2243-2269 Fairview Street & 864 Drury Lane Development Phase 1

Environmental Noise and Vibration Study
Version 2

SLR Project No: 241.18239.A0000
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ENVIRONMENTAL NOISE & VIBRATION ASSESSMENT

2243-2269 Fairview Street & 864 Drury Lane, Phase 1
Version 2
Burlington, ON, L7T 4A8
SLR Project No: 241.18239.A0000

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1.0 INTRODUCTION

SLR Consulting (Canada) Ltd. ("SLR"), was retained by CLV Group Inc. to conduct an Environmental Noise and Vibration Assessment for Phase 1 of the proposed 2243-2269 Fairview Street and 86 Drury Lane development (site), located in Burlington, Ontario.

SLR previously completed an Environmental Noise and Vibration Assessment Report, dated January 9, 2020, in support of the first Site Plan Approval submission. Comments were received from the City of Burlington, Halton Region, and Metrolinx. Responses to the comments were provided in a letter dated October 23, 2020, a copy of which is included in Appendix A. Additional comments were subsequently received on September 16, 2021. Additional conversations between SLR staff and City reviewers took place on October 28, 2021. Responses to these comments are also provided in Appendix A.

This updated assessment is intended to document our response to City comments and provides updated/ additional analyses where required.

Please note that a separate Construction Vibration Study has been completed as part of a separate report.

1.1 Focus of Report

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 nearby roadways and railways;
- Railway vibration impacts from the adjacent rail line; and
- Stationary noise impacts from adjacent commercial and industrial properties.

1.2 Nature of Subject Lands

The proposed development is located on the north side of Fairview Street, in the northwest corner of the Fairview Street / Drury Lane intersection. The site is currently occupied by various commercial buildings, including an indoor greenhouse, a brewery, and an automotive repair facility. The proposed overall development consists of four buildings (Buildings A – D) with above ground parking, a park located in the southwestern corner of the site, and retail space located on the ground floors of all four buildings. Buildings B, C and D each consist of two towers with a maximum height of 38 storeys (Building C2) while Building A consists of one tower at a height of 33 storeys.

This report assesses Phase 1of the development plan. Phase one includes one building comprised of Towers C1 and C2 which are 34- and 38-storey towers respectively, joined by a 4-storey podium (Podium C).

There is one communal outdoor amenity area in Phase 1 of the development buildings of the development. It is located at level 5 on top of podium C, between Building C1 and Building C2.

A context plan can be found in Figure 1. Excerpts from the site plan are provided in Figure 1c and in Appendix B.

1.3 Nature of Surroundings

Immediately surrounding the site is the Lakeshore West GO Transit Rail Line to the north, low-rise commercial buildings to the east and south, and a car dealership to the west. Automotive repair shops are also located to the east, on the other side of Drury Lane. Beyond the immediate surroundings there are residential areas to the north and south, commercial buildings to the east, the Burlington GO Station to the west and industrial facilities to the northwest. The Queen Elizabeth Way (QEW) is located approximately 560 m north of the proposed development.

A context plan of the site and surroundings is shown in Figure 1a. A zoning map of the area is provided in Figure 1c.

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:

1) Transportation noise impacts from the QEW, Fairview Street and Drury Lane;
2) Transportation noise impacts from the GO, Freight and Passenger trains along the railway line north of the site;
3) Transportation vibration impacts from GO, Freight and Passenger trains along the railway line;
4) Stationary noise from surrounding industries.

2.0 TRANSPORTATION NOISE IMPACTS

In evaluating transportation noise impacts on the proposed development, as a worst-case assumption Phase 1 (Building C) alone has been modelled (the other development buildings, which may provide future screening of road and tail noise, were excluded).

2.1 Transportation Noise Sources

Under the applicable guidelines (see Section 2.2), roadways with significant traffic volumes within 500m of the site, and railways within 300 m of the site, must be assessed. Roadways and railways at farther distances will generally not adversely affect the development.

Transportation noise sources of interest with the potential to produce roadway and railway noise at the proposed development are:

- Fairview Street;
- Drury Lane; and
- Railway activity (including GO, CN Freight and Passenger trains).

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

Roadways, such as Guelph Line and Brant Street are located approximately 800 m from the development site, and well outside of the maximum allowable input for road traffic noise modelling software (e.g., MECP STAMSON). Given the number of intervening buildings, and large separation distance, Guelph Line and Brant Street would not impact the development.

The QEW is also located at a distance of approximately 600m, and also outside of the maximum allowable input for STAMSON modelling software. Given the large separation distance and the absorptive intervening ground, roadway impacts from QEW are not expected to significantly impact the development.

The closest significant airports include the John C Munro Hamilton international Airport and the Toronto Pearson International Airport. The proposed development is located well outside of the airport NEF 25 noise contours. Additional aircraft noise assessment is not required.

2.2 Surface Transportation Noise Criteria

2.2.1 MECP Publication NPC-300

2.2.1.1 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 summarize the applicable surface transportation (road and rail) criteria limits.

2.2.1.2 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	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	Daytime (0700-2300h)	45	40	Indoors
	Night-time (2300-0700h)	45	40	Indoors
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors
	Night-time (2300-0700h)	40	35	Indoors

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

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

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

Time Period	Sound Exposure 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

2.2.1.3 Ventilation and Warning Clauses

Table 3 summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where required, if sound exposure levels exceed the guideline limits in Table 1, warning clauses advising future occupants of the potential excesses are required. Warning clauses are discussed further in Section 2.4.2.

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

Assessment Location	Time Period	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.

Table 4 provides sound level thresholds which, if exceeded require the building shell and components (i.e., wall, windows) to be designed to ensure that the Table 3 and 4 indoor sound criteria are met.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	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.

2.2.2 Halton Region

The Halton Region guidelines include the Noise Abatement Guidelines – Regional Official Plan Guidelines and the Land Use Compatibility Guidelines – Regional Official Plan Guidelines, both dated June 18, 2014.

Halton Region's Noise Abatement Guidelines (NAG) were developed to provide an overview of the approved policy and outlines implementation processes for Existing Residential Development, Regional Capital Road projects and New Developments. The applicable portion of the NAG for this assessment is Section 4.0 – New Development.

In general, the Halton Region guidelines are consistent with the MECP NPC-300 guidelines. Differences include the requirement to consider mature-state-of-development traffic volumes to be analyzed; and noise barrier limitations of a 3.5 m maximum and recommended minimum height of 2.4 m. In addition, elevated OLAs are excluded from the Halton Region noise guidelines.

2.2.3 City of Burlington

In general, the City of Burlington follows the MECP NPC-300 and Halton Region NAG guidelines for noise, with the exception of the Common Amenity Space requirements.

Common amenity spaces are required to be assessed, regardless of being elevated, by the City of Burlington. Additionally, the 60 dBA limit + warning clause may be acceptable under NPC-300 for an amenity space, however, excesses of 55 dBA are generally not acceptable to City Staff.

2.2.4 Railway Association of Canada/ Federation of Canadian Municipalities Guidelines

Both CN and Metrolinx have adopted the guidelines for development in proximity to railway corridors published by the Railway Association of Canada/ Federation of Canadian Municipalities ("RAC/FCM"). The CN Oakville Subdivision is classified as a Principal Main Line. Accordingly, the applicable RAC/FCM guideline limits are presented below.

Table 5: RAC/FCM Sound Level Criteria for Rail Noise

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

2.2.5 Guidelines Adopted in the Assessment

The most stringent of the above criteria have been adopted in this assessment.

2.3 Traffic Data and Future Projections

2.3.1 Roadway Traffic Data

Traffic volumes for Fairview Street and Drury Lane were provided by the City of Burlington. Discussions were held with City Transportation Department staff to determine the best approach to determine "future mature-state-of-development" volumes.

Data was provided in the form of PM peak hour turning movements. The percentage of vehicle splits were determined from the turning movement counts. Annual Average Daily Traffic ("AADT") volumes were estimated by multiplying the PM peak data by 10, consistent with normal urban traffic distributions.

A conservative growth rate of 2.0 % was then applied to predict future traffic volumes. Traffic data was projected to a 2041 future year, which is understood to be representative of the future mature-state-of-development requirement.

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

Table 6: Summary of Road Traffic Data Used in the Transportation Analysis

Roadway Link	2041 Traffic Volumes (AADT)	% Day/ Night Volume Split [3]		Commercial Traffic Breakdown		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
Fairview Street	45,158	92	8	0.3	0.5	60
Drury Lane North of Fairview St	1438	92	8	0.0	0.0	40
Drury Lane South of Fairview St	10,033	92	8	0.2	0.0	40

Notes: [1] The Day/Night split was determined from historic data at SLR for Freeways

2.3.2 Rail Traffic Data

Rail traffic data was obtained directly from CN and Metrolinx. Existing train volumes were provided by CN. In keeping with RAC/FCM and CN requirements, an annual growth rate of 2.5% was applied to the CN rail data to forecast volumes for a 2031 design year.[1]

Metrolinx provided future forecast data directly, with no additional adjustments required[2]. The Metrolinx data provided includes both the future electrification of the system and increased service (frequency) of trains. Both electric and diesel volumes were provided however, consistent with Metrolinx' current requirements, all trains were conservatively modelled as diesel units.

No whistle crossings were identified in the area.

The rail traffic data used in the assessment is summarized in the Table 7 and included in Appendix C.

Table 7: Summary of Rail Traffic Data Used in the Transportation Analysis

Rail Line	Train Type	Typical No. of Engines Per Train	No. of Cars Per Train	No of Trains		Maximum Speed (km/h)
				Daytime (7am to 11pm)	Night-time (11pm to 7am)	
CN Trains	Passenger	2	10	18	0	145
CN Trains	Freight	4	140	6	3	97
Metrolinx	GO (diesel/electric)	1	12	238	35	152

2.4 Projected Sound Levels

Future road traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions were validated and are equivalent to those made using the MECP's ORNAMENT or STAMSON v5.04 road traffic noise models. A STAMSON validation file is included in Appendix C.

Rail operation sound levels at the proposed development were predicted using the U.S. Department of Transportation Federal Transit Administration ("FTA") and Federal Railway Administration ("FRA") rail noise modelling algorithms included in the Cadna/A software. The FTA/FRA algorithms are the replacement models for the former MECP "STEAM" model and are written into the current draft version of MECP Publication NPC-306, which will replace the current NPC-206 guideline on transportation noise prediction. The FTA/FRA algorithms have been used in

[1] Data received in 2018 was used. See Appendix C. CN was contacted to confirm the applicability of the data.

[2] Data was received in January 2021. See Appendix C.

numerous Environmental Assessments ("EAs") for Metrolinx and CN railway projects, as well as in numerous land use planning projects across the province.

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.

Changes in ground elevation contours for the surrounding area were included in the modelling using topography from the City of Burlington Open Data files.

As a conservative assessment, ground absorption was set to G=0 (Reflective) by default with residential neighborhoods set to G=1 (Absorptive).

2.4.1 Façade Sound Levels

The façade sound levels were predicted at all noise sensitive spaces within the proposed development. The worst-case façade sound levels for each façade are presented in Table 8. The transportation façade sound levels of the development, showing the ranges of predicted daytime and night-time sound levels are shown in Figure 3 for combined road and rail impacts. As façade sound levels are predicted to be above 65 dBA during the day and 60 dBA at night for railway noise, an assessment of building components is required for the development.

Table 8: Summary of Transportation Facade Sound Levels

Building	Façade [1]	Roadway Sound Levels		Railway Sounds Levels		Combined Road & Rail	
		L_{eq} Day (dBA)	L_{eq} Night (dBA)	L_{eq} Day (dBA)	L_{eq} Night (dBA)	L_{eq} Day (dBA)	L_{eq} Night (dBA)
Tower C1	North	45	37	71	68	71	68
	East	58	50	68	64	68	64
	South	61	53	57	53	62	56
	West	58	51	68	64	68	64
Tower C2	North	44	37	71	68	71	68
	East	59	51	68	64	69	64
	South	61	53	57	54	62	57
	West	58	50	68	64	68	64
Building C Podium	East	59	51	64	61	65	61
	South	61	53	58	55	63	57
	West	58	51	66	63	67	63

Notes: [1] Sound Levels shown are the maximums along the facade and are not necessarily for the same location for the various source types.

2.4.2 Glazing Requirements

Based on the sound levels shown in Table 8, façade sound levels were predicted to exceed the applicable criteria at multiple locations throughout the development. Therefore, an assessment

of glazing requirements is necessary for meeting the indoor sound level requirements outlined in Table 1.

Indoor sound levels and required facade Sound Transmission Classes (STCs) were estimated using the procedures outlined in National Research Council Building Practice Note BPN-56.

Floor plates and elevation drawings were reviewed to determine room sizes and wall and window sizes for use in the calculations. The non-glazing portion of walls were assumed to have a rating of STC 45 for all locations, typical for spandrel panel wall constructions.

The acoustic requirements are provided below in Table 9, which is the STC rating taking into consideration roadway noise and railway noise and the assumptions listed in the previous section.

The combined glazing and frame assembly must be designed to ensure the overall sound isolation performance for the entire window unit meets the sound isolation requirements. It is recommended window manufacturers test data be reviewed to confirm acoustical performance is met.

Table 9: Façade Sound Transmission Class (STC) Requirements

Building	Façade [1]	Non-Glazing Component	Glazing Requirements	
			Living Room	Bedroom
Building C1 - Tower	North	45	30	36
	East	45	OBC (28)	32
	South	45	OBC (16)	OBC (23)
	West	45	OBC (27)	32
	North Corners	45	33	N/A
	South Corners	45	31	N/A
Building C2 - Tower	North	45	30	36
	East	45	OBC (28)	32
	South	45	OBC (16)	OBC (23)
	West	45	OBC (27)	32
	North Corners	45	33	N/A
	South Corners	45	31	N/A
Building C Podium	East	45	OBC (23)	OBC (29)
	South	45	OBC (19)	OBC (24)
	West	45	OBC (26)	31
	North Corners	45	OBC (29)	N/A
	South Corners	45	OBC (29)	N/A

Notes: [1] OBC = wall and window constructions meeting the minimum structural and thermal requirements of the Ontario Building Code (equivalent to a glazing element with a rating of STC 29).

2.4.3 Outdoor Living Area Sound Levels

There is a major communal outdoor amenity area planned for the rooftop of the parking podium along the north side of the building, and a smaller communal area to the south, as shown in Figure 3.

There are additional private terraces at Levels 2 and 4, and numerous private balconies. Under MECP NPC-300 noise guidelines for transportation noise, private balconies and terraces are only considered to be points of reception if they are 4 m in depth or greater, and if there are no communal amenity areas provided (i.e., they are the only outdoor living area for the occupant). As communal amenity spaces are provided, the private balconies and terraces do not need to be considered in the assessment.

The small 4th floor outdoor amenity area at the south façade of the development is less than 4 m in depth, and therefore assessment is not required at this location. Landscaped areas at grade are considered to be publicly accessible and have not been included as an communal amenity spaces in this assessment.

The remaining area requiring assessment is major communal outdoor amenity area planned for the rooftop of the parking podium along the north side of the building. The assessment location and the predicted road and rail noise impacts are shown in Figure 3, and represent proposed seating areas. Results are summarized for the seating areas in the following table:

Table 10: Summary of Predicted Outdoor Living Area Sound Levels

Location	Description	Transportation Noise Levels L_{eq} Day (dBA)	Applicable Guideline Limit L_{eq} Day (dBA)	Meets Criteria? (Yes/No)
OLA 1	Floor 4, Seating Areas, North Side of Building	60.8 to 61.1	55	No

Sound levels are predicted to be above 55 dBA for the outdoor amenity space; therefore, an assessment noise control measures is required.

2.4.4 Acoustic Barrier Requirements

An assessment of noise barriers was completed for OLA1. Barriers along the perimeter of the outdoor amenity space were assessed. The recommended noise barrier location is shown in Figure 4. The following table summarizes the predicted OLA sound levels with acoustic barriers at different heights.

Table 11: Summary of OLA Noise Barrier Modelling Results

Building Section	Barrier Location	Perimeter Barrier Height (m)	Transportation Noise Levels L_{eq} Day (dBA)	Change in Noise Attenuation (dB)
Podium C Main Rooftop	Level 4 Perimeter (see Figure 4)	0	60.8 to 61.1	--
		1.1 (OBC Minimum)	58.1 to 59.1	1.9 to 2.7
		2.0	58.1 to 59.0	2.0 to 2.7
		3.0	58.1 to 59.0	2.0 to 2.7
		....	...	...
		10.0	58.1 to 58.9	2.1 to 2.7

As shown in Table 11, barriers much great than 10 m in in height would be required to mitigate sound levels for outdoor living areas to meet the 55 dBA sound level limit, which is not considered technically feasible or practical, due to structural limitations and maintenance concerns for acoustic barriers on elevated structures.

A maximum height noise barrier of 1.1 m (Ontario Building Code minimum height for railings) is recommended. While the City's goal of 55 dBA at outdoor amenity areas is not met, maximum sound levels in the seating areas will be 58 to 59 dBA, and the MECP "upper limit" of 60 dBA will be met. There are countless developments in the Greater Toronto and Golden Horseshoe Area which experience similar sound levels, with no adverse effects.

The perimeter barriers and localized screening (interior barrier) can be composed of solid walls and glass/ plexiglass panels. The panels should be selected so that they have sufficient mass to adequately attenuate the noise (generally a minimum of 20 kg/m^2 face density). The panels and frames should be free of gaps and cracks on the sides and bottom. The system should also be designed to withstand any wind loading.

2.4.5 Ventilation and Warning Clause Requirements

The requirements regarding warning clauses are summarized in Table 3. Based on the predicted noise sound levels, warning clauses are recommended to 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 clause text can be found in Appendix C.

As physical mitigation will be required for the common outdoor amenity areas, a Type B warning clause is required.

The development will include central air conditioning systems for all units. Window-installed AC systems or "packaged terminal air conditioners (PTACs)" will not be used. A Type D Warning Clause is recommended for all residential units.

CN and Metrolinx Warning Clauses are required for all residential units.

3.0 TRANSPORTATION VIBRATION SOURCES

3.1 Transportation Vibration Criteria

For the assessment of the proposed development the major source of potential vibration is the Passenger and GO trains along the Oakville Subdivision.

3.1.1 Transportation Vibration Guidelines

The Railway Association of Canada / Federation of Canadian Municipalities ("RAC/FCM") have developed *Guidelines for New Development in Proximity to Railway Operations*. The "Proximity Guidelines" have been adopted by CN, CP, and Metrolinx. International Standard ISO 2631-2: 2003 (1989) also provides supplementation criteria for commercial and office space and for industrial buildings.

Table 12: Transportation Vibration Guideline Limits

Train Type	Receptor Type	Limit (mm/s RMS)	Source
Heavy Rail (Freight and Commuter)	Residential	0.14	RAC/FCM, CN, CP, Metrolinx, MECP
	Commercial / Office	0.40	ISO 2631-2: 2003 (1989)
	Industrial	0.80	ISO 2631-2: 2003 (1989)

Notes: Limits are overall vibration levels in the vertical direction, measured in root-mean square ("RMS") values (1-second averaging time), in the frequency range from 4 Hz to 200 Hz.

3.1.2 Vibration Assessment

A site visit was conducted on November 20, 2018, by Novus-SLR staff to conduct measurements of ground-borne vibrations on the proposed site and surrounding lands. Vibration data was recorded at a single location along Drury Lane, that was estimated to be the closest residential structure to the rail line. The measurement location is shown in Figure 5.

Multiple pass-bys of GO trains were measured to quantify the potential impacts at the proposed development. The data were post-processed to compute the 1-second sliding window RMS amplitudes of vibration velocity in units of mm/s.

The maximum vibration level of the measured trains along the Oakville Sub is 0.02 mm/s RMS. This is well below the applicable limits of 0.14 mm/s RMS.

Adjustments based on published guidance from the Federal Transit Administration (FTA) were applied to the measured vibration data, to account for changes in train type (e.g., freight vs. passenger), maximum speed and setback of the closest occupied space. Considering these adjustments, vibration levels from the trains on the Oakville Sub are expected to meet the 0.14 mm/s RMS criterion at the nearest residential locations. Therefore, no vibration mitigation measures are recommended or required.

4.0 STATIONARY SOURCE NOISE IMPACTS

In evaluating stationary noise impacts from off-site sources on the proposed development, as a worst-case assumption Phase 1 (Building C) alone has been modelled (the other development buildings, which may provide future screening of stationary noise sources, were excluded).

4.1 MECP Publication NPC-300 Guidelines for Stationary Noise

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

- Non-impulsive, "continuous" noise sources such as ventilation fans, mechanical equipment, and vehicles while moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound exposures (L_{eq} (1-hr) values), in dBA; and
- Impulsive noise, which is a "banging" type noise characterized by rapid rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (L_{LM}) of the impulses in a one-hour period, in 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 development is considered to be a "Class 1 Urban" area under Publication NPC-300. The following tables set out the exclusion limits from the guideline.

Table 13: NPC-300 Exclusion Limits for Non-Impulsive Sounds (L_{eq} (1-hr), dBA), Class 1 Area

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

Table 14: NPC-300 Exclusion Limits for Impulsive Sounds (L_{LLM}, dBAI), Class 1 Area

Time of Day	No. of Impulses in a 1-hour Period	Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception	Time of Day	No. of Impulses in a 1-hour Period	Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception
7 am to 11 pm	9 or more	50	50	11 pm to 7 am	9 or more	45	n/a
	7 to 8	55	55		7 to 8	50	n/a
	5 to 6	60	60		5 to 6	55	n/a
	4	65	65		4	60	n/a
	3	70	70		3	65	n/a
	2	75	75		2	70	n/a
	1	80	80		1	75	n/a

Notes:

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

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

4.1.1 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.

4.2 Site Visit and Noise Observations

SLR staff completed site visits in On November 20th, 2018, and October 7th, 2021, to the development lands and surrounding area. The surrounding area primarily includes residential and commercial/retail lands, with industrial facilities located to the west (approx. 150 m from the development).

The general ambient environment surrounding the development lands are dominated by roadway noise from the QEW, and Fairview street during all periods of the day. Railway noise along the CN Oakville subdivision is frequent throughout the day and audible within the area surrounding the development lands.

4.3 Facilities of Interest

Industrial and commercial facilities within 1000m of the site were reviewed. The industrial facilities with a potential to impact the development, are summarized in below. Other industrial or commercial were inaudible at the development, and/or are located closer to other existing residences than the proposed development. If the noise guidelines are met at these existing receptors, they will be met at the proposed development.

Facilities currently operating under an approved MECP Certificates of Approval (CofAs), Environmental Compliance Approvals (ECAs) or Environmental Activity and Sector Registrations (EASRs) are identified in the following table. Industries which emit significant levels of contaminants to the environment (including noise) are required to obtain these MECP permits. Only one facility in the immediate area has an MECP permit.

Table 15: Summary of Surrounding Industries with Potential for Noise

Name	Description	Separation Distance (m)	CofA/ECA No.
Leggat Chevrolet Cadillac Buick GMC	Car Dealership	0	-
Bull Moose Tube	Tube manufacturer	220	6419-AXBH6F
Carline muffler	Car Repair Shop	20	-
LifeLabs Medical Laboratory Services	Medical Services	35	-

Note that idling and stopping locomotives at the nearby Metrolinx GO Station are not considered to be "stationary" sources of sound under the Publication NPC-300 guidelines. These sources are addressed under the transportation noise guidelines. Railway traffic on the mainline, traveling at maximum speed, dominate transportation noise emissions.

There are no impulsive noise sources associated with the facilities of interest, and impulsive noise has not been considered further.

4.4 Stationary Source Data

Leggat Chevrolet Cadillac Buick GMC Ltd. – Dealership

Significant noise sources identified during the October 2021 site visit include activity from the automotive shop and the on-site car wash on the northeast corner of the building. Noise from these sources was audible at the west property line of the development. These sources operate during the daytime hours.

Stationary noise sources modelled for the dealership include noise from the automotive shop, car wash, rooftop HVAC units, and make up air units. Source locations are shown in Figure 6. Reference sound levels and additional details regarding noise modelling parameters are included in Appendix E.

Bill Moose Tube – Manufacturer

During the site visit in October 2021, the only significant noise sources audible near the Bull Moose Tube (BMT) property line was on-site truck movement. The facilities operations were observed to be inaudible during all periods of the day at the development lands, due to high ambient noise from nearby roadways. Trucks were assumed to only be active during daytime and evening hours. Stationary noise sources modelled for the BMT facility include movement of heavy trucks on site. Figure 6 shows the locations of the above sources. Appendix E summarizes the reference sound levels and parameters used in the noise modelling.

Carline Muffler – Automotive Repair Shop

During the site visit in October 2021, the only significant noise sources audible from the facility was an angle grinder. Operations of the repair shop are only active during daytime hours. Figure 6 shows the locations of the above sources. Appendix E summarizes the reference sound levels and parameters used in the noise modelling.

LifeLabs – Medical Supplier

No noise was heard from the facility during either site visit, but the large number of rooftop HVAC units have the potential for noise impacts at the site. Impacts from these units are unlikely to be heard on the development site due to high roadway ambient noise from Fairview street.

Stationary noise sources modelled for the facility include rooftop HVAC units, and small mushroom exhaust fans. The locations of these sources are shown in Figure 6, with reference sound levels and modelling parameters summarized in Appendix E.

4.5 Stationary Noise Modeling

The impacts from stationary sources were modelled using Cadna/A, a software implementation of the internationally recognized ISO-9613-2 environmental noise propagation algorithms. Cadna/A / ISO-9613 is the preferred noise model 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 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) by default, with grassy areas set to G = 1(absorptive); and
- Reflection: An order of reflection of 1 was used.

As described in ISO 9613-2, ground factor values that represent the effect of ground absorption on sound levels range between 0 and 1. Based on the specific site conditions, the ground factor values used in the modelling were a ground factor value of 0 for acoustically reflective surfaces, such as asphalt. Large grassy areas are considered to have a ground factor of 1 and included as localized ground absorption in the modelling. Dirt areas considered to be intermediate ground type with an absorption factor of 0.5.

The "building evaluation" feature of the Cadna/A was used to assess noise impacts on the residential portions of the towers. This feature allows for noise levels to be predicted across the entire façade of a structure.

4.5.1 Ambient Sound Levels and Applicable Guideline Limits

Traffic volumes for Fairview Street and Drury Lane were provided by the City of Burlington. Data was provided in the form of PM peak hour turning movements. The percentage of vehicle splits were determined from the turning movement counts. Annual Average Daily Traffic ("AADT") volumes were estimated by multiplying the PM peak data by 10, consistent with normal urban traffic distributions.

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

Table 16: Summary of Road Traffic Data Used in the Ambient Guideline Limit Analysis

Roadway Link	Current Traffic Volumes (AADT)	Percent Traffic in Quietest Hour			Commercial Traffic Breakdown		Vehicle Speed (km/h)
		Daytime	Evening	Night-time	% Medium Trucks	% Heavy Trucks	
Fairview Street	29,410	4.3%	3.1%	0.4%	0.3	0.5	60
Drury Lane North of Fairview St	930	4.3%	3.1%	0.4%	0.0	0.0	40
Drury Lane South of Fairview St	6,490	4.3%	3.1%	0.4%	0.2	0.0	40

Notes: [1] The Day/Night split was determined from historic data at SLR for Freeways

The predicted guideline limits are shown in Figure 7. The values shown are the higher of the predicted sound levels due to road traffic, and the guideline minimums.

4.5.2 Predicted Stationary Noise Façade Levels From Off-Site Sources

A summary of the predicted noise impacts on each façade are shown in Table 16, and Figure 8 for the daytime/evening and night-time periods, respectively.

Table 17: Summary of Off-Site Stationary Noise Levels and Compliance

Building	Façade	Stationary Sound Levels [1]]		Applicable Guideline Limit		Meets Guideline Limits?	
		Day/Eve (dBA)	Night (dBA)	Day/Eve (dBAI)	Night (dBAI)	Day/Eve (Y/N)	Night (Y/N)
Building C Podium	East	49 / 49	35	55 / 54	45	Y / Y	Y
	South	48 / 48	44	58 / 56	47	Y / Y	Y
	West	54 / 48	44	55 / 53	45	Y / Y	Y
Tower C1	North	45 / 41	25	50 / 50	45	Y / Y	Y
	East	40 / 40	37	54 / 53	45	Y / Y	Y
	South	48 / 47	44	57 / 56	47	Y / Y	Y
	West	52 / 48	44	54 / 53	45	Y / Y	Y
Tower C2	North	44 / 44	20	50 / 50	45	Y / Y	Y
	East	50 / 50	35	55 / 54	45	Y / Y	Y
	South	45 / 45	41	58 / 56	47	Y / Y	Y
	West	42 / 42	39	54 / 53	45	Y / Y	Y
Outdoor Amenity Area		35 to 37	n/a	50	n/a	Y / Y	n/a

Notes: [1] Sound levels shown represent the worst-case impact along the identified façade

The predicted worst-case noise impacts at the façade and outdoor amenity areas are predicted to be at or below the default Class 1 limits. Therefore, additional noise mitigation is not required.

4.6 Ventilation and Warning Clause Requirements

As the surrounding industries have the potential to be audible at times, a warning clause should be included in the Agreement of Purchase and Sale or Lease and in the relevant Development Agreements. An MECP NPC-300 Type E warning clause is recommended for all residential suites within the development. See Appendix D for warning clause details.

PART 2: IMPACTS OF THE DEVELOPMENT ON ITSELF

In evaluating stationary noise impacts from Phase 1 Building C sources on the proposed development, as a worst-case assumption all development buildings have been modelled, as the Phase 1 noise sources may also affect these future buildings.

5.0 NOISE IMPACTS FROM DEVELOPMENT MECHANICAL SOURCES ON ITSELF

An assessment of building mechanical systems was completed based on the current development floor plans, elevations, equipment, and mechanical specifications.

5.1 Development Stationary Noise Sources

Significant noise sources associated with the development includes:

- A cooling tower with 5 exposed faced that radiate noise (C1_CT_A, C1_CT_B, C1_CT_C, C1_CT_D, C1_CT_E)
- Make up air unit intake louvres (C1_MUA, C2_MUA),
- Parking garage ventilation vents (Ex_shaft1, Ex_shaft2, Ex_shaft3), with two (2) parking garage fans connected to each vent; and
- An emergency generator, within a Level 2 Acoustic Enclosure (EGen).

Locations of development noise sources are shown in Figure 3.

Sound power level data used in the analysis was completed based on current mechanical specifications and/or historical data for similar sized units. A summary of the sound power levels, design considerations and assumptions used in the analysis are included in Appendix E.

5.2 NPC-300 Stationary Source Guideline Limits

The applicable MECP noise guidelines for new sensitive land uses adjacent to existing stationary sources are provided in MECP Publication NPC-300 previously discussed in Section 4.1.

5.3 Stationary Source Modelling

Modelling was completed using Cadna/A, a software implementation of the ISO 9613 noise propagation algorithms.

5.3.1 Mechanical Equipment Noise

Predicted sound levels from Building C mechanical noise are shown in Figure 10a, and are summarized below:

Table 18: Summary of On-Site Stationary Noise Levels and Compliance – Building C Mechanical Sources

Building	Façade	Stationary Sound Levels [1]]		Applicable Guideline Limit		Meets Guideline Limits?	
		Day/Eve (dBA)	Night (dBA)	Day/Eve (dBAI)	Night (dBAI)	Day/Eve (Y/N)	Night (Y/N)
Building C Podium	East	3	3	50	45	Y	Y
	South	33	33	50	45	Y	Y
	West	42	42	50	45	Y	Y
Tower C1	North	37	37	50	45	Y	Y
	East	35	35	50	45	Y	Y
	South	32	32	50	45	Y	Y
	West	45	45	50	45	Y	Y
Tower C2	North	44	44	50	45	Y	Y
	East	30	30	50	45	Y	Y
	South	18	18	50	45	Y	Y
	West	39	39	50	45	Y	Y
Outdoor Amenity Area		18 to 20	n/a	50	n/a	Y	n/a
Building A		25	25	50	45	Y	Y
Building B1		31	31	50	45	Y	Y
Building B2		10	10	50	45	Y	Y
Building D1		28	28	50	45	Y	Y
Building D2		20	20	50	45	Y	Y

Notes: [1] Sound levels shown represent the worst-case impact at the building and/or at the identified façade

The predicted worst-case noise impacts at the façade and outdoor amenity areas are predicted to be at or below the default Class 1 limits. Therefore, additional noise mitigation is not required.

5.3.2 Emergency Generator Equipment Testing Noise

Predicted sound levels from Building C emergency generator set testing noise are shown in Figure 10b, and are summarized below:

Table 19: Summary of On-Site Stationary Noise Levels and Compliance – Building C Emergency Generator Testing

Building	Façade	Stationary Sound Levels [1]]		Applicable Guideline Limit		Meets Guideline Limits?	
		Day/Eve (dBA)	Night (dBA)	Day/Eve (dBAI)	Night (dBAI)	Day/Eve (Y/N)	Night (Y/N)
Building C Podium	East	0	n/a	55	n/a	Y	n/a
	South	1	n/a	55	n/a	Y	n/a
	West	15	n/a	55	n/a	Y	n/a
Tower C1	North	55	n/a	55	n/a	Y	n/a
	East	41	n/a	55	n/a	Y	n/a
	South	22	n/a	55	n/a	Y	n/a
	West	48	n/a	55	n/a	Y	n/a
Tower C2	North	48	n/a	55	n/a	Y	n/a
	East	34	n/a	55	n/a	Y	n/a
	South	27	n/a	55	n/a	Y	n/a
	West	48	n/a	55	n/a	Y	n/a
Outdoor Amenity Area		36 to 44	n/a	50	n/a	Y	n/a
Building A		35	n/a	55	n/a	Y	n/a
Building B1		19	n/a	55	n/a	Y	n/a
Building B2		7	n/a	55	n/a	Y	n/a
Building D1		41	n/a	55	n/a	Y	n/a
Building D2		34	n/a	55	n/a	Y	n/a

Notes: [1] Sound levels shown represent the worst-case impact at the building and/or at the identified façade

The predicted worst-case noise impacts at the façade and outdoor amenity areas are predicted to be at or below the default Class 1 limits. Therefore, additional noise mitigation is not required.

PART 3: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDINGS

6.0 NOISE IMPACTS FROM THE DEVELOPMENT MECHANICAL SYSTEMS ON THE SURROUNDING AREA

As indicated above in Part 2: Impacts of the Development on Itself, noise impacts from the development mechanical equipment were predicted based on the current mechanical design, equipment selection, existing site conditions and surrounding receptors.

The surrounding area is consistent with a downtown core, with a mixture of commercial and residential buildings. The closest noise sensitive buildings include the following:

- 2-storey single family residential homes located along Fassel Avenue to the north.

An assessment of the development's mechanical equipment sound levels was completed on each of the above noise-sensitive buildings.

6.1 Development Stationary Noise Sources

Modelled noise sources for the development on the surrounding area are consistent with the noise sources impacting the development itself, as discussed in Section 5.1 above.

6.2 NPC-300 Stationary Source Guideline Limits

The stationary source limit, previously discussed in Section 5.2 above, also apply to the stationary noise impacts from the proposed development on the surroundings.

6.3 Stationary Source Modelling

Modelling was performed using Cadna/A, as per the assessment of impacts from the development's mechanical equipment (refer Section 5.3). Noise impacts were predicted on the facades of the surrounding noise sensitive buildings, as outlined in Section 5.3 above.

6.3.1 Mechanical Equipment

The development's mechanical equipment noise impacts were assessed, excluding the generator testing, as shown in Figure 11a for daytime/evening/night-time periods. As mentioned above, this is a conservative assessment of impacts due to the assumed continuous operations with no duty cycling during all periods of the day.

The highest predicted off-site sound level is 18 dBA. Based on the above, the stationary noise impacts from the development's mechanical equipment are predicted to meet the applicable guideline limits at the surrounding noise sensitive receptors.

6.3.2 Generator Testing

Noise impacts from generator testing were predicted on the surrounding noise sensitive buildings, as shown in Figure 6b. Generator testing was also assessed for a duration of 30 minutes (refer Section 4.3.2) and applied against the daytime guideline limits.

As shown in Figure 11b, generator testing noise impacts are predicted to be below the exclusionary limit of 55 dBA at all surrounding noise sensitive buildings. The highest predicted off-site sound level is 13 dBA.

Therefore, generator testing meets the applicable guideline limits at the surrounding noise sensitive buildings, with the inclusion of the Level 2 Acoustic Enclosure. No additional noise mitigation will be required.

7.0 TRANSPORTATION NOISE IMPACTS FROM THE DEVELOPMENT ON THE SURROUNDING AREA

7.1 Road Traffic

Road traffic volumes associated with the development are very small compared to existing traffic volumes levels on surrounding roadways; therefore, adverse impacts on existing sensitive residences due to road traffic are not anticipated.

7.2 Rail Traffic

The City has requested that the effects of reflections from the building podium be examined to identify if the podium will result in increases in rail traffic noise at existing residences along Fassel Avenue and Phillip Street.

The podium wall in question includes textured panels (not smooth concrete or glass panels), which are not perfectly reflective acoustically. The effects of reflections on off-site sound levels were investigated using the noise model. Off-site sound levels will increase over existing conditions by a negligible, imperceptible amount (0.3 dB). Additional mitigation measures are not required

8.0 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:

8.1 Transportation Noise

- An assessment of transportation noise impacts was completed. Based on transportation façade sound levels upgraded glazing is required within the development, as outlined in outlined in Section 2.5.1.
- Central Air Conditioning and a Type D Warning Clause is recommended for all residential units, as outlined in Section 2.4.2.
- Noise impacts within the common outdoor amenity areas, are predicted to exceed the applicable guidelines. With the inclusion of a 1.1 m high perimeter noise barrier, transportation noise can be reduced to levels as close to 55 dBA as possible, as outlined in Section 2.6.1.
- As acoustic barriers are required to reduce transportation noise levels within the rooftop amenity spaces, a Type B warning Clauses are required as outlined in Section 2.6.2.
- In addition, CN and Metrolinx Warning Clauses are also required for all units in the development. Warning clauses are included in Appendix C.

8.2 Transportation Vibration

- A rail transportation vibration assessment was completed. Vibration impacts are not predicted.

8.3 Stationary Noise

- Stationary noise impacts from the surrounding industrial and commercial noise are predicted to meet NPC-300 Class 1 guideline limits at all facades and outdoor amenity areas.
- A **Type E** noise warning clause is recommended, as outlined in **Section 4.4,** due to the general noise from the surrounding industries and commercial properties. Warning clauses are included in **Appendix C**.

8.4 Development Mechanical Equipment Noise

- Noise impacts from the development's mechanical systems were assessed on the development itself and the surrounding noise sensitive buildings. As discussed in **Sections 5 and 6,** based on the current equipment selections, the NPC-300 Class 1 Area guideline limits will be met at all on site receptors and off-site sensitive residences.
- Prior to final selection of equipment, the equipment and system layout should be reviewed by an acoustical consultant.

8.5 Overall Assessment

- Impacts of the environment on the proposed development can be adequately controlled with upgraded glazing, inclusion of noise barriers, ventilation requirements and warning clauses, as outlined in **Part 1** of this report.
- Impacts of the proposed development on itself are not anticipated and can be adequately controlled by following the design guidance outlined in **Part 2** of this report.
- Impacts of the proposed development on the surroundings are expected to meet the applicable guideline limits and can be adequately controlled by following the design guidance outlined **Part 3** of this report.
- As the glazing analysis was completed based on generic room and window dimensions, the analysis should be revised once detailed floor and façade plans are available.
- The final selection of building mechanical and electrical equipment should be reviewed by an acoustical consultant, as the design progresses. We understand that the City will require the following:
  - At the Building Permit Application submission, a letter from the acoustical consultant confirming they have reviewed the architectural/mechanical plans and that the recommendations in the Noise and Vibration Assessment have been included in the design.

- At the time of occupancy and prior to security release a certification letter from the Acoustical Engineer confirming they have conducted a site visit and confirming that the recommendations in the approved Noise and Vibration Assessment have been implemented AND that field measurements have been taken and noise levels are below the estimated levels in the Noise and Vibration Assessment.

9.0 REFERENCES

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U.S. Federal Transit Administration (FTA, 2013), *Transit Noise and Vibration Impact Assessment Manual*

10.0 STATEMENT OF LIMITATIONS

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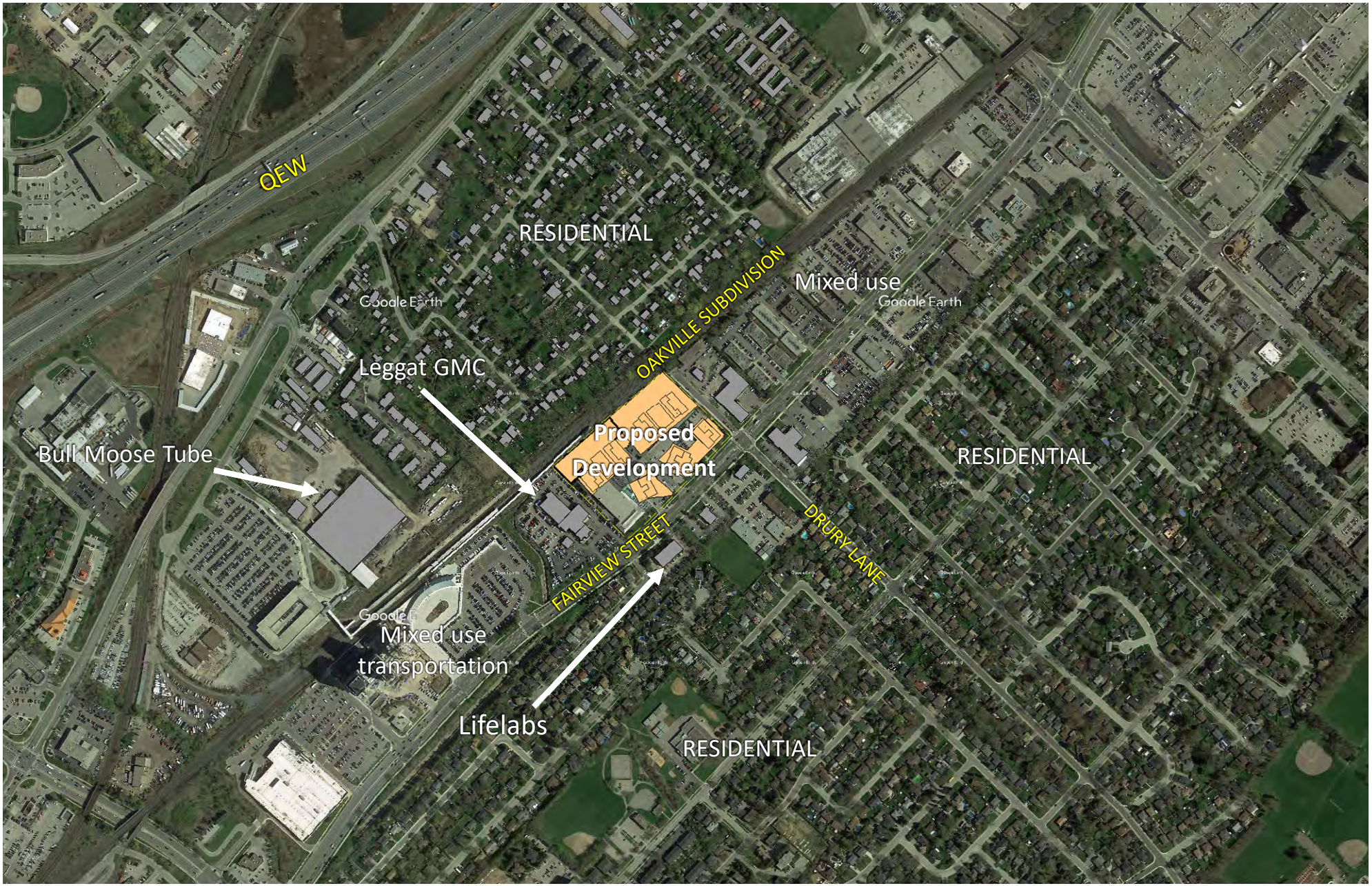
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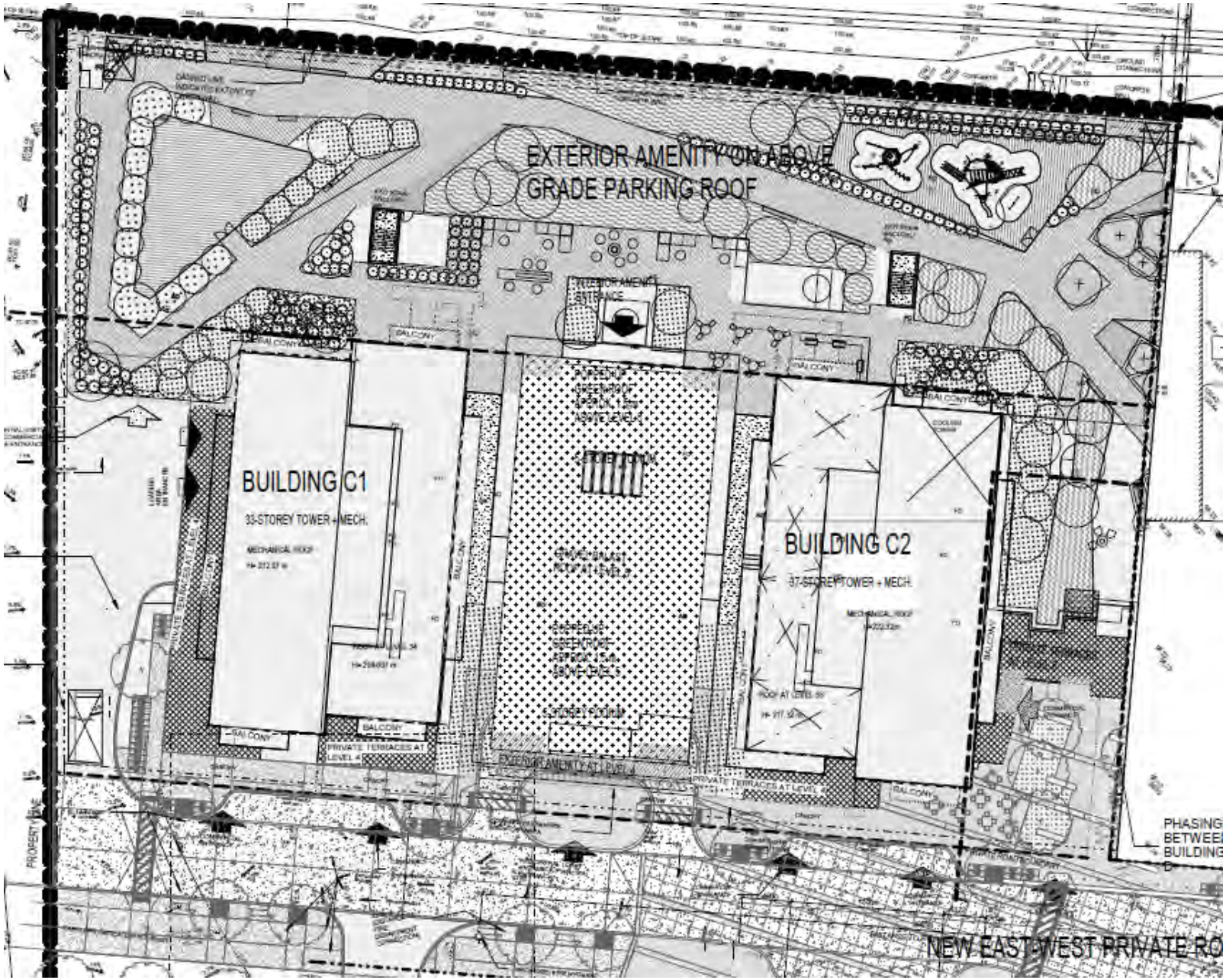


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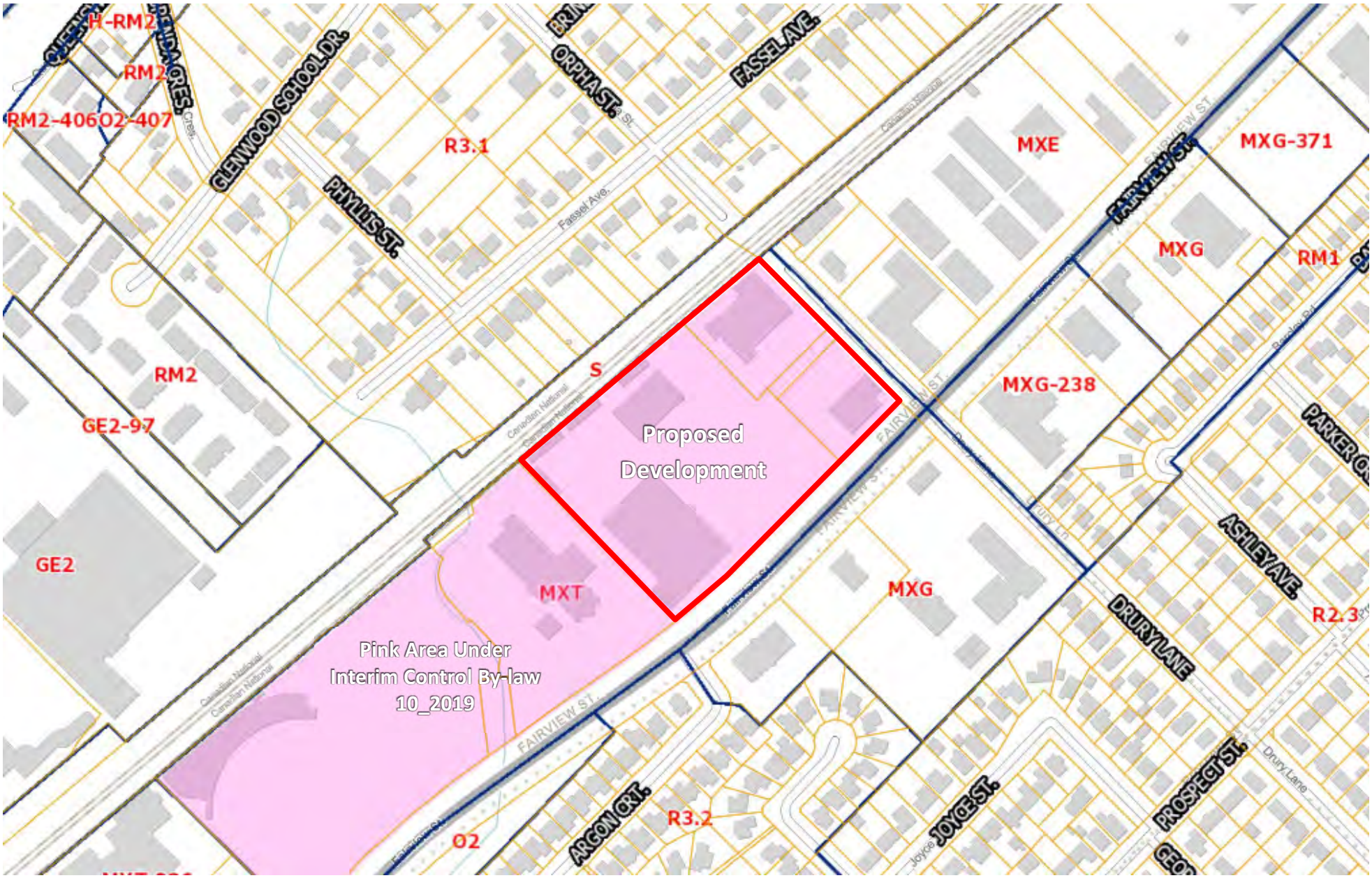
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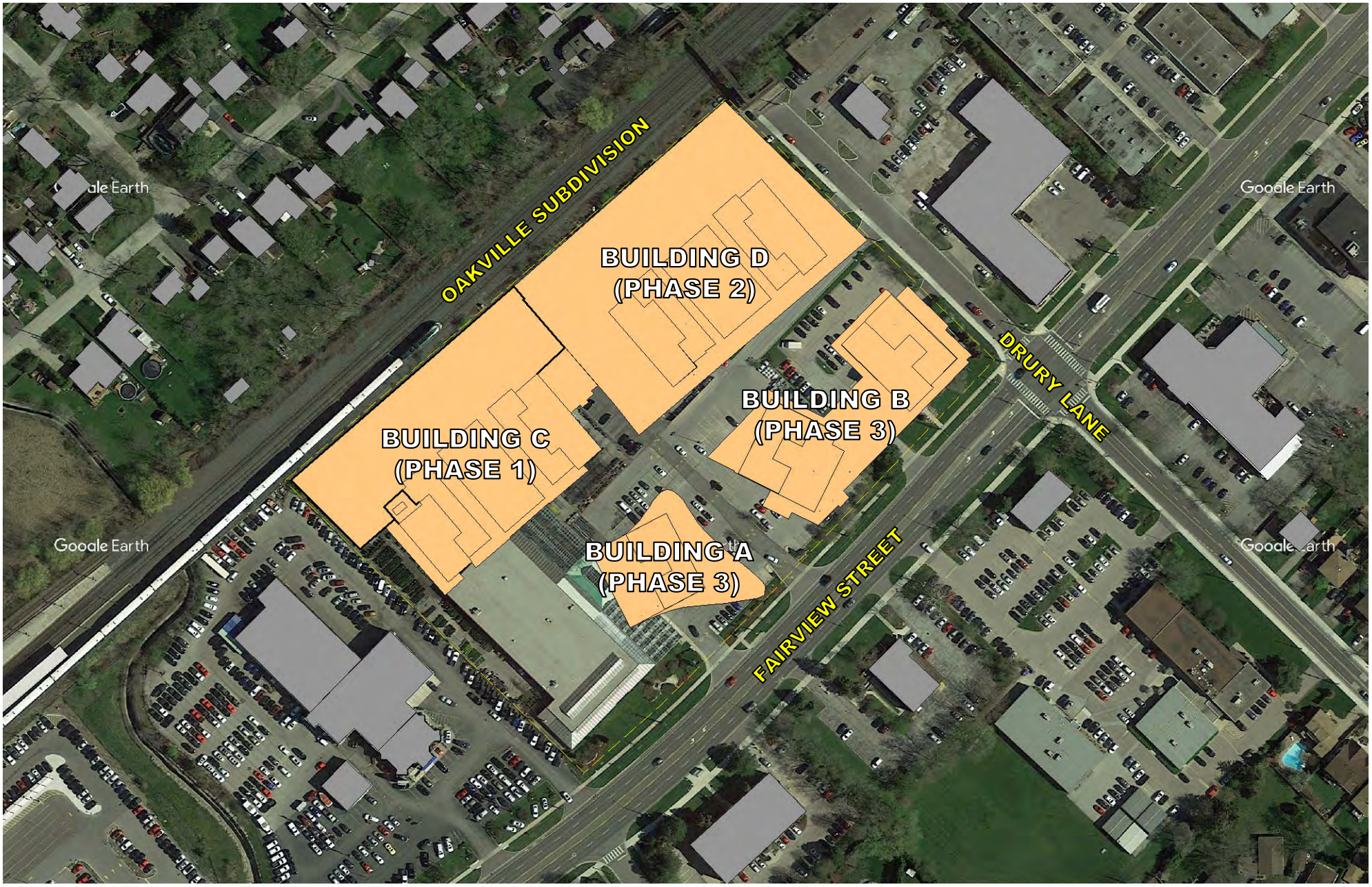
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2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Oct 14, 2021 Rev 0.0	Figure No. **1a**	
CONTEXT MAP		Project No. 241.18239.A0000		



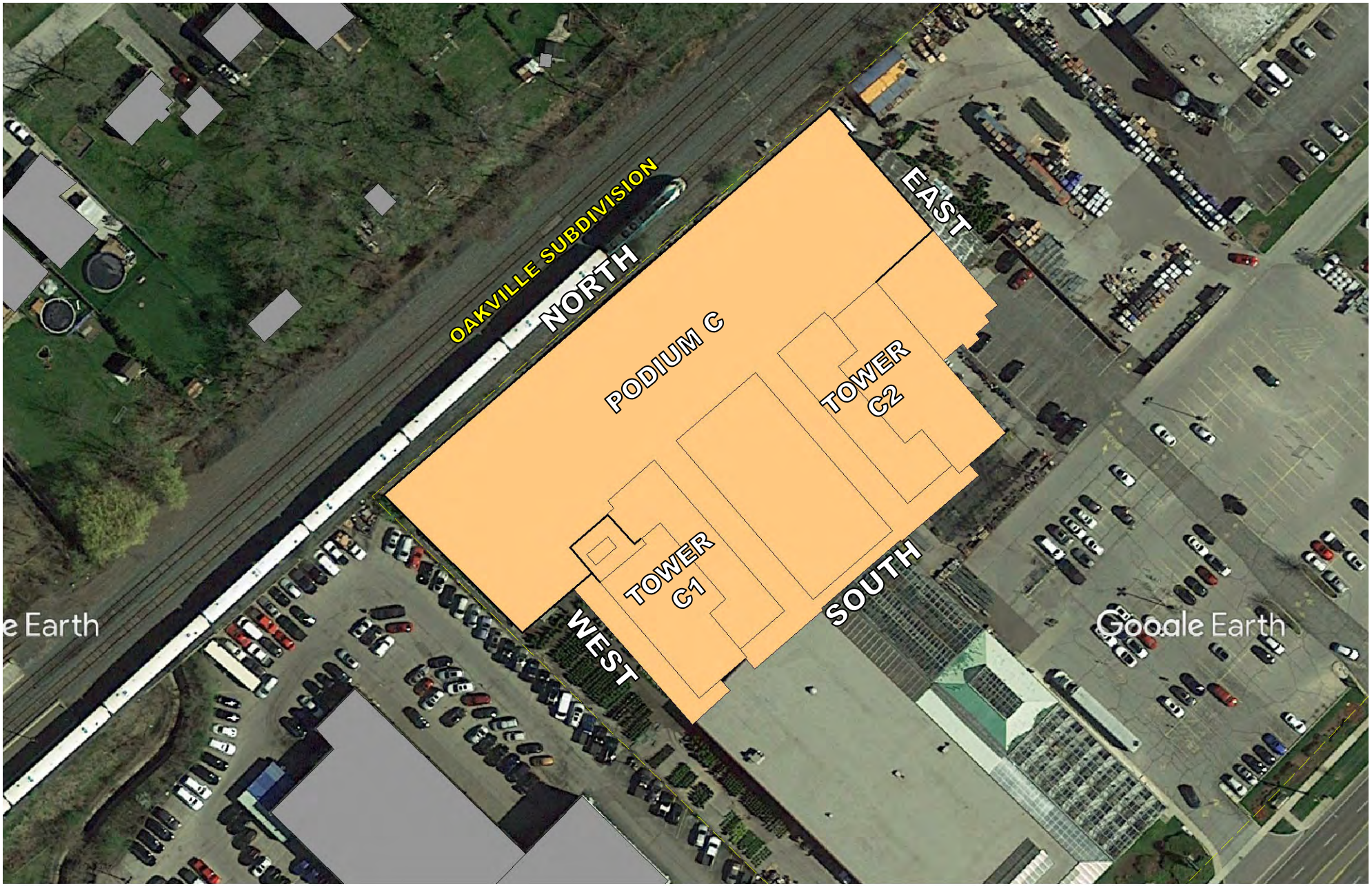
CLV GROUP	True North	Scale: N.T.S.	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **1b**	
EXCERPTS FROM SITE PLAN (FROM CORE ARCHITECTS DWG A007)		Project No. 241.18239.A0000		



CLV GROUP	True North	Scale: N.T.S.	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **1c**	
ZONING MAP (HTTPS://BURLINGTON.MAPS.ARCGIS.COM)		Project No. 241.18239.A0000		

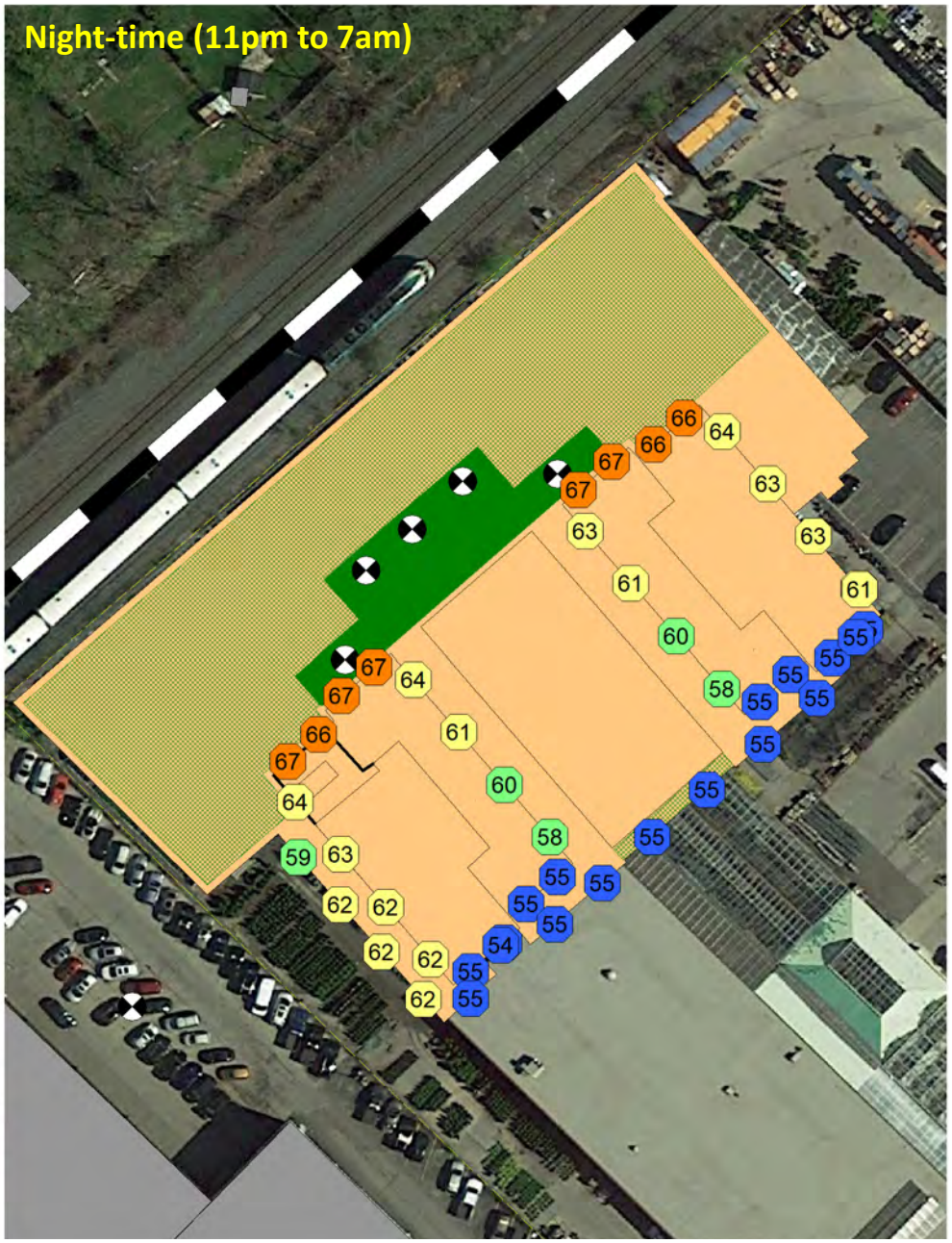


CLV GROUP	True North	Scale: 1:2000	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Oct 14, 2021 Rev 0.0	Figure No. **2a**	
PROPOSED BUILDING LAYOUT (FULL DEVELOPMENT)		Project No. 241.18239.A0000		



CLV GROUP	True North	Scale: 1:1000	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Oct 14, 2021 Rev 0.0	Figure No. **2b**	
PROPOSED BUILDING LAYOUT (PHASE 1)		Project No. 241.18239.A0000		



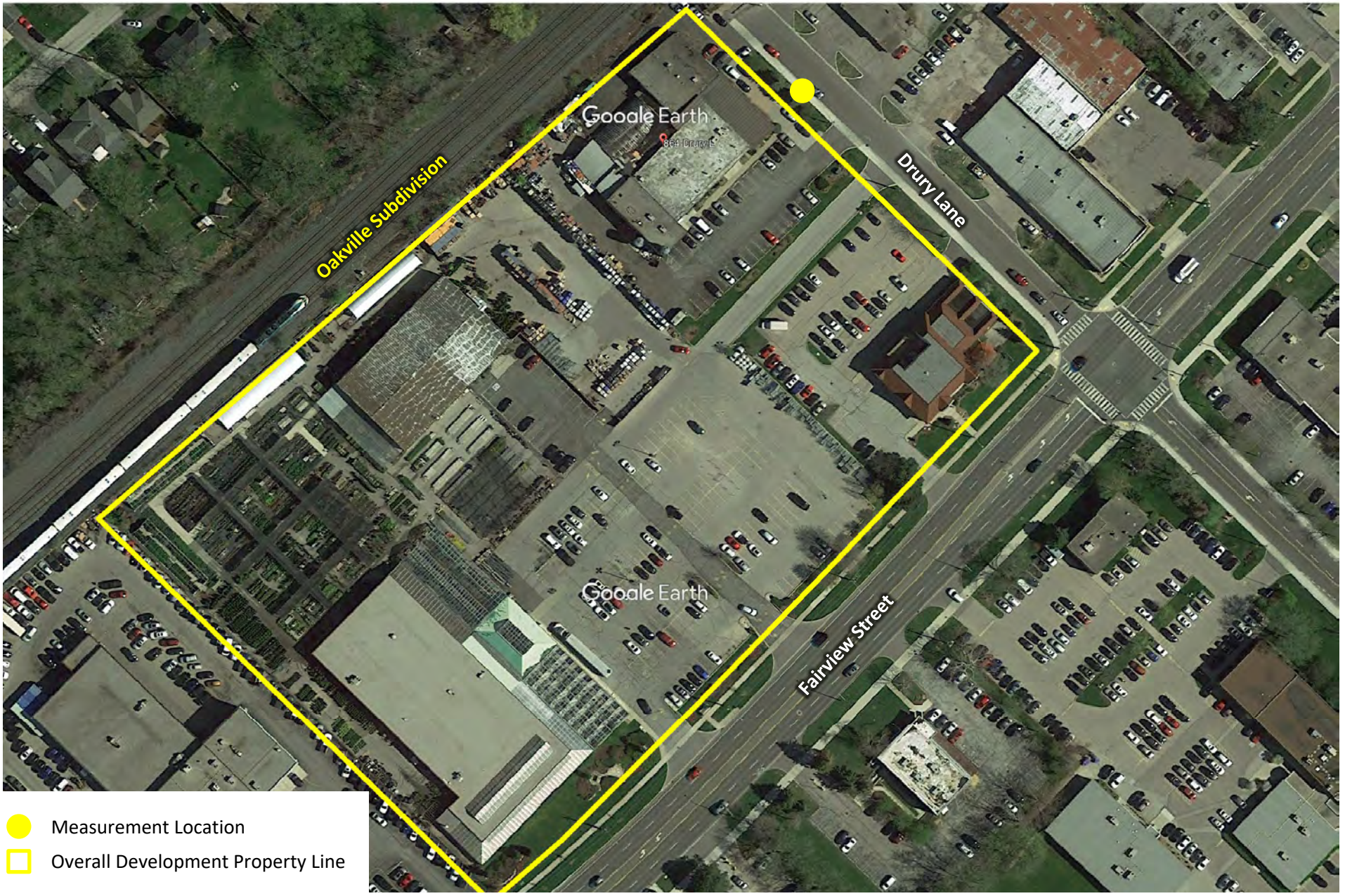


CLV GROUP	True North	Scale: 1:1000	METRES
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **3**
COMBINED TRANSPORTATION NOISE LEVELS (ROAD + RAIL)		Project No. 241.18239.A0000	

SLR global environmental solutions

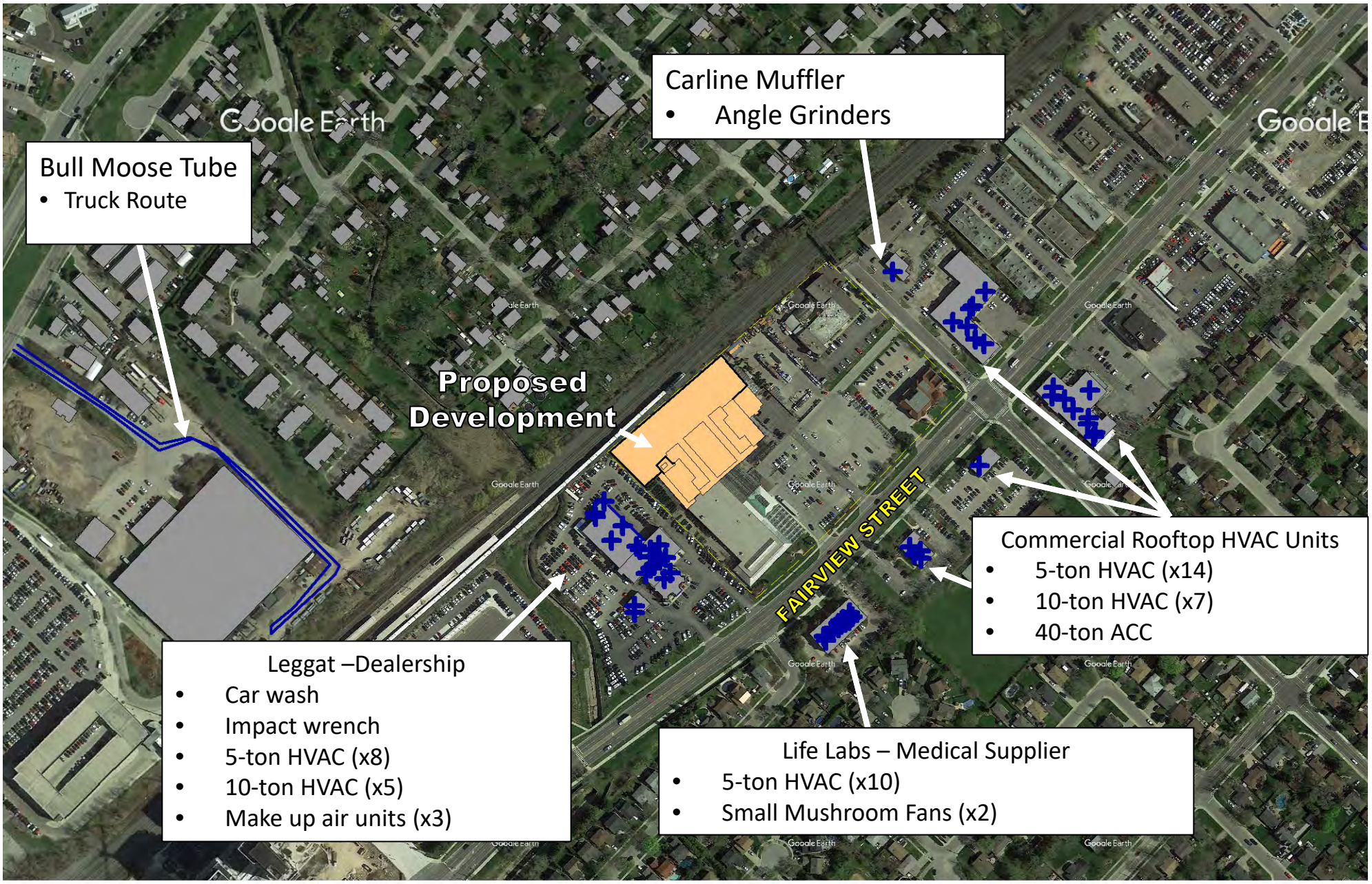


CLV GROUP	True North	Scale: 1:800	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **4**	
RECOMMENDED NOISE BARRIER LOCATIONS AND RESULTING SOUND LEVELS AT THE COMMUNAL OUTDOOR AMENITY AREA		Project No. 241.18239.A0000		

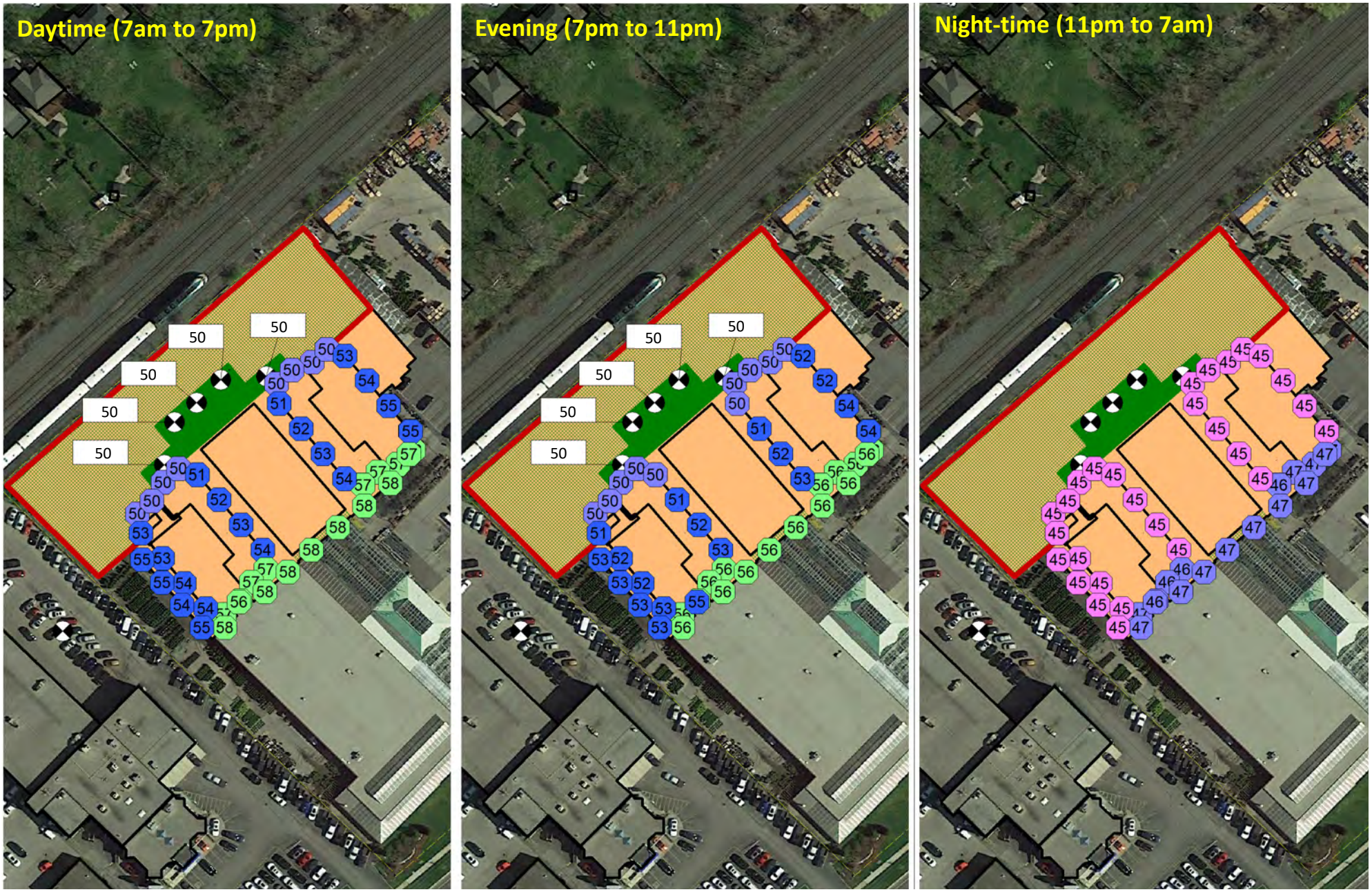


CLV GROUP	True North	Scale: 1:1500	METRES
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **5**
VIBRATION MEASUREMENT LOCATION		Project No. 241.18239.A0000	

SLR global environmental solutions



CLV GROUP	True North	Scale: 1:4000	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **6**	
OFF-SITE STATIONARY NOISE SOURCE LOCATIONS		Project No. 241.18239.A0000		



CLV GROUP

2243-2269 FAIRVIEW STREET & 864 DRURY LANE

CLASS 1 AREA STATIONARY NOISE GUIDELINE LIMITS

True North

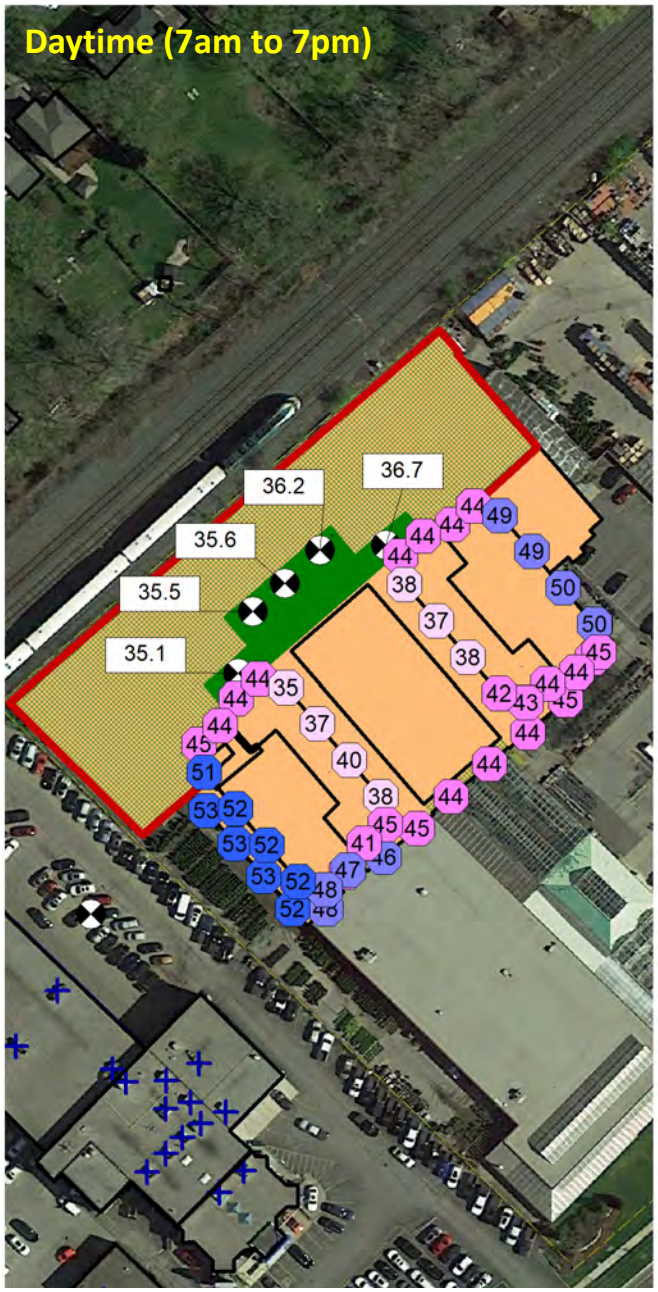
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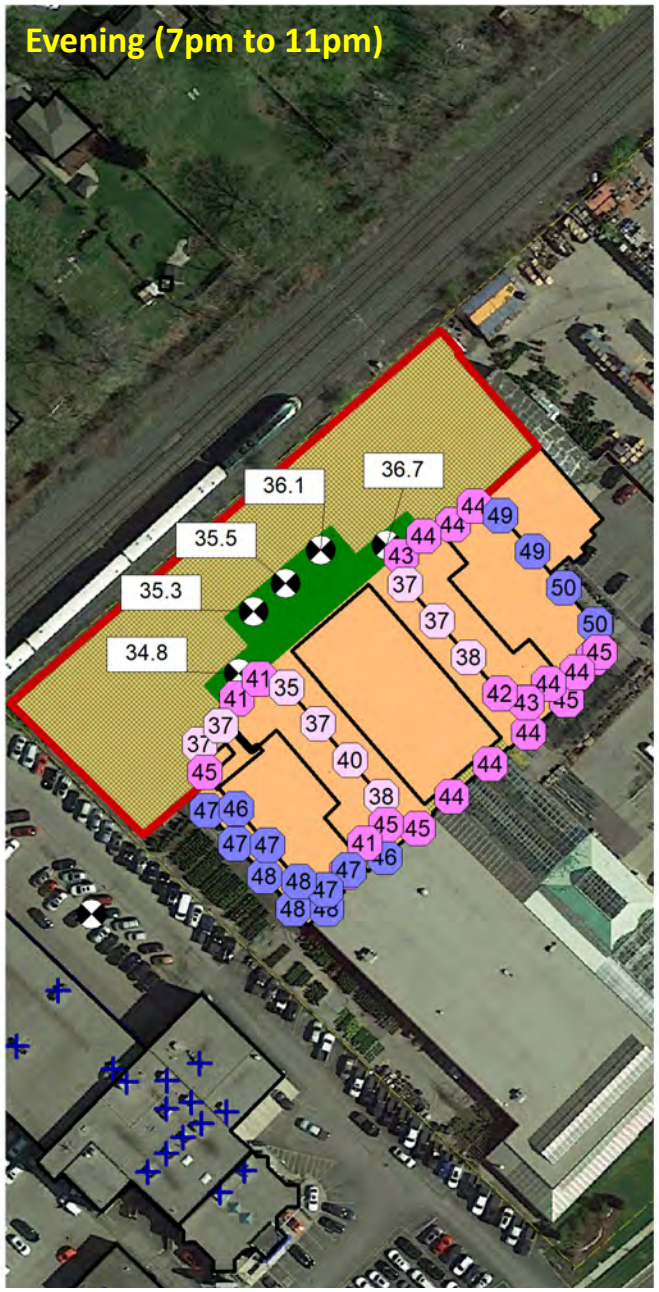
Date: Nov 18, 2021 Rev 0.0

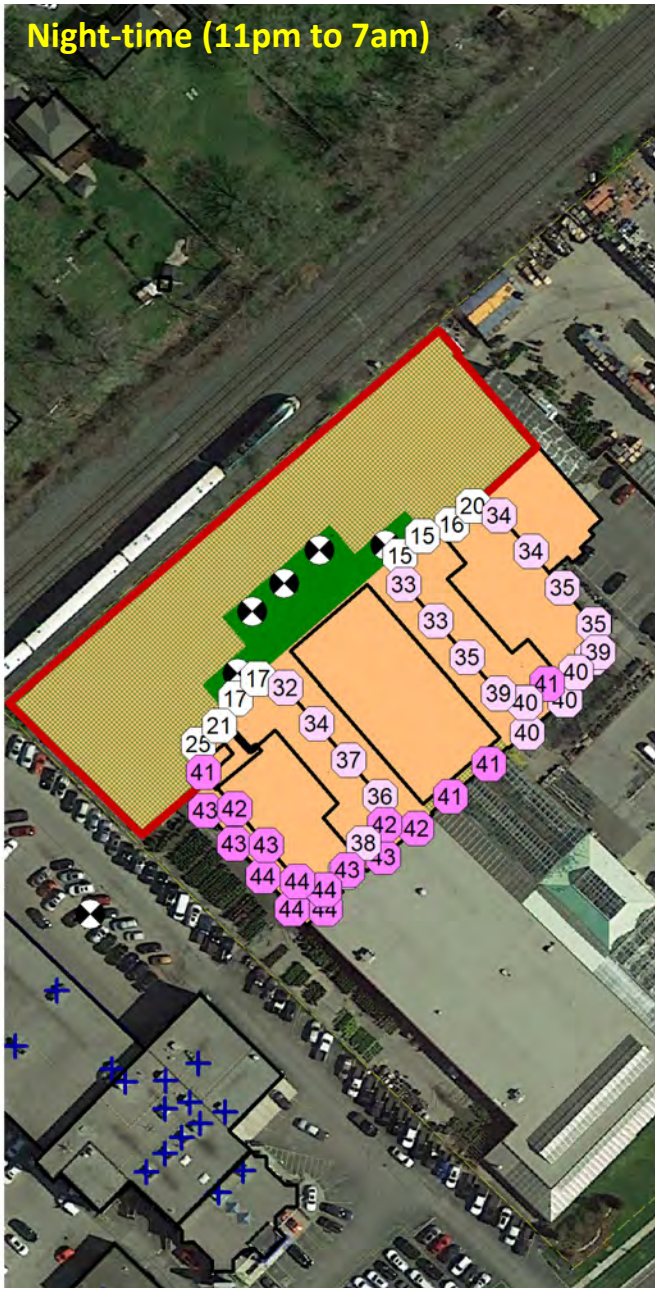
Project No. 241.18239.A0000

Figure No. **7**

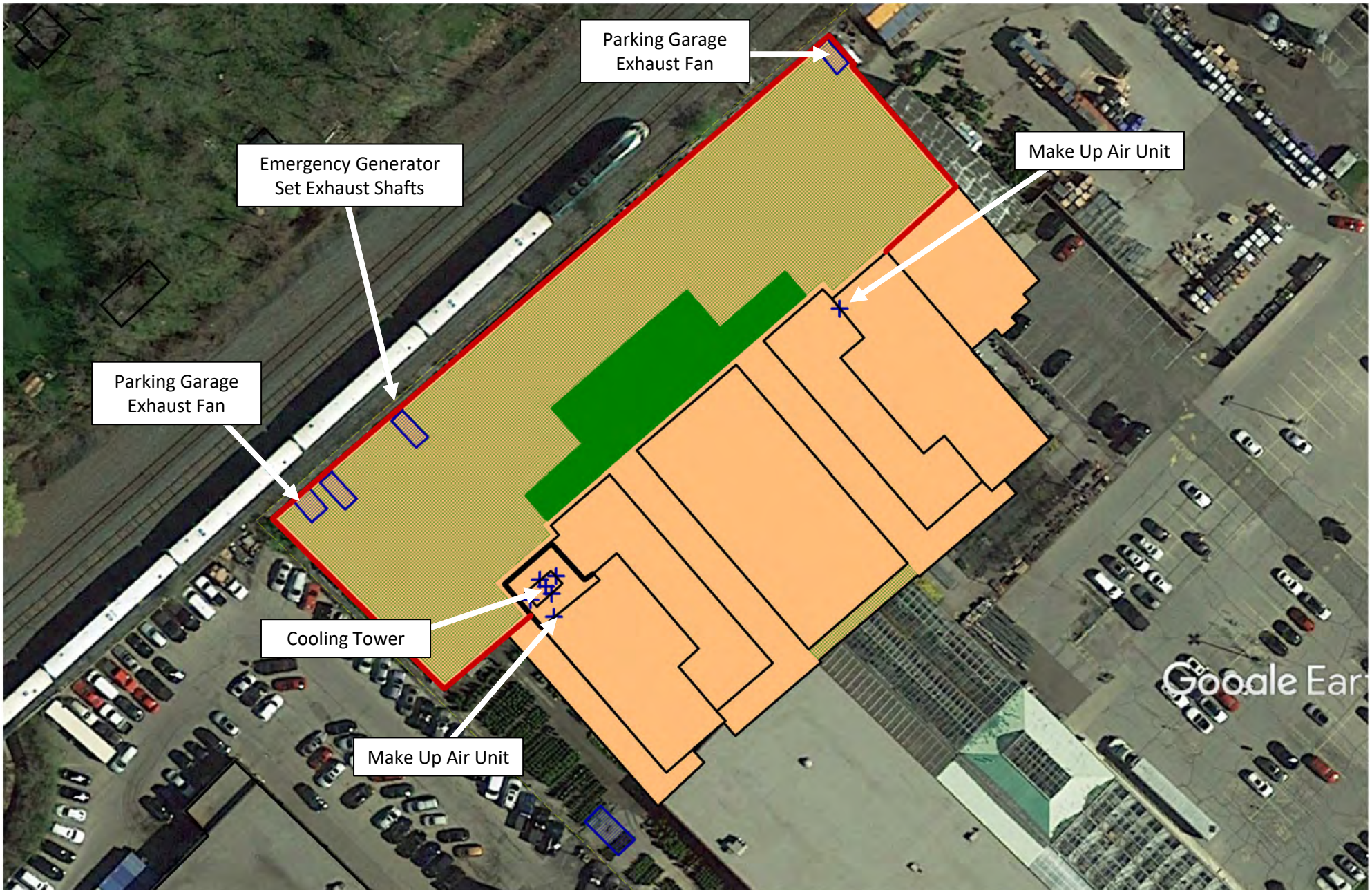
SLR global environmental solutions



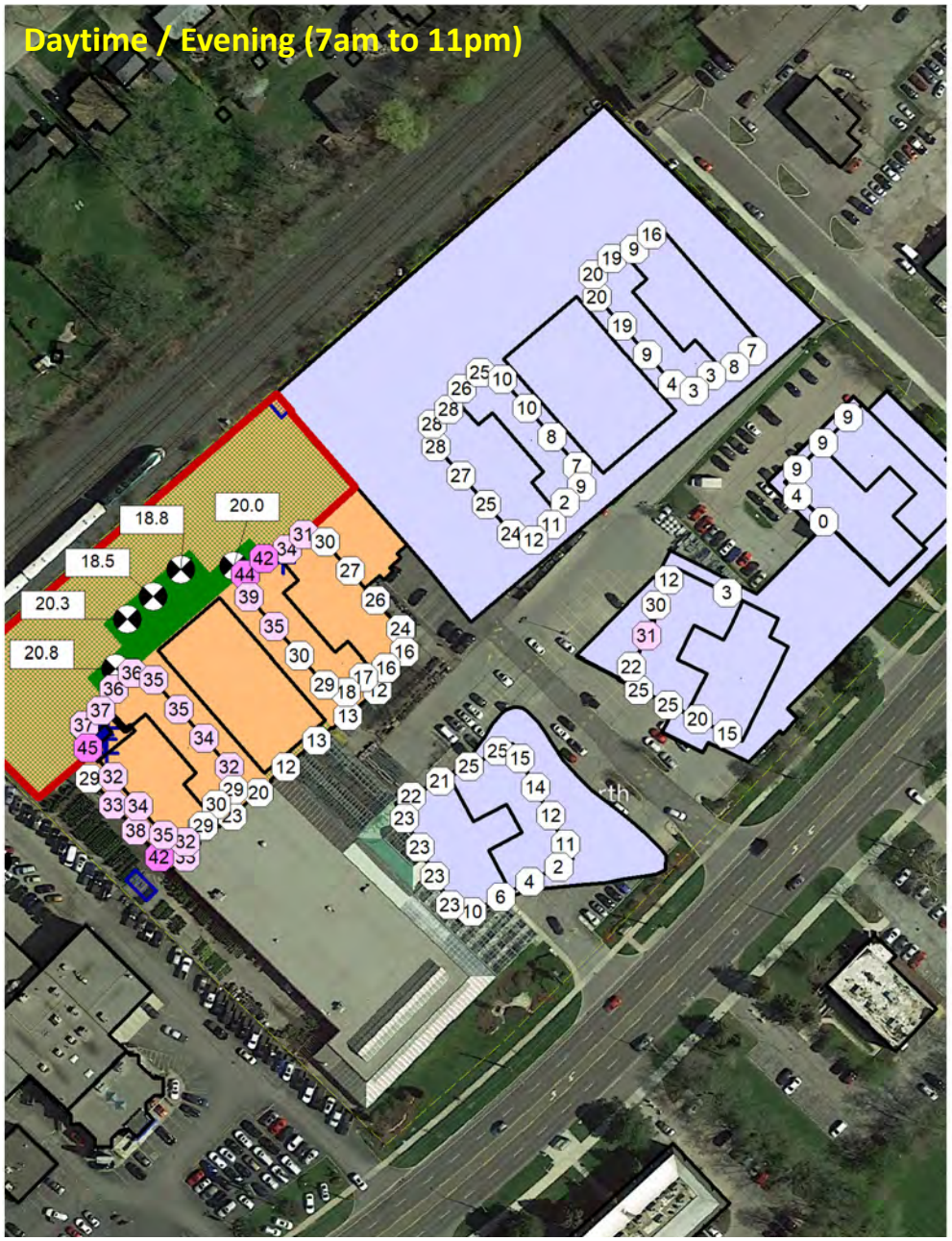


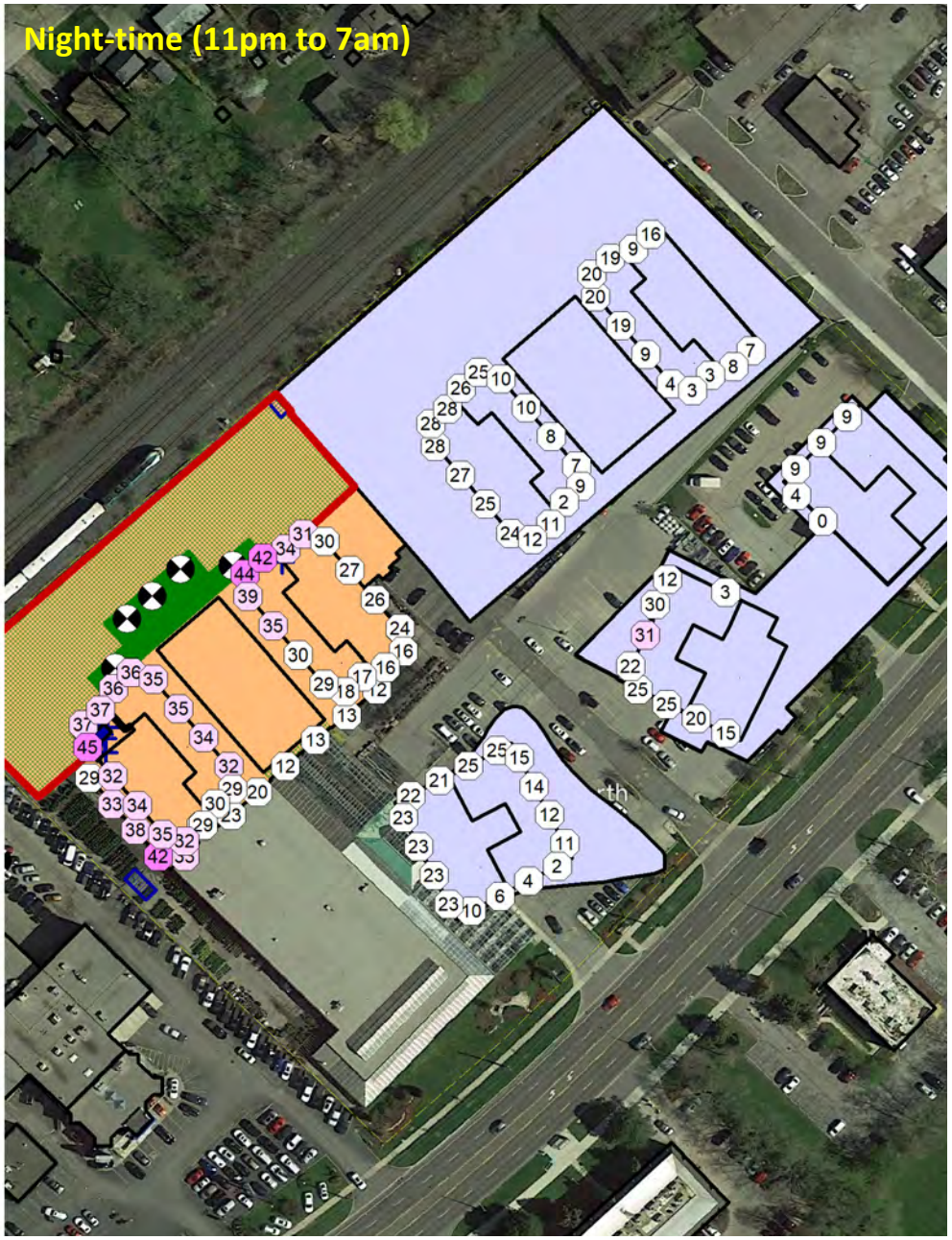


CLV GROUP	True North	Scale: 1:1500	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **8**	
STATIONARY NOISE LEVELS FROM OFF-SITE SOURCES		Project No. 241.18239.A0000		



CLV GROUP	True North	Scale: 1:800	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **9**	
ON-SITE STATIONARY NOISE SOURCE LOCATIONS		Project No. 241.18239.A0000		

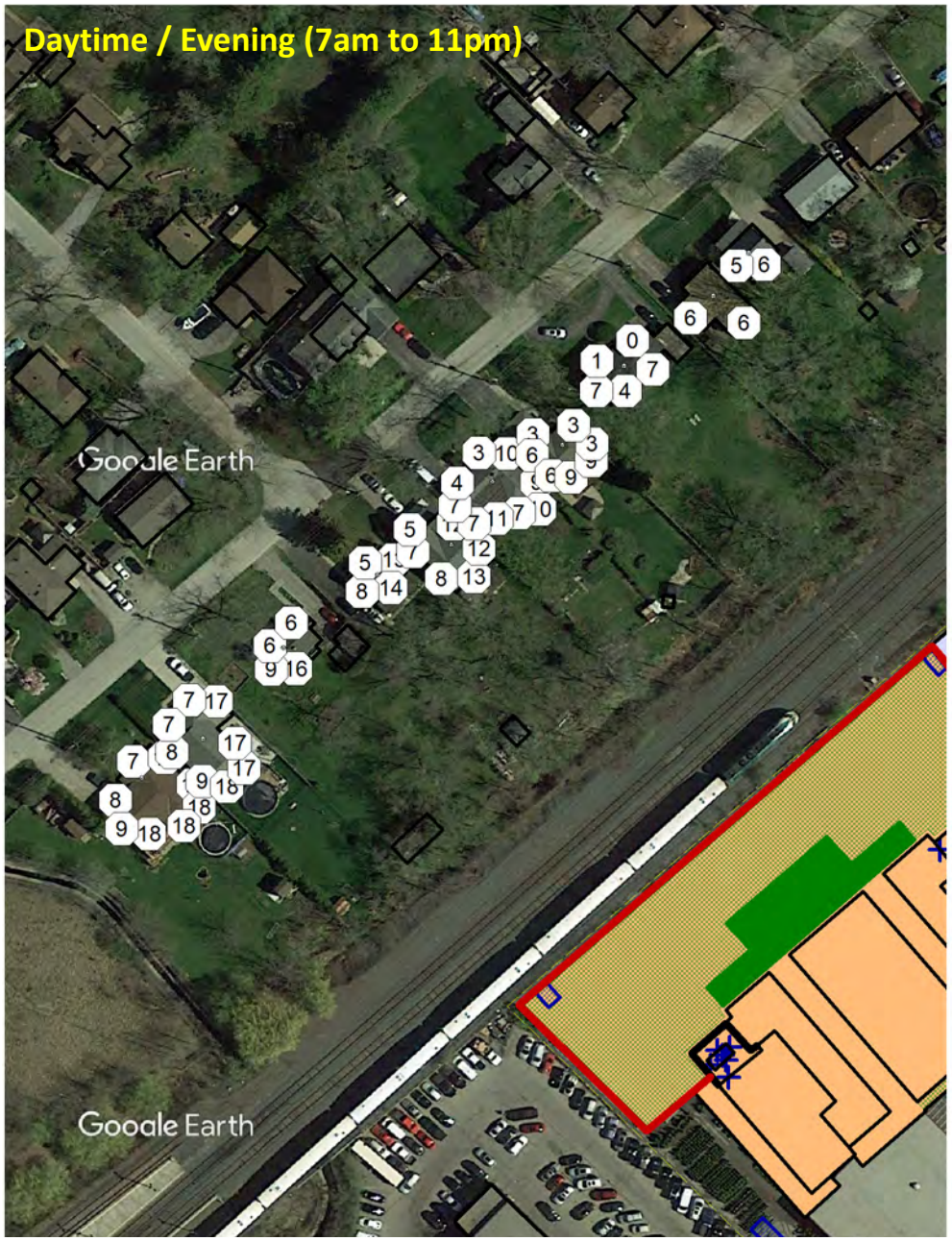


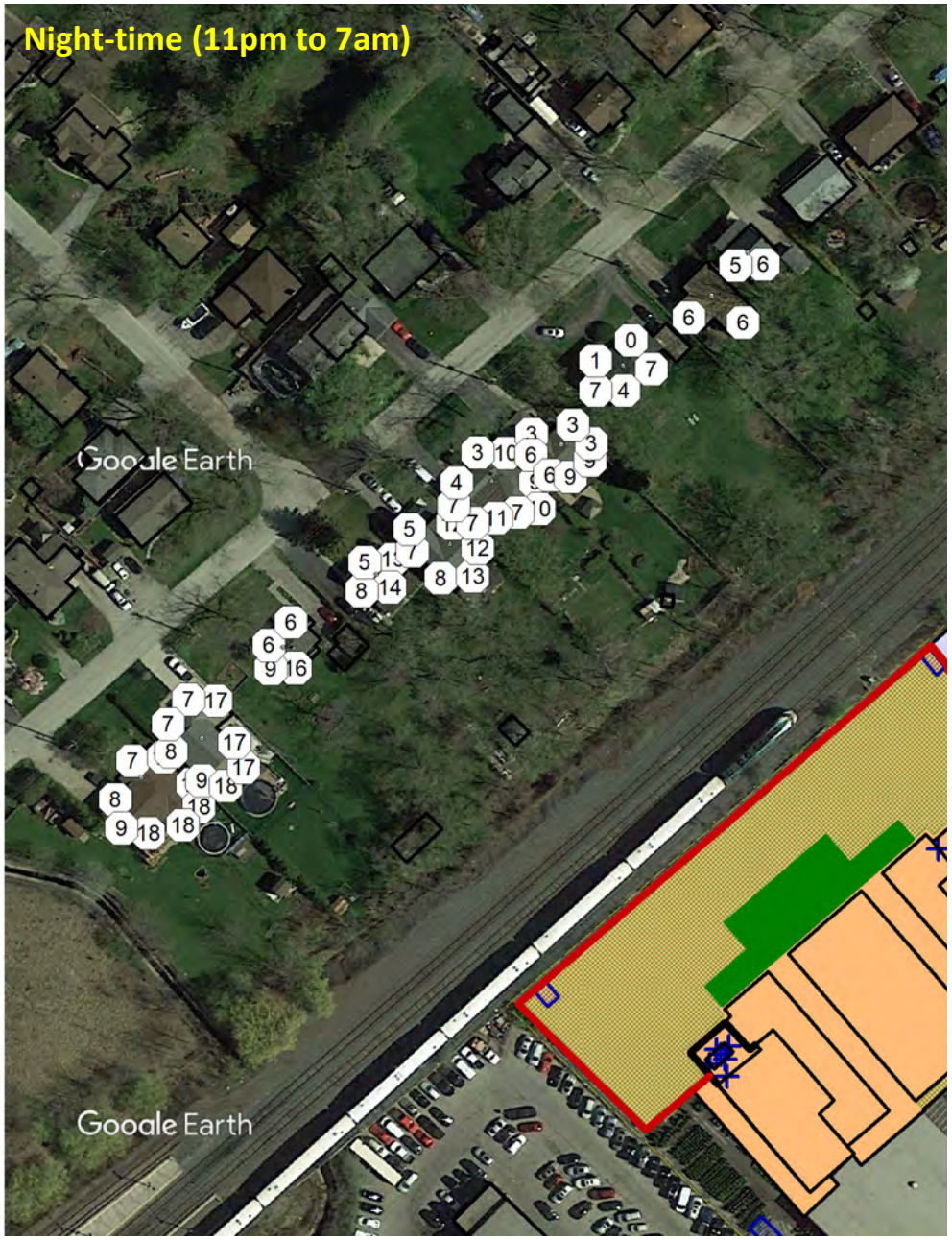


CLV GROUP	True North	Scale: 1:1800	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **10a**	
STATIONARY NOISE LEVELS FROM ON-SITE SOURCES AT THE DEVELOPMENT – BUILDING MECHANICAL EQUIPMENT		Project No. 241.18239.A0000		



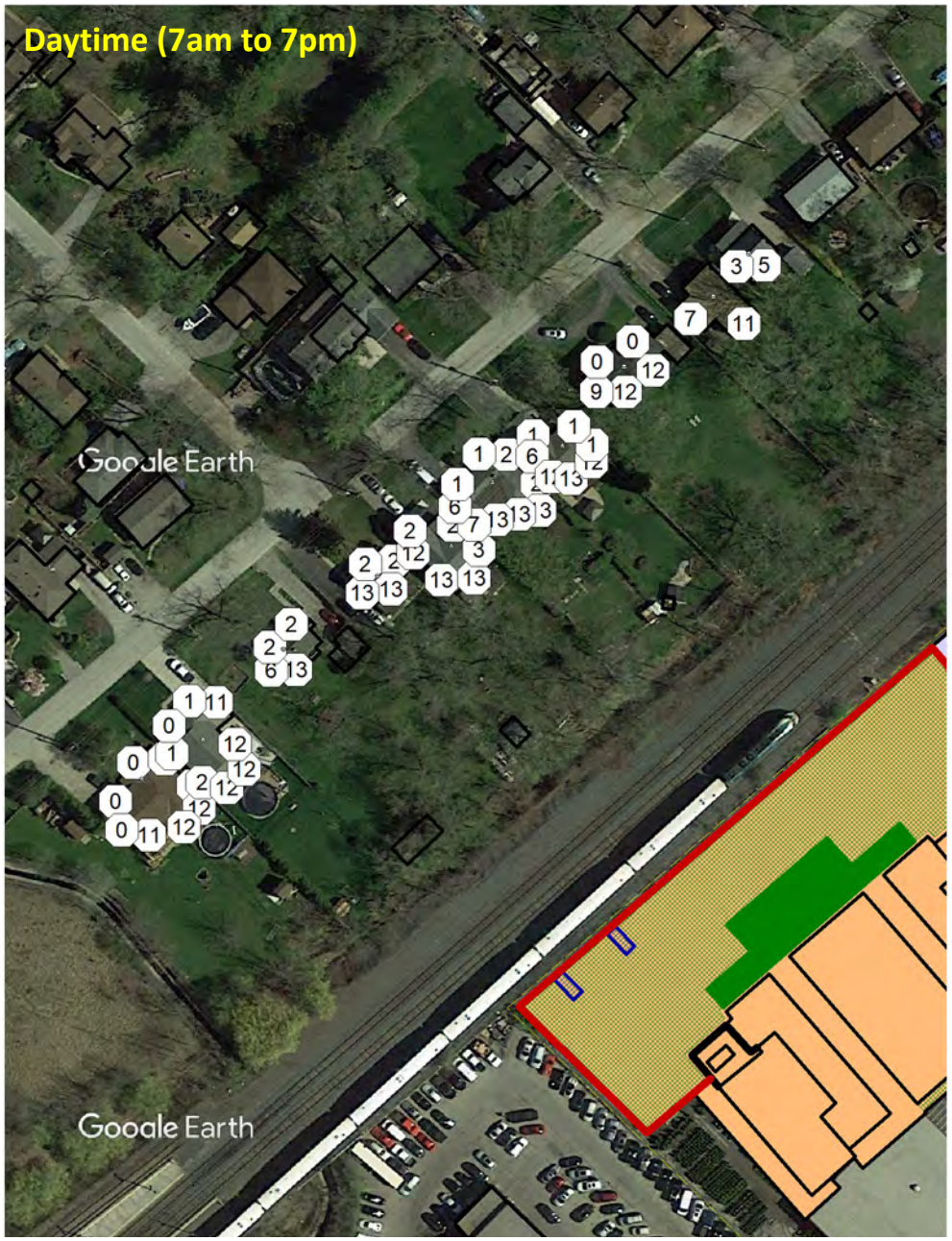
CLV GROUP	True North	Scale: 1:1800	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **10b**	
STATIONARY NOISE LEVELS FROM ON-SITE SOURCES AT THE DEVELOPMENT – EMERGENCY GENERATOR TESTING		Project No. 241.18239.A0000		





CLV GROUP	True North	Scale: 1:1500	METRES
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **11a**
STATIONARY NOISE LEVELS FROM ON-SITE SOURCES AT OFF-SITE RESIDENCES – BUILDING MECHANICAL EQUIPMENT		Project No. 241.18239.A0000	

SLR global environmental solutions



CLV GROUP	True North	Scale: 1:1500	METRES	SLR global environmental solutions
2243-2269 FAIRVIEW STREET & 864 DRURY LANE		Date: Nov 18, 2021 Rev 0.0	Figure No. **11b**	
STATIONARY NOISE LEVELS FROM ON-SITE SOURCES AT OFF-SITE RESIDENCES – EMERGENCY GENERATOR TESTING		Project No. 241.18239.A0000		

APPENDIX A
Comment Responses

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for 2-sided printing purposes

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

October 23, 2020

Jenn Morrison
Fairview Limited Partnership
2386 New Street
Burlington, ON L7R 1J7

SLR Project No.: 241.18239.00000
Novus Project No.: 18-0239

RE: Environmental Noise and Vibration Study - First Submission, Comment Response 2243-2269 Fairview Street & 864 Drury Lane, Burlington ON

SLR Consulting (Canada) Ltd.(SLR), now including Novus Environmental Inc. (SLR-Novus), completed an Environmental Noise and Vibration Assessment Report, dated January 9, 2020 (2020 N+V Study), in support of the Site Plan Approval submission for the 2243-2269 Fairview Street & 864 Drury Lane development, located in Burlington, Ontario.

Following a review of the 2020 N+V Study, comments were provided by City of Burlington, Halton Region and Metrolinx. The following letter outlines our responses to the comments received, up to and including August 20, 2020.

Each comment is presented in italics, with SLR-Novus' response following each comment. Comment references correspond to the Comment Tracking Matrix included with the resubmission of File: 535-001/20.

CITY OF BURLINGTON - CONSTRUCTION & MOBILITY MANAGEMENT POLICY - SITE ENGINEERING 2, ADDITIONAL REQUIREMENTS

COMMENT NO. B.78

A Vibration Study prepared by a Professional Engineer outlining the following:
- The anticipated vibration generated by the proposed construction on adjacent lands;
- The anticipated vibration generated by the proposed construction on itself.
- Details of the measures proposed to mitigate or reduce the anticipated negative vibration impacts

A Construction Vibration Zone Of Influence (ZOI) assessment can be completed to determine the extent of vibration impacts for various stages of construction and associated activities. Results of the study will indicate the expected boundaries of the ZOI and requirements for vibration monitoring, if necessary. We understand this would typically be included as a condition of Site Plan Approval.

CITY OF BURLINGTON - CAPITAL WORKS DEPARTMENT, DEVELOPMENT & STORM WATER ENGINEERING - ANNETTE SIMPSON, NOISE

COMMENT NO. B.91

Halton Region, Metrolinx, Canadian National Railway, and the Planning Department may also review the noise report, in case of discrepancy between departments/agencies, the most stringent criteria shall apply.

No action is understood to be required at this time, as this assessment was completed consistent with other studies reviewed and approved for OPA/ZBA/SPA within the City of Burlington.

COMMENT NO. B.92

Please be advised that the City considers NPC-300 as a minimum standard to be met.

No action is understood to be required at this time, as this assessment was completed consistent with other studies reviewed and approved for OPA/ZBA/SPA within the City of Burlington.

COMMENT NO. B.93

The report is titled "Assessment" please confirm if this is a Detailed Noise Study, if not, please upgrade to a Detailed Noise Study..

A Detailed Noise Study was completed, based on available information at the time of the assessment. An addendum may be required once City staff approve building locations and detailed design can commence.

COMMENT NO. B.94

Section 1.2 describes the nature of the surroundings, we ask that all land uses within 1000m of the site be assessed. Please reference Figure 1 and revise the figure to include dimensions from possible sources of noise, including the QEW, Guelph Line and Brant Street, as well as clearly label the sources.

Figure 1 was prepared based on a review of the surrounding areas and the potential for impacts from various noise sources.

Roadways, such as Guelph Line and Brant Street are located approximately 800 m from the development site, and well outside of the maximum allowable input for the STAMSON modelling software. Given the number of intervening buildings, and large separation distance, Guelph Line and Brant Street would not impact the development.

The QEW is also located at a distance of approximately 600m, and also outside of the maximum allowable input for STAMSON modelling software. Given the large separation distance and the absorptive intervening ground, roadway impacts from QEW are not expected to significantly impact the development. Any future revisions to the study that may be required will review the QEW impacts and confirm significance of roadway impacts.

The development site is primarily surrounded by residential lands. As industries located beyond these lands are required to meet the NPC-300 guideline limits at the closer intervening noise sensitive lands, stationary noise criteria would also be met at the development site. Therefore, only the immediate surrounding lands were reviewed in detail for the stationary noise assessment.

COMMENT NO. B.95

Section 2,
a. please confirm if there are any aircraft sources of noise (or not), if so please include NEF/NEP map
b. Please confirm if there are any impulsive noises in the area STAMSON calculations – Fairview should be divided into two segments for the STAMSON calculations
c. Please confirm if the Burlington Go Station is a stationary source of noise.

Response to comment a.

The closest significant airports include the John C Munro Hamilton international Airport and the Toronto Pearson International Airport. The proposed development is located well outside of the airport NEF 25 noise contours and were not included in the noise study. A general comment can be included in any future revisions to the N+V report.

Response to comment b., part 1

As indicated in the CN Rail Data in Appendix B of the 2020 N+V Study, the continuous welded rail is understood to be used throughout the study area. Therefore, adjustments for jointed rail tracks were not necessary.

Response to comment b., part 2

Fairview Street currently includes 4 lanes of traffic flow. As indicated in the ORNAMENT Technical Document, dated October 1989, a roadway is required to be separated into 2 directions of flow, if more than 4 lanes of traffic. In addition, separating roads such as Fairview Street, into 2 directions of flow has not historically shown significant changes in noise impacts (< 0.5 dBA). Therefore, splitting the traffic flow into 2 directions is not technically required, and separating is not expected to change the results of the 2020 N+V Study.

Response to comment c.

The assessment of Burlington GO Station was completed based on the requirements outlined by Metrolinx. As indicated in Comment M3, no concerns were raised by Metrolinx regarding the Noise and Vibration Study. As this source is not a concern for Metrolinx, a detailed assessment of the stationary noise from the Burlington GO Station is not considered necessary.

COMMENT NO. B.96

Section 2.1 please also include the QEW, Brant Street and Guelph Line, even if it is just your professional assessment that they are not sources of noise.

As indicated above in response to Comment B.94, roadways, such as Guelph Line and Brant Street are located well outside of the maximum inputs for STAMSON. Given the number of intervening buildings, absorptive intervening ground and large separation distance, Guelph Line and Brant Street would not impact the development.

The QEW is also located outside of the maximum allowable input for STAMSON modelling software. Given the large separation distance and the absorptive intervening ground, roadway impacts from QEW are not expected to significantly impact the development. Future revisions to the study will review the QEW roadway volumes and confirm insignificance for roadway impacts.

COMMENT NO. B.97

Section 2.2, please clearly state that the property is considered Class 1

The property is considered a Class 1 noise receptor. Any future revisions of the 2020 N+V Study will clearly indicate the receptors within the surroundings are considered to be in a Class1 area.

COMMENT NO. B.98

Section 2.3, please verify the Fairview traffic counts with the City Transportation department, contact florin.patrau@burlington.ca, and include a copy of the correspondence in the appendix of the report, and update the calculations if necessary.

The Burlington City Transportation Department is currently unavailable to verify studies completed by third parties. We understand the Traffic Consultant has obtained the appropriate traffic data from the Region/Municipality. Future revisions to the Noise Study will include the appropriate data.

COMMENT NO. B.99

Section 2.3.2 references correspondence in Appendix B, the Metrolinx correspondence in Appendix B indicates that the consultant should contact VIA Rail. Was VIA Rail contacted? Please include correspondence from VIA Rail as well as update the calculations to include VIA Rail counts.

Based on correspondence from VIA, traffic data cannot be provided for Railway Noise Studies as this information is considered protected and commercially sensitive.

Historically, passenger train data has been provided through CN/CP for VIA rail operations. As indicated in the CN Traffic Data in Appendix B of the 2020 N+V Study, passenger trains are included as 13 daytime trains which would not be representative of the current 100+ trains/day for Metrolinx. Therefore, these volumes are considered an appropriate representation of VIA train activity.

COMMENT NO. B.100

Section 2.3.2 references correspondence in Appendix B, the CN Train Count Data is from December 2018, please confirm that the data is still accurate in 2020 (as was done for the Metrolinx information), if necessary please update calculations.

We are in the process of confirming with CN the applicability of the traffic data for the 2020 N+V Study. As of the date of this letter, a response has not been received from CN. Historically, application of 2+ year old traffic data has not been questioned by CN rail for other noise studies completed by SLR-Novus.

COMMENT NO. B.101

Section 2.5 please provide a table outlining mitigated indoor noise level

The façade glazing requirements were calculated to meet the indoor sound level criteria outlined in Table 1 of the 2020 N+V Study. Therefore, a table summarizing the indoor noise levels of facades with upgraded glazing requirements would equal to the road and rail sound level criteria of NPC-300 (Table 1 of the 2020 N+V Study). The relevant section of the 2020 N+V Study, with Table 1, is included in Attachment A of this letter.

COMMENT NO. B.102

Section 2.5, states that "detailed floor plans were not available at time of analysis", this application is for a Site Plan, so the detailed floor plans should be available, please contact the architect for the detailed floor plans and update the façade to floor area ratio and calculations accordingly

Upon review of the current Architectural drawing set, complete floor plans with detailed room dimensions and façade plans are not yet complete. Once available, the glazing analysis will be revised accordingly at such time as approval of the building locations is received from City Staff.

COMMENT NO. B.103

Section 2.5.2 details warning clause requirements and references Type C which in Appendix E references low and medium density, our understanding is that this is a high density development, the warning clause needs to reflect the development proposal. Additionally, window air conditioning units will not be allowed, so how is air conditioning being dealt with? Will the buildings have centralized heating/air conditioning/ventilation? Or will each individual unit has its own HVAC system? Please clearly detail how HVAC for the units will be addressed.

We understand air condition will be provided centrally through the building mechanical systems, and PTAC units and/or individual unit AC will not be used.

COMMENT NO. B.104

Table 12, Building B2 NW/SW is missing the Metrolinx warning clause, please add

The Metrolinx Warning Clause will be included in Table 12 for any future revisions of the N+V Study required.

COMMENT NO. B.105

Section 2.6, please provide a table outlining mitigated Outdoor Amenity Area noise levels

The mitigated outdoor amenity area noise impacts from transportation noise are shown in Tables 13 and 14 of the 2020 N+V Study.

COMMENT NO. B.106

Section 2.6 please detail the type of noise barrier that will be installed, and provide a detail in the report as well as a full size plan (based on the same base drawing as architectural, civil, and landscape drawings) detailing limits, height and material of the noise barriers. Additionally, please provide a plan showing the locations of the noise barriers to be installed, clearly showing the limits, and stating the height, material and density.

Locations and extents of the Acoustic Barriers are shown in Figure 7 of the 2020 N+V Study as green lines. in addition, height, material requirements are summarized in Table 15 and Section 2.6.1 of the 2020 N+V Study. A copy of Figure 7, and relevant sections of the 2020 N+V study are included in Attachment B of this letter.

Future Architectural and landscape plans will include details of the acoustic barriers outlined in the 2020 N+V Study.

COMMENT NO. B.107

Section 2.6, the sentence directly above Table 14 references OLA3, should it reference OLA4?

The text above Table 14 and Table 14 heading will be revised to reference OLA4 in any future revisions of the study required.

COMMENT NO. B.108

Section 2.6, table 14 was provided to demonstrate it is not feasible to provide mitigation to 55dBA for the Building C&D north podium roof OLA, it is at 60dBA or less, which is allowable under NPC-300 with guidelines. Please confirm a 1.0m height barrier (not noise related) meets OBC for the rooftop outdoor amenity area, if the OBC requires a taller barrier, please use the height OBC requires for a barrier and use the noise barrier material for the full height., please clearly state the height of the barrier to be installed in Table 15.

Typical parapets are approximately 1.1 m in height. As shown in Table 14, the results between 1 and 5 m high barriers are indifferent. Therefore, to meet the noise requirements, a barrier height of at least 1.0 m is required, as indicated in Table 15 of the 2020 N+V Study.

COMMENT NO. B.109

Section 2.6, there are also OLAs at grade level for Buildings A and B and on Level 5 for Building B, Level 6 for Building C & D, as well as various terraces that look to be 4.0m or deeper on various floors of all buildings, please refer to the architectural drawings and provide reception points and calculations for all OLA's.

Outdoor Amenity Areas shown at grade are understood to be publicly accessible landscaped areas, and are not private amenity spaces for the occupants of the building. Therefore, an assessment of impacts are not required for these spaces.

Noise impacts within the Building B, 5th floor common amenity space are shown in Table 10 and Figure 6 of the 2020 N+V Study. The predicted impacts are 54 dBA, which are below the 55 dBA criteria requiring any noise control measures.

COMMENT NO. B.110

Section 2.6 does not address private balconies/terraces less than 4.0m depth, we acknowledge that mitigation is not required under NPC-300, however we do ask that a warning clause be included on title/in the site plan agreement Wording to be worked out, but something along the lines of: In accordance with provincial guidelines, private terraces/balconies under 4.0m depth have not been provided mitigation to reduce noise levels. Purchasers/tenants are advised that traffic (road and rail) may interfere with the quiet enjoyment of their private balcony/terrace area.

As a general Type B Warning Clause is currently required for Buildings A, C and D, we consider the warning clause to be sufficient to include the above requested warning clause.

For Building B, a generic Type A warning clause is considered to be sufficient for meeting this request. The Type A warning clause is included below and we understand to be acceptable to Fairview Limited Partnership. The Type A Warning Clause is below:

> "Purchasers/tenants are advised that sound levels due to increasing road and rail traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

COMMENT NO. B.111

Section 2.6 there are auto-mechanic related, and other types of businesses in close proximity to the site, please include a warning clause that activities of the area businesses may at time be audible, appropriate wording to be determined by the consultant and provided to the City for review.

We understand an MECP Type E Warning clause is considered acceptable to Fairview Limited Partnership, as follows:

> "Purchasers/tenants are advised that due to the proximity of the adjacent commercial facilities (including auto-mechanic related noise), noise from the commercial facilities may at times be audible."

COMMENT NO. B.112

Part 2 indicates that the building ventilation has not been designed at this time, the property has applied for Site Plan Approval, so it should be at a stage where this information is available. We would ask that you contact the architect/mechanical engineer/owner/etc. and obtain the information required to assess the equipment to determine any mitigation measures required and include them in your report and on the architectural drawings. Please note that as a condition of site plan approval a letter from the acoustical consultant confirming they have reviewed the architectural/mechanical plans and that the recommendations in the Noise and Vibration Assessment have been included in the design. Additionally, prior to security release a certification letter from the Acoustical Engineer confirming they have conducted a site visit and confirming that the recommendations in the approved Noise and Vibration Assessment have been implemented AND that field measurements have been taken and noise levels are below the estimated levels in the Noise and Vibration Assessment.

We understand the Mechanical Systems have not been sufficiently designed for inclusion in the assessment. Should the designs be sufficiently complete, an assessment will be included in future SPA re-submissions.

COMMENT NO. B.113

Please include a section on the emergency generators for the development, i.e. number, location, noise levels, etc. Our understanding is that generally emergency generators are required to be tested/run on a regular basis, i.e. monthly, so they could be a source of non-emergency noise. We would ask that you consult with the Architect and advise of appropriate locations for the generators, as well as provide recommendations on shielding if necessary and detail in the report.

We understand four (4) generators are proposed for the development, with one (1) per phase. Locations are as proposed and coordinated with Core, to be located in the podiums of the C1/C2 and D1/D2 buildings, and at the penthouse of A and B buildings.

COMMENT NO. B.114

Section 4.0, states the date the site visit was taken and field observations, but does not state if levels were measured, duration of test, prevailing meteorology, equipment, calibration, procedures, etc. Were field measurements taken? Please provide more detail if so. If no field measurements taken, we would ask that you revisit the site and take measurements.

During the site visit, audible noise within the development lands included only transportation noise sources (road and rail). Stationary noise from industries and the surrounding commercial buildings were inaudible within publicly accessible areas and the development lands. Therefore, measurements of the surrounding stationary noise sources could not be measured.

COMMENT NO. B.115

Provide confirmation if an MECP Certificate of Approval is required for any of the mechanical equipment in the development (Sections 5.2 and 6.2 speaks to this)

Once mechanical systems are sufficiently designed, a review will be completed of equipment selections to confirm if an MECP permit is required. In general, residential buildings typically meet the exemption requirements, and an MECP permit would not be required.

COMMENT NO. B.116

Section 6.2, please assess the mechanical equipment for the development, it should be available at the site plan stage, and any impacts on nearest residential and office receptors. Please include a figure detailing the receptor locations and distance from the site.

Typically mechanical equipment is finalized in the later stages of site plan approval, once building location and elevations have been approved in principle by municipal staff. Once mechanical systems are sufficiently designed, an assessment of stationary noise impacts will be completed. If required, noise controls will be included to meet the applicable guideline limits at noise sensitive spaces/building within the development and within the surrounding area.

COMMENT NO. B.117

Section 7.4 states "given the early stage of design", the application that has been submitted to the City is for a Site Plan, which is where details should be available. Once the pertinent details (i.e. mechanical equipment) are available please assess and update the report with specific design information.

As indicated in response to comment B.116, once mechanical systems are sufficiently designed, an assessment of stationary noise impacts will be completed. If required, noise controls will be included to meet the applicable guideline limits at noise sensitive spaces/building within the development and within the surrounding area.

COMMENT NO. B.118

Section 7.4, please add that a separate certification letter is to be provided after a detailed review of the architectural and mechanical drawings has been undertaken and you confirm that the recommendations of the Noise and Vibration Assessment have been incorporated into the design.

A general statement will be included in future revisions to the 2020 N+V Study to indicate the City of Burlington will be requiring a Certification Letter as a Condition of Site Plan Approval to meet the above comment requirements.

COMMENT NO. B.119

Section 7.4 please add that Site visits will be undertaken during construction to verify building materials recommended for noise control are being installed, as well as inspection of buildings and as-constructed noise measurements to be taken after completion of construction/prior to occupancy to confirm all recommended noise control measures have been implemented and noise levels are in accordance with the approved Noise and Vibration Assessment (or Detailed Study if the title of the report changes). Certification will be required prior to security release.

A general statement will be included in future revisions to the 2020 N+V Study to indicate the City of Burlington will be requiring a Certification Letter as a Condition of Site Plan Approval to meet the above comment requirements.

COMMENT NO. B.120

Section 7.4 please add that individual window-style air conditioning units are not allowed

We understand the individual window-style air conditioning units/PTAC units will not be used for the development.

COMMENT NO. B.121

Figures 2a through 5, at what elevation are the noise levels calculated, please state the floor on the drawing?

As indicated in Section 2.4 of 2020 N+V Study, all floors were included in the assessment, with the maximum levels shown.

Worst-case impacts are typically the lowest floors for roadway noise, as increased height also contributes to increased separation distance from the source.

Railway noise were also found to have the highest impacts on the lowest floors of the towers and podiums, with the exception of the inner towers (Buildings C2 and D1), in which highest impacts were found to occur starting on floor 15 (approximately). This is due to the screening of railway noise from the above ground parking structure.

COMMENT NO. B.122

"Please provide an additional Figures with mitigated noise indoor noise levels, minimum one for each side of each building, for the following levels as shown on the architectural plans:

a. Level 1 as shown on A103, there are residential town homes in Building B facing Fairview

b. Level 1 as shown on A103, for office space to confirm NPC-300 table C-9 is met

c. Level 2, as shown on A105

d. Level 3 as shown on A106

e. Level 4 as shown on A107

f. Level 5 as shown on A108

g. Level 6 as shown on A109

h. Level 13 as shown on A111

i. Level 20 as shown on A115

j. Level 29 as shown on A116

k. Level 37 (For C2)

l. Please note that once the above information is received, if there is marked difference in noise levels on the upper floors it may be required to assess every side of every floor of every building."

An assessment of indoor noise levels was not completed for various facades with acceptable sound levels (per NPC-300). For facades requiring an indoor glazing analysis, the glazing requirements were specified to meet the indoor noise requirements in NPC-300. Therefore, the indoor noise levels for all affected units would be equal to Table 1 of the 2020 N+V Study. The relevant section of the 2020 N+V Study is included in **Attachment A** of this letter.

As the glazing analysis is dependent on room and window dimensions, a more detailed glazing analysis will be completed once detailed floor and façade plans are available once building locations are approved in principle by City Staff. Where the glazing requirements change significantly along the façade the building, recommendations will be provided at the time of the detailed glazing analysis.

COMMENT NO. B.123

Figure 7, please note the floor the OLAs are located on, in the box with the OLA number and dBA value

The floors will be identified in Figure 7 of any future revisions for the report.

COMMENT NO. B.124

"Please include additional Figures for outdoor Terraces, balconies, and amenity areas, even if less than 4.0m depth we still want to know what the noise levels will be, at minimum please provide estimated noise levels for each side of each building, as shown on the following architectural drawings:

a. the ground level OLAs as shown on A103

b. the terraces shown on A105

c. the terrace on A107

d. Terraces on A109

e. Terraces on A110

f. balconies shown on A111

g. Terrace on A112

h. Terrace and balconies on A113

i. Terrace on A114

j. balconies on A115

k. Terraces and balconies on A116

l. Outdoor Amenity and balconies on A117"igure 7, please note the floor the OLAs are located on, in the box with the OLA number and dBA value

Response to comment, part 1

As indicated above in response to comment B.109, publicly accessible areas are not considered OLAs for the occupants, and have not been assessed.

Response to comment, part 2

The anticipated impacts within the private terraces (< 4m depth) would be similar to the façade levels shown in Figures 2 to 4 of the 2020 N+V Study. Differences between the lower floor façade levels and the top floor façade levels can vary as much as 9 dBA along the façade of the building. Railway impacts are not expected to change significantly along the north facades of the buildings. A copy of the façade sound level figures are included in **Attachment C** of this letter.

Response to comment, part 3

The estimated noise levels on each façade of each building are shown in Figures 2 to 4 of the 2020 N+V Study. A copy of the façade level figures are included in **Attachment C** of this letter.

COMMENT NO. B.125

"Appendix C:

a. STAMSON calculations please provide all calculations for all receptors, please clearly label the receptor ID in the description area of the calculation sheet, i.e. Building B1 first floor

b. STAMSON calculations - Fairview should be divided into two segments for the STAMSON calculations

c. STAMSON calculations – Drury Lane should have an estimated number of medium and heavy trucks for the STAMSON calculations, there are currently businesses on Drury Lane, and in the future there will be loading areas that will get truck traffic

d. STAMSON calculations for Drury lane please confirm with the excerpt from the TIS in the appendix the future traffic counts for Drury Lane"

Response to comment a.

The STAMSON validation files included in Appendix C of the 2020 N+V Study were included to confirm propagation and barrier effects within the CadnaA implementation are equivalent.

In addition, the STAMSON modelling output files for every location on every façade of every building is likely to exceed 4000 modelling points. In addition, STAMSON cannot readily take into consideration complex geometries, in which each output file would likely require significant effort.

Based on the above, an extensive set of validation files is not considered necessary as the Appendix C validation files confirm the CadnaA modelling is equivalent to the STAMSON results.

Response to comment b.

As mentioned above in response to comment B.95, Fairview Street includes 4 lanes of traffic flow. As indicated in the ORNAMENT Technical Document, dated October 1989, a roadway is required to be separated into 2 directions of flow, if more than 4 lanes of traffic. In addition, separating roads such as Fairview Street, into 2 directions of flow has not historically shown significant changes in noise impacts (< 0.3 dBA). Therefore, splitting the traffic flow into 2 directions is not technically required and is not expected to change the results of the 2020 N+V Study.

Response to comment c.

The assessment was completed based on the available information at this time, which included counts at the intersection of Fairview and Drury. Future developments are expected to require a Traffic Impact Study, in which concerns related to those developments would be addressed at that time. Given the information currently available and observations made, significant trucking traffic is not anticipated along Drury Lane.

In addition, noise impacts and glazing requirements are driven by railway noise and Fairview Street. The increase of truck percentages for a Drury Lane (<900 AADT), relative to the 43,000 AADT of Fairview St, would not affect the overall roadway results. Also, Railway noise impacts are nearly 10 dBA higher than roadway noise for the worst-case facades long Drury Lane.

Based on the above, increases in truck percentages for small commercial operations along Drury Lane would not affect the overall results of the 2020 N+V Study. An update to include future truck percentages is not considered necessary.

Response to comment d.

Based on the Traffic Data Verification requested in comment B.98, traffic data will be updated based on approved data from the Region/City. Future noise studies will be revised to account for the data provided.

COMMENT NO. B.126

"Appendix E:

a. The type B warning clause mentions aircraft, but the report does not, please remove the word aircraft if aircraft is not a source or expected source of noise. As mentioned in the report comments above please address aircraft noise in the report.

b. The type C warning clause mentions low and medium density developments, is that how this development is classified? Or is it high density? Please revise the warning clauses so they reflect the specific development as they will be included in the site plan agreement, and if the development is condo, on all offers of purchase, sale, lease and in the condo declaration.

c. The City requests that an additional warning clause be included for private balconies less than 4.0m depth that do not require mitigation under NPC-300. Wording to be worked out, but something along the lines of: In accordance with provincial guidelines, private terraces/balconies under 4.0m depth have not been provided mitigation to reduce noise levels. Purchasers/tenants are advised that traffic (road and rail) may interfere with the quiet enjoyment of their private balcony/terrace area.

d. Warning clauses for the communal outdoor amenity areas are also required, maybe more than one, as some of the amenity areas have mitigation and others do not, warning clauses should be in accordance with NPC-300

e. The city requests that an additional warning clause be added with regard to area commercial businesses as there are auto-mechanic related, and other types of businesses in close proximity to the site, please include a warning clause that activities of the area businesses may at time be audible, appropriate wording to be determined by the consultant and provided to the City for review."

Response to comments a and b.

As generic warning clauses were included in the 2020 N+V Study, wording will be reviewed and revised for future revisions to the report.

Response to comment c.

We understand the additional warning clause required by the City is considered acceptable by Fairview Limited Partnership.

Response to comment d.

The warning clauses in the 2020 N+V study were recommended based on the NPC-300 requirements, in which amenity spaces with impacts below 55 dBA do not require any warning clauses. As all other common outdoor amenity areas require a noise barrier for impacts to be

between 55 dBA and 60 dBA, a Type B Warning Clause was recommended and included in the 2020 N+V Study. Therefore, this condition is considered to be met.

Response to comments e.

As indicated above in response to comment B.111, an MECP Type E Warning clause is understood to be acceptable to Fairview Limited Partnership, and will be included in future revisions to the 2020 N+V Study.

COMMENT NO. B.127

Precondition surveys of area structures are required as a condition of site plan approval as well as vibration monitoring for the duration of construction. The City requires a professional to advise on the precondition study limits and locations for vibration monitoring during construction, it is our understanding that Acoustical Engineers and/or in conjunction with Geotechnical Engineers are able to provide this information. If so directed to do so by the Owner/Developer, please include a section in the report regarding precondition surveys and vibration monitoring during construction.

As indicated in response to comment B.78, A Construction Vibration Zone Of Influence (ZOI) assessment can be completed to determine the extent of vibration impacts for various stages of construction and associated activities. Results of the study will indicate the expected boundaries of the ZOI and requirements for vibration monitoring, if necessary. A pre-condition survey of the surrounding area will be completed prior to the start of construction and vibration monitoring, where required. A general recommendation can be included in revisions to the 2020 N+V Study.

CITY OF BURLINGTON – ENVRIONMENTAL, GEOTECHNICAL REPORT AND GENERAL COMMENTS

COMMENT NO. B.187

Precondition surveys of area structures are required as a condition of site plan approval as well as vibration monitoring for the duration of construction, section 5.3 touches on this but more information is needed. The City requires a professional to advise on the precondition study limits and locations for vibration monitoring during construction, it is our understanding that Acoustical Engineers and/or in conjunction with Geotechnical Engineers are typically able to provide this information. If so directed to do so by the Owner/Developer, please include a section in the report regarding precondition surveys and vibration monitoring during construction, including detailing study area required and number and location of vibration monitoring stations required.

As indicated in response to comment B.127, Construction ZOI assessment can be completed in which vibration monitoring locations and pre-condition surveys would be recommended. A general statement can be included in future revisions to the 2020 N+V study to recommend the Construction ZOI assessment.

COMMENT NO. B.384

In addition to the precondition survey, provide confirmation that vibration monitoring will be continuously undertaken for the duration of construction. Include confirmation from the consultant that they have been contracted for the work along with a plan showing the vibration monitoring stations, and written permission from the landowner (if not on development property) that they agree to have the vibration monitoring stations on their structure/land. Additionally, if there are any vibration exceedances beyond the recommendations of the consultant the city shall be notified for our records.

A general recommendation can be included in the future revisions to the 2020 N+V Study to have a Construction ZOI study completed, vibration monitoring completed (as required), and the pre-condition survey to be completed.

COMMENT NO. B.393

Provide a letter from the acoustical consultant confirming they have reviewed the architectural/mechanical plans and that the recommendations in the Noise and Vibration Assessment have been included in the design. (As an advisory - prior to security release a certification letter from the Acoustical Engineer confirming they have conducted a site visit and confirming that the recommendations in the approved Noise and Vibration Assessment have been implemented AND that field measurements have been taken and noise levels are below the estimated levels in the Noise and Vibration Assessment.).

The review of the Architectural/Mechanical Plans will be completed, as needed.

HALTON REGION – PLANNING ANALYSIS

COMMENT NO. R.8

"As part of the Site Plan submission, Regional Staff note that a Noise and Vibration Study was completed by SLR Environmental (January 9, 2020) in support of this development. This report review and provides recommendations to mitigate the impact of the railway corridor (amongst other noise and vibration sources) on these lands. It would appear as though this study effectively addresses the requirements of Policy 1434(9); however, the Region relies on the railway authority's review to determine the appropriateness of the Noise and Vibration Study has occurred. Consideration should be given to the comments and recommendations of the railway authority."

No action is understood to be required at this time, pending comments from CN. As per comment M3, the assessment was completed based on the established procedures for Metrolinx, the mitigation requirements were reviewed and no additional comments were provided regarding the analysis, conclusions and recommendations.

COMMENT NO. R.9

"Additionally, and in accordance with ROP policy direction, consideration of the impact of the adjacent commercial uses (east side of Drury Lane and the commercial lands to the west) should be given, as the proposed development would permit new sensitive land use(s) adjacent to these adjacent commercial uses, which may generate noise and air quality impacts on the proposed residential development."

As indicated in Section 4.0 of the 2020 N+V Study, a site visit was completed by SLR-Novus personnel to review the surrounding lands. No significant noise was observed from the adjacent commercial lands. Therefore, a detailed assessment of stationary noise impacts was not completed and stationary noise impacts were not observed.

METROLINX – GENERAL COMMENTS

COMMENT NO. M.3

"Given the proximity to the rail corridor and the proposed residential use, the proponent shall engage a qualified professional to prepare a noise and vibration study for review and to the satisfaction of Metrolinx. The current rail data forecast required for the study can be obtained by submitting a request to raildatarequests@metrolinx.com.

a. I am in receipt of the Environmental Noise and Vibration Assessment, prepared by SLR Environmental, dated January 9, 2020. The assessment is based off of the most up to date rail data forecast and the modeling is based off of diesel parameters, which is Metrolinx's established approach. The report recommends noise mitigation measures that will achieve applicable MECP noise guideline requirements. I have no further comment in this regard."

No action required.

COMMENT NO. M.6 – OWNERSHIP ACTION

"The following warning clause shall be inserted in all development agreements, offers to purchase and agreements of Purchase and Sale or Lease of each dwelling within 300 metres of the rail right-of-way Warning: Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the right-of-way or their assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way.

> The Metrolinx Warning Clause wording in the 2020 N+V Study will be revised to include the specific wording identified above.

Should you have any questions or comments on the above responses, please do not hesitate to contact me at your earliest convenience.

Yours sincerely,
SLR Consulting (Canada) Ltd.



Marcus Li
Principal - Acoustics Noise & Vibration
226-706-8080 ext 217
mli@slrconsulting.com

Enc

MTL/MTL

Document1

ATTACHMENT A
Indoor Noise Limits

Environmental N+V Study - 1st Submission, Comment Response
2243-2269 Fairview Street & 864 Drury Lane
SLR Project No.: 241.18239.00000

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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:

1) Transportation noise impacts from Fairview Street and Drury Lane;
2) Transportation noise impacts from the GO, Freight and Passenger trains along the railway line north of the site; and
3) Transportation vibration impacts from GO and Passenger trains along the railway line.

2.0 Transportation Noise Impacts

2.1 Transportation Noise Sources

Transportation noise sources of interest with the potential to produce roadway and railway noise at the proposed development are:

- Fairview Street;
- Drury Lane; and
- Railway activity (including GO, Freight and Passenger trains).

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

2.2 Surface Transportation Noise Criteria

2.2.1 Ministry of the Environment Publication NPC-300

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 5** 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. 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.

ATTACHMENT B
Acoustic Barrier Recommendations

Environmental N+V Study - 1st Submission, Comment Response
2243-2269 Fairview Street & 864 Drury Lane
SLR Project No.: 241.18239.00000

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Based on the above noise modelling, the following is a summary of the recommended noise barriers for the development.

Table 15: Summary of Recommended OLA Barrier Heights

Building Section	Location	ID	Barrier Height (m)	Notes
Building A	Level 2 (south)	OLA 1	2.5	• Perimeter barrier • Approx. length of 35 m • Surface Density of 20 kg/m^2 required • Must be sealed with no gaps
	Level 2 (north)	OLA 2	1.75	• Perimeter barrier • Approx. length of 20 m • Surface Density of 20 kg/m^2 required • Must be sealed with no gaps
Building C+D	Level 5 podium (north)	OLA 4	1.0	• Perimeter barrier • Total Length of 310 m • Surface Density of 20 kg/m^2 required • Must be sealed with no gaps
Building C1+C2	Level 5 podium (South)	OLA 5	2.0	• Perimeter barrier • Approx. length of 30 m • Surface Density of 20 kg/m^2 required • Must be sealed with no gaps

The acoustic barriers can be composed of solid walls and/or glass/ plexiglass panels. The panels should be selected so that they have sufficient mass to adequately attenuate the noise (generally a minimum of 20 kg/m^2 face density). The panels and frames should be free of gaps and cracks on the sides and bottom. The system should also be designed to withstand any wind loading.

2.6.2 Warning Clause Recommendations

Based on the above analysis, acoustic barriers are required for the outdoor common amenity terraces associated with Building A and Buildings C and D. Therefore, a **Type B** warning clause are required to be included in agreements of purchase and sale or lease and rental agreements for the residential units for Building A, Building C+D podium, Building C1, Building C2, Building D1 and Building D2. The **Type B** warning clauses are summarized in **Appendix E**.

3.0 Transportation Vibration Sources

3.1 Transportation Vibration Criteria

For the assessment of the proposed development the major source of potential vibration is the Passenger and GO trains along the “Oakville Subdivision” track.

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Line Source (Roadway)

Railway

Outdoor Living Area

Acoustic Barrier

Figure No. **7**

Outdoor Living Area Sound Levels
Roadway + Railway Impacts, Mitigated

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 20/01/08
File No.: 18-0239
Drawn By: MTL

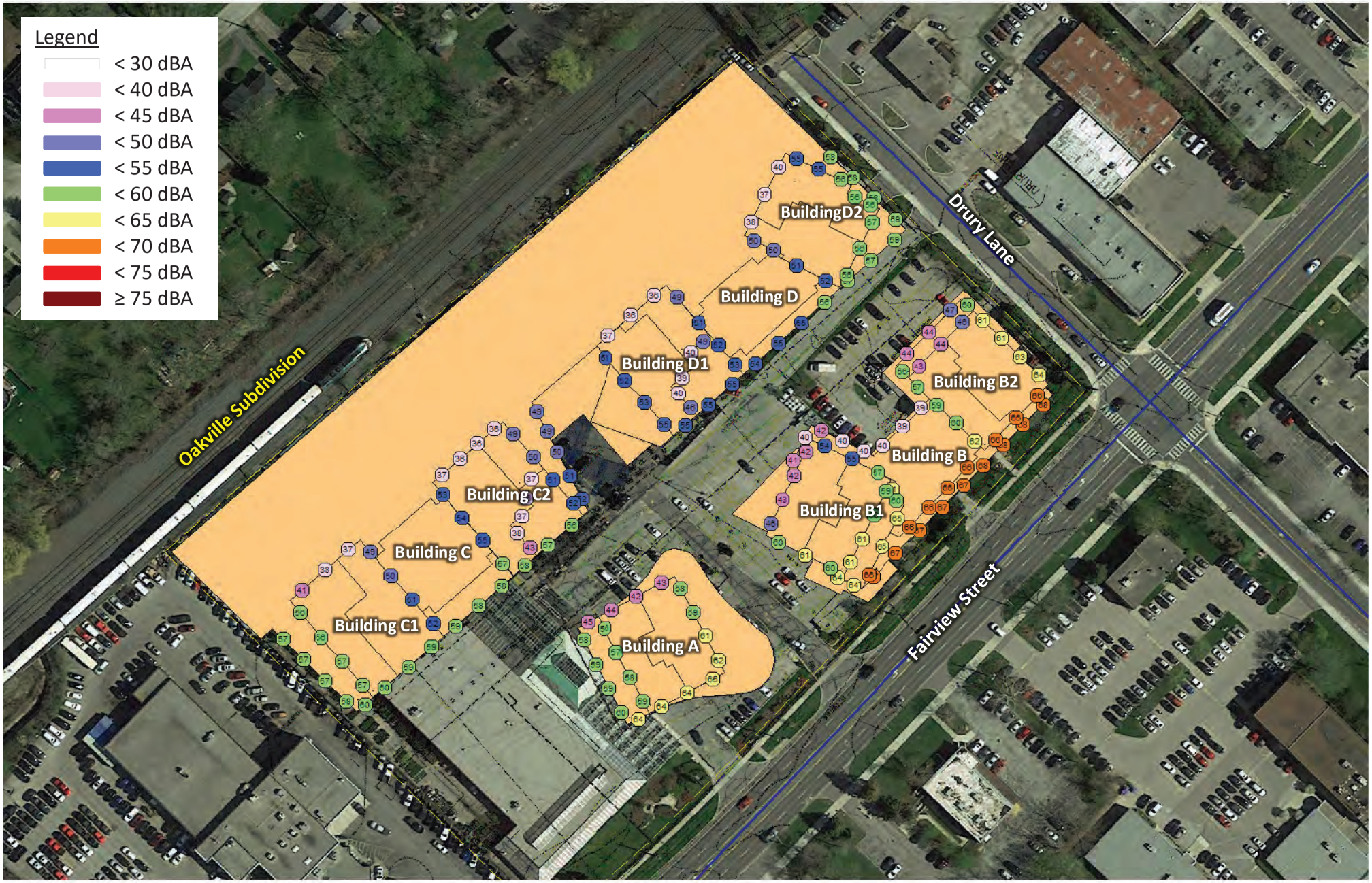
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ATTACHMENT C
Facade Sound Levels

Environmental N+V Study - 1st Submission, Comment Response
2243-2269 Fairview Street & 864 Drury Lane
SLR Project No.: 241.18239.00000

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Line Source (Roadway)

Figure No. **2a**

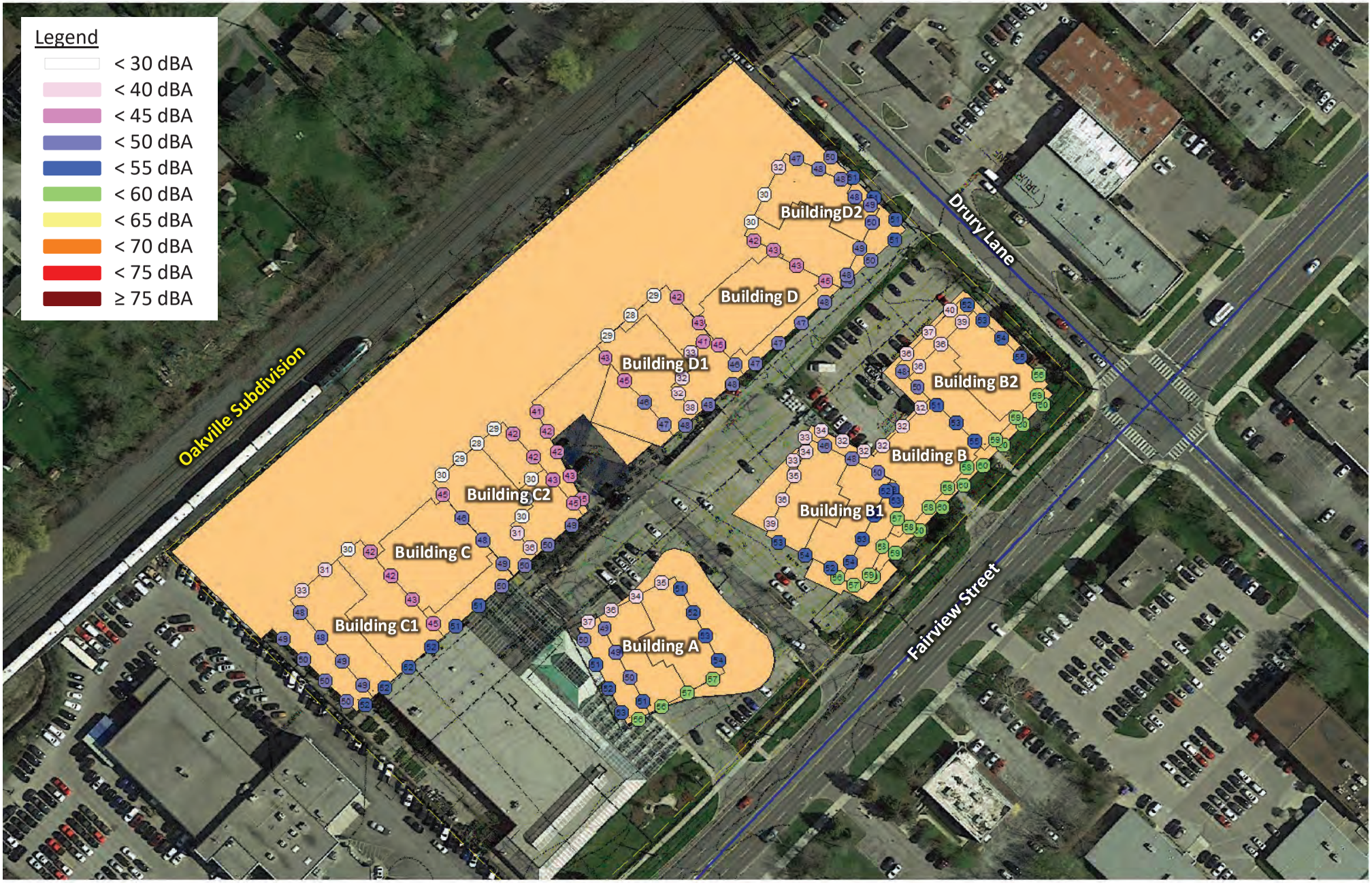
Façade Sound Levels – Roadway
Daytime

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 19/12/31
File No.: 18-0239
Drawn By: MTL

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Line Source (Roadway)

Figure No. **2b**

Façade Sound Levels – Roadway
Night-time

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 19/12/31
File No.: 18-0239
Drawn By: MTL

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Railway

Figure No. **3a**

Façade Sound Levels – Railway
Daytime

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 19/12/31
File No.: 18-0239
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Railway

Figure No. **3b**

Façade Sound Levels – Railway
Night-time

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 19/12/31
File No.: 18-0239
Drawn By: MTL

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Line Source (Roadway)

Railway

Figure No. **4a**

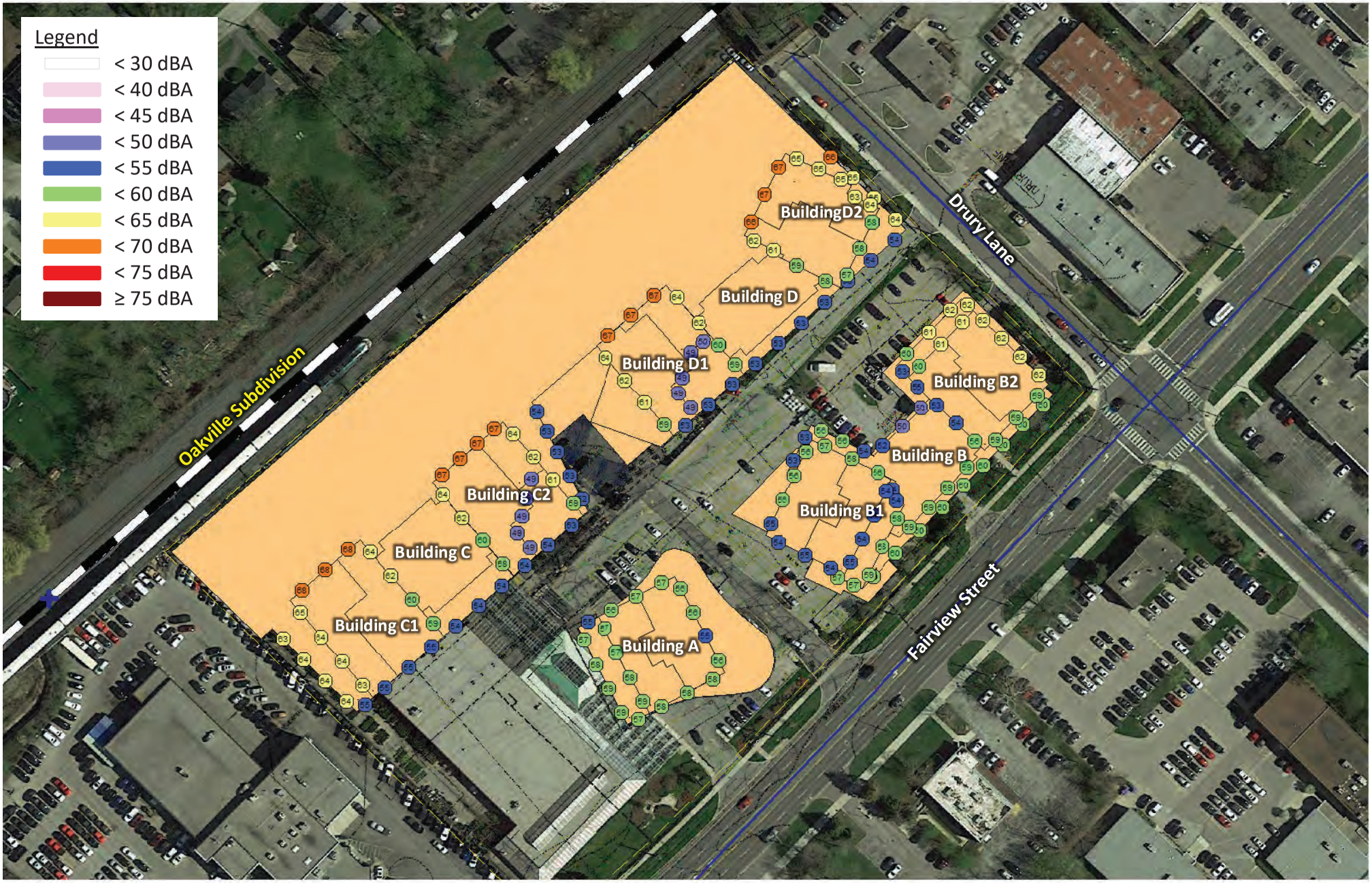
Façade Sound Levels – Roadway + Railway
Daytime

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 19/12/31
File No.: 18-0239
Drawn By: MTL

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Line Source (Roadway)

Railway

Figure No. **4b**

Façade Sound Levels –Roadway & Railway Night-time

2243-2269 Fairview St & 864 Drury Lane – Burlington, ON

True North

Scale: 1: 1,500
Date: 19/12/31
File No.: 18-0239
Drawn By: MTL

novus ENVIRONMENTAL

Comments on Fairview LP Burlington GO SPA Submission #2 (October 26, 2020)
Second Submission

Revision date: Sept. 16, 2021

#	Comment	Date Received	Response
City of Burlington			
Capital Works Department, Development & Storm Water Engineering - *Annette Simpson*			
Noise			
B30	A complete copy of the revised Environmental Noise and Vibration Study was not provided, please provide. The comment response letter looked to address many of the first submission comments, however without a full revised report to review we are unable to confirm if the report is satisfactory or if revisions are required. Please ensure that the responses indicted in the letter are reflected in the revised report (and the letter is included in the appendix) when submitted, so that a fulsome review can be undertaken, and comments provided. Please also be advised, and as previously advised Halton Region, Metrolinx, Canadian National Railway, and the Planning Department may also review the noise report, in case of discrepancy between departments/agencies, the most stringent criteria shall apply.	20-Jul-21	Response Letter provided in Appendix A of the Version 2 Report. All applicable criteria are discussed in the revised report. The most stingent criteria have been used.
B31	As advised by Planning Staff, only Phase One (Building C) is included in the current application, therefore please also include temporary noise mitigation measures for the east side of the Level 5 amenity area, that would have to be constructed and remain in place until Building D is constructed under a future site plan application.	20-Jul-21	Included in the Version 2 Report
B32	Attachment B in the letter, Table 15 noted outdoor amenity areas for Buildings A, C & D, however there is also a level 5 amenity area for building B shown on the architectural plans, as well as several private balconies/terraces that are 4.0m depth or greater. As mentioned above, only Building C is being reviewed at this time under the current site plan application, so this information is for future reference.	20-Jul-21	Noted. No additional assessment required at this time.
B33	Several of the comments in the letter indicated that the information was not available yet, please do not submit another report until the information is available, i.e. mechanical, windows, etc.	20-Jul-21	Noted. Addressed in the Version 2 Report.
B34	The response letter indicated “Future developments”, please be clear about only Building C being included in the current site plan application, and that Buildings A, B and D will be assessed separately under future site plan applications.	20-Jul-21	Noted. Addressed in the Version 2 Report.
B35	Please provide the zone of influence assessment for construction related vibration and limits of the area for recommended precondition surveys to be undertaken, as well as the vibration monitoring plan. The precondition survey will need to be completed and a copy provided to the City, prior to site plan approval.	20-Jul-21	Included in the separate Construction Vibration Study Report

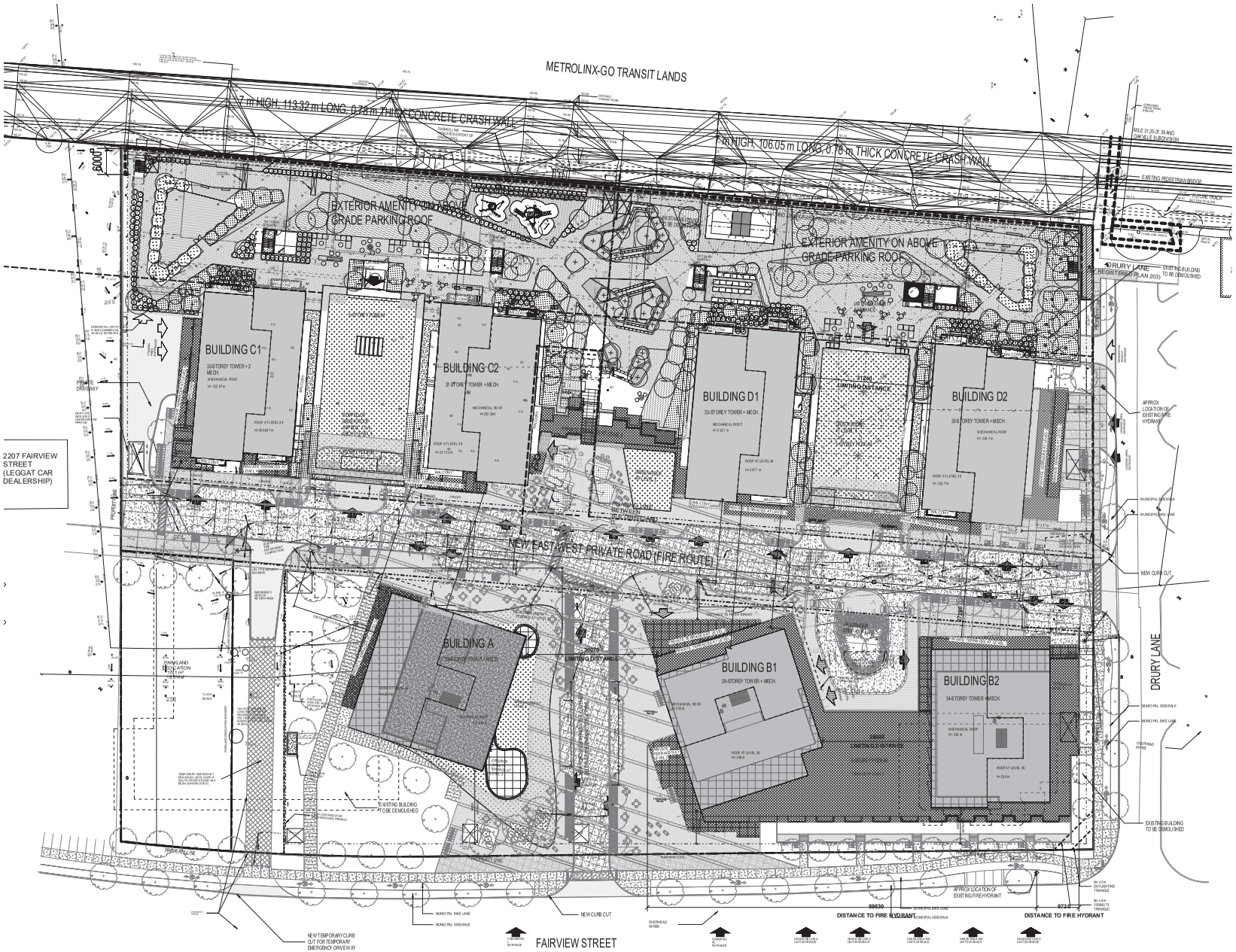
B35A	Is there a reflective property to the 5 storey concrete (?) above ground parking structure/crash wall on the north side of Phase One (and Two) that could impact the residents on the north side of the rail tracks? If so, is there an (absorptive ?) mitigation measure that can be installed on the wall?	10-Sep-21	An assessment of the effects of reflections on offsite areas was undertaken. The wall in question includes textured panels (not smooth concrete or glass panels), which are not perfectly reflective. Off-site sound levels will increase by a negligible, imperceptible amount (less than 1 dB). Additional mitigation measures are not required
B35B	Is a second noise wall on the north side of the tracks warranted to mitigate reflective noise (if) caused by the above ground parking structure/crash wall onto the residents north of the tracks?	10-Sep-21	See above. An additonal wall is not required.
B35C	Please provide a calculation for a receptor at the rear yard of one of the properties mid street on Phyllis to demonstrate the impacts, if any, resulting from the development.	10-Sep-21	Included in the Version 2 Report.
General Comments			
B400	Provide a precondition survey of surrounding commercial and residential structures, limit of study area to be determined in conjunction with geotechnical and acoustical (vibration) consultants. Please confirm study radius with city staff before undertaking the study. Please also be advised that the City assumes no responsibility for any damage to surrounding structures as a result of construction, we only ask that the precondition survey be completed as a baseline as insurance for any future claims that may arise in the future. Any damages would be a civil matter between the developer and adjacent property owner.	20-Jul-21	Addressed in the separate Construction Vibration Study Report
B409	Provide a letter from the acoustical consultant confirming they have reviewed the architectural/mechanical plans and that the recommendations in the Noise and Vibration Assessment have been included in the design. (As an advisory - prior to security release a certification letter from the Acoustical Engineer confirming they have conducted a site visit and confirming that the recommendations in the approved Noise and Vibration Assessment have been implemented AND that field measurements have been taken and noise levels are below the estimated levels in the Noise and Vibration Assessment.)	20-Jul-21	To be completed once Site Plan approval has been secured, and the Building Permit Drawings are finalized.
Region of Halton			
Region of Halton - Adam Huycke			
R5	It is the expectation of the Region that revised reports and/or addendums be submitted providing detailed analysis from noise, vibration, odor and air pollution perspective on the merits of this proposal and the potential impact the adjacent industrial and transportation sources have on this development, as well as the above mentioned internal phasing plan and any potential mitigation measures that may be required.	2-Jun-21	Noted. Addressed in the Version 2 Report.
R6	Further, the Noise and Vibration Study and comment response letter note that SLRNovus, conducted a site visit for the surrounding lands and determined that no significant noise was observed from the adjacent commercial lands, and therefore did not complete a detailed assessment of stationary noise impacts, as stationary noise impacts were not observed. Further detailed analysis was not provided in this regard and is required.	2-Jun-21	Additional Stationary Noise analysis is provided in the Version 2 Report

R7	As part of the Site Plan submission, Regional Staff note that a Noise and Vibration Study was completed by Novus Environmental (January 9, 2020) and Comment Response prepared by SLR Consulting Canada LTD. (October 23, 2020) in support of this development. The submitted Noise Study and comment response provides recommendations to mitigate the impact of the railway corridor (amongst other noise and vibration sources) on these lands. It would appear as though this study effectively addresses the requirements of Policy 1434(9); however, the Region relies on the railway authority's review to determine the appropriateness of the Noise and Vibration Study has occurred. Regional staff are of the understanding that Metrolinx has provided comments on this application, as such implementation of Metrolinx recommendations is required to ensure conformity with ROP policy.	2-Jun-21	Noted. No additional assessment required at this time.
Transportation			
R24	Noise Report: "Noise_and_Vibration_Response_Letter_FairviewDrury_Oct_23_2020" Regional Staff are generally satisfied with the submitted noise study from a Regional Road perspective only.	2-Jun-21	Noted

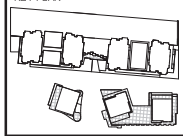
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APPENDIX B
Drawing Excerpts

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KEY PLAN



UNDERGROUND PARKING
PROPERTY LINE
NEW PROPERTY ROW LINE
EASEMENT LINE

NO.	REVISIONS	DATE
13	Issued for Consultant Coordination (WSS) 03	September 16, 2021
12	Issued for Consultant Coordination (WSS) 02	July 30, 2021
11	Issued for Consultant Coordination (WSS)	July 05, 2021
11	Reissued for 100 % DD	June 11, 2021
10	Issued for 100 % DD	April 16, 2021
9	Issued for Consultant Coordination 15	April 05, 2021
8	Issued for Consultant Coordination 14	March 19, 2021
7	Issued for Consultant Coordination 13	January 29, 2021
6	Issued for 100 % DD Coordination	January 01, 2021
5	Issued for Consultant Coordination 12	December 11, 2020
4	Reissued for Site Plan Approval	September 25, 2020
3	Issued for Site Plan Approval	January 03, 2020
2	Issued for revision	November 29, 2019
1	Issued for Zoning Application	November 21, 2019

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CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS ON THE JOB.

CORE

CORE ARCHITECTS INC
317 Adelaide St West Suite 600
Toronto ON Canada M5V 1P9

Tel 416 348 0400
Fax 416 348 0401
info@corearchitects.com
COREARCHITECTS.COM

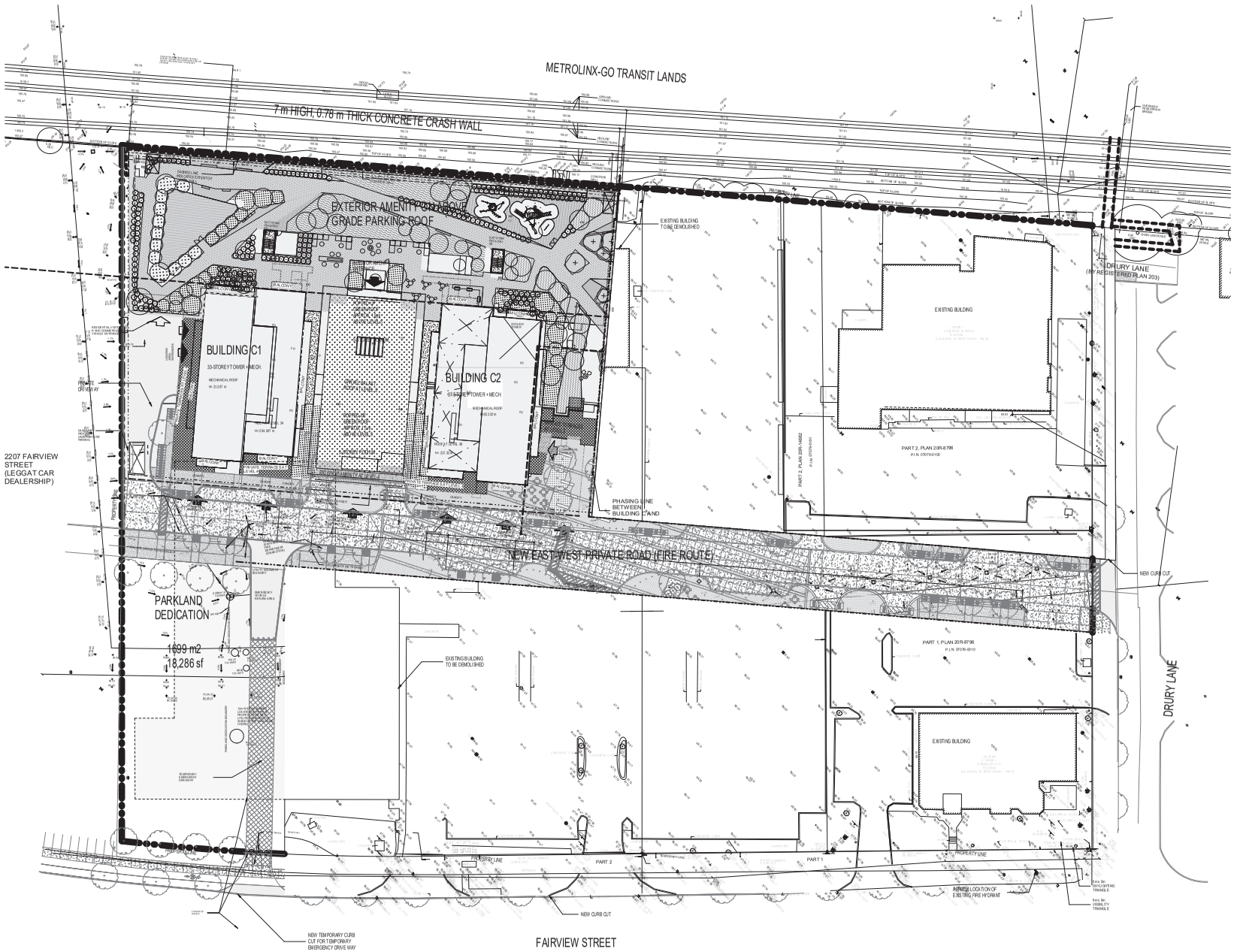
FAIRVIEW AND DRURY
BUILDING C

N

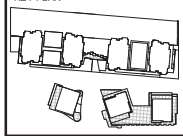
DRAWN	SCALE
Author	As Indicated
CHECKED	DATE
Checker	Issue Date

TITLE
MASTER SITE PLAN

PROJECT NO.	DRAWING NO.
18-223	A006



KEY PLAN



NO.	REVISIONS	DATE
4	Issued for Consultant Coordination (WS3.0)	September 17, 2021
3	Issued for Consultant Coordination (WS2.0)	July 19, 2021
2	Issued for Consultant Coordination (WS1)	July 05, 2021
1	Issued for ZTA (OPA 352)	June 11, 2021
0	Issued for ZTA (OPA 352)	May 28, 2021

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FAIRVIEW AND DRURY
BUILDING C

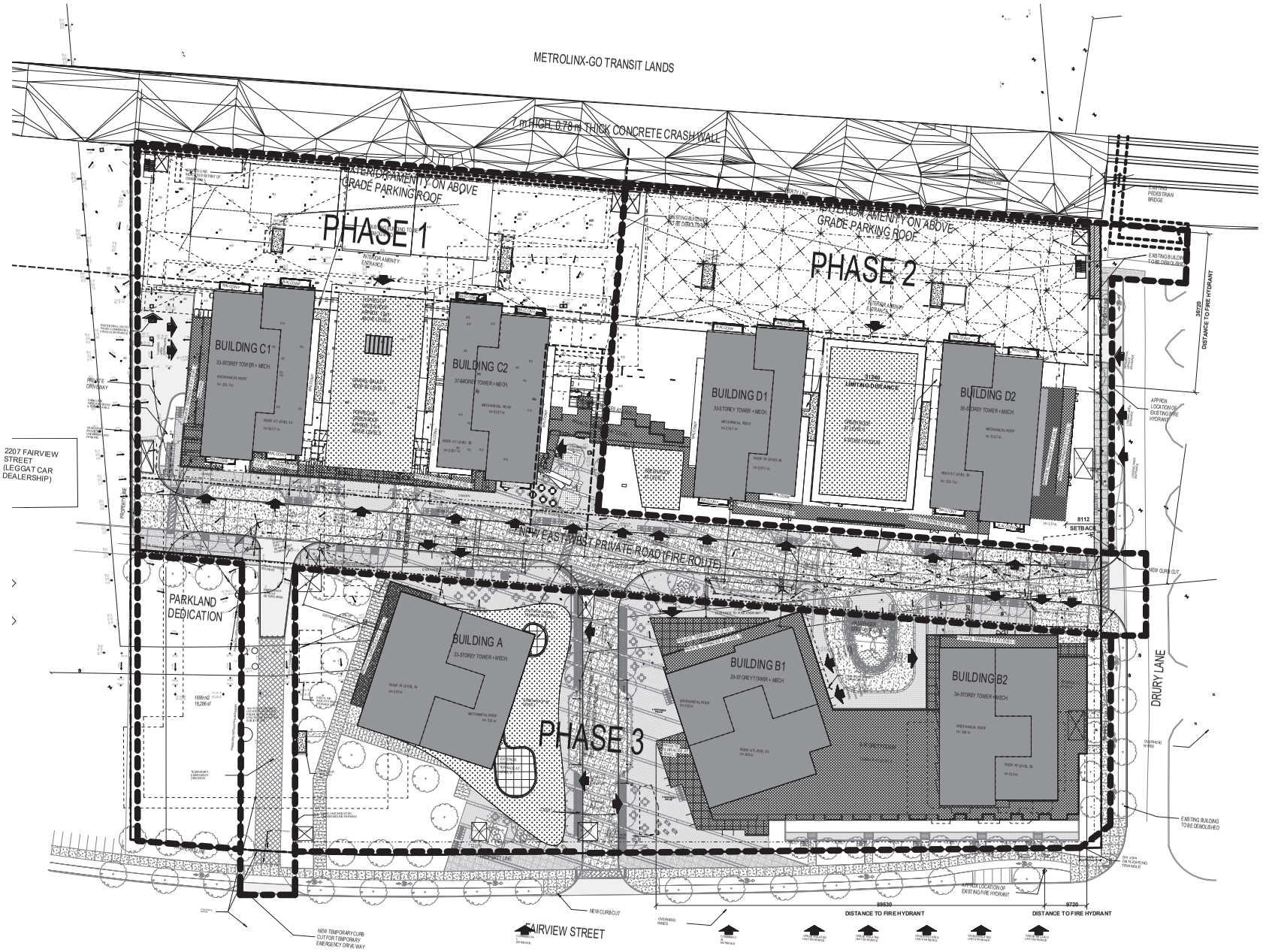
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DRAWN: Author	SCALE: 1 : 300
CHECKED: Checker	DATE: Issue Date

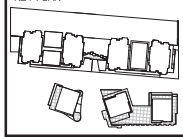
TITLE
BUILDING C SITE PLAN

PROJECT NO.	DRAWING NO.
18-223	A007

DO NOT SCALE DRAWINGS - VERIFY ALL DIMENSIONS ON SITE



KEY PLAN



NO.	REVISIONS	DATE
7	Issued for Consultant Coordination (WTD.03	September, 17 , 2021
6	Issued for Consultant Coordination (WTD.02	July, 30, 2021
5	Issued for Consultant Coordination (WTD.01	July, 05, 2021
4	Issued for 100 % DD	April, 16, 2021
3	Issued for Consultant Coordination 15	April, 09, 2021
2	Issued for Consultant Coordination 14	March, 19, 2021
1	Issued for Consultant Coordination 13	January, 25, 2021
	Issued for 100 % DD Correction	January, 01, 2021
	Issued for Consultant Coordination 12	December, 18, 2020

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CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS ON THE JOB.

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FAIRVIEW AND DRURY
BUILDING C

N

DRAWN: Author	SCALE: 1 : 300
CHECKED: Checker	DATE: Issue Date

TITLE
PHASING PLAN

PROJECT NO.	DRAWING NO.
18-223	A007c

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APPENDIX C
Traffic Data and Calculations

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200661-Fairview St & Drury Ln

Morning Peak Diagram

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

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

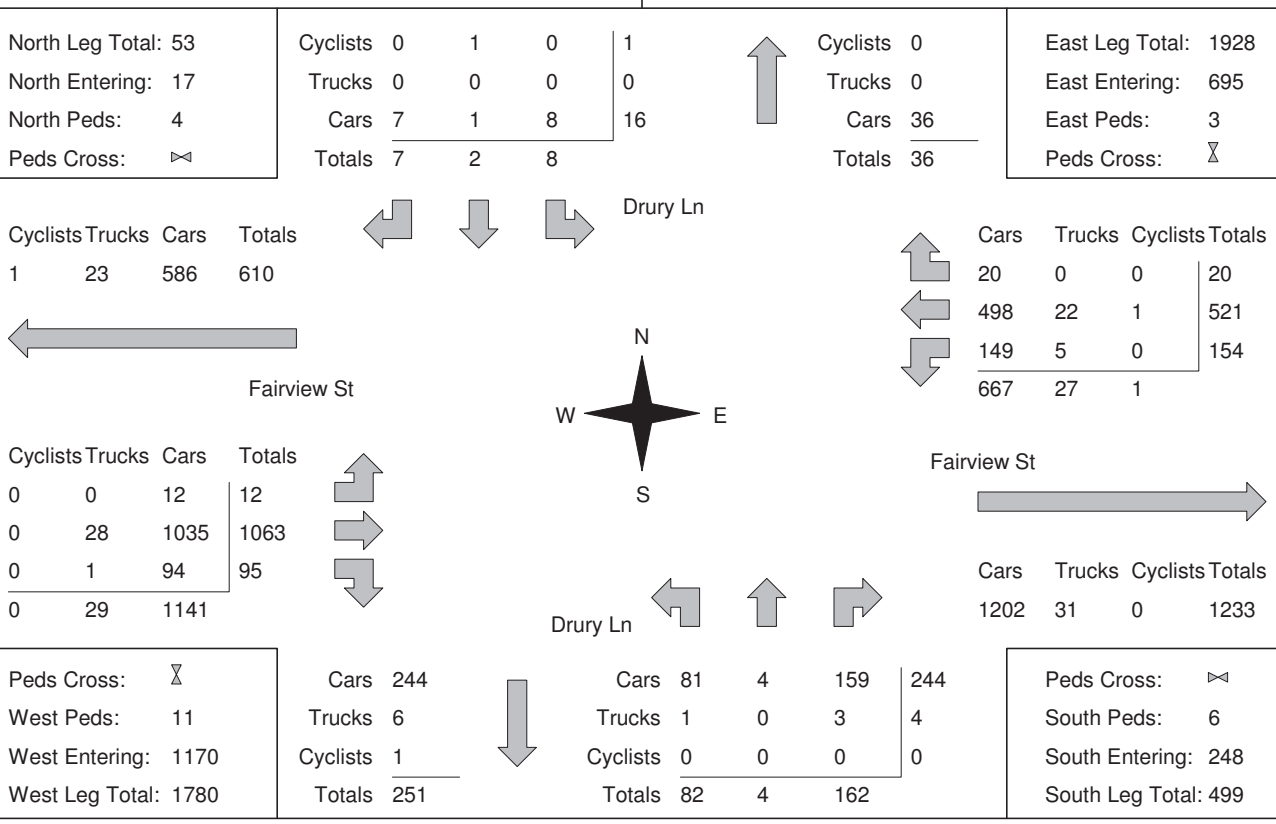
Municipality: Burlington
Site #: 0000200661
Intersection: Fairview St & Drury Ln
TFR File #: 1
Count date: 30-Apr-2019

Weather conditions:
Cloudy

Person(s) who counted:
Nick

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

200661-Fairview St & Drury Ln

Mid-day Peak Diagram

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

One Hour Peak
From: 12:00:00
To: 13:00:00

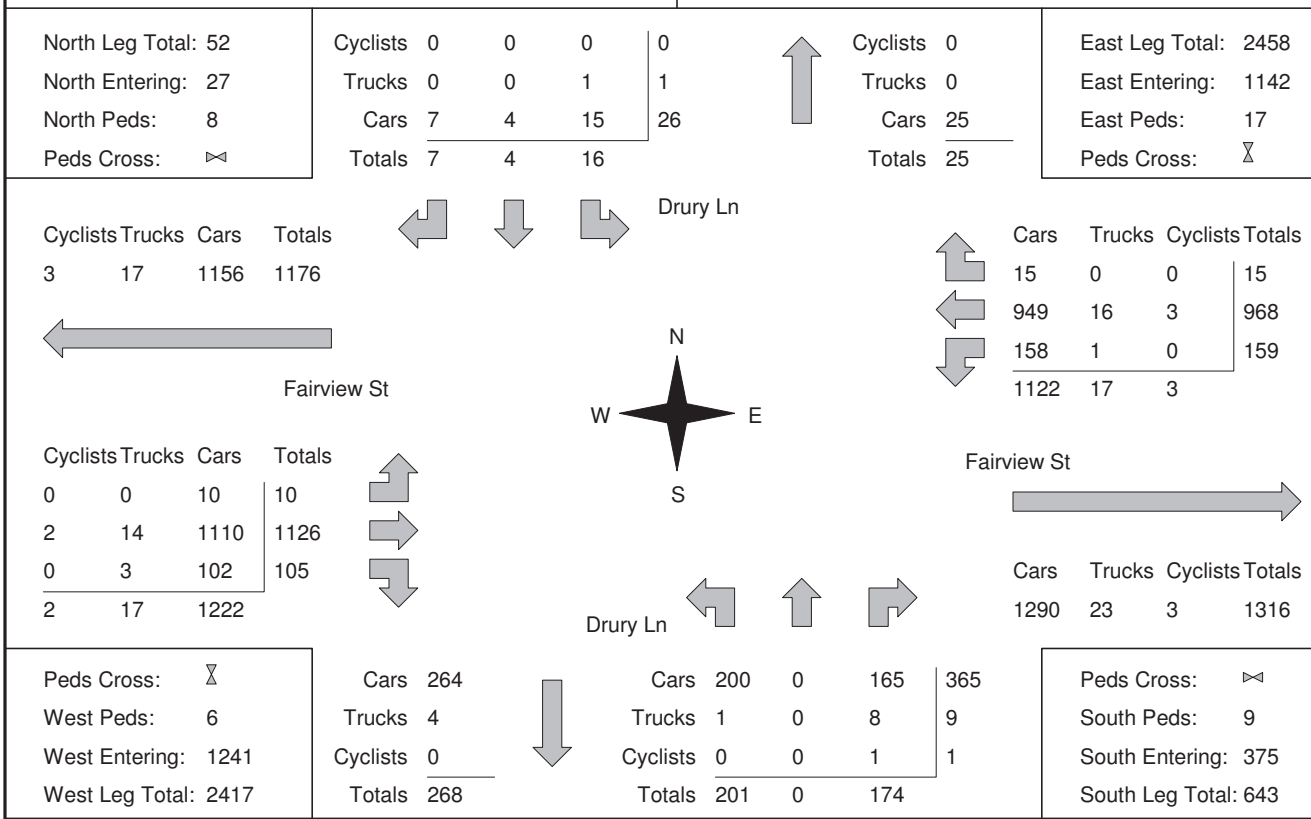
Municipality: Burlington
Site #: 0000200661
Intersection: Fairview St & Drury Ln
TFR File #: 1
Count date: 30-Apr-2019

Weather conditions:
Cloudy

Person(s) who counted:
Nick

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

200661-Fairview St & Drury Ln

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

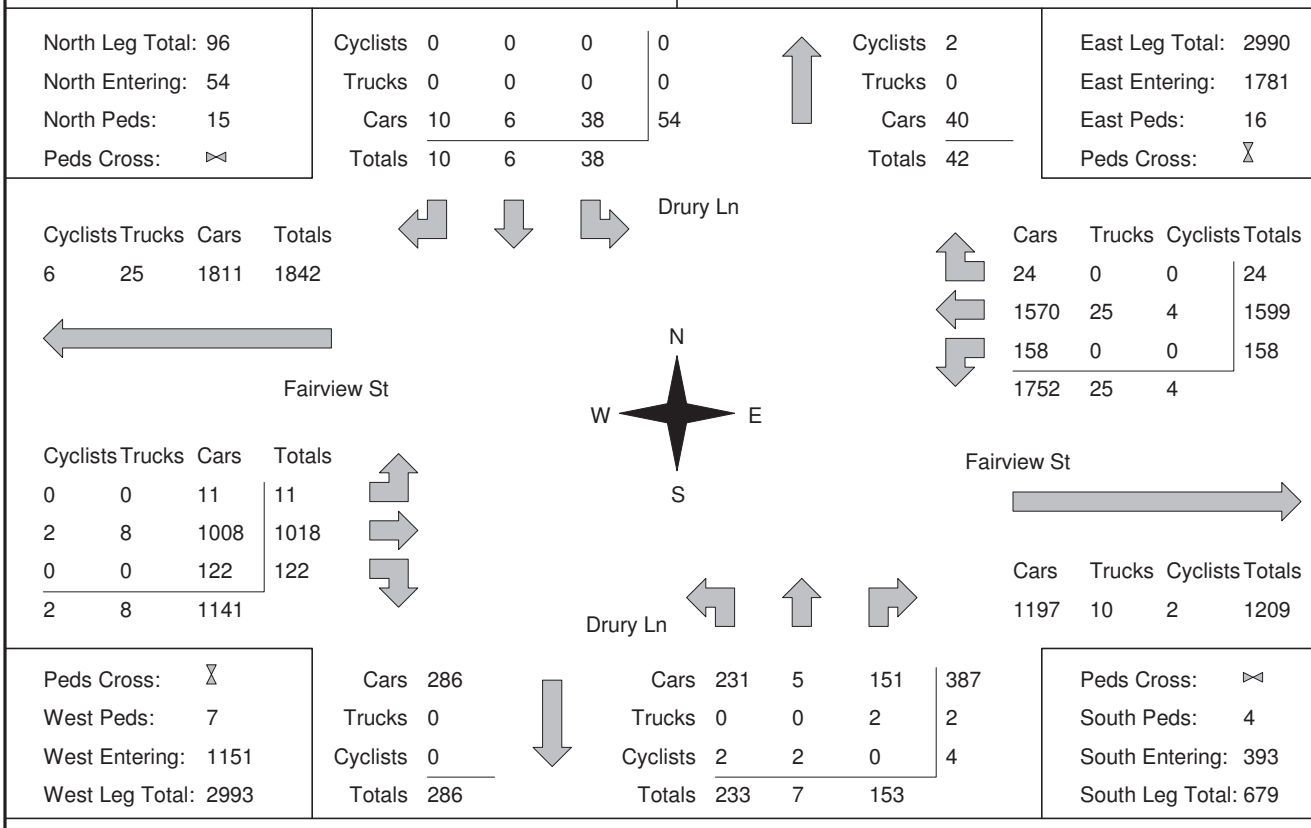
Municipality: Burlington
Site #: 0000200661
Intersection: Fairview St & Drury Ln
TFR File #: 1
Count date: 30-Apr-2019

Weather conditions:
Cloudy

Person(s) who counted:
Nick

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

200661-Fairview St & Drury Ln

Total Count Diagram

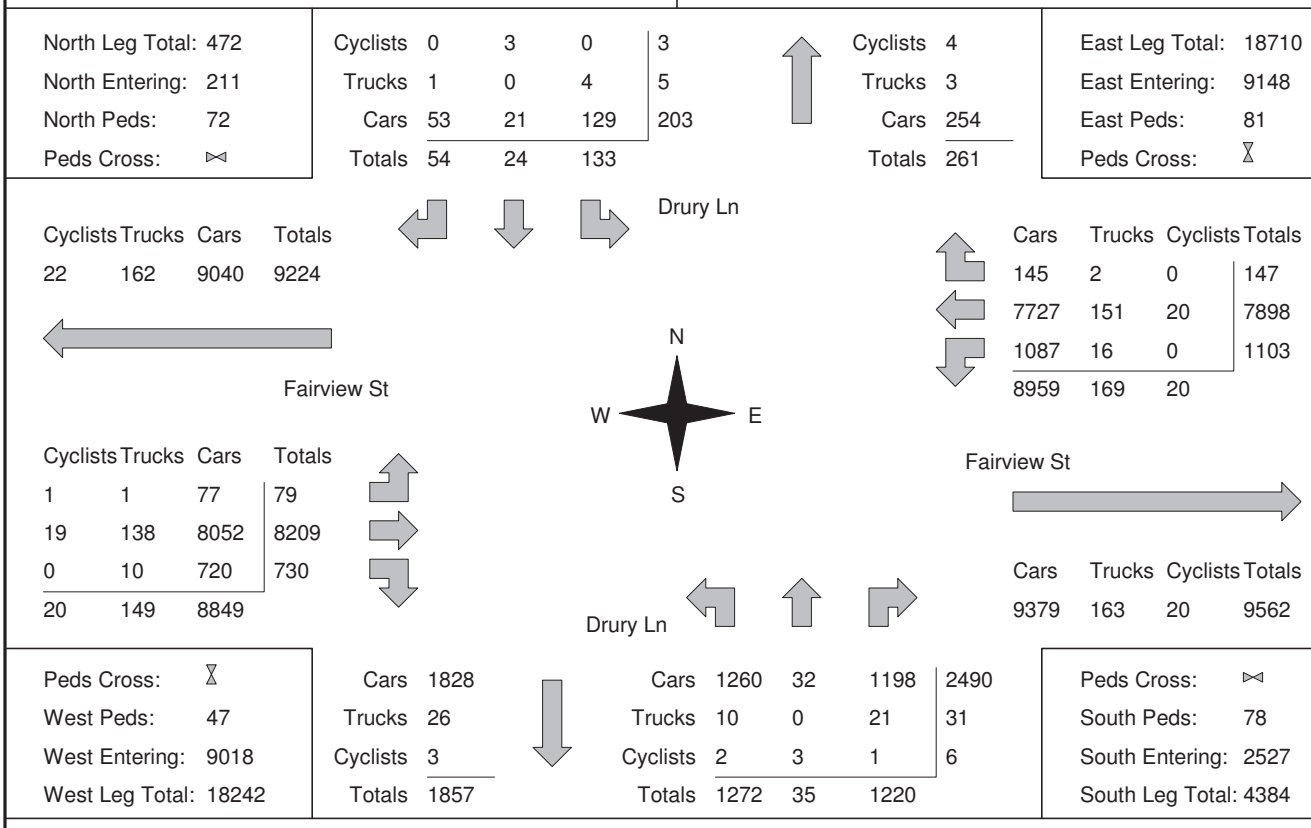
Municipality: Burlington
Site #: 0000200661
Intersection: Fairview St & Drury Ln
TFR File #: 1
Count date: 30-Apr-2019

Weather conditions:
Cloudy

Person(s) who counted:
Nick

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

200661-Fairview St & Drury Ln
Traffic Count Summary

Intersection: Fairview St & Drury Ln | **Count Date:** 30-Apr-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	5	0	1	6	7	186
9:00:00	8	2	7	17	4	265
11:00:00	0	0	0	0	0	0
12:00:00	12	4	14	30	7	363
13:00:00	16	4	7	27	8	402
14:00:00	23	2	3	28	5	360
15:00:00	0	0	0	0	0	0
16:00:00	16	4	6	26	12	371
17:00:00	35	3	5	43	20	435
18:00:00	18	5	11	34	9	356
Totals:	133	24	54	211	72	2738

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	68	3	109	180	4
9:00:00	82	4	162	248	6
11:00:00	0	0	0	0	0
12:00:00	163	3	167	333	17
13:00:00	201	0	174	375	9
14:00:00	163	2	167	332	17
15:00:00	0	0	0	0	0
16:00:00	177	7	161	345	5
17:00:00	223	7	162	392	14
18:00:00	195	9	118	322	6
Totals:	1272	35	1220	2527	78

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	54	323	13	390	0	1442
9:00:00	154	521	20	695	3	1865
11:00:00	0	0	0	0	0	0
12:00:00	112	948	17	1077	7	2230
13:00:00	159	968	15	1142	17	2383
14:00:00	164	969	19	1152	16	2310
15:00:00	0	0	0	0	0	0
16:00:00	139	1212	18	1369	10	2446
17:00:00	147	1451	26	1624	13	2702
18:00:00	174	1506	19	1699	15	2788
Totals:	1103	7898	147	9148	81	18166

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	10	997	45	1052	8
9:00:00	12	1063	95	1170	11
11:00:00	0	0	0	0	0
12:00:00	12	1053	88	1153	1
13:00:00	10	1126	105	1241	6
14:00:00	9	1064	85	1158	2
15:00:00	0	0	0	0	0
16:00:00	8	976	93	1077	2
17:00:00	15	967	96	1078	9
18:00:00	3	963	123	1089	8
Totals:	79	8209	730	9018	47

Calculated Values for Traffic Crossing Major Street

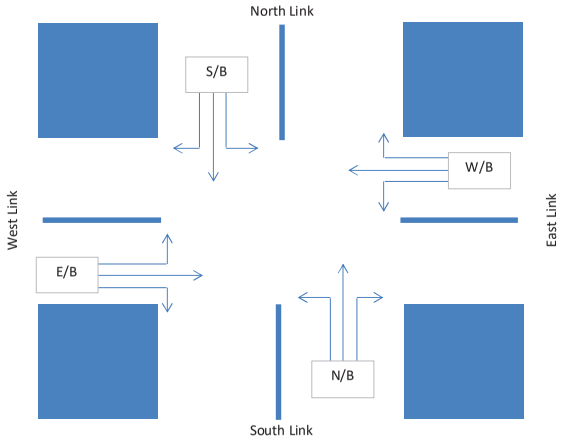
Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	84	108	187	244	206	212	287	245

Fairview Street and Drury Lane
31/04/2019
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	44	226	7	159	392	1218	13	1022	97	1132	255	37	5	7	49	1719	153	1486	24	1663
TRUCK	0	0	0	2	2	11	0	9	0	9	0	0	0	0	0	29	0	29	0	29
BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	44	226	7	161	394	1229	13	1031	97	1141	255	37	5	7	49	1748	153	1515	24	1692

AADT Conversion

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



PM Peak

North Link	Drury				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	49	0	0	49	0.0%
N/B North of Int.	44	0	0	44	0.0%
TOTAL	93	0	0	93	0.0%

South Link	Drury				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	255	0	0	255	0.0%
N/B South of Int.	392	2	0	394	0.5%
TOTAL	647	2	0	649	0.3%

West Link	Fairview				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	1132	9	0	1141	0.8%
W/B West of Int	1719	29	0	1748	1.7%
TOTAL	2851	38	0	2889	1.3%

East Link	Fairview				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	1663	29	0	1692	1.7%
E/B East of Int	1218	11	0	1229	0.9%
TOTAL	2881	40	0	2921	1.4%

AADT

North Link	Drury				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B North of Int.	490	0	0	490	0.0%
N/B North of Int.	440	0	0	440	0.0%
TOTAL	930	0	0	930	0.0%

South Link	Drury				
	CAR	TRUCK	BUS	TOTAL	% COMM
S/B South of Int.	2550	0	0	2550	0.0%
N/B South of Int.	3920	20	0	3940	0.5%
TOTAL	6470	20	0	6490	0.3%

West Link	Fairview				
	CAR	TRUCK	BUS	TOTAL	% COMM
E/B West of Int	11320	90	0	11410	0.8%
W/B West of Int	17190	290	0	17480	1.7%
TOTAL	28510	380	0	28890	1.3%

East Link	Fairview				
	CAR	TRUCK	BUS	TOTAL	% COMM
W/B East of Int.	16630	290	0	16920	1.7%
E/B East of Int	12180	110	0	12290	0.9%
TOTAL	28810	400	0	29210	1.4%

Marcus Li

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: January 25, 2021 11:15 AM
To: Marcus Li
Cc: Tony To
Subject: RE: Rail Traffic Request - Area around 2269 Fairview Street, Burlington

Hi Marcus:

Sorry for the delay. Further to your request dated October 5, 2020, the subject lands (2269 Fairview Street, Burlington) are located adjacent to the Metrolinx Oakville Subdivision (which carries Lakeshore West GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel and electric trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 273 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives	1 Electric Locomotive	2 Electric Locomotives		1 Diesel Locomotive	2 Diesel Locomotives	1 Electric Locomotive	2 Electric Locomotives
Day (0700-2300)	60	11	129	38	Night (2300-0700)	8	4	19	4

The current design track design speed near the subject lands is 95 mph (152 km/h).

There are no anti-whistling by-laws in affect near the subject property.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has studied the feasibility of another form of electrification - hydrogen powered vehicles.

Both options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process and teams are currently completing the bids that will close in 2021. GO Expansion construction will get underway in 2022.

Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. However, we can advise that train noise is dominated by the powertrain at lower speeds and by the wheel- track interaction at higher speeds. Hence, the noise level and spectrum of electric trains is expected to be very similar at higher speeds, if not identical, to those of equivalent diesel trains.

Given the above considerations, it would be prudent at this time, for the purposes of acoustical analyses for development in proximity to Metrolinx corridors, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future once the proponent team is selected.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

EDMOND WU, MCIP, RPP
Project Manager
Third Party Projects Review, Capital Projects Group
Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3
T: 416.202.8513 | C: 437.240.8613

From: Rail Data Requests
Sent: October 19, 2020 18:25
To: Marcus Li <mli@slrconsulting.com>
Cc: Tony To <Tony.To@metrolinx.com>
Subject: RE: Rail Traffic Request - Area around 2269 Fairview Street, Burlington

Hi Marcus:

I apologize for the delay in responding to your request. At this time, Metrolinx is continuing to refine GO Expansion Environmental Assessments as well as the associated rail traffic forecast updates. As such, we are not in a position to provide this information to you at present. We have been told that the EA process will be completed shortly. We will be sure to contact you to provide the new data at that time.

Further to your request dated October 5, 2020, the subject property (2269 Fairview Street, Burlington) is located adjacent to Metrolinx's Oakville Subdivision which carries Lakeshore West Train services. We note we do not maintain information pertaining to idling and stationary activities at stations – that would be up to the consultant to collect that information for a typical weekday period.

The maximum track design speed at this location on this corridor is 95 mph (152 km/h).

There are no anti-whistling by-laws in place around the subject property.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO and UP Express rail network and we are currently working towards the next phase. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

1. At lower speeds, train noise is dominated by the powertrain. At higher speeds, train noise is dominated by the wheel- track interaction. Hence, at higher speeds, the noise level and spectrum of electric trains is expected to be very similar, if not identical, to those of equivalent diesel trains.

2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised GO Expansion service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability, and passenger demand.

It should be noted that this information is only as it pertains to Metrolinx trains. It would be prudent to contact other rail operators in the area directly for their rail traffic information.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

EDMOND WU, MCIP, RPP

Project Manager
Third Party Projects Review, Capital Projects Group
Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3
T: 416.202.8513 | C: 437.240.8613

METROLINX

From: Marcus Li [mailto:mli@slrconsulting.com]
Sent: Monday, October 05, 2020 3:08 PM
To: Rail Data Requests
Cc: Brandon Gaffoor
Subject: RE: Rail Traffic Request - Area around 2269 Fairview Street, Burlington

Hello,

The traffic data below was received in December of 2018 for a development near the Burlington GO Station. Could you please let me know if the data below is still considered representative. An aerial showing the location of the development is embedded in the email below.

Thanks

Marcus

SLR

Marcus Li, P.Eng.
Principal, Acoustics Noise and Vibration

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E mli@slrconsulting.com

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

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From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: December 27, 2018 12:59 PM
To: Aaron Haniff <AaronH@novusenv.com>
Cc: Brandon Gaffoor <Brandon.Gaffoor@metrolinx.com>; Rail Data Requests <RailDataRequests@metrolinx.com>
Subject: RE: Rail Traffic Request - Area around 2269 Fairview Street, Burlington

Good afternoon Aaron,

Further to your request dated November 16, 2018, we note the subject site (2269 Fairview Street, Burlington) is located within 300 metres of GO Transit's Lakeshore West rail corridor.

It's anticipated that GO service on this corridor will be comprised of a mix of both diesel and electric trains within (at least) a 10-year time horizon. The combined preliminary midterm weekday train volume forecast at this location, including both revenue and equipment trips is in the order of 238 trains (54 diesel: 45 day, 9 night; 184 electric: 147 day, 37 night). Trains will be comprised of a single locomotive and up to 12 passenger cars.

The maximum design speed on this corridor is 95 mph (153 km/h).

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

1. At lower speeds, train noise is dominated by the powertrain. At higher speeds, train noise is dominated by the wheel- track interaction. Hence, at higher speeds, the noise level and spectrum of electric trains is expected to be very similar, if not identical, to those of equivalent diesel trains.

2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised GO Expansion service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability, and passenger demand.

It should be noted that VIA operates trains in this area and it would be prudent to contact them directly for rail traffic information.

I trust this information is useful. Should you have any questions, please feel free to contact me.

Best Regards,

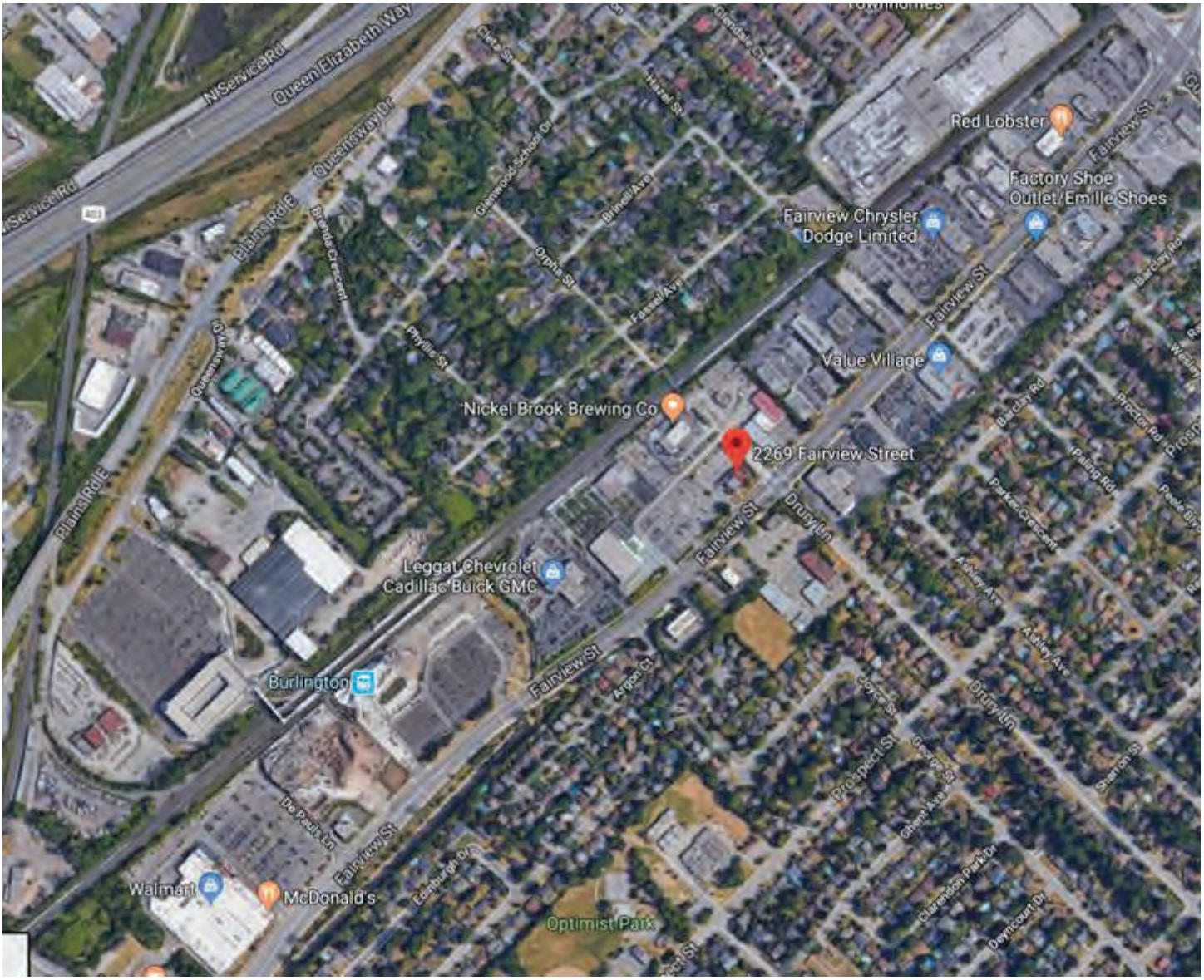
IVAN CHEUNG, **M.Sc, B.URPl**
Intern
Metrolinx
Pre-Construction Services | Capital Projects Group
20 Bay Street, Suite 600 | Toronto | Ontario | M5J 2W3
T: 416-202-5920

METROLINX

From: Aaron Haniff [mailto:AaronH@novusenv.com]
Sent: November-16-18 12:15 PM
To: Rail Data Requests
Subject: Rail Traffic Request - Area around 2269 Fairview Street, Burlington

Hello to whom reads this,

We are working on a noise study for a development at 2269 Fairview Street in Burlington, as identified in the map below. The site is located between the Burlington GO station and Guelph Line.
Can you kindly provide the usual rail data along this corridor?



Thank you very much for your time,
Aaron

Aaron Haniff, P.Eng.
Specialist - Acoustics, Noise & Vibration
t 226.706.8080 x 206 | aaronh@novusenv.com

Harmonizing the built and natural environments

Novus Environmental Inc. | 150 Research Lane, Suite 105 | Guelph, ON Canada, N1G 4T2
Novus West Inc. | 906 – 12 Avenue SW, Suite 600 | Calgary, AB Canada, T2R 1K7 | **t** 403.990.5947

www.novusenv.com

This e-mail is intended only for the person or entity to which it is addressed. If you received this in error, please contact the sender and delete all copies of the e-mail together with any attachments.

System Engineering
Engineering Services

1 Administration Road
Concord, ON, L4K 1B9
T: 905.669.3264
F: 905.760.3406

Train Count Data

TRANSMITTAL

To: *Destinataire :*	Novus Environmental 150 Research Lane Suite 105 Guelph, ON N1G 4T2	*Project :*	OAK-31.29-2269 Fairview St, Burlington, ON
Att'n:	Aaron Haniff	*Routing:*	AaronH@novusenv.com
From: *Expéditeur :*	Michael Vallins	*Date:*	12/07/2018
Cc:	Adjacent Development CN via e-mail		

☐ Urgent ☐ For Your Use ☐ For Review ■ For Your Information ☐ Confidential

Re: Train Traffic Data – CN Oakville Subdivision near 2269 Fairview St in Burlington, ON

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at 905-669-3264.

Sincerely,
CN Design & Construction

Michael Vallins P.Eng
Manager of Public Works
public_works_gld@cn.ca

Date: 2018/12/07 Project Number: OAK-31.29-2269 Fairview St, Burlington, ON

Dear Aaron:

Re: Train Traffic Data – CN Oakville Subdivision near 2269 Fairview St in Burlington, ON

The following is provided in response to Aaron's 2018/11/16 request for information regarding rail traffic in the vicinity of 2269 Fairview St in Burlington, ON at approximately Mile 31.29 on CN's Oakville Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	4	140	60	4
Way Freight	0	25	60	4
Passenger	13	10	90	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	2	140	60	4
Way Freight	0	25	60	4
Passenger	0	10	90	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Oakville Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are no at-grade crossing in the immediate vicinity of the study area at Mile 31.29 (2269 Fairview St). Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The double mainline track is considered to be continuously welded rail throughout the study area.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

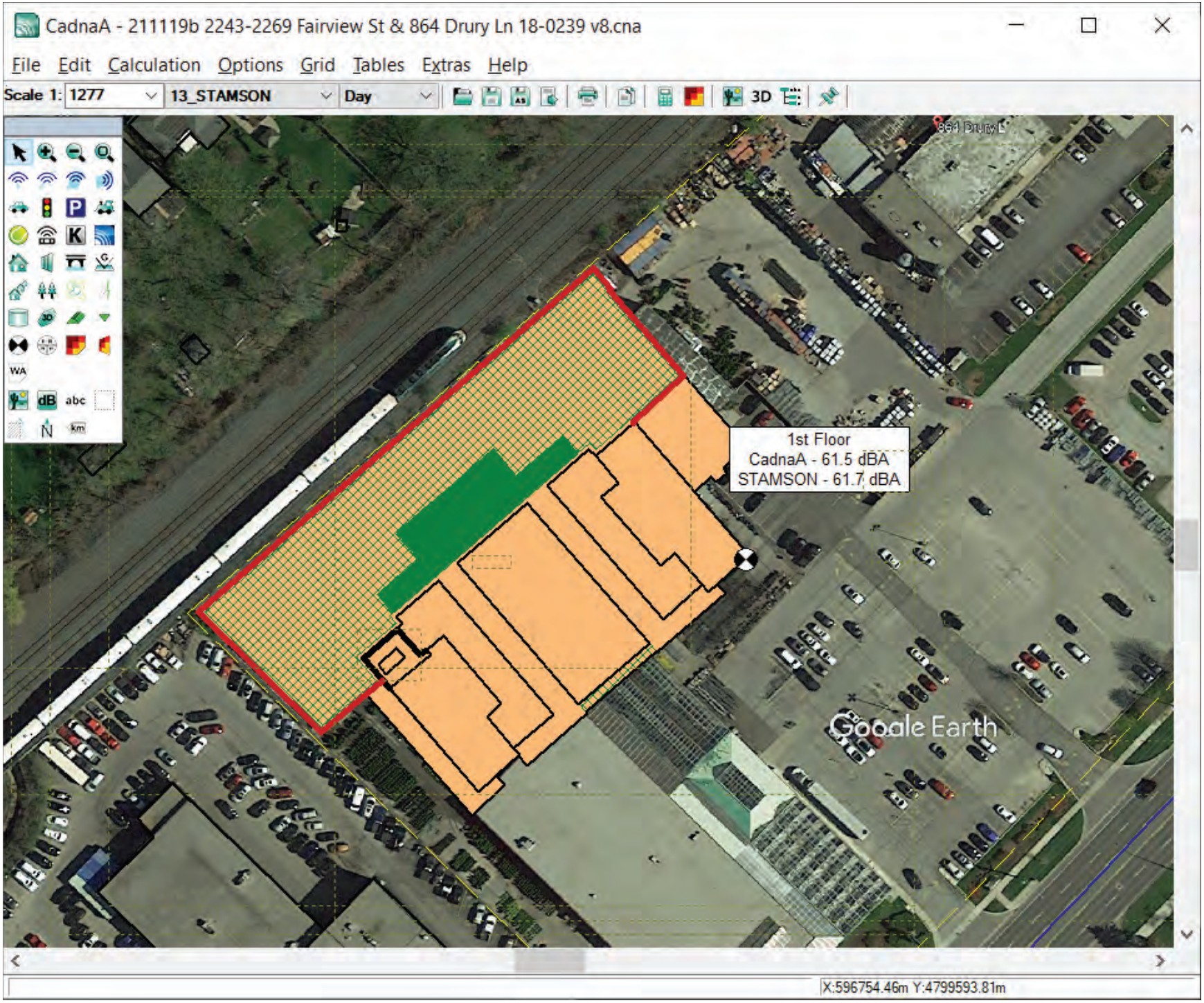
Sincerely,

Michael Vallins P.Eng
Manager of Public Works
public_works_gld@cn.ca

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

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
FV	Fairview Street	Future Daytime	60	16	45158	98.6%	0.6%	0.8%	40977	249	320	0	0.00	**85.1**	**0.9**
D_NL	Drury Lane North Link	Future Daytime	40	16	1438	100.0%	0.0%	0.0%	1323	0	0	0	0.00	**63.6**	**0.5**
D_SL	Drury Lane South Link	Future Daytime	40	16	10033	99.7%	0.3%	0.0%	9202	28	0	0	0.00	**72.3**	**0.5**
FV	Fairview Street	Future Nighttime	60	8	45158	98.6%	0.6%	0.8%	3563	22	28	0	0.00	**77.5**	**0.9**
D_NL	Drury Lane North Link	Future Nighttime	40	8	1438	100.0%	0.0%	0.0%	115	0	0	0	0.00	**56.0**	**0.5**
D_SL	Drury Lane South Link	Future Nighttime	40	8	10033	99.7%	0.3%	0.0%	800	2	0	0	0.00	**64.7**	**0.5**
FV	Fairview Street	Fairview Ambient Daytime	60	1	1266	98.6%	0.6%	0.8%	1149	7	9	0	0.00	**81.7**	**0.9**
FV	Fairview Street	Fairview Ambient Evening	60	1	904	98.6%	0.6%	0.8%	821	5	6	0	0.00	**80.2**	**0.9**
FV	Fairview Street	Fairview Ambient Nighttime	60	1	107	98.6%	0.6%	0.8%	97	1	1	0	0.00	**70.9**	**0.9**
Drury S	Drury S	Drury ambient daytime	40	1	279.378008	99.7%	0.3%	0.0%	279	1	0	0	0.00	**69.1**	**0.5**
Drury S	Drury S	Drury ambient evening	40	1	200	99.7%	0.3%	0.0%	199	1	0	0	0.00	**67.6**	**0.5**
Drury S	Drury S	Drury ambient nighttime	40	1	24	99.7%	0.3%	0.0%	23	0	0	0	0.00	**58.4**	**0.5**
Drury N	Drury N	Drury ambient daytime	40	1	40.0341368	100.0%	0.0%	0.0%	40	0	0	0	0.00	**60.5**	**0.5**
Drury N	Drury N	Drury ambient evening	40	1	29	100.0%	0.0%	0.0%	29	0	0	0	0.00	**59.0**	**0.5**
Drury N	Drury N	Drury ambient nighttime	40	1	3	100.0%	0.0%	0.0%	3	0	0	0	0.00	**49.7**	**0.5**


CadnaA - 211119b 2243-2269 Fairview St & 864 Drury Ln 18-0239 v8.cna
File Edit Calculation Options Grid Tables Extras Help
Scale 1: 1277
13_STAMSON
Day
3D
1st Floor
CadnaA - 61.5 dBA
STAMSON - 61.7 dBA
Google Earth
X:596754.46m Y:4799593.81m

STAMSON 5.0 NORMAL REPORT Date: 14-10-2021 10:36:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 21f1.te Time Period: 16 hours
Description:

Road data, segment # 1: Fairview

Car traffic volume : 40977 veh/TimePeriod
Medium truck volume : 249 veh/TimePeriod
Heavy truck volume : 320 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fairview

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 103.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Drury_NL

Car traffic volume : 1323 veh/TimePeriod
Medium truck volume : 0 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Drury_NL

Angle1 Angle2 : 0.00 deg 48.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 140.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Dury_SL

```
------------------------------
Car traffic volume  :  9202 veh/TimePeriod
Medium truck volume :    28 veh/TimePeriod
Heavy truck volume  :     0 veh/TimePeriod
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: Dury_SL
------------------------------
Angle1   Angle2           :  48.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 173.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

🠝
Results segment # 1: Fairview
------------------------------

Source height = 0.94 m

ROAD (0.00 + 61.70 + 0.00) = 61.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  70.07   0.00  -8.37   0.00   0.00   0.00   0.00  61.70
-------------------------------------------------------------------------------

Segment Leq : 61.70 dBA

🠝
Results segment # 2: Drury_NL
------------------------------

Source height = 0.50 m

ROAD (0.00 + 33.11 + 0.00) = 33.11 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     48   0.00  48.55   0.00  -9.70  -5.74   0.00   0.00   0.00  33.11
-------------------------------------------------------------------------------

Segment Leq : 33.11 dBA

🠝
Results segment # 3: Dury_SL
------------------------------
```

Source height = 0.50 m

ROAD (0.00 + 40.24 + 0.00) = 40.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	57.18	0.00	-10.62	-6.32	0.00	0.00	0.00	40.24

Segment Leq : 40.24 dBA

Total Leq All Segments: 61.74 dBA

TOTAL Leq FROM ALL SOURCES: 61.74

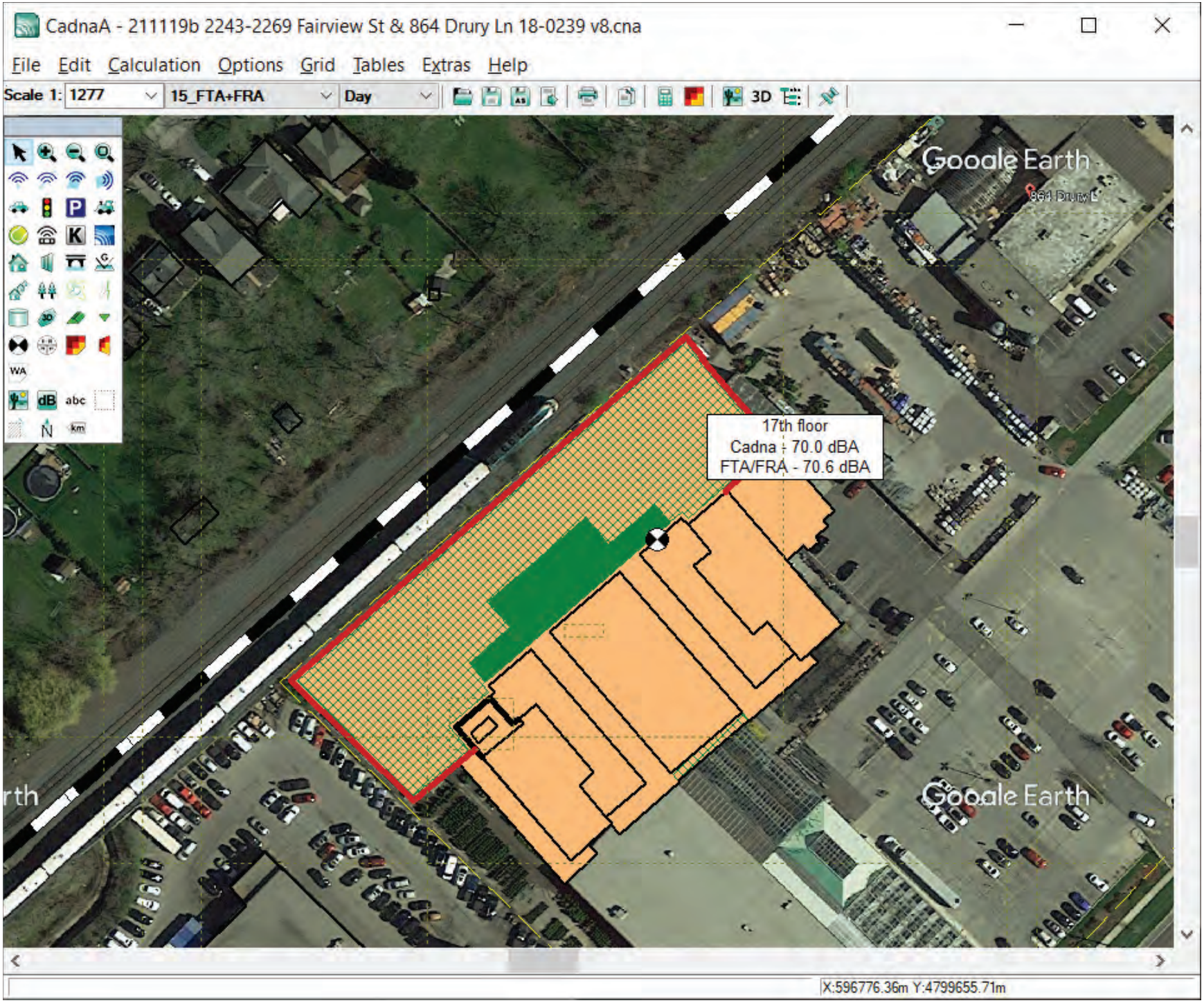

CadnaA - 211119b 2243-2269 Fairview St & 864 Drury Ln 18-0239 v8.cna
File Edit Calculation Options Grid Tables Extras Help
Scale 1: 1277
15_FTA+FRA
Day
3D
Google Earth
17th floor
Cadna - 70.0 dBA
FTA/FRA - 70.6 dBA
Google Earth
X:596776.36m Y:4799655.71m

Table B.1: Summary of Rail Impacts

Train Type	L_{eq} - day (dBA)
GO (Diesel)	69.3
VIA	58.0
Freight	63.6
Total	**70.6**

FTA 2006 - General Noise Assessment - FREIGHT

from Chapter 5 of FTA (2006) Transit Noise and Vibration Impact Assessment (modified to include reflective ground and throttle settings)

hours per day: 16

5.2.1 Fixed-Guideway Transit Sources

Table 5-1. Reference SEL's at 50 feet from Track and 50 mph

5.2 Noise Source Levels For General Assessment

5.3 Computation Of Noise Exposure-Vs.-Distance Curves

Source / Type, Reference Conditions	SEL (dBA)	Throttle Setting	Speed (mph or kph)	Units (mph or kph)	No. of Veh/Train	No. of Trains/hr - day	L_{eq} - day (dBA)	Ground Type (Abs orRefl)	Dist (ft or m)	Units (ft or m)	Rows of Houses	L_{eq} - day (dBA)
Commuter Rail, At-Grade - Diesel-electric Locomotive, 3000 hp, throttle 8	92	8	152	kph	1	11.8	70.4	Refl	90	m		62.6
Commuter Rail, At-Grade - Diesel-electric Locomotive, 3000 hp, throttle 8	92	8	152	kph	2	6.1	70.5	Refl	90	m		62.8
Conventional Freight Locomotive (FRA)	97			kph				Refl		m		
Commuter Rail, At-Grade - Electric Locomotive	90			kph				Refl		m		
Commuter Rail, At-Grade - Diesel Multiple Unit (DMU), 1200 hp	85			kph				Refl		m		
Commuter Rail, At-Grade - Horn Within 1/4 mile of grade crossing	110			-				Refl		m		
Commuter Rail, At-Grade - GO Train Bell (adjusted FTA Horn)	96			-				Refl		m		
Commuter Rail, At-Grade - Cars - Ballast, welded rail	82		152	kph	12	14.9	74.4	Refl	90	m		66.7
Conventional Rail Car (FRA)	100			kph				Refl		m		
Rail transit - At-grade, ballast, welded rail	82			kph				Refl		#REF!		
Transit whistles /warning devices - Within 1/8 mile of grade crossing	93		-	-	-			Refl		#REF!		
AGT - Steel wheel - Aerial, concrete, welded rail	80			kph				Refl		#REF!		
AGT - Rubber Tire - Aerial, concrete guideway	78			kph				Refl		#REF!		
Monorail - Aerial straddle beam	82			kph				Refl		#REF!		
Maglev - Aerial, open guideway	72			kph				Refl		#REF!		
											Total Fixed-Guideway Noise Exposures	69.3

Rail Vehicle Adjustments

Jointed Track? (+5)	no	(applied to all commuter rail cars, transit cars, AGT and monorail)
Embedded Track on Grade? (+3)	no	(applied to all commuter rail cars, transit cars, AGT and monorail)
Aerial Structure with Slab Track? (+4)	no	(applied to all commuter rail cars, transit cars, except AGT or Monorail)
Noise Barrier Blocks Line of Sight? (-5)	no	(applied to all fixed guideway sources)

FTA 2006 - General Noise Assessment - FREIGHT

from Chapter 5 of FTA (2006) Transit Noise and Vibration Impact Assessment (modified to include reflective ground and throttle settings)

hours per day 16

5.2.1 Fixed-Guideway Transit Sources

Table 5-1. Reference SEL's at 50 feet from Track and 50 mph

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5.3 Computation Of Noise Exposure-Vs.-Distance Curves

Source / Type, Reference Conditions	SEL (dBA)	Throttle Setting	Speed (mph or kph)	Units (mph or kph)	No. of Veh/Train	No. of Trains/hr - day	L_{eq} - day (dBA)	Ground Type (Abs orRefl)	Dist (ft or m)	Units (ft or m)	Rows of Houses	L_{eq} - day (dBA)
Commuter Rail, At-Grade - Diesel-electric Locomotive, 3000 hp, throttle 8	92	8	145	kph	2	1.1	63.4	Refl	90	m		55.7
Conventional Freight Locomotive (FRA)	97			kph				Refl		m		
Commuter Rail, At-Grade - Electric Locomotive	90			kph				Refl		m		
Commuter Rail, At-Grade - Diesel Multiple Unit (DMU), 1200 hp	85			kph				Refl		m		
Commuter Rail, At-Grade - Horn Within 1/4 mile of grade crossing	110		-	-	-			Refl		m		
Commuter Rail, At-Grade - GO Train Bell (adjusted FTA Horn)	96		-	-	-			Refl		m		
Commuter Rail, At-Grade - Cars - Ballast, welded rail	82		145	kph	10	1.1	62.0	Refl	90	m		54.3
Conventional Rail Car (FRA)	100			kph				Refl		m		
Rail transit - At-grade, ballast, welded rail	82			kph				Refl		#REF!		
Transit whistles /warning devices - Within 1/8 mile of grade crossing	93		-	-	-			Refl		#REF!		
AGT - Steel wheel - Aerial, concrete, welded rail	80			kph				Refl		#REF!		
AGT - Rubber Tire - Aerial, concrete guideway	78			kph				Refl		#REF!		
Monorail - Aerial straddle beam	82			kph				Refl		#REF!		
Maglev - Aerial, open guideway	72			kph				Refl		#REF!		
											Total Fixed-Guideway Noise Exposures	58.0

Rail Vehicle Adjustments

Jointed Track? (+5)	no	(applied to all commuter rail cars, transit cars, AGT and monorail)
Embedded Track on Grade? (+3)	no	(applied to all commuter rail cars, transit cars, AGT and monorail)
Aerial Structure with Slab Track? (+4)	no	(applied to all commuter rail cars, transit cars, except AGT or Monorail)
Noise Barrier Blocks Line of Sight? (-5)	no	(applied to all fixed guideway sources)

FTA 2006 - General Noise Assessment - FREIGHT

from Chapter 5 of FTA (2006) Transit Noise and Vibration Impact Assessment (modified to include reflective ground and throttle settings)

hours per day 16

5.2.1 Fixed-Guideway Transit Sources

Table 5-1. Reference SEL's at 50 feet from Track and 50 mph

5.2 Noise Source Levels For General Assessment

5.3 Computation Of Noise Exposure-Vs.-Distance Curves

Source / Type, Reference Conditions	SEL (dBA)	Throttle Setting	Speed (mph or kph)	Units (mph or kph)	No. of Veh/Train	No. of Trains/hr - day	L_{eq} - day (dBA)	Ground Type (Abs orRefl)	Dist (ft or m)	Units (ft or m)	Rows of Houses	L_{eq} - day (dBA)
Commuter Rail, At-Grade - Diesel-electric Locomotive, 3000 hp, throttle 8	92			kph				Refl		m		
Conventional Freight Locomotive (FRA)	97	8	96.6	kph	4	0.36	64.7	Refl	90	m		57.0
Commuter Rail, At-Grade - Electric Locomotive	90			kph				Refl		m		
Commuter Rail, At-Grade - Diesel Multiple Unit (DMU), 1200 hp	85			kph				Refl		m		
Commuter Rail, At-Grade - Horn Within 1/4 mile of grade crossing	110		-	-	-			Refl		m		
Commuter Rail, At-Grade - GO Train Bell (adjusted FTA Horn)	96		-	-	-			Refl		m		
Commuter Rail, At-Grade - Cars - Ballast, welded rail	82			kph				Refl		m		
Conventional Rail Car (FRA)	100		96.6	kph	140	0.36	70.3	Refl	90	m		62.5
Rail transit - At-grade, ballast, welded rail	82			kph				Refl		#REF!		
Transit whistles /warning devices - Within 1/8 mile of grade crossing	93		-	-	-			Refl		#REF!		
AGT - Steel wheel - Aerial, concrete, welded rail	80			kph				Refl		#REF!		
AGT - Rubber Tire - Aerial, concrete guideway	78			kph				Refl		#REF!		
Monorail - Aerial straddle beam	82			kph				Refl		#REF!		
Maglev - Aerial, open guideway	72			kph				Refl		#REF!		
											Total Fixed-Guideway Noise Exposures	63.6

Rail Vehicle Adjustments

Jointed Track? (+5)	no	(applied to all commuter rail cars, transit cars, AGT and monorail)
Embedded Track on Grade? (+3)	no	(applied to all commuter rail cars, transit cars, AGT and monorail)
Aerial Structure with Slab Track? (+4)	no	(applied to all commuter rail cars, transit cars, except AGT or Monorail)
Noise Barrier Blocks Line of Sight? (-5)	no	(applied to all fixed guideway sources)

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for 2-sided printing purposes

APPENDIX D
Warning Clauses

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for 2-sided printing purposes

SUMMARY OF NOISE 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:

MECP Type B Warning Clause (All Units)

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road and rail traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

MECP Type D Warning Clause (All Units)

"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."

MECP Type E Warning Clause (All Units)

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

Canadian National Railways Warning Clause (All Units)

"Purchasers are advised that the Canadian National Railway Company or its assigns or successors in interest has or have a right-of-way within 300 metres from the land the subject thereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future, including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

Metrolinx Warning Clause (All Units)

"Warning: Metrolinx and its assigns and successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that Metrolinx or any railway entering into an agreement with Metrolinx to use the right-of-way or their assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

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APPENDIX E
Stationary Noise Modelling Data

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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)
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596708.36	4799391.68	102.31
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596707.87	4799396.35	102.31
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596720.24	4799434.24	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596727.17	4799431.34	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596732.19	4799433.65	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596720.41	4799439.83	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596725.22	4799435.48	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596712.32	4799439.56	107.5
Chevvy_MUA	~	Chevy_MUA_cont	74.9	74.9	74.9	Lw	GEN_MUA_Inlet		0	0	0				60	60	0	0		(none)	1.5	g 596726.79	4799443.24	107.5
Chevvy_MUA	~	Chevy_MUA_cont	74.9	74.9	74.9	Lw	GEN_MUA_Inlet		0	0	0				60	60	0	0		(none)	1.5	g 596698.78	4799457.78	105.79
Chevvy_MUA	~	Chevy_MUA_cont	74.9	74.9	74.9	Lw	GEN_MUA_Inlet		0	0	0				60	60	0	0		(none)	1.5	g 596690.52	4799446.7	105.79
Chevvy_MUA	~	Chevy_MUA_cont	74.9	74.9	74.9	Lw	GEN_MUA_Inlet		0	0	0				60	60	0	0		(none)	1.5	g 596709.71	4799442.18	105.79
Chevvy_HVAC	~	Chevy_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 596730.91	4799417.58	105.6
Chevvy_HVAC	~	Chevy_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 596735.71	4799421.94	105.6
Chevvy_HVAC	~	Chevy_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 596716.55	4799421.64	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 596720.22	4799425.41	107.5
Chevvy_HVAC	~	Chevy_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 596723.5	4799428.59	107.5
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596854.82	4799370.16	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596853.3	4799373.09	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596860.34	4799376.34	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596859.88	4799379.35	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596867.9	4799386.56	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596869.7	4799383.76	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596864.33	4799383.55	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596875.18	4799388.5	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596873.34	4799391.54	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596864.82	4799379.67	103.52
Surrounding Mushroom fan	~	surrounds_Mfan_cont	78.6	78.6	78.6	Lw	MushroomEx_Small		0	0	0				60	60	60	0		(none)	1.5	g 596872.7	4799385.57	103.52
Surrounding Mushroom fan	~	surrounds_Mfan_cont	78.6	78.6	78.6	Lw	MushroomEx_Small		0	0	0				60	60	60	0		(none)	1.5	g 596873.76	4799387.26	103.52
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596919.64	4799441.58	103.4
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596923.07	4799436.24	103.4
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596927.61	4799438.93	103.4
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596928.3	4799433.28	103.4
Surrounding HVAC	~	surrounds_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 596972.82	4799504	105
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596952.69	4799614.27	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596963.39	4799610.75	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596969.69	4799601.38	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596976.23	4799597.84	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596965.56	4799624.41	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596967.61	4799626.89	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 596977.18	4799637.62	104
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 597057.5	4799562.08	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	76	76	76	Lw	HVAC_5ton	76	0	0	0				60	60	30	0		(none)	1.5	g 597028.45	4799557.62	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 597029.65	4799563.91	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 597038.56	4799555.22	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 597045.13	4799547.02	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 597055.87	4799536.28	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	82	82	82	Lw	HVAC_10ton	82	0	0	0				60	60	30	0		(none)	1.5	g 597061.74	4799529.64	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	85.5	85.5	85.5	Lw	ACC_40ton		0	0	0			15	45	45	45	0		(none)	1.5	g 597060.82	4799526.67	105.5
Surrounding HVAC	~	surrounds_HVAC_cont	74.9	74.9	74.9	Lw	GEN_MUA_Inlet		0	0	0				60	60	60	0		(none)	1.5	g 597056.73	4799540.57	105.5
Car Wash Entrance -	~	chevy_CarW_in_cont	92	92	92	Lw	A120_Exit	87	5	5	5				10	0	0	0		Alcove w K0	1.5	r 596684.81	4799476.53	99.88
Cevy service centre overall	-	chevy_Service_cont	90	90	90	Lw	Husky_impact	90	0	0	0				60	60	0	0		(none)	2	r 596698.96	4799462.88	100.07
Muffler shop Grinder	~	Muffler_grinder_cont	109	109	109	Lw	Milwaukee_Grinder+10		0	0	0				10	10	0	0		(none)	1.5	r 596906.23	4799653.17	100.95
Car Wash Entrance	~	chevy_CarW_in_cont	103	102.6	102.6	Lw	A120_Exit+5		0	0	0				15	15	0	0		Alcove w K0	1.5	r 596677.86	4799467.85	99.82
Service center North bay door	~	chevy_Service_cont	89.1	89.1	89.1	Lw	Husky_impact	89.1	0	0	0				60	60	0	0		(none)	2.5	r 596678.16	4799464.87	100.78
Cooling Tower Opp end (Side C)	~	C1_CT_dev	62.6	62.6	62.6	Lw	CT_C_dev		0	0	0				60	60	60	0		CT_corr	2	g 596732.81	4799506.01	210.1
Cooling Tower motor (Side B)	~	C1_CT_dev	65.6	65.6	65.6	Lw	CT_B_dev		0	0	0				60	60	60	0		CT_corr	2	g 596732.08	4799503.35	210.1

Cooling Tower Opp motor (Side D)	~	C1_CT_dev	65.6	65.6	65.6	Lw	CT_D_dev	0	0	0	60	60	60	0	CT_corr	2	g	596730.3	4799505.46	210.1
Cooling Tower top (side E)	~	C1_CT_dev	64.3	64.3	64.3	Lw	CT_E_dev	0	0	0	60	60	60	0	CT_corr	0.05	g	596731.24	4799504.38	212.15
Cooling Tower End (Side A)	~	C1_CT_dev	62.6	62.6	62.6	Lw	CT_A_dev	0	0	0	60	60	60	0	CT_corr	2	g	596728.88	4799502.39	210.1
MUA Intake Louvre	~	C1_MUA_dev	81.1	81.1	81.1	Lw	C1_MUA	0	0	0	60	60	60	3	H&K_Vstk - meas at 0 deg	1.5	g	596732.48	4799499.82	209.6
MUA Intake Louvre	~	C2_MUA_dev	81.1	81.1	81.1	Lw	C1_MUA	0	0	0	60	60	60	3	H&K_louv - meas at 0 deg	2	g	596776.21	4799547.02	223

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li		Correction			Sound Reduction	Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day (dBA)	Evening (dBA)	Night (dBA)	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)		Number Day	Evening	Night	Speed (km/h)
Fairview Street	~	FV_avg	116.6	31.5	109	85.1	0	77.5	Lw'	roadway	0	85.1	0	77.5						0		(none)				
Drury Lane North Link	~	D_NL_avg	83.3	21.7	77.7	61.6	0	56	Lw'	roadway	0	61.6	0	56						0		(none)				
Drury Lane South Link	~	D_SL_avg	97.5	25.2	89.9	72.3	0	64.7	Lw'	roadway	0	72.3	0	64.7						0		(none)				
Bull moose tube truck route	~	BMT_truck_cont	94.3	94.3	-13.4	65.5	65.5	-42.3	PWL-Pt	HeavyTruckPassby		101.9	0	86.8						0		(none)	6	6	0	15
Fairview Street	~	FV_min	113.2	111.7	102.4	81.7	80.2	70.9	Lw'	roadway	0	81.7	80.2	70.9						0		(none)				
Drury Lane North Link	~	D_NL_min	82.2	80.7	71.4	60.5	59	49.7	Lw'	roadway	0	60.5	59	49.7						0		(none)				
Drury Lane South Link	~	D_SL_min	94.3	92.8	83.6	69.1	67.6	58.4	Lw'	roadway	0	69.1	67.6	58.4						0		(none)				

Area Sources

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li		Correction			Sound Reduction	Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day (dBA)	Evening (dBA)	Night (dBA)	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)		Number Day	Evening	Night
Exhuast shaft (Parking Fans)	~	Ex_shaft1_dev	82.8	82.8	82.8	71.5	71.5	71.5	Lw	ParkFanWLoss+3-15		0	0	0			10	10	10	0		H&K_Vstk - meas at 0 deg			
Exhuast shaft (Parking Fans)	~	Ex_shaft2_dev	82.8	82.8	82.8	68.8	68.8	68.8	Lw	ParkFanWLoss-15+3		0	0	0			10	10	10	0		H&K_Vstk - meas at 0 deg			
Exhuast shaft (Parking Fans)	~	Ex_shaft2_dev	82.8	82.8	82.8	72.1	72.1	72.1	Lw	ParkFanWLoss+3-15		0	0	0			10	10	10	0		H&K_Vstk - meas at 0 deg			
EGen Exhuast shaft (Split between two exhaust shafts)		EGen_ex	93.6	93.6	93.6	82.3	82.3	82.3	Lw	NG500PM_exhaust-3		-13	-13	-13			30	0	0	0		H&K_Vstk - meas at 0 deg			
EGen Intake shaft (Split between two exhaust shafts)		EGen_ex	97	97	97	85.7	85.7	85.7	Lw	NG500PM_exhaust	97	0	0	0			60	0	0	0		H&K_Vstk - meas at 0 deg			

Verticle Area Sources

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li		Correction			Sound Reduction	Attenuation	Operating Time			K0	Freq.	Direct.
			Day (dBA)	Evening (dBA)	Night (dBA)	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)	
impact wrench (Incl +5 tonality)	~	chevy_impact_wr	90	90	90	68.2	68.2	68.2	Lw	Shop_activity	90	0	0	0			30	0	0	3		(none)

Sound Power Levels

Name	ID	Type	1/3 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
Air Cooled Condensor (40 ton)	ACC_40ton	Lw		95	98	99	99	98	96	92	88	82	100.5	105.8	H&K calc for Packaged Roof Top Unit
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
Idling GO MP40 with idle throttle settings	GO_idle	Lw		116.7	126.7	114.2	109.9	103.2	98	96.9	95.2	90.3	107.7	127.4	MP40 spec + 140121 824kit1_LA_MTL file__001.slmdl
Generic 3500 cfm MUA - Inlet	GEN_MUA_Inlet	Lw			78	79	73	75	69	63	56	45	74.9	83.1	Daiken Skyline
Upblast Mushroon Fan - Small	MushroomEx_Small	Lw				80	75.8	79.4	71	67	64.4	59.3	78.6	83.9	
C1 MUA intake	C1_MUA	Lw		0	84	78	88	76	72	63	56	51	81.1	90	
Cooling tower Face A (End)	CT_A_dev	Lw		0	52	52	55	56	58	55	55	53	62.6	64	Manufacurers data
Cooling tower Face B (Motor Side)	CT_B_dev	Lw		0	54	52	54	57	61	59	57	57	65.6	66.3	Manufacurers data
Cooling tower Face C (Opp end)	CT_C_dev	Lw		0	52	52	55	56	58	55	55	53	62.6	64	Manufacurers data
Cooling tower Face D (Opp Motor Side)	CT_D_dev	Lw		0	54	52	54	57	61	59	57	57	65.6	66.3	Manufacurers data
Cooling Tower Face E (Top)	CT_E_dev	Lw		0	51	52	54	58	58	58	57	55	64.3	65.1	Manufacurers data
Parking_Fan with shaft loss	ParkFanWLoss	Lw			82	95.1	93.3	91.4	88.8	87.1	85.4	82.4	94.8	99.4	fairview-garage ex
Husky impact Wrench	Husky_impact	Lw	A	-39.4	-26.2	-16.1	-8.6	102	0	1.2	1	-1.1	102	105.2	Network
Shop activity	Shop_activity	Lw		101.2	101.2	91.2	87.9	89.1	90.5	84.7	83.1	78.2	93.7	104.9	211022 F6
Milwaukee Grinder	Milwaukee_Grinder	Lw	A	-39.4	-26.2	-16.1	-8.6	99	0	1.2	1	-1.1	99	102.2	Network
Heavy Truck - Passby	HeavyTruckPassby	Lw (c)		98.2	101.4	101.1	96.5	96.3	95.6	91.5	84.1	78	99.5	106.8	14-0126 Polytainers
Aerodry, Model A120 - Exit	A120_Exit	Lw		95.5	101.2	96	92.3	99.9	84.6	83.9	79.2	72.8	97.6	105.2	man data, adj for Entr/Exit, shaped on A45
Devlopment Generator Exhuast	NG500PM_exhaust	Lw				101	101.1	104.5	105.4	104.4	95.4	87.7	109.6	110.8	NG500PM-A01 Sound Data Report 1SEP2021