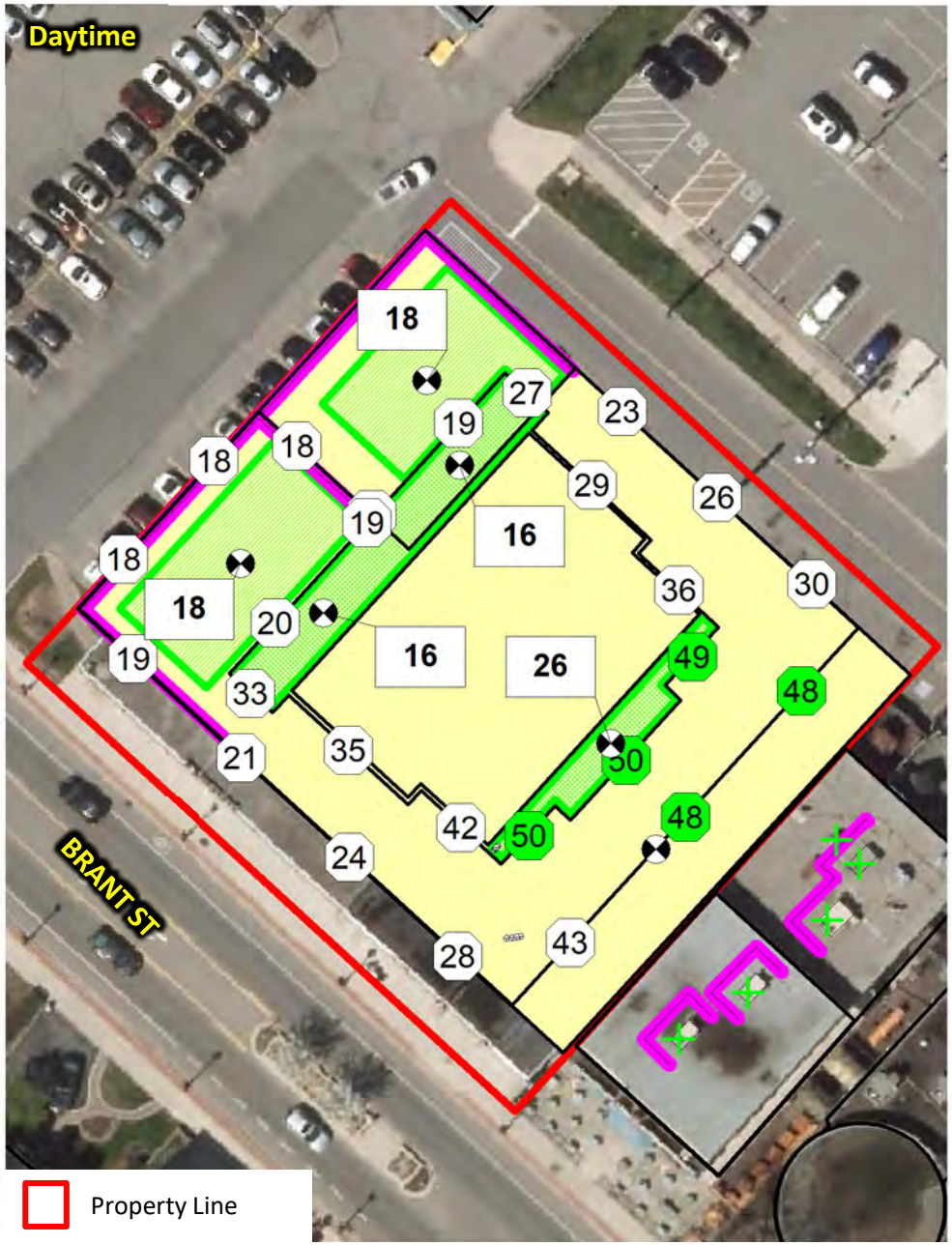
Property Line

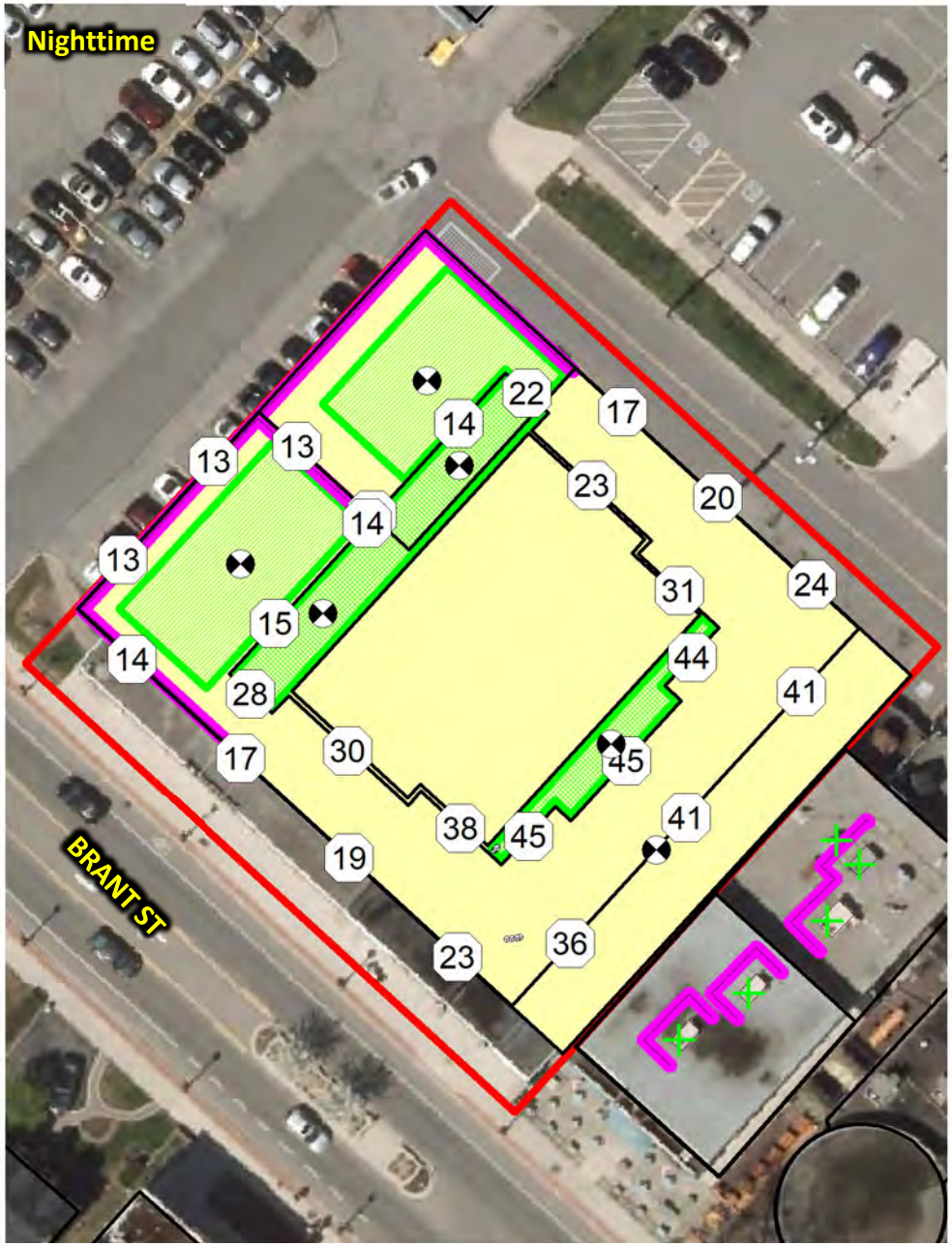
RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **8a**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES JOE DOG'S GASBAR GRILL, UNMITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions



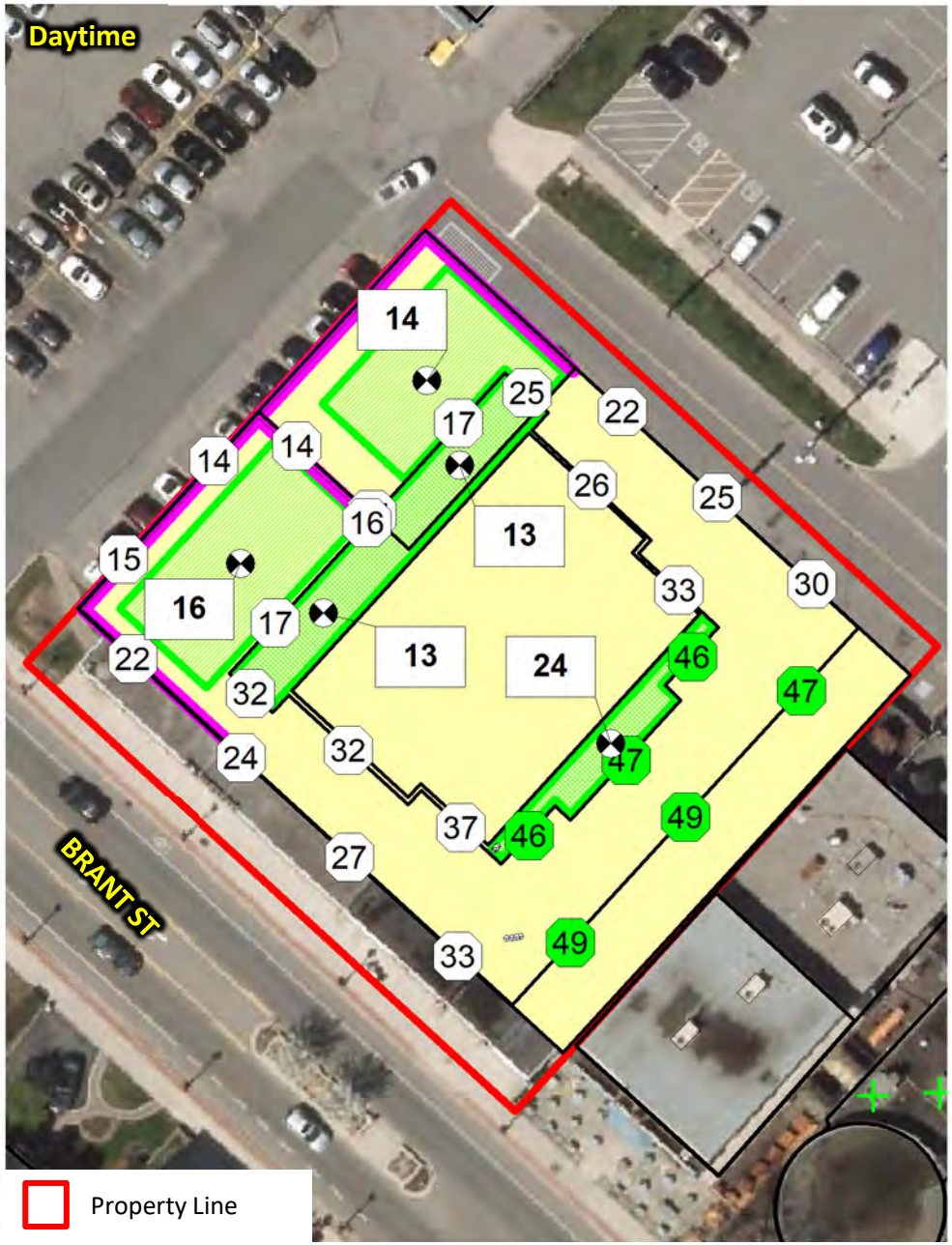
RENIMMOB PROPERTIES LIMITED	True North	Scale: 1:300	METRES	SLR global environmental solutions
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **8b**	
REQUIRED NOISE MITIGATION AT JOE DOG'S GASBAR GRILL		Project No. 241.18271.00000		

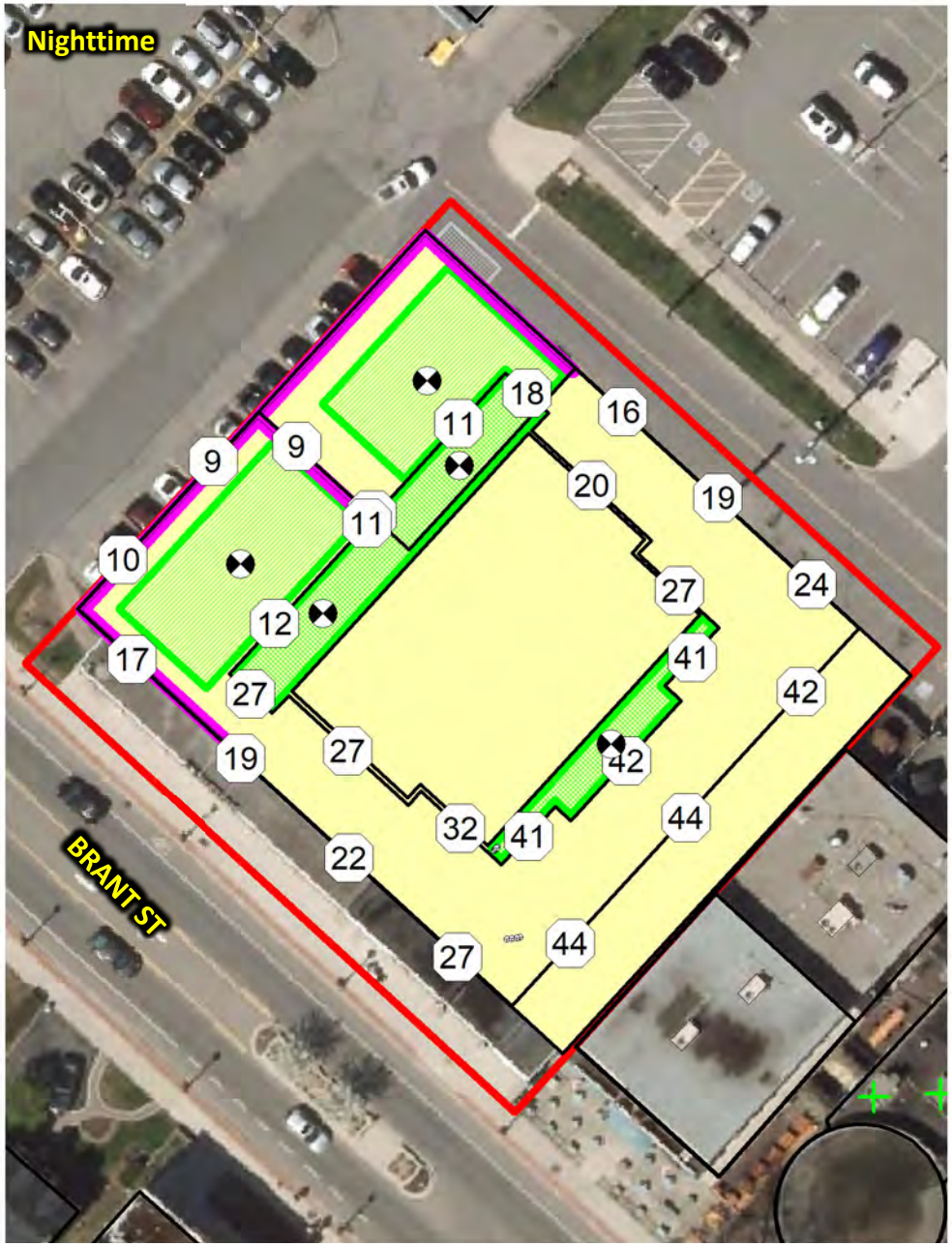




RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **8c**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES JOE DOG'S GASBAR GRILL, MITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions

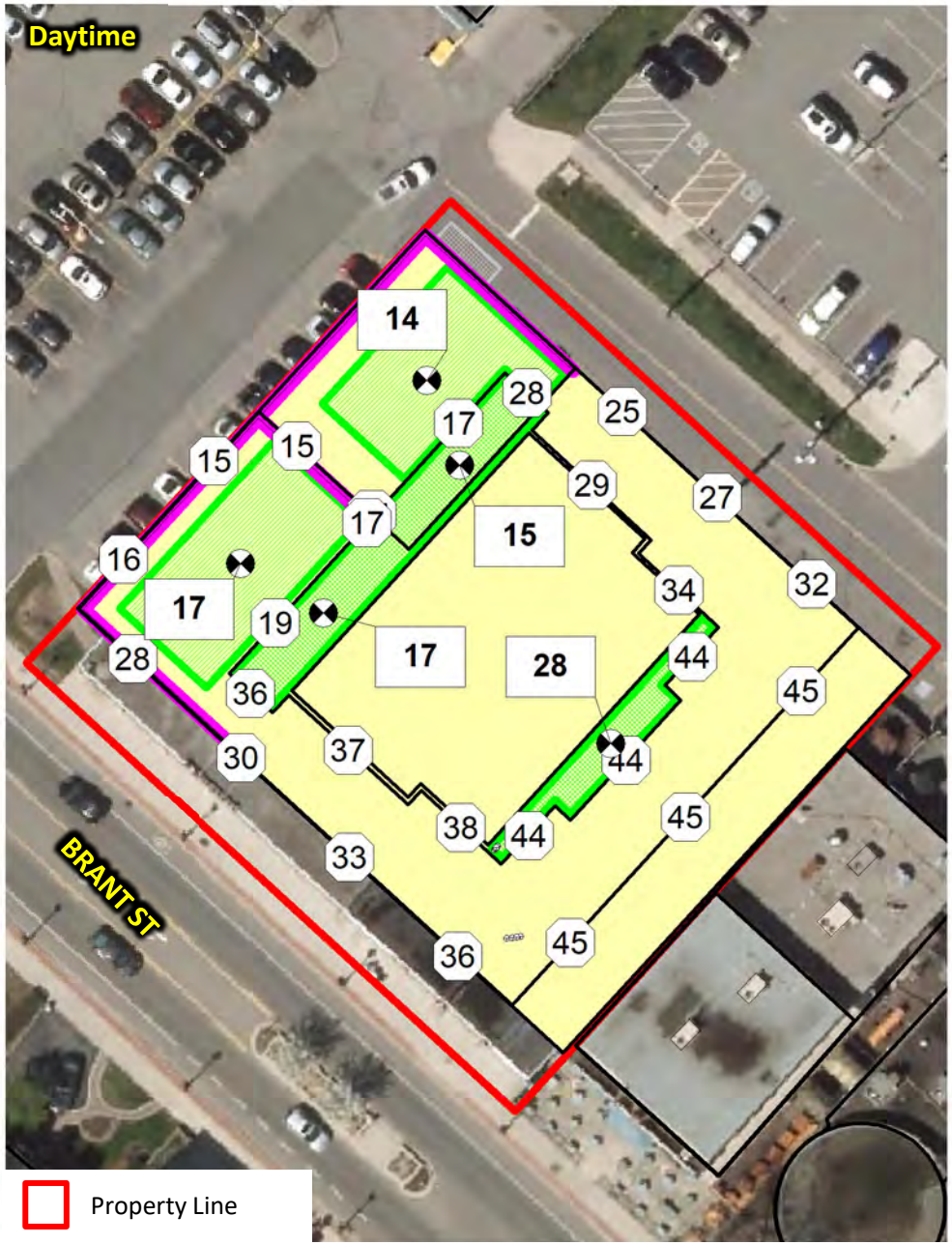


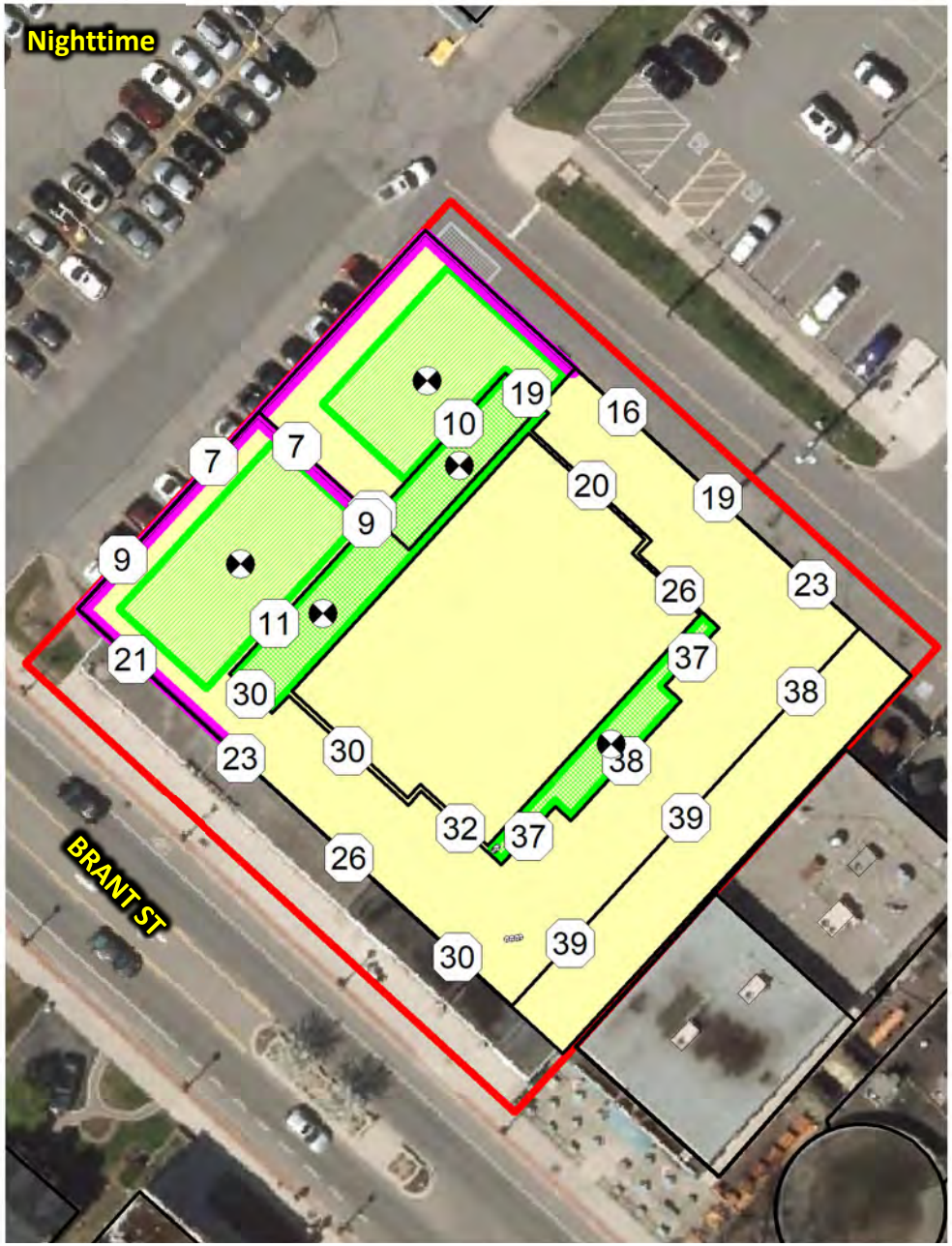


Property Line

RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **9**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES CULACCINO BAR + KITCHEN, UNMITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions

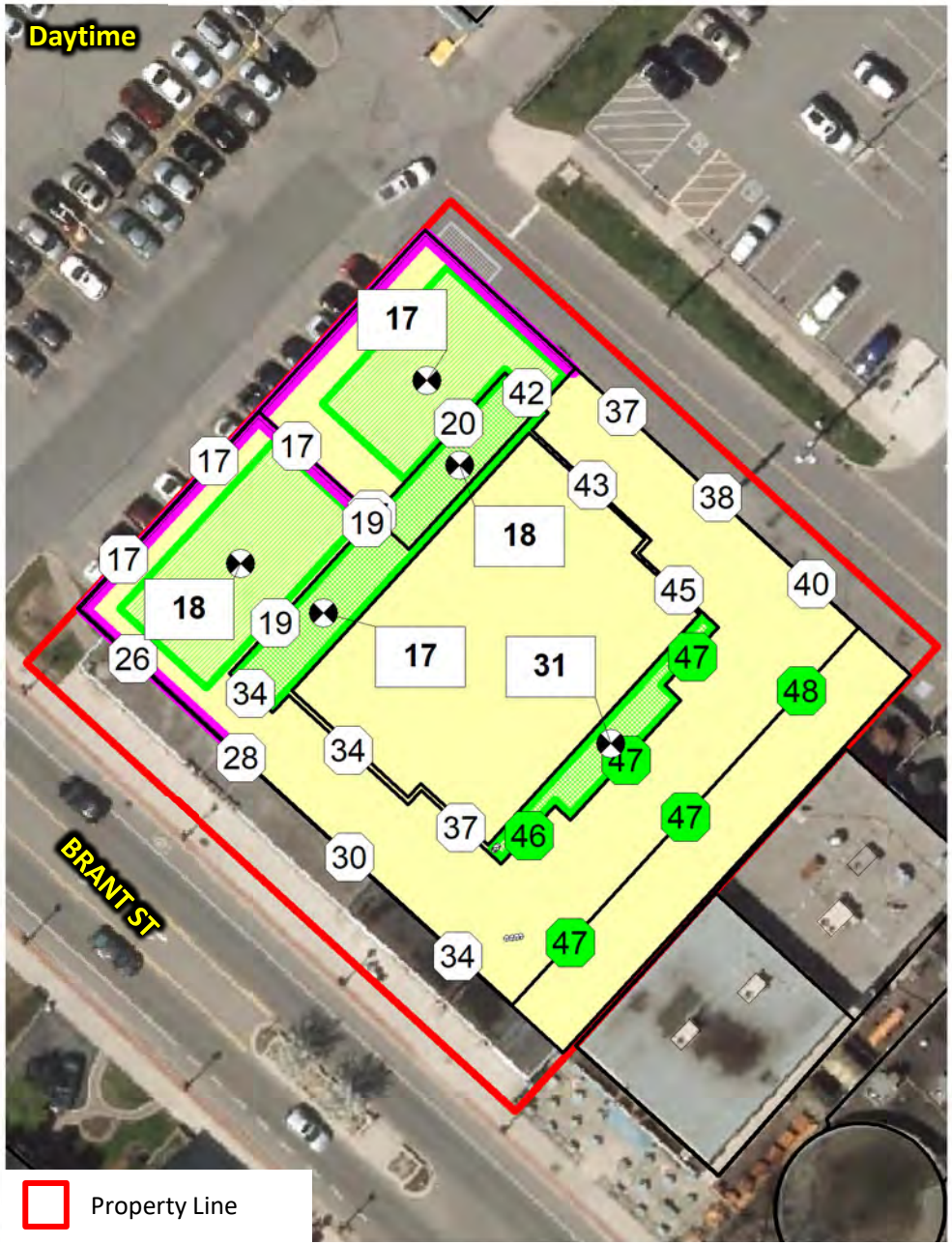


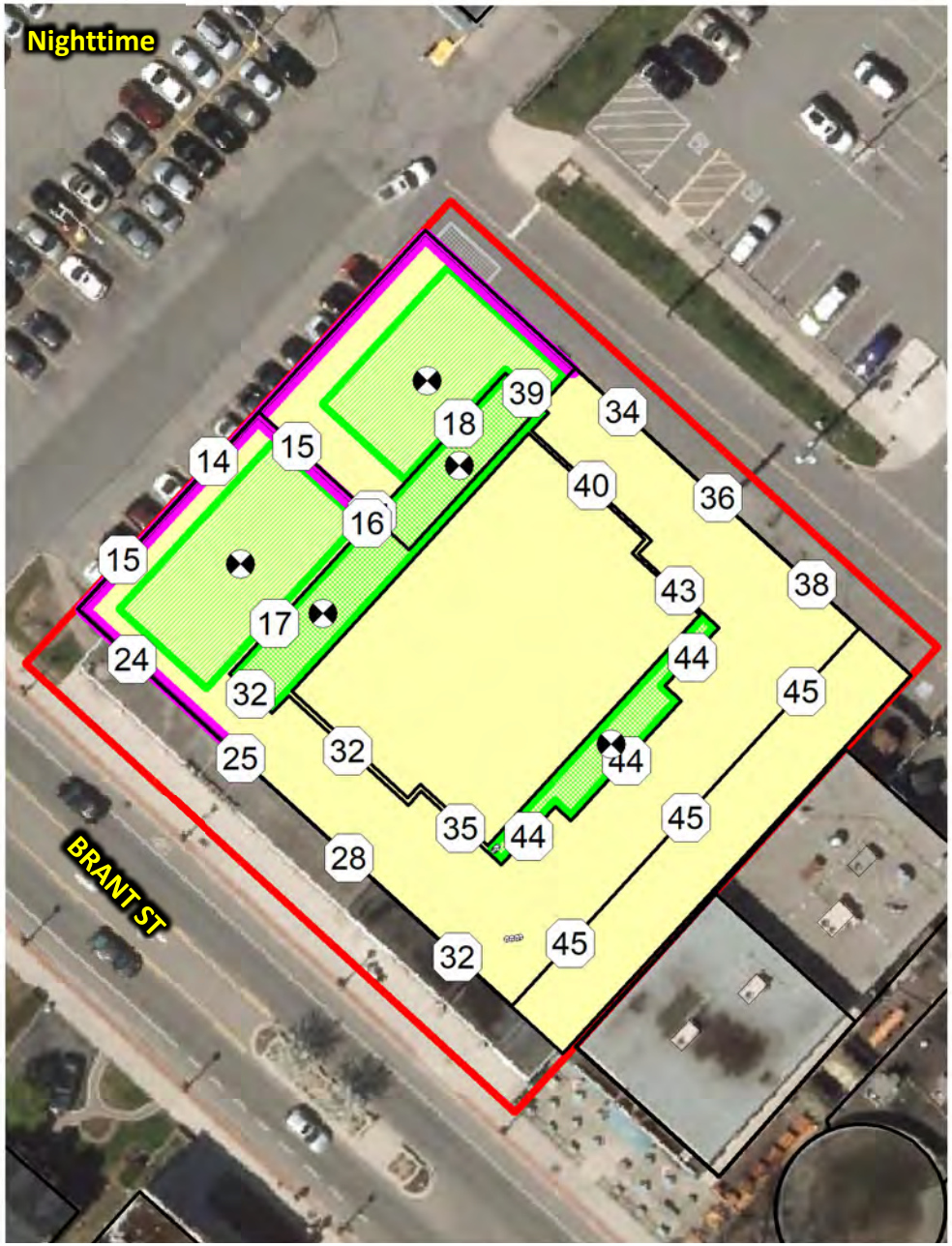


Property Line

RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **10**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES BMO BANK, UNMITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions

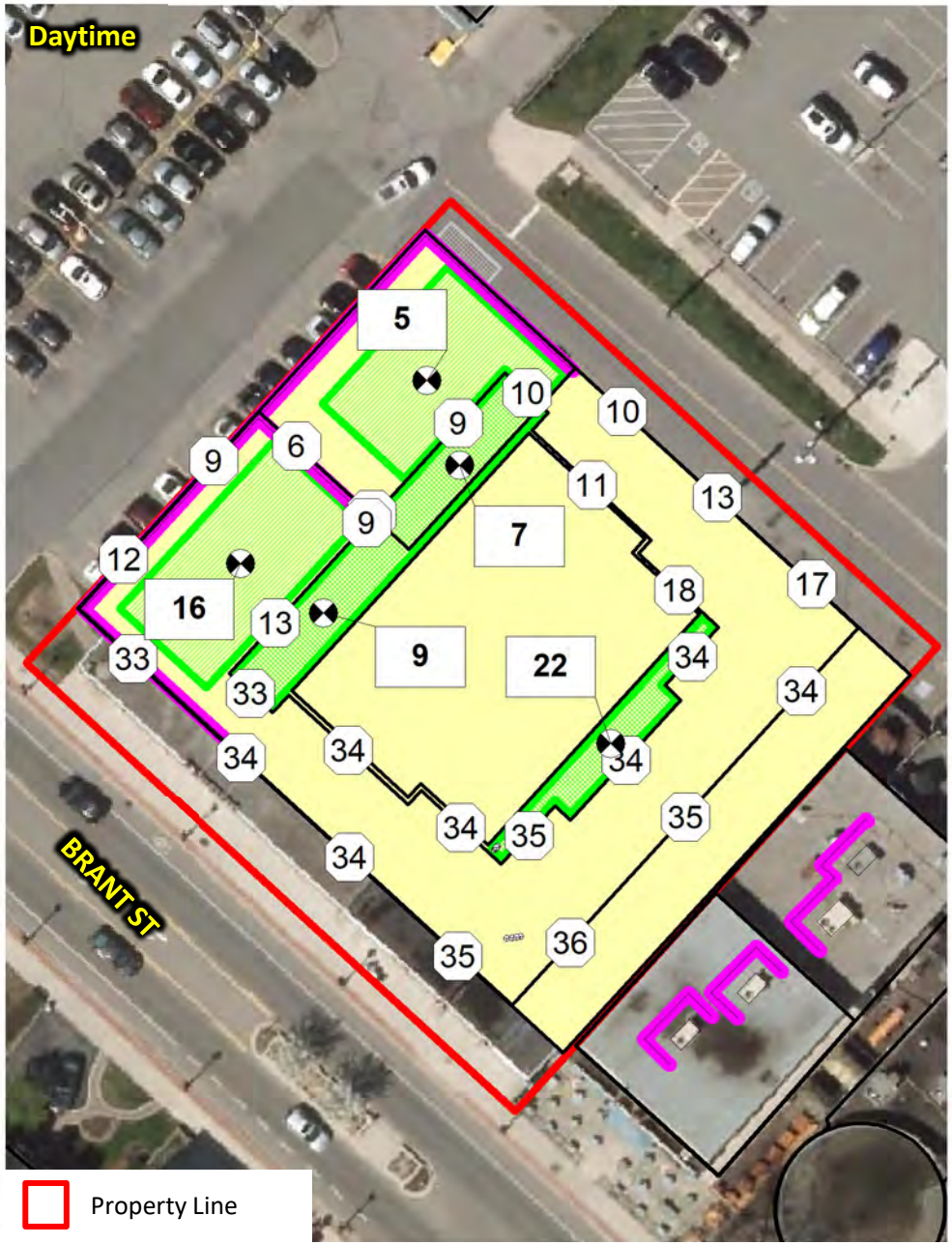


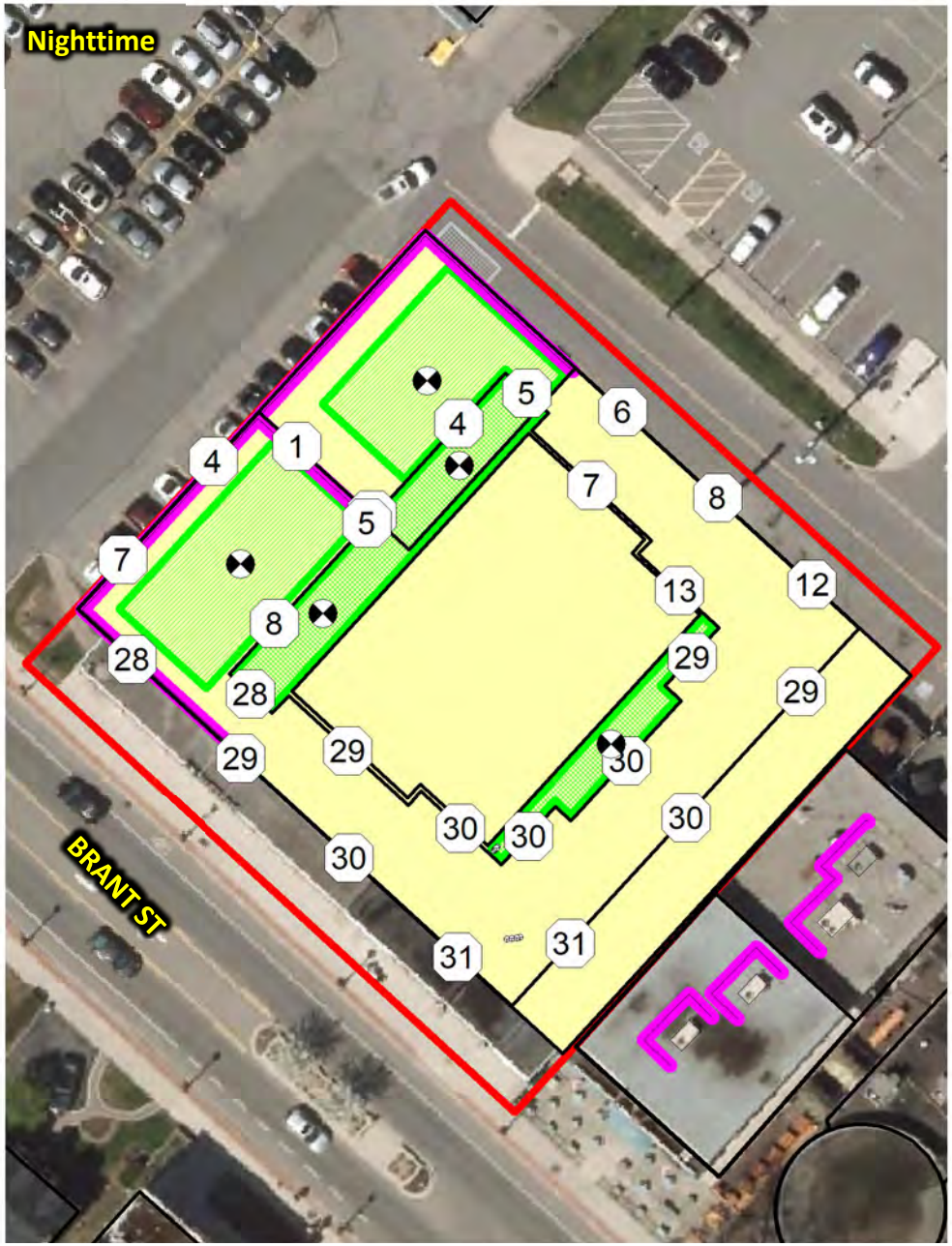


Property Line

RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **11**
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES BELL CANADA, UNMITIGATED		Project No. 241.18271.00000	

SLR global environmental solutions





RENIMMOB PROPERTIES LIMITED	True North	Scale: 1: 600	METRES	SLR global environmental solutions
535-551 BRANT STREET DEVELOPMENT		Date: Feb 26, 2021 Rev 0.0	Figure No. **12**	
PREDICTED STATIONARY SOURCE SOUND LEVELS FROM OFF-SITE SOURCES TD CANADA TRUST BANK, UNMITIGATED		Project No. 241.18271.00000		

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APPENDIX A
MITIGATION AND WARNING CLAUSE SUMMARY

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for 2-sided printing purposes

SUMMARY OF MITIGATION MEASURES AND WARNING CLAUSES

Receptor-Based Physical Mitigation Measures

Ventilation System Design

Mandatory Air Conditioning

All units should be designed with central air conditioning systems, will allow windows and exterior doors to remain closed.

Warning Clauses

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 (Road and Rail)

MECP Type D Warning Clause

"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."

Industrial Sources

MECP Type E Warning Clause

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

MECP Type F Warning Clause (Only if Class 4 Designation Provided)

"Purchasers/tenants are advised that sound levels due to the adjacent industries are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

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for 2-sided printing purposes

APPENDIX B
TRAFFIC DATA AND CALCULATIONS

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for 2-sided printing purposes

Scott Penton

From: Jason Dorssers
Sent: January 19, 2021 10:54 AM
To: Scott Penton
Subject: FW: 535 Brant Street - TMC Request
Attachments: 200272-Brant St _ Caroline St.pdf; 200272-Brant St _ Caroline St.xls

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

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+1 226 706 8080
519-362-0958
jdorssers@slrconsulting.com

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

From: Patrau, Florin <Florin.Patrau@burlington.ca>
Sent: January 31, 2020 10:59 AM
To: Jason Dorssers <jdorssers@slrconsulting.com>
Subject: RE: 535 Brant Street - TMC Request

HI Jason, attached is the study requested. The invoice will follow shortly.

For any questions please let me know.

Thanks,

Florin Patrau | Traffic Technologist
Transportation Services Department
City of Burlington
Phone: 905-335-7671 x 7838
Florin.Patrau@Burlington.ca

Please consider the environment before printing this email

From: Jason Dorssers <jdorssers@slrconsulting.com>
Sent: Thursday, January 30, 2020 1:21 PM
To: Patrau, Florin <Florin.Patrau@burlington.ca>
Subject: RE: 535 Brant Street - TMC Request

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Florin,

That's great, please send the necessary invoice.

Thanks,
Jason

SLR

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

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jdorssers@slrconsulting.com

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

WINNERS: RoSPA Gold Award, 2017
WINNERS : International Business Excellence Award, 2016

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From: Patrau, Florin <Florin.Patrau@burlington.ca>
Sent: January 30, 2020 1:16 PM
To: Jason Dorssers <jdorssers@slrconsulting.com>
Subject: RE: 535 Brant Street - TMC Request

Hi Jason,
I have a fresh count done last year, if you are in agreement for the rate of $ 57.72 + HST I can send you the files.

For any questions let me know,
Thanks,

Florin Patrau | Traffic Technologist
Transportation Services Department
City of Burlington
Phone: 905-335-7671 x 7838
Florin.Patrau@Burlington.ca

Please consider the environment before printing this email

From: Jason Dorssers <jdorssers@slrconsulting.com>
Sent: Wednesday, January 29, 2020 9:12 AM
To: Patrau, Florin <Florin.Patrau@burlington.ca>
Subject: 535 Brant Street - TMC Request

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Florin,

SLR is working on an Environmental Noise Study for a development located on Brant Street, north-west of Caroline Street.

We require turning movement counts at the corner of Brant and Caroline Street to use in our assessment. I have attached an image of the area being developed.

Official address is 535-551 Brant Street, Burlington, ON.

I currently possess counts from 2015, if there is newer data available I will require it. If not, I can move forward with what I have.

Thank you,
Jason

SLR

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

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jdorssers@slrconsulting.com

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

WINNERS: RoSPA Gold Award, 2017
WINNERS : International Business Excellence Award, 2016

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200272-Brant St & Caroline St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Burlington
Site #: 0000200272
Intersection: Brant St & Caroline St
TFR File #: 1
Count date: 15-May-2019

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total:	866			
North Entering:	437			
North Peds:	1			
Peds Cross:	⋈			
Cyclists	1	2	0	3
Trucks	7	37	7	51
Cars	46	263	74	383
Totals	54	302	81	
Cyclists	3			
Trucks	53			
Cars	373			
Totals	429			
East Leg Total:	354			
East Entering:	159			
East Peds:	49			
Peds Cross:	⧖			

Brant St

Cyclists	Trucks	Cars	Totals
1	14	100	115

Cars	Trucks	Cyclists	Totals
74	16	0	90
46	6	0	52
14	3	0	17
134	25	0	

Caroline St

N
W E
S

Cyclists	Trucks	Cars	Totals
0	8	122	130
0	6	90	96
0	2	17	19
0	16	229	

Caroline St

Cars	Trucks	Cyclists	Totals
180	15	0	195

Brant St

Peds Cross:	⧖			
West Peds:	18			
West Entering:	245			
West Leg Total:	360			
Cars	294			
Trucks	42			
Cyclists	2			
Totals	338			
Cars	8	177	16	201
Trucks	1	29	2	32
Cyclists	0	3	0	3
Totals	9	209	18	
Peds Cross:	⋈			
South Peds:	15			
South Entering:	236			
South Leg Total:	574			

Comments

200272-Brant St & Caroline St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

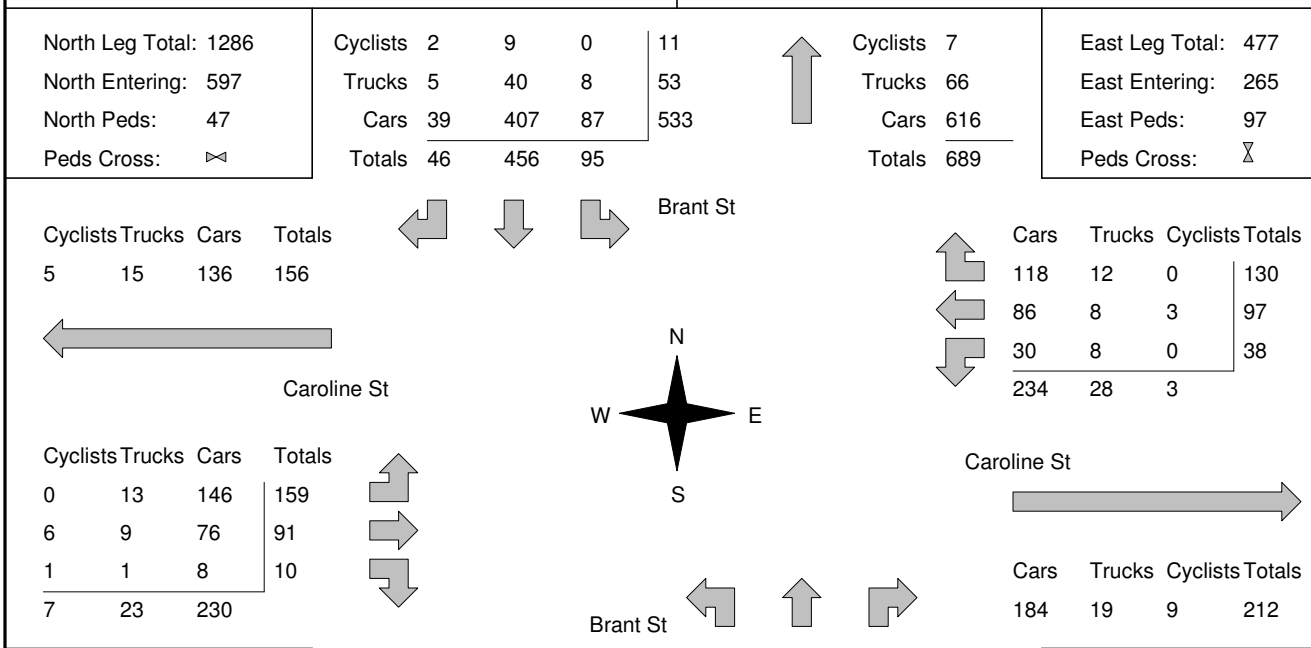
Municipality: Burlington
Site #: 0000200272
Intersection: Brant St & Caroline St
TFR File #: 1
Count date: 15-May-2019

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200272-Brant St & Caroline St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

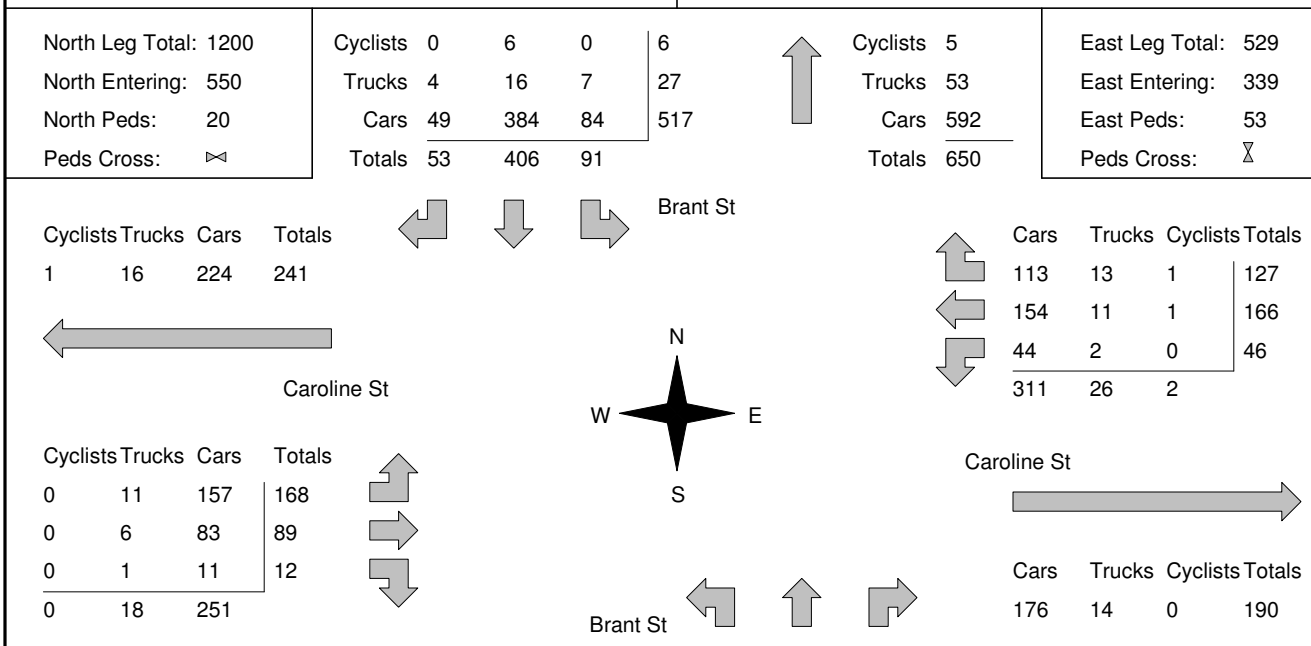
Municipality: Burlington
Site #: 0000200272
Intersection: Brant St & Caroline St
TFR File #: 1
Count date: 15-May-2019

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

200272-Brant St & Caroline St

Total Count Diagram

Municipality: Burlington
Site #: 0000200272
Intersection: Brant St & Caroline St
TFR File #: 1
Count date: 15-May-2019

Weather conditions:
Sunny

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total:	8370			
North Entering:	3869			
North Peds:	206			
Peds Cross:	⋈			
Cyclists	5	33	2	40
Trucks	34	274	57	365
Cars	323	2565	576	3464
Totals	362	2872	635	
Cyclists	42			
Trucks	435			
Cars	4024			
Totals	4501			
East Leg Total:	3294			
East Entering:	1892			
East Peds:	556			
Peds Cross:	⧖			

Brant St

Cyclists	Trucks	Cars	Totals
12	97	1131	1240

Caroline St

Cyclists	Trucks	Cars	Totals
2	82	1050	1134
14	36	560	610
2	12	116	130
18	130	1726	

Cars	Trucks	Cyclists	Totals
764	98	3	865
706	55	7	768
227	30	2	259
1697	183	12	

N
W E
S

Caroline St

Cars	Trucks	Cyclists	Totals
1270	109	23	1402

Brant St

Peds Cross:	⧖			
West Peds:	340			
West Entering:	1874			
West Leg Total:	3114			
Cars	2908			
Trucks	316			
Cyclists	37			
Totals	3261			
Cars	102	2210	134	2446
Trucks	8	255	16	279
Cyclists	0	37	7	44
Totals	110	2502	157	
Peds Cross:	⋈			
South Peds:	315			
South Entering:	2769			
South Leg Total:	6030			

Comments

200272-Brant St & Caroline St
Traffic Count Summary

Intersection: Brant St & Caroline St | **Count Date:** 15-May-2019 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	49	183	29	261	7	432
9:00:00	81	302	54	437	1	673
11:00:00	0	0	0	0	0	0
12:00:00	87	354	43	484	47	877
13:00:00	105	473	53	631	42	1051
14:00:00	55	388	45	488	38	895
15:00:00	0	0	0	0	0	0
16:00:00	81	386	34	501	34	898
17:00:00	88	399	55	542	20	916
18:00:00	89	387	49	525	17	896
Totals:	635	2872	362	3869	206	6638

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	3	151	17	171	0
9:00:00	9	209	18	236	15
11:00:00	0	0	0	0	0
12:00:00	11	358	24	393	73
13:00:00	13	385	22	420	79
14:00:00	19	360	28	407	58
15:00:00	0	0	0	0	0
16:00:00	17	357	23	397	40
17:00:00	25	338	11	374	34
18:00:00	13	344	14	371	16
Totals:	110	2502	157	2769	315

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	17	29	82	128	17	282
9:00:00	17	52	90	159	49	404
11:00:00	0	0	0	0	0	0
12:00:00	40	77	126	243	106	496
13:00:00	31	101	114	246	95	501
14:00:00	32	83	112	227	101	482
15:00:00	0	0	0	0	0	0
16:00:00	36	106	103	245	88	472
17:00:00	36	158	137	331	54	587
18:00:00	50	162	101	313	46	542
Totals:	259	768	865	1892	556	3766

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	103	36	15	154	8
9:00:00	130	96	19	245	18
11:00:00	0	0	0	0	0
12:00:00	145	91	17	253	60
13:00:00	156	87	12	255	77
14:00:00	158	73	24	255	60
15:00:00	0	0	0	0	0
16:00:00	142	73	12	227	49
17:00:00	155	86	15	256	38
18:00:00	145	68	16	229	30
Totals:	1134	610	130	1874	340

Calculated Values for Traffic Crossing Major Street

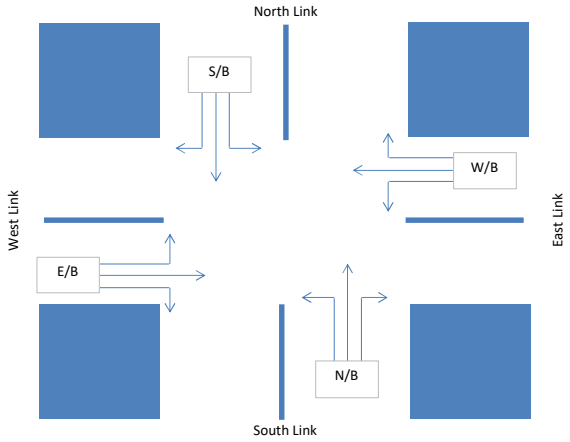
Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	163	259	396	409	369	358	403	390

Brant and Caroline
5/15/2019
AM Peak

	NORTHBOUND					EASTBOUND					SOUTHBOUND					WESTBOUND				
	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total
CAR	373	8	177	16	201	180	122	90	17	229	294	74	263	46	383	100	14	46	74	134
TRUCK	53	1	29	2	32	15	8	6	2	16	42	7	37	7	51	14	3	6	16	25
BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	426	9	206	18	233	195	130	96	19	245	336	81	300	53	434	114	17	52	90	159

AADT Conversion

PM Peak to AADT	10
AM Peak to AADT	11
8-Hour to AADT	2.2



AM Peak

North Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	383	51	0	434	11.8%
N/B North of Int.	373	53	0	426	12.4%
TOTAL	756	104	0	860	12.1%

South Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	294	42	0	336	12.5%
N/B South of Int.	201	32	0	233	13.7%
TOTAL	495	74	0	569	13.0%

West Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	229	16	0	245	6.5%
W/B West of Int	100	14	0	114	12.3%
TOTAL	329	30	0	359	8.4%

East Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	134	25	0	159	15.7%
E/B East of Int	180	15	0	195	7.7%
TOTAL	314	40	0	354	11.3%

AADT

North Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	4213	561	0	4774	11.8%
N/B North of Int.	4103	583	0	4686	12.4%
TOTAL	8316	1144	0	9460	12.1%

South Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	3234	462	0	3696	12.5%
N/B South of Int.	2211	352	0	2563	13.7%
TOTAL	5445	814	0	6259	13.0%

West Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	2519	176	0	2695	6.5%
W/B West of Int	1100	154	0	1254	12.3%
TOTAL	3619	330	0	3949	8.4%

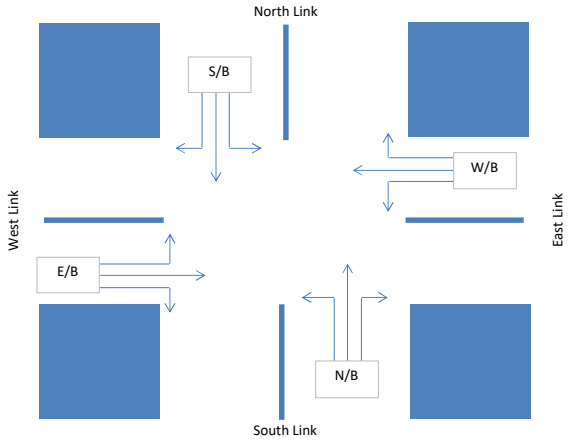
East Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	1474	275	0	1749	15.7%
E/B East of Int	1980	165	0	2145	7.7%
TOTAL	3454	440	0	3894	11.3%

Brant and Caroline
5/15/2019
PM Peak

	NORTHBOUND					EASTBOUND					SOUTHBOUND					WESTBOUND				
	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total
CAR	592	21	322	9	352	176	157	83	11	251	439	84	384	49	517	224	44	154	113	311
TRUCK	53	1	29	1	31	14	11	6	1	18	19	7	16	4	27	16	2	11	13	26
BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	645	22	351	10	383	190	168	89	12	269	458	91	400	53	544	240	46	165	126	337

AADT Conversion

PM Peak to AADT	10
AM Peak to AADT	11
8-Hour to AADT	2.2



PM Peak

North Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	517	27	0	544	5.0%
N/B North of Int.	592	53	0	645	8.2%
TOTAL	1109	80	0	1189	6.7%

South Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	439	19	0	458	4.1%
N/B South of Int.	352	31	0	383	8.1%
TOTAL	791	50	0	841	5.9%

West Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	251	18	0	269	6.7%
W/B West of Int	224	16	0	240	6.7%
TOTAL	475	34	0	509	6.7%

East Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	311	26	0	337	7.7%
E/B East of Int	176	14	0	190	7.4%
TOTAL	487	40	0	527	7.6%

AADT

North Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	5170	270	0	5440	5.0%
N/B North of Int.	5920	530	0	6450	8.2%
TOTAL	11090	800	0	11890	6.7%

South Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	4390	190	0	4580	4.1%
N/B South of Int.	3520	310	0	3830	8.1%
TOTAL	7910	500	0	8410	5.9%

West Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	2510	180	0	2690	6.7%
W/B West of Int	2240	160	0	2400	6.7%
TOTAL	4750	340	0	5090	6.7%

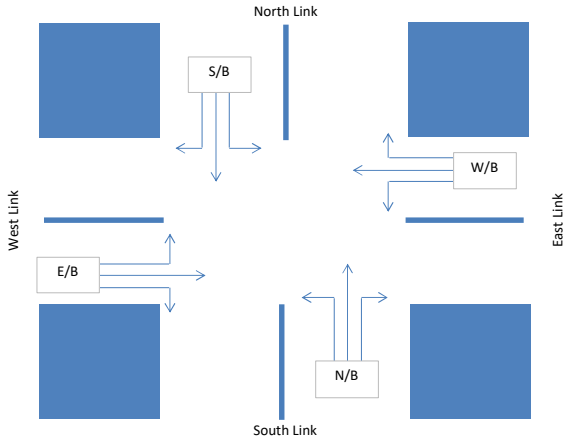
East Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	3110	260	0	3370	7.7%
E/B East of Int	1760	140	0	1900	7.4%
TOTAL	4870	400	0	5270	7.6%

Brant and Caroline
5/15/2019
12-Hour Count

	NORTHBOUND					EASTBOUND					SOUTHBOUND					WESTBOUND				
	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total
CAR	4024	102	2210	134	2446	1260	1050	550	116	1716	2908	576	2565	323	3464	1131	227	706	764	1697
TRUCK	435	8	255	16	279	109	82	36	12	130	316	57	274	34	365	97	30	55	98	183
BUS	0				0	0				0	0				0	0				0
TOTAL	4459	110	2465	150	2725	1369	1132	586	128	1846	3224	633	2839	357	3829	1228	257	761	862	1880

AADT Conversion

PM Peak to AADT	10
AM Peak to AADT	11
12-Hour to AADT	1.497



8-Hour

North Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	3464	365	0	3829	9.5%
N/B North of Int.	4024	435	0	4459	9.8%
TOTAL	7488	800	0	8288	9.7%

South Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	2908	316	0	3224	9.8%
N/B South of Int.	2446	279	0	2725	10.2%
TOTAL	5354	595	0	5949	10.0%

West Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	1716	130	0	1846	7.0%
W/B West of Int	1131	97	0	1228	7.9%
TOTAL	2847	227	0	3074	7.4%

East Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	1697	183	0	1880	9.7%
E/B East of Int	1260	109	0	1369	8.0%
TOTAL	2957	292	0	3249	9.0%

AADT

North Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	5186	546	0	5732	9.5%
N/B North of Int.	6024	651	0	6675	9.8%
TOTAL	11210	1197	0	12407	9.6%

South Link	Brant Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	4353	473	0	4826	9.8%
N/B South of Int.	3662	418	0	4080	10.2%
TOTAL	8015	891	0	8906	10.0%

West Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	2569	195	0	2764	7.1%
W/B West of Int	1693	145	0	1838	7.9%
TOTAL	4262	340	0	4602	7.4%

East Link	Caroline Street				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	2540	274	0	2814	9.7%
E/B East of Int	1886	163	0	2049	8.0%
TOTAL	4426	437	0	4863	9.0%

Road		AADT Estimates			2019	Growth	2032	% Commercial		
		AM	PM	12-Hour	AADT	Rate	AADT	Total	Med	Heavy
Brant	N	9460	11890	12407	11252	1.5%	13655	9.6%	5.2%	4.4%
	S	6259	8410	8906	7858	1.5%	9536	10.0%	5.4%	4.6%
Caroline	W	3949	5090	4602	4547	1.5%	5518	7.4%	4.0%	3.4%
	E	3894	5270	4863	4676	1.5%	5674	9.0%	4.9%	4.1%

O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	PWL/2 (dBA)	Source Height, s (m)
Brant Street, N of Caroline	Daytime Impacts	50	16	12290	94.7%	5.2%	4.4%	11644	640	545	0	0.00	**82.5**	**79.5**	**1.4**
Brant Street, S of Caroline	Daytime Impacts	50	16	8583	94.6%	5.4%	4.6%	8115	464	395	0	0.00	**81.1**	**78.1**	**1.4**
Caroline Street, W of Brant	Daytime Impacts	50	16	4966	96.0%	4.0%	3.4%	4766	198	169	0	0.00	**77.7**	**74.7**	**1.3**
Caroline Street, E of Brant	Daytime Impacts	50	16	5107	95.1%	4.9%	4.1%	4857	248	211	0	0.00	**78.5**	**75.5**	**1.4**
Brant Street, N of Caroline	Nighttime Impacts	50	8	1366	94.7%	5.2%	4.4%	1294	71	61	0	0.00	**76.0**	**73.0**	**1.4**
Brant Street, S of Caroline	Nighttime Impacts	50	8	954	94.6%	5.4%	4.6%	902	52	44	0	0.00	**74.6**	**71.6**	**1.4**
Caroline Street, W of Brant	Nighttime Impacts	50	8	552	96.0%	4.0%	3.4%	530	22	19	0	0.00	**71.2**	**68.2**	**1.3**
Caroline Street, E of Brant	Nighttime Impacts	50	8	567	95.1%	4.9%	4.1%	540	28	23	0	0.00	**72.0**	**69.0**	**1.4**

Note:
PWL Values above are noise emission rates used in additional noise modelling, and not predicted sound levels at the development.
For those levels, see the report text and figures.

STAMSON 5.0 NORMAL REPORT Date: 12-11-2020 18:55:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 535b.te Time Period: Day/Night 16/8 hours
Description: 535 Brant W-C Facade NW Corner

Road data, segment # 1: Brant NB (day/night)

Car traffic volume	: 5552/617	veh/TimePeriod
Medium truck volume	: 320/36	veh/TimePeriod
Heavy truck volume	: 273/30	veh/TimePeriod
Posted speed limit	: 50	km/h
Road gradient	: 0	%
Road pavement	: 1	(Typical asphalt or concrete)

Data for Segment # 1: Brant NB (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 15.00 / 15.00	m
Receiver height	: 8.00 / 8.00	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Brant SB (day/night)

Car traffic volume	: 5552/617	veh/TimePeriod
Medium truck volume	: 320/36	veh/TimePeriod
Heavy truck volume	: 273/30	veh/TimePeriod
Posted speed limit	: 50	km/h
Road gradient	: 0	%
Road pavement	: 1	(Typical asphalt or concrete)

Data for Segment # 2: Brant SB (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 19.00 / 19.00	m
Receiver height	: 8.00 / 8.00	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Brant NB (day)

Source height = 1.45 m

ROAD (0.00 + 64.43 + 0.00) = 64.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.43	0.00	0.00	0.00	0.00	0.00	0.00	64.43

Segment Leq : 64.43 dBA

Results segment # 2: Brant SB (day)

Source height = 1.45 m

ROAD (0.00 + 63.40 + 0.00) = 63.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.43	0.00	-1.03	0.00	0.00	0.00	0.00	63.40

Segment Leq : 63.40 dBA

Total Leq All Segments: 66.96 dBA

Results segment # 1: Brant NB (night)

Source height = 1.45 m

ROAD (0.00 + 57.87 + 0.00) = 57.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.87	0.00	0.00	0.00	0.00	0.00	0.00	57.87

Segment Leq : 57.87 dBA

Results segment # 2: Brant SB (night)

Source height = 1.45 m

ROAD (0.00 + 56.85 + 0.00) = 56.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.87	0.00	-1.03	0.00	0.00	0.00	0.00	56.85

Segment Leq : 56.85 dBA

Total Leq All Segments: 60.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.96
(NIGHT): 60.40

BPN 56 Calculation Procedure - Required Glazing STC Rating (Fixed Veneer)

Location	Room		Sound Levels				Room / Façade Inputs									Source Inputs			Veneer - Component 1							Glazing - Component 2					
			Façade Sound Level:	Free - field Correction:	Required Indoor Sound Level:	Required Noise Reduction:	Glazing as % of Wall Area	Exposed Wall Height (m)	Exposed Wall Length (m)	Room Depth (m)	Total Floor Area	Veneer Wall Area	Glazing Wall Area	Veneer as % of Floor Area:	Glazing as % of Floor Area:	Room Absorption:	Incident Sound Angle:	Angle Correction Factor:	Spectrum type:	Assumed Veneer STC	Component Category:	Room Correction	Frequency Correction	Sound Energy Correction	% Total Transmitted Energy	Component Category:	Room Correction	Frequency Correction	% Total Transmitted Energy	Sound Energy Correction	Require Glazing STC
			(dBA)	(dBA)	(dBA)	(dBA)					(m^2)	(m^2)	(m^2)	(%)	(%)		(deg)			(STC)					(%)				(%)		(STC)
DAYTIME																																
Dev Flr 2,3 - N	LR		63	3	45	21	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	17	5	C. sealed thin window, or openable thick window	-2	4	95	0	**23**
Dev Flr 2,3 - E	LR		47	3	45	5	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	33	5	C. sealed thin window, or openable thick window	-2	4	95	0	**7**
Dev Flr 2,3 - S	LR		62	3	45	20	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	18	5	C. sealed thin window, or openable thick window	-2	4	95	0	**22**
Dev Flr 2,3 - W	LR		67	3	45	25	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	13	5	C. sealed thin window, or openable thick window	-2	4	95	0	**27**
Dev Flr 4-25 - N	LR		60	3	45	18	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	20	5	C. sealed thin window, or openable thick window	-2	4	95	0	**20**
Dev Flr 4-25 - E	LR		49	3	45	7	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	31	5	C. sealed thin window, or openable thick window	-2	4	95	0	**9**
Dev Flr 4-25 - S	LR		61	3	45	19	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	19	5	C. sealed thin window, or openable thick window	-2	4	95	0	**21**
Dev Flr 4-25 - W	LR		64	3	45	22	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	16	5	C. sealed thin window, or openable thick window	-2	4	95	0	**24**
																				40											
Dev Flr 2,3 - N	BR		56	3	45	14	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	22	5	C. sealed thin window, or openable thick window	-5	4	95	0	**13**
Dev Flr 2,3 - E	BR		41	3	45	-1	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	37	5	C. sealed thin window, or openable thick window	-5	4	95	0	**-2**
Dev Flr 2,3 - S	BR		56	3	45	14	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	22	5	C. sealed thin window, or openable thick window	-5	4	95	0	**13**
Dev Flr 2,3 - W	BR		60	3	45	18	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	18	5	C. sealed thin window, or openable thick window	-5	4	95	0	**17**
Dev Flr 4-25 - N	BR		54	3	45	12	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	24	5	C. sealed thin window, or openable thick window	-5	4	95	0	**11**
Dev Flr 4-25 - E	BR		43	3	45	1	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	35	5	C. sealed thin window, or openable thick window	-5	4	95	0	**0**
Dev Flr 4-25 - S	BR		54	3	45	12	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	24	5	C. sealed thin window, or openable thick window	-5	4	95	0	**11**
Dev Flr 4-25 - W	BR		58	3	45	16	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	20	5	C. sealed thin window, or openable thick window	-5	4	95	0	**15**
NIGHT-TIME																																
Dev Flr 2,3 - N	LR		63	3	40	26	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	12	6	C. sealed thin window, or openable thick window	-2	4	94	0	**28**
Dev Flr 2,3 - E	LR		47	3	40	10	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	28	5	C. sealed thin window, or openable thick window	-2	4	95	0	**12**
Dev Flr 2,3 - S	LR		62	3	40	25	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	13	5	C. sealed thin window, or openable thick window	-2	4	95	0	**27**
Dev Flr 2,3 - W	LR		67	3	40	30	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	8	16	C. sealed thin window, or openable thick window	-2	4	84	1	**33**
Dev Flr 4-25 - N	LR		60	3	40	23	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	15	5	C. sealed thin window, or openable thick window	-2	4	95	0	**25**
Dev Flr 4-25 - E	LR		49	3	40	12	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	26	5	C. sealed thin window, or openable thick window	-2	4	95	0	**14**
Dev Flr 4-25 - S	LR		61	3	40	24	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	14	5	C. sealed thin window, or openable thick window	-2	4	95	0	**26**
Dev Flr 4-25 - W	LR		64	3	40	27	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Hard	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-5	7	11	8	C. sealed thin window, or openable thick window	-2	4	92	0	**29**
Dev Flr 2,3 - N	BR		56	3	40	19	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	17	5	C. sealed thin window, or openable thick window	-5	4	95	0	**18**
Dev Flr 2,3 - E	BR		41	3	40	4	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	32	5	C. sealed thin window, or openable thick window	-5	4	95	0	**3**
Dev Flr 2,3 - S	BR		56	3	40	19	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	17	5	C. sealed thin window, or openable thick window	-5	4	95	0	**18**
Dev Flr 2,3 - W	BR		60	3	40	23	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	13	5	C. sealed thin window, or openable thick window	-5	4	95	0	**22**
Dev Flr 4-25 - N	BR		54	3	40	17	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	19	5	C. sealed thin window, or openable thick window	-5	4	95	0	**16**
Dev Flr 4-25 - E	BR		43	3	40	6	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	30	5	C. sealed thin window, or openable thick window	-5	4	95	0	**5**
Dev Flr 4-25 - S	BR		54	3	40	17	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	19	5	C. sealed thin window, or openable thick window	-5	4	95	0	**16**
Dev Flr 4-25 - W	BR		58	3	40	21	40%	3.0	3.0	3.0	9.0	5.4	3.6	60	40	Very Absorptive	0 - 90	0	D. mixed road traffic, distant aircraft	40	D. sealed thick window, or exterior wall, or roof/ceiling	-3	7	15	5	C. sealed thin window, or openable thick window	-5	4	95	0	**20**

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APPENDIX C
STATIONARY NOISE MODELLING INPUTS

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Point Sources

Name	M.	ID	Result. PWL			Lw / Li		Correction				Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value	norm. dB(A)	Day dB(A)	Evening dB(A)	Night dB(A)	R	Area (m²)		Day (min)	Special (min)	Night (min)	(dB)	(Hz)		(m)		X (m)	Y (m)	Z (m)
ACC 1 - High speed op		ACC1_cont	91.3	91.3	91.3	Lw	CVX3_high	91.3	0	0	0				30	30	15	0		(none)	1.2	g	597159.32	4798119.86	6.7
ACC 1 - Low speed operation		ACC1_cont	83.3	83.3	83.3	Lw	CVX3_low	83.3	0	0	0				30	30	45	0		(none)	1.2	g	597159.15	4798119.68	6.7
ACC 2 - high speed op		ACC2_cont	91.3	91.3	91.3	Lw	CVX3_high	91.3	0	0	0				30	30	15	0		(none)	1.2	g	597161.08	4798122.22	6.7
ACC 2 - Low speed op		ACC2_cont	83.3	83.3	83.3	Lw	CVX3_low	83.3	0	0	0				30	30	45	0		(none)	1.2	g	597160.92	4798122.05	6.7
Bell ACC - high speed op		ACCBell_cont	91.3	91.3	91.3	Lw	CVX3_high	91.3	0	0	0				30	30	15	0		(none)	1.2	g	597243.88	4797964.43	8.2
Bell ACC - high speed op		ACCBell_cont	89.3	89.3	89.3	Lw	CVX3_high	89.3	0	0	0				30	30	15	0		(none)	1.2	g	597239.2	4797961.68	8.2
Bell ACC - high speed op		ACCBell_cont	88.3	88.3	88.3	Lw	CVX3_high		0	0	0				30	30	15	0		(none)	1.2	g	597236.94	4797940.31	8.2
Bell ACC - high speed op		ACCBell_cont	86.6	86.6	86.6	Lw	CVX3_high	86.6	0	0	0				30	30	15	0		(none)	1.2	g	597234.16	4797938.01	8.2
Bell ACC - high speed op		ACCBell_cont	86.6	86.6	86.6	Lw	CVX3_high	86.6	0	0	0				30	30	15	0		(none)	1.2	g	597241.47	4797932.2	8.2
Bell ACC - Low speed op		ACCBell_cont	83.3	83.3	83.3	Lw	CVX3_low	83.3	0	0	0				30	30	45	0		(none)	1.2	g	597243.99	4797964.26	8.2
Bell ACC - Low speed op		ACCBell_cont	81.3	81.3	81.3	Lw	CVX3_low	81.3	0	0	0				30	30	45	0		(none)	1.2	g	597239.31	4797961.59	8.2
Bell ACC - Low speed op		ACCBell_cont	80.3	80.3	80.3	Lw	CVX3_low		0	0	0				30	30	45	0		(none)	1.2	g	597237.07	4797940.2	8.2
Bell ACC - Low speed op		ACCBell_cont	78.6	78.6	78.6	Lw	CVX3_low	78.6	0	0	0				30	30	45	0		(none)	1.2	g	597234.2	4797937.94	8.2
Bell ACC - Low speed op		ACCBell_cont	78.6	78.6	78.6	Lw	CVX3_low	78.6	0	0	0				30	30	45	0		(none)	1.2	g	597241.56	4797932.31	8.2
Garbage Compactor		Compactor_cont	77	77	77	Lw	GarbageCompact		0	0	0				15	0	0	0		(none)	1	g	597171.2	4798107.57	1
Garbage Compactor		Compactor_cont	77	77	77	Lw	GarbageCompact		0	0	0				15	0	0	0		(none)	1	g	597169.45	4798105.21	1
HVAC 1		HVAC1_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	4.75	a	597152.67	4798085.05	4.75
HVAC 2		HVAC2_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	4.75	a	597168.27	4798083.96	4.75
HVAC 3		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	4.75	a	597160.78	4798094.17	4.75
HVAC001		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597121.09	4798137.02	3.75
HVAC002		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597122.6	4798126.58	4.75
HVAC003		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597110.13	4798143.62	3.75
HVAC004		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597091.76	4798156.81	3.75
HVAC005		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597091.82	4798162.64	3.75
HVAC006		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597084.79	4798149.01	3.75
HVAC007		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597091.16	4798149.88	3.75
HVAC008		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597090.51	4798144.49	3.75
HVAC009		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597076.77	4798157.41	6.75
HVAC010		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597072.69	4798154.52	6.75
HVAC011		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597067.67	4798150.54	6.75
HVAC012		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597063.75	4798154.3	6.75
HVAC013		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597077.59	4798166.73	6.75
HVAC014		HVAC1_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597187.28	4797992.64	4.25
HVAC014		HVAC1_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597191.08	4797978.22	7.25
HVAC014		HVAC1_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597241.79	4797952.87	7.75
HVAC014		HVAC1_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597245.82	4797957.78	7.75
HVAC014		HVAC1_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597196.14	4797893.44	4.75
HVAC015		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597180.82	4797986.67	7.25
HVAC015		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597196.56	4797978.45	7.25
HVAC015		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597209.83	4797954.83	7.25
HVAC015		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597211.27	4797953.68	7.25
HVAC015		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597215.98	4797952.27	7.25
HVAC015		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597212.89	4797952.25	7.25
HVAC016		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597175.16	4797982.89	7.25
HVAC017		HVAC3_cont	85.5	85.5	85.5	Lw	HVAC_10ton		0	0	0				45	45	15	0		(none)	0.75	g	597105.12	4798147.27	3.75
HVAC018		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597095.09	4798146.4	3.75
HVAC019		HVAC3_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597096.34	4798145.69	3.75
HVAC020		HVAC1_cont	82.5	82.5	82.5	Lw	HVAC_5ton		0	0	0				45	45	15	0		(none)	0.75	g	597189.93	4797997.24	4.25
Kitchen Exhaust		Exh_cont	85	85	85	Lw	EF_Kitchen		0	0	0				60	60	0	0		(none)	1.2	g	597107.85	4798151.06	4.2
Kitchen Exhaust		Exh_cont	85	85	85	Lw	EF_Kitchen		0	0	0				60	60	0	0		(none)	1.2	g	597188.06	4797999.23	4.7
Kitchen Exhaust		Exh_cont	85	85	85	Lw	EF_Kitchen		0	0	0				60	60	0	0		(none)	1.2	g	597203.22	4797978.61	7.7
Kitchen Exhaust		Exh_cont	85	85	85	Lw	EF_Kitchen		0	0	0				60	60	0	0		(none)	1.2	g	597218.16	4797953.12	7.7
Reefer Unit		reefer_cont	101.9	101.9	101.9	Lw	reefer_lrg		0	0	0				60	60	0	0		(none)	2	g	597147.18	4798143.32	2

Line Sources

Name	M.	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Result. PWL' Day (dBA)	Result. PWL' Evening (dBA)	Result. PWL' Night (dBA)	Lw / Li Type	Lw / Li Value	Correction norm. dB(A)	Correction Day dB(A)	Correction Evening dB(A)	Correction Night dB(A)	Sound Reduction R	Sound Reduction Area (m²)	Attenuation Day (min)	Attenuation Special (min)	Attenuation Night (min)	Operating Time	K0 (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Moving Pt. Src Number Evening	Moving Pt. Src Number Night	Moving Pt. Src Speed (km/h)
Brant Street S of Caroline - NB	~	brant_avg	100.8	22.7	94.3	78.1	0	71.6	Lw'	roadway	0	78.1	0	71.6							0		(none)				
Brant Street S of Caroline - SB	~	brant_avg	100.8	22.7	94.3	78.1	0	71.6	Lw'	roadway	0	78.1	0	71.6							0		(none)				
Brant Street N of Caroline, NB	~	brant_avg	105.1	25.6	98.6	79.5	0	73	Lw'	roadway	0	79.5	0	73							0		(none)				
Brant Street N of Caroline, SB	~	brant_avg	105.1	25.6	98.6	79.5	0	73	Lw'	roadway	0	79.5	0	73							0		(none)				
Caroline Street W of Brant WB	~	caroline_avg	96.7	22	90.2	74.7	0	68.2	Lw'	roadway	0	74.7	0	68.2							0		(none)				
Caroline Street W of Brant EB	~	caroline_avg	96.7	22	90.2	74.7	0	68.2	Lw'	roadway	0	74.7	0	68.2							0		(none)				
Caroline Street E of Brant WB	~	caroline_avg	99.6	24.1	93.1	75.5	0	69	Lw'	roadway	0	75.5	0	69							0		(none)				
Caroline Street E of Brant EB	~	caroline_avg	99.4	23.9	92.9	75.5	0	69	Lw'	roadway	0	75.5	0	69							0		(none)				

Library

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
BPN56 spectrum D (Roadway, Distant Aircraft)	roadway	Lw		-6	-5	-4	-6	-8	-9	-12	-20	-28	-4.6	2	BPN56
HVAC Unit (5 ton)	HVAC_5ton	Lw		77	80	81	81	80	78	74	70	64	82.5	87.8	H&K calc, adj against Man Data Avg
HVAC Unit (10 ton)	HVAC_10ton	Lw		80	83	84	84	83	81	77	73	67	85.5	90.8	H&K calc, adj against Man Data Avg
Large Reefer Truck - front	reefer_lrg	Lw		97.3	112.1	101.9	103.7	99.7	94.7	93.5	89.4	80.4	101.9	113.5	historical data from Ice Cream Facility
Kitchen Exhaust Fan	EF_Kitchen	Lw		0	83	93	88	82	77	75	69	66	85	94.9	historical data (SQUad, 12-0101)
Garbage Compactor	GarbageCompact	Lw		0	87	80	73	71	70	71	69	60	77	88.2	HGC Data
Refplus CVX 1x3, high speed	CVX3_high	Lw		81	82	83	84	81	83	83	79	72	88.3	91.3	Refplus datasheet, shaped spectrum
Refplus CVX 1x3, low speed	CVX3_low	Lw		73	74	75	76	73	75	75	71	64	80.3	83.3	Refplus datasheet, shaped spectrum

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