

ENVIRONMENTAL NOISE REPORT

PROPOSED MIXED-USE
RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET
CITY OF MISSISSAUGA
REGION OF PEEL



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DeZen Realty Co. Ltd.

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SUMMARY

The proposed mixed-use residential development is located at 120, 128 and 142 to 158 Queen Street South and 169 Crumbie Street, in the City of Mississauga. The proposed development includes eight (8) residential towers of varying heights, with associated podiums. The site is affected by road traffic noise, rail traffic noise and by existing commercial operations.

The development is proposed to consist of four (4) phases. This report addresses the ultimate condition of the site, accounting for the complete future development based on available information at this time.

The environmental noise guidelines NPC-300 of the Ministry of the Environment, Conservation and Parks (MOE), for transportation and stationary noise sources, set out sound level limits for both the indoor (transportation sources only) and outdoor space (both transportation and stationary sources). Sound levels due to the nearby roads, rail and the existing commercial sources were determined and compared to the MOE and Region of Peel/City of Mississauga guidelines to determine the appropriate mitigation measures.

Using road traffic data obtained from the City of Mississauga and rail traffic data from CP and Metrolinx, the sound levels for various locations in the proposed development were determined. The analysis of the noise sources associated with the existing commercial developments external to the subject site was based on information collected by Jade Acoustics Inc. during site visits and from other similar facilities available in Jade Acoustics Inc. files.

To address road and rail traffic noise, central air conditioning, upgraded exterior wall, exterior door and window construction will be required, as shown in this report. When final building plans are available for each building, sound level predictions and architectural requirements should be verified, to ensure applicable guidelines are met.

The mechanical drawings and detailed information regarding the mechanical equipment associated with the proposed development (all phases), were not available at the time of preparation of this noise report. Once mechanical drawings are available, additional noise analysis will need to be conducted to determine if the selected mechanical equipment requires noise mitigation measures.

The overall proposed development was evaluated using the MOE noise criteria for stationary sources applicable to both a Class 1 area and a Class 4 area. A previous Environmental Noise Report dated October 30, 2015, revised July 25, 2016, was prepared for a portion of the subject development; however, the assessed proposed development was not constructed. The portion of the subject site was classified by the City of Mississauga as a Class 4 Area, as recommended in the previous noise report.

Currently, the additional proposed development not previously approved as Class 4 is considered to be a Class 1 area; therefore, the land use planning authority would need to approve the new classification based on the noise analysis and incorporate a Class 4 designation in a site-specific zoning by-law or alternate planning document, as determined by the City.

Where minor excesses exist and noise mitigation measures are required, future occupants will be advised through the use of warning clauses.

1.0 INTRODUCTION

Jade Acoustics Inc. was retained by DeZen Realty Co. Ltd. to prepare an Environmental Noise Report, to investigate the potential noise impact on the proposed mixed-use residential development to the satisfaction of the City of Mississauga and Regional Municipality of Peel.

An Environmental Noise Report dated October 30, 2015, revised July 25, 2016, was prepared by Jade Acoustics Inc. in support of the previous development application for a portion of the overall subject site. This report has been prepared to address an updated development proposal, as shown in the below noted architectural drawings set.

An evaluation of the potential acoustic impact between the dwelling units, between the non-residential uses and residential uses, and all internal acoustic matters is outside of the scope of work of this report.

The proposed site is identified as:

120, 128 and 142 to 158 Queen Street South
and 169 Crumbie Street
City of Mississauga
Region of Peel

The proposed mixed-use residential development is located at 120, 128 and 142 to 158 Queen Street South and 169 Crumbie Street, in the City of Mississauga. Surrounding land uses are existing and future residential and existing commercial/institutional uses. Queen Street South is located directly east of the subject site and the CP Galt Subdivision is located directly west.

The subject site is proposed to undergo phased development, as shown in the architectural drawings package. This report addresses the ultimate condition of the complete build-out of the overall development, as to address all proposed phases.

The proposed development is not affected by aircraft traffic or industrial uses.

Based on the proximity to the rail line, railway ground-borne vibration has been considered in this report.

The analysis was based on:

- Architectural Package (DARC 3) prepared by SRM Architects and Urban Designers dated March 12, 2024, received March 13, 2024;

- Environmental Noise Report prepared by Jade Acoustics Inc. dated October 30, 2015, revised July 25, 2016;
- Road traffic information provided by the City of Mississauga;
- Rail traffic information provided by CP and Metrolinx; and
- Site visits conducted by Jade Acoustics Inc. on November 2, 9, and 22, 2023.

A Key Plan is attached as Figure 1.

Figure 2 shows the proposed residential development which includes eight (8) new mixed-use residential towers (with associated podia), outdoor amenity areas, a market square, a public park, and new internal roads.

Figures 3 to 6 show the noise sources considered along with the associated predicted sound levels.

2.0 NOISE AND VIBRATION SOURCES

2.1 Transportation Sources

2.1.1 Road and Rail

The primary ground transportation noise sources of potentially adverse impact are the road traffic on Queen Street South and rail traffic on the CP Galt Subdivision.

The ultimate road traffic data for Queen Street South was provided by the City of Mississauga on October 23, 2023 for another nearby project and has been used in preparation of this report.

Rail traffic information for the CP Galt Subdivision was provided by CP and Metrolinx.

The rail traffic information from CP Rail was originally provided January 2, 2019, and re-confirmed as valid on May 7, 2020, based on work on another nearby development. Since the time the data was confirmed to be applicable, CP Rail has indicated that they will no longer be providing information regarding their rail operations. As such, the information previously provided in support of this report has been used in this revision, as it is the best available information. The rail traffic information has been escalated to the Year 2034 (ten (10) years beyond the report date).

Based on information from CP and/or Metrolinx, there is an anti-whistle by-law at the Tannery Street and Ontario Street at-grade crossings; therefore, whistle noise has not been considered in the analysis.

Due to the separation distance to the rail right-of-way and as required by the applicable guidelines, railway ground-borne vibration was investigated at the proposed locations of the future residential buildings on site nearest to the railway through on-site ground-borne vibration measurements conducted by Jade Acoustics Inc. staff.

See Appendix A for correspondence regarding the road and rail traffic information and Table 1 for a summary of traffic information.

This site is not impacted by aircraft traffic or existing industrial noise sources.

2.2. Stationary Sources

2.2.1 Stationary Sources within the Development

The identified mechanical sources of noise associated with the proposed development which may acoustically impact the adjacent residential developments include but may not be limited to garage exhaust fans and other mechanical systems associated with the future uses. These potential noise sources will be addressed when information becomes available, at the time of the Detailed Environmental Noise and Vibration Report (if information is available), or through the building permit process.

The subject site is currently an active commercial site. As the development will be phased, the existing commercial uses will be removed and relocated to the new buildings as the construction progresses. As the ultimate future build-out will remove these existing uses, they have not been included in the stationary noise source analysis. That said, as the future uses will be relocated to the proposed buildings, any noise sources associated with the uses can be addressed in the future once the necessary information is available.

2.2.2 Stationary Sources External to the Development

There are several existing commercial/institutional buildings located in the general vicinity of the proposed site. These uses were investigated in a preliminary manner during the site visits conducted by Jade staff. No significant sources of stationary noise were observed near the site. It should be noted that some of the low-rise commercial uses were observed to include residential uses within the upper building level.

No contact was made with the existing surrounding commercial/institutional uses and the specific sources of potential noise were not investigated at this time; however, in order to investigate potential adverse impacts towards the feasibility of development at the subject site, the nearby commercial uses were assessed in a preliminary fashion, based on information in Jade files for similar existing developments and site visits associated with the noise report previously completed for a portion of this site. The noise sources would need to be reviewed in greater detail at the time of the Detailed Environmental Noise and Vibration Report, as needed.

The exception to the above is the existing commercial use located at 136 Queen Street South (Gino's Pizza building), where previous investigations of the associated mechanical systems were conducted by Jade staff, in support of the work for the previous development application for a portion of the subject site. The information collected at that time has been used in the assessment of this building.

In addition to the nearby existing commercial/mixed-use developments, the CP Galt Rail Yard is located at the northwest quadrant of Queen Street South and Britannia Road West. The limits of the yard are not clear based on available information; however, the main portion of the yard is located north of Britannia Road West, at a distance of approximately 750 m or greater from the subject site. Although as noted in Section 2.1.1, CP Rail no longer provides operational information, the facility has been previously assessed in a preliminary fashion by our office for another nearby development. Based on information in our files and due to the separation distance, the CP facility is not anticipated to cause an exceedance over the applicable sound level limits and was not investigated further in this report. It should be noted that there are existing residential uses near the subject site with similar exposure and distance to the rail yard. Based on the separation distance of less than 1,000 m to the yard, a warning clause will be required to address the yard with language as specified by CP.

See Figure 6 for locations of the stationary noise sources included in the assessment.

Section 4.2 includes details of the noise assessment.

3.0 ENVIRONMENTAL NOISE AND VIBRATION CRITERIA

The environmental noise criteria used for residential developments in the City of Mississauga, Region of Peel and the Ontario Ministry of the Environment, Conservation and Parks (MOE) environmental noise criteria are contained in Appendix B and summarized below.

The Ontario Ministry of the Environment, Conservation and Parks document “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300”, dated August 2013, released October 21, 2013, (updated final version # 22) has been used in this assessment.

3.1 Transportation Sources

3.1.1 Indoors

If the nighttime (11:00 p.m. to 7:00 a.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window is equal to or greater than 60 dBA and/or if the daytime (7:00 a.m. to 11:00 p.m.) sound level in terms of Leq at the exterior face of a living/dining room or bedroom window is greater than 65 dBA, means must be provided so that windows can be kept closed for noise control purposes and central air conditioning is required. For nighttime sound levels (LeqNight) greater than 50 dBA to less than or equal to 59 dBA on the exterior face of a bedroom or living/dining room window or daytime sound levels (LeqDay) greater than 55 dBA to less than or equal to 65 dBA on the exterior face of a bedroom or living/dining room window, there need only be the provision for adding central air conditioning by the occupant at a later date. This typically involves a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. A warning clause advising the occupant of the potential interference with some activities is also required.

As required by the MOE, to determine the building component requirements the indoor noise criteria for road traffic noise is 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for the living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. These criteria are used to determine the architectural requirements. The MOE guidelines for rail noise are 5 dB more stringent to account for the low frequency component of rail noise. These criteria are used to determine the architectural requirements.

With respect to rail noise, the MOE requires additional consideration for the first row of dwellings, as follows, should they be located within 100 m of the rail line. Should dwellings be exposed to a 24-hour Leq greater than 60 dBA at the location of a nighttime receptor, they are to be provided with brick veneer or masonry equivalent construction from the foundation to the rafters. The intention of this requirement has been considered in the context of the proposed development.

3.1.2 Outdoors

For the outdoor amenity areas, a design goal of 55 dBA daytime (7:00 a.m. to 11:00 p.m.) sound level is used for road and rail traffic. In some cases, an excess not exceeding 5 dB is considered acceptable. Where the unmitigated sound levels during the day exceed 55 dBA (Leq16hour, daytime) but are less than 60 dBA (Leq16hour, daytime), a warning clause is required and mitigation should be considered. Where the unmitigated sound levels during the daytime hours exceed 60 dBA, mitigation measures and a warning clause are required.

The definition of outdoor amenity area as defined by the MOE is given below.

"Outdoor Living Area (OLA)

(applies to impact assessments of transportation sources) means that part of a noise sensitive land use that is:

- intended and designed for the quiet enjoyment of the outdoor environment; and
- readily accessible from the building.

The OLA includes:

- backyards, front yards, gardens, terraces or patios;
- balconies and elevated terraces (e.g. rooftops), with a minimum depth of 4 metres, that are not enclosed, provided they are the only outdoor living area (OLA) for the occupant; or
- common outdoor living areas (OLAs) associated with high-rise multi-unit buildings."

For both the indoor and outdoor conditions where the acoustical criteria are exceeded, warning clauses must be placed in offers of purchase and sale and/or lease agreements and included in the development agreement.

3.2 Stationary Sources

The guidelines of the Ontario Ministry of the Environment, Conservation and Parks (MOE) for stationary sources are to be used for the commercial facilities.

The MOE has recently published the document NPC-300 titled "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning".

The MOE also has vibration guidelines with respect to stationary sources, NPC-207. These guidelines require that the peak vibration velocities not exceed 0.3 mm/s at the point of reception during the day or night.

The MOE recognizes the need for back-up beepers/alarms as safety devices and as such does not have any guidelines or criteria to address these sources.

It should be noted that the MOE guidelines do not require that the source be inaudible, but rather that specific sound level limits be achieved.

With respect to stationary sources of noise in urban areas, the MOE guidelines require that the sound level due to the stationary source at the building façade and outdoor amenity spaces not exceed the sound level due to road traffic and in certain situations due to rail traffic in any hour of source operation, subject to specific exclusions. Tables C-5, C-6, C-7 and C-8 of NPC-300, included in Appendix B, provide the exclusion limit values of one-hour equivalent sound level ($L_{eq,dBA}$) and impulsive sound level ($L_{Im,dBAI}$).

In general, if the criteria for a stationary source of noise are exceeded, the MOE recommends that control be implemented at the source rather than at the receiver. Alternatively, if the receiver is set back from the source or if a physical barrier is constructed so that the criteria can be met at the receiver, no additional mitigative measures are required. In addition, a warning clause in offers of purchase and sale and/or lease agreements noting the proximity of dwellings to such a source should be considered. Treatment of the receptor building by the use of suitable exterior wall and window construction and central air conditioning to keep windows closed is not an acceptable solution to the MOE in Class 1 and 2 areas (urban). In addition, a warning clause in offers of purchase and sale and/or lease agreements noting the proximity of dwellings to such a source should be considered.

A Class 4 designation of a proposed residential use can be used to permit higher sound levels from neighbouring stationary sources. Based on the NPC-300 guidelines, Class 4 areas can only be established in Class 1 or 2 areas in proximity to existing, lawfully established stationary sources. This is not applicable in areas with existing noise sensitive land use(s) unless they are redeveloped/rezoned/replaced with new noise sensitive land use(s). Classification of a Class 4 area is subject to formal confirmation from the land use planning authority and continues as long as the stationary source(s) can potentially operate (i.e. until change in zoning).

Class 4 does not exempt the evaluation of the noise impact of the noise sources associated with the proposed development on the noise sensitive receptors within the proposed buildings.

Sound level limits for Class 4 areas shown in NPC-300 Tables C-5, C-6, C-7 and C-8 assume closed windows together with a ventilation system which is in most situations, central air conditioning.

3.3 CP Rail/Metrolinx Guidelines

CP and Metrolinx have guidelines which apply to residential developments adjacent to their rights-of-way. In general, the railway guidelines follow the MOE guidelines for indoor and outdoor sound level limits.

The Railway Association of Canada and Federation of Canadian Municipalities (RAC/FCM) guidelines “Guidelines for New Development in Proximity to Railway Operations” dated May 2013 have been used in this assessment. The CP/Metrolinx guidelines are consistent with the RAC/FCM guidelines.

In addition, the railways require that for a principal main line:

- a minimum setback of 30 m from the right-of-way be maintained;
- a safety berm (minimum height 2.5 m)/sound barrier (minimum total height 5.5 m above top-of-rail) be constructed along the right-of-way;
- in general, regardless of whether the noise level exceeds the 60 dBA level set by MOE, as a minimum, brick veneer or masonry equivalent construction for the first row of dwellings facing the railway right-of-way;
- ground vibration transmission be assessed through site tests. If an excess exists, all residential units within 75 m of the nearest track should be protected; and
- all residential units within 300 m of the right-of-way have a warning clause placed in offers of purchase and sale, in lease agreements and in the development agreement and condominium documents, making future residents aware of the existence of the railway.

CP/Metrolinx have vibration guidelines which apply to new residential development adjacent to railway lines. These guidelines state that for any residential dwellings within 75 m of the railway right-of-way, an overall vertical vibration velocity limit of 0.14 mm/s between 4 Hz and 200 Hz is applicable, consistent with the RAC/FCM guidelines. These guidelines have been used in the analysis.

The scope of this report addresses the CP/Metrolinx Rail line from a noise and vibration perspective and does not consider the feasibility, design and implementation of setback requirements or safety features required by the Municipality/CP Rail/RAC/FCM/Metrolinx.

3.4 City of Mississauga Noise Control By-law and Nuisance Type Noise By-law

The City of Mississauga has two (2) by-laws to prohibit or regulate unusual noises likely to disturb the inhabitants of the City; Noise Control By-law Number 0360-1979 and Nuisance Type Noise By-law Number 785-80. The by-laws do not provide specific sound level limits, but rather provide qualitative information with respect to sources and prohibitions by time and place.

3.5 Region of Peel Guidelines

The Region of Peel document titled “General Guidelines for the Preparation of Acoustical Report in the Region of Peel” dated November, 2012 (updated August, 2020), outlines requirements for the assessment of proposed residential developments.

4.0 NOISE AND VIBRATION IMPACT ASSESSMENT

4.1 Transportation Sources

Sound levels at the common outdoor amenity spaces and at the building envelopes of the proposed residential dwellings in terms of Leq, the energy equivalent continuous sound levels for both day (16 hours) and night (8 hours) were predicted using ORNAMENT and STEAM, the MOE Traffic Noise Prediction Models for road and rail traffic, respectively, implemented within the CadnaA computer program (Version 2023 MR2). The respective road and rail reference sound levels from STAMSON were used to calibrate the CadnaA noise source modelling in order to account for the complexity of the site geometry, while preparing the analysis using MOE approved calculation methods as the basis. See Table 2 for a detailed summary of the predicted sound levels. Appendix C contains sample calculations of the predicted sound levels.

As per the MOE guidelines, as there are private rooftop terraces with a depth greater than 4.0 m proposed within the Phase 1 development, they are generally considered to be outdoor areas requiring acoustical assessment; however, providing one (1) acoustically protected outdoor amenity area within the development which is accessible by all residents is acceptable. In this case, the common outdoor amenity areas associated with the buildings have been considered in the assessment. On the basis that the daytime sound level at the common outdoor amenity areas will be within the acceptable range (as later discussed), assessment of the individual dwelling rooftop terraces is not warranted and has not been included in this report.

The applicability of assessment of any private outdoor amenity areas associated with future Phases 2 to 4, inclusive, is to be determined at a later date once the design has progressed. It is however demonstrated in this report that sound level limit compliance is predicted to be achieved at the proposed common outdoor amenity areas in each future phase; therefore, the assessment of all private outdoor amenity areas is not warranted based on the current design. Should the assessment of private areas be warranted based on future designs, they can be considered at the time of the future Detailed Environmental Noise and Vibration Report.

The below predicted daytime and nighttime sound levels represent the highest sound level on the building façades due to both road and rail noise combined. As shown in Figure 5, the highest daytime and nighttime sound levels may be predicted on different façades. Additionally, the highest sound level due to separate road and rail sources for each respective building may be on different façades, based on the location of the sources. This has all been considered in the preliminary analysis of architectural façade components, discussed later in the report. In all cases, the predicted sound levels account for the identified tower and all associated lower levels, including shared podia. The calculations include a standard 1.2 m high railing along the roof edges of the amenity areas.

For Building 1A, the unmitigated sound levels at the façade are predicted to be up to 61 dBA for the daytime period (16 hours) between 7:00 a.m. and 11:00 p.m. and up to 58 dBA for the nighttime period (8 hours) between 11:00 p.m. and 7:00 a.m. The predicted daytime sound level at the common outdoor amenity area located on the sixth (6th) floor rooftop is 45 dBA.

For Building 1B, the unmitigated sound levels at the façade are predicted to be up to 61 dBA for the daytime period (16 hours) between 7:00 a.m. and 11:00 p.m. and up to 62 dBA for the nighttime period (8 hours) between 11:00 p.m. and 7:00 a.m. The predicted daytime sound level at the common outdoor amenity area located on the third (3rd) floor rooftop is 46 dBA.

For Building 2A, the predicted daytime and nighttime sound levels are up to 70 dBA and up to 72 dBA, respectively. The predicted daytime sound level at the common outdoor amenity area located on the sixth (6th) floor rooftop is 57 dBA; at the common outdoor amenity area located on the eighth (8th) floor rooftop, it is 50 dBA.

For Buildings 3A to 3D, inclusive, the sound levels at the façades are predicted to be up to 71 dBA during daytime hours and up to 73 dBA during nighttime hours. The predicted daytime sound level at the three common outdoor amenity areas located on the sixth (6th) floor rooftop between the towers is 54 to 55 dBA.

For Building 4, the predicted daytime and nighttime sound levels are up to 60 dBA and up to 62 dBA, respectively. The predicted daytime sound level at the common outdoor amenity area located on the third (3rd) floor rooftop is 51 dBA.

Where the sound level limits are expected to be exceeded, mitigative measures and warning clauses are required.

4.2 Railway Vibration

Ground-borne railway vibration measurements conducted by Jade Acoustics Inc. on September 2 and 9, 2023 have been used to investigate the potential railway ground-borne vibration impact of the through trains on the CP Galt Subdivision, due to freight train and GO Transit pass-bys. Figure 2 shows the locations of the measurement locations associated with each of the sets of measurements. Locations on-site were selected to represent the nearest proposed/existing structure within the subject site.

The vibration measurements conducted on November 2, 2023, were aligned with the façade location of proposed Building 2A; the November 9, 2023 vibration measurements were conducted within the Phase 3 area in the general area of the proposed 2-storey parking garage. Although there will be no residential units in the area of the garage, the assessment was conducted at the nearer location as vibration would be transmitted into the structure at the nearest location to the tracks.

Vibration measurements were made using Endevco accelerometers feeding into a Crystal Instruments Spider-20 Wireless Dynamics Signal Analyzer and Data Recorder. The recorded signal (vertical acceleration) was analyzed using the Crystal Instruments EDM Post Analyzer Software for a maximum one (1) second (averaging time) overall rms vibration velocity in mm/s.

The results of the measurements are summarized in Table A.

TABLE A
SUMMARY OF VIBRATION MEASUREMENTS OF FREIGHT AND PASSENGER TRAIN PASSBY

Train Time	Train Direction	Approximate Train Speed (km/h)	Train Type	Number of Locomotives	Number of Rail Cars	Overall Vertical Vibration Velocity (mm/s)			
						V1*	V2*	V3*	V4*
November 2, 2023 Measurements									
8:16 a.m.	Southbound	35	GO	1	12	0.004	0.007	0.007	**
8:32 a.m.	Northbound	40	Freight	1	153	0.05	0.06	0.1	0.07
8:43 a.m.	Southbound	25	GO	1	10	0.01	0.01	0.01	0.009
10:10 a.m.	Northbound	45	Freight	1	98	0.05	0.05	0.06	0.06
12:05 p.m.	Northbound	50	Freight	1	34	0.03	0.02	0.02	0.02
2:07 p.m.	Southbound	35	Freight	1	136	0.17	0.1	0.15	0.09
2:53 p.m.	Northbound	50	Freight	1	104	0.04	0.04	0.05	0.04
November 9, 2023 Measurements									
10:58 a.m.	Southbound	35	Freight	1	109	0.17	0.27	0.26	0.36
1:02 p.m.	Southbound	35	Freight	1	14	0.24	0.28	0.26	0.60
1:30 p.m.	Southbound	40	Freight	1	131	0.28	0.36	0.29	0.49
3:13 p.m.	Northbound	70	Freight	1	17	0.31	0.35	0.43	0.65

* Vibration measurement locations.

** Not recorded.

As can be seen from Table A, the measured vibration velocities exceed the CP/Metrolinx criteria of 0.14 mm/s at some measurement locations. Based on the conducted measurements, structural vibration isolation measures may be required in order to isolate the building foundations from the ground; however, this should be revisited in the future once the design of the future phases near the rail line has progressed.

Based on the proposed locations of the Phase 1 and Phase 4 buildings, they are more than 75 m from the railway right-of-way; therefore, assessment of railway ground-borne vibration at these locations is not required.

4.3 Stationary Sources

At the time of completion of this report, contact with the neighbouring commercial businesses was not completed and investigation into associated noise sources was conducted in a preliminary fashion.

As noted in Section 2.2, a previous investigation and site visit at the existing commercial plaza between Buildings 1A and 1B was conducted by Jade staff.

The noise sources and approach to the preliminary modelling of external noise sources are based on the information collected through the previous site investigations and information from Jade Acoustics Inc. files.

Potentially significant noise sources associated with the neighbouring commercial businesses included in the analysis are generally limited to rooftop HVAC units, such as heat/cool units and exhaust fans.

Additionally, included in the analysis is the existing restaurant located at 158 Queen Street South, shown on the master plan as Building 2B and anticipated to remain operating as-is. The potential impacts of the rooftop HVAC units have been included in the assessment of noise impacting the proposed noise sensitive uses at the subject site.

Appendix D includes information regarding the sound power levels used in the calculations.

Figure 6 shows the location of the commercial buildings and noise sources analyzed.

For the rooftop heat/cool units, duty cycles of 100% (daytime), 70% (evening) and 40% (nighttime) were accounted for in the analysis.

For the exhaust fans, a duty cycle of 100% was accounted for in the analysis, in the applicable time periods where the respective use is in operation.

The unmitigated sound levels in terms of one-hour Leq were calculated for the façades (and relevant outdoor amenity areas) of all proposed buildings using the CadnaA 2023 MR2 computer program, which uses International Standard Analytical Code ISO 9613-2. As the existing topography has no significant ground elevation changes, flat ground was used in the calculations.

As noted in Section 4.1 regarding transportation noise sources, the relevant private rooftop terraces do not require assessment in this case, as the common outdoor amenity areas will provide the acoustically protected OLA for each building.

Table B was prepared showing the results of the analysis at the worst-case building façades, for each of the proposed buildings. Figure 6 shows the predicted unmitigated sound levels at all building façades and common outdoor amenity spaces.

As shown in Table B, the predicted sound levels at some of the proposed building façade locations exceed the Class 1 sound level limits; therefore, mitigation measures are required.

The predicted sound levels were also compared with the MOE Class 4 exclusion sound level limits of 60 dBA (daytime and evening hours) and 55 dBA (nighttime hours) at the building façades, and 55 dBA (daytime) at the outdoor amenity areas. As shown in Table B, exceedances were not predicted over the Class 4 exclusion sound level limits; therefore, physical mitigation measures are not required.

Due to the configuration of the buildings in the neighbouring commercial site, nature of the businesses and based on the information collected through the site visit, impulsive noise sources were considered at this time to be acoustically insignificant and not investigated further.

TABLE B

SUMMARY OF PREDICTED SOUND LEVELS DUE TO CONTINUOUS NOISE SOURCES WITHOUT MITIGATION MEASURES

Worst Case Receptor* On	Predicted Sound Level (dBA)								
	Daytime (7:00 a.m. to 7:00 p.m.)			Evening (7:00 p.m. to 11:00 p.m.)			Nighttime (11:00 p.m. to 7:00 a.m.)		
	Predicted	Limit**	Exceedance (Class 1/Class 4)	Predicted	Limit**	Exceedance (Class 1/Class 4)	Predicted	Limit**	Exceedance (Class 1/Class 4)
Building 1A	52	50/60	Yes/No	51	50/60	Yes/No	49	45/55	Yes/No
Building 1B	57	50/60	Yes/No	56	50/60	Yes/No	55	45/55	Yes/No
Building 2A	46	50/60	No/No	45	50/60	No/No	43	45/55	No/No
Building 3A	42	50/60	No/No	40	50/60	No/No	38	45/55	No/No
Building 3B	40	50/60	No/No	39	50/60	No/No	38	45/55	No/No
Building 3C	34	50/60	No/No	33	50/60	No/No	31	45/55	No/No
Building 3D	34	50/60	No/No	32	50/60	No/No	30	45/55	No/No
Building 3 Podium	43	50/60	No/No	42	50/60	No/No	40	45/55	No/No
Building 4	43	50/60	No/No	42	50/60	No/No	41	45/55	No/No
OLA1***	38	50/55	No/No	38	50/55	No/No	N/A***	N/A***	N/A***
OLA2***	33	50/55	No/No	33	50/55	No/No	N/A***	N/A***	N/A***
OLA3***	35	50/55	No/No	34	50/55	No/No	N/A***	N/A***	N/A***
OLA4***	33	50/55	No/No	32	50/55	No/No	N/A***	N/A***	N/A***
OLA5***	30	50/55	No/No	29	50/55	No/No	N/A***	N/A***	N/A***
OLA6***	22	50/55	No/No	21	50/55	No/No	N/A***	N/A***	N/A***
OLA7***	23	50/55	No/No	22	50/55	No/No	N/A***	N/A***	N/A***
OLA8***	24	50/55	No/No	23	50/55	No/No	N/A***	N/A***	N/A***

* Building façade receptors except as noted. Building/receptor naming convention as shown on Figures 3 to 6.

** Class 1/Class 4 area exclusion sound level limit.

*** There are no nighttime sound level limits for outdoor living areas.

5.0 NOISE AND VIBRATION ABATEMENT MEASURES

5.1 Transportation Sources

5.1.1 Indoors

Architectural Component Requirements

Indoor sound level criteria for road and rail traffic can be achieved in all cases by using appropriate architectural elements for external wall, roof, window and exterior door construction. MOE indoor criteria for road traffic noise are 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for the living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. As noted in Section 3.1.1, the MOE guidelines for rail noise are 5 dB more stringent. These criteria have been used in this report. The characteristic spectra for the noise sources have been accounted for in the determination of the architectural components. Appendix E contains a sample calculation of architectural component selection.

Once final dwelling plans become available, the noise control requirements should be re-evaluated.

In determining the architectural requirements, it is assumed that the worst-case residential condition would involve a bedroom. As detailed dwelling layouts are not available at this time, assumptions have been made on the representative room and façade dimensions, based on our experience with similar developments. For the preliminary analysis, it is assumed that the exterior walls would be 30% and the windows 50% of the associated floor area for both the wall perpendicular to the noise source and the wall parallel to the noise source.

Based on the proximity to the rail line, it is required that the north, west, and south façades of all buildings within Phases 2 and 3 be provided with brick veneer or acoustically equivalent masonry construction. This has been accounted for in the analysis of the associated glazing requirements.

Based on the preliminary analysis for Phase 3, for the worst-case receptors, windows and exterior doors need to be up to STC 46 accounting for the above noted assumptions and brick veneer exterior walls, to provide the mitigation required for noise due to road, and rail traffic.

For the Phase 1B building (worse-case Phase 1 location relative to transportation noise), accounting for the above noted room assumptions, exterior walls having up to an STC 42 rating would be required, as well as STC 37 windows/exterior doors.

Based on the predicted sound levels as shown on Figures 3 to 5, the requirements for Building 2A will be similar to those for the Phase 3 buildings. Also, the requirements for Building 4 will be similar to those for Building 1B.

An STC 37 (and STC 46) rating for windows and exterior doors and an STC 42 rating (and brick veneer or acoustically equivalent masonry construction) for exterior walls are upgrades above the minimum structural and safety requirements of standard construction.

Applicable to the Phase 3 and 4 buildings, as windows and exterior doors with an STC 46 rating is a significant requirement and windows with this performance may not be readily available for purchase, alternative measures to reduce the performance requirements can be explored, including, but not limited to reducing the window-to-floor areas into noise sensitive spaces, and upgrade the exterior wall construction. Limiting the sensitive spaces with glazing openings facing the railways should be considered in the building design. These options can be explored in further detail in preparation of the detailed noise and vibration report.

The above assessment accounts for the comparatively worse-case residential uses when compared to proposed retail uses, which are required to be assessed for indoor sound level limit compliance due to transportation noise, based on the Region of Peel Guidelines. The acoustical façade requirements for the future commercial areas will be lower than for the residential dwellings.

The acoustical performance of a window as a whole depends on glass configuration/thickness, air space, material used for frames and construction details including seals. Therefore, the acoustical performance of the glass configuration alone expressed as a sound transmission class (STC) rating, generally available in the literature, does not address the STC rating of the whole window. Glass configurations with different frame materials and/or construction details often produce different STC ratings. Therefore, it is recommended that prior to installation the window manufacturers provide proof (STC test results of window configuration from an accredited laboratory) that their windows meet the required STC ratings.

Ventilation Requirements

Where the sound level is equal to or greater than 60 dBA (at night) at the outside face of a bedroom window or living/dining room window or exceeds 65 dBA (during the day) on the outside face of a bedroom window or living/dining room window, the indoor noise criteria would not be met with open windows and provisions must be made to permit the windows to remain closed. The MOE requires central air conditioning. In addition, a warning clause is needed. Based on the analysis, most dwelling units require central air conditioning. See Table 3 and Figure 2.

Where the sound level is exceeded by 1 dB to 10 dB (i.e. LeqNight greater than 50 dBA to less than or equal to 59 dBA and LeqDay greater than 55 dBA to less than or equal to 65 dBA), the provision for adding central air conditioning by the occupants and a warning clause is required. Based on the calculations, provision for adding central air conditioning is required for the dwelling units not requiring mandatory central air conditioning. See Table 3 and Figure 2.

It is anticipated that all residential units will be provided with central air conditioning; thereby, satisfying the acoustical requirements.

Warning clauses will also be required to be placed in offers of purchase and sale, lease agreements and included in the development/condominium agreement for all relevant dwelling units to make future occupants aware of the potential noise situation. All buildings (units) within 300 m of the CP Galt Subdivision will also require a warning clause to advise of the proximity to the rail line, regarding the separate CP Rail and GO/Metrolinx operations. See Table 3 for details.

See Table 3 and notes to Table 3 for details of minimum noise abatement measures required.

5.1.2 Outdoors

The outdoor amenity area is required to be exposed to a sound level of 55 dBA or less during the day. A 5 dBA increase is considered acceptable in certain situations. Typically, if the sound level is above 55 dBA, some form of mitigation is recommended, and warning clauses are required. Where the sound levels exceed 60 dBA, mitigation and warning clauses are required.

An unmitigated daytime sound level due to transportation noise of less than 55 dBA is predicted at all but one rooftop common outdoor amenity areas as shown on Figure 5. The one (1) exceedance predicted at receptor OLA5 (Building 2A sixth (6th) floor rooftop OLA) is predicted to be 57 dBA with the inclusion of a standard height railing, which is acceptable as it is less than 60 dBA. Additionally, it should be noted that the daytime sound level at the OLA on the eighth (8th) floor rooftop of Building 2A is predicted to be less than 55 dBA and therefore provides the overall acoustically protected OLA for the building. On this basis, acoustical mitigation measures are not required for the rooftop OLAs.

As noted in Section 4.1, the analysis accounts for a standard height railing. As the calculations show this railing is required to achieve sound level limit compliance, it should be designed to achieve the properties of an acoustic barrier; i.e. gapless construction having a minimum surface density of 20 kg/m².

All balconies and other private terraces which are less than 4.0 m in depth are not considered a noise sensitive space that require mitigation. As noted previously, the assessment of relevant private terraces is not required, as the analysis demonstrates an acoustically protected OLA can be provided for each building/phase.

Where an excess will remain or where mitigation measures are required, a warning clause should be placed in offers of purchase and sale and/or lease agreements and in the development agreement. Warning clause requirements are listed in Table 3 and specific wording is included in the Notes to Table 3.

5.1.3 Railway Vibration

As noted in Section 4.2, ground-borne vibration measurements were conducted at the subject site at representative locations of some of the nearest proposed dwellings to the rail line. As shown in Table A, exceedances above the 0.14 mm/s limit were measured in some cases. At the time of the measurements, the existing ground conditions were not reflective of the final conditions at the subject site. It is therefore recommended that ground-borne vibration measurements be completed across the site at the time of preparation of the Detailed Environmental Noise and Vibration Report once current uses within the site have ended and the pavement is removed, in order to confirm if vibration mitigation measures will be required based on the future site design.

5.2 Stationary Sources

As discussed in Section 4.2, based on the stationary noise source review, noise mitigation measures are required to achieve the MOE sound level limits.

As previously noted, the City of Mississauga approved the previous development application of the subject site as a Class 4 development. On this basis, physical mitigation measures to achieve the Class 1 exclusion sound level limits (where required) have not been investigated. Instead, the analysis has considered achieving compliance with the Class 4 area sound level limits of the MOE.

Based on the preliminary analysis, the Class 4 sound level limits are predicted to be met without the use of physical mitigation measures, as shown in Table A; therefore, no physical mitigation measures in addition to those required as a function of the Class 4 designation are required for the subject site.

Based on the MOE NPC-300 guidelines, Class 4 designation can be used for new sensitive land uses adjacent to lawfully established stationary sources if approved by the municipality. Mandatory central air conditioning would also be required to satisfy the Class 4 requirements.

Currently, a portion of the proposed site is considered to be a Class 1 area; therefore, the land use planning authority would need to approve the new classification based on the noise analysis and incorporate Class 4 designation in a site-specific zoning by-law or alternative planning document that remains registered, as approved by the City of Mississauga. As previously discussed, the City has approved the Class 4 designation previously for a portion of the site.

With the designation of the site as Class 4, a warning clause advising future owners/tenants of this designation and mandatory central air conditioning for the dwellings will be required. A sample Class 4 warning clause has been provided below for reference.

“Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed. The residential area has been designated Class 4 as defined by the Ministry of the Environment, Conservation and Parks.”

Due to their proximity to the existing commercial buildings, all proposed dwelling units should be provided with a proximity warning clause notifying the purchasers/tenants that the activities and/or equipment associated with the commercial buildings may at times be audible. See Table 3 and Notes to Table 3.

6.0 RECOMMENDATIONS

1. The requirements as stipulated in Table 3 should be incorporated in the development.
2. An analysis of the proposed mechanical equipment and final architectural façade requirements will need to be prepared once the final site plan, architectural plans, mechanical plans and grading plan are available to ensure the appropriate criteria are achieved. This can be done through the building permit process.
3. Future ground-borne railway vibration measurements should be conducted once site conditions are suitable.
4. A Detailed Environmental Noise and Vibration Report should be prepared once the final site plan, architectural plans, mechanical plans and grading plan are available to ensure the appropriate criteria are achieved.


7.0 CONCLUSIONS

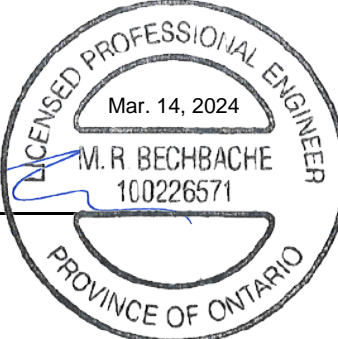
Based on the acoustical analysis, with the incorporation of the appropriate acoustical mitigation measures, it is feasible to develop these lands for residential and commercial/retail use. In accordance with City, CP Rail, Metrolinx and Ministry implementation guidelines, where mitigation is required, future purchasers will be advised through the use of warning clauses.

A detailed environmental noise and vibration report will need to be prepared once detailed site plan, architectural and mechanical drawings for the subject site are available to ensure the appropriate criteria are achieved.

Respectfully submitted,

JADE ACOUSTICS INC.

Per: 
Michael Bechbache, P.Eng.



Per: 
Chris B. Kellar, P.Eng.



MB/CK/jg
L:\Reports\06-062-03 Mar 14-24 120 128 and 142 to 158 Queen Street South and 169 Crumbie Street (ENR).doc

8.0 REFERENCES

1. “Model Municipal Noise Control By-Law”, Final Report, Ontario Ministry of the Environment, August, 1978.
2. ORNAMENT – “Ontario Road Noise Analysis Method for Environment and Transportation”, Ontario Ministry of the Environment, October, 1989.
3. “STEAM” – Sound from Trains Environmental Analysis Method”, Ontario Ministry of the Environment, July, 1990.
4. “Building Practice Note No. 56: Controlling Sound Transmission into Buildings”, J.D. Quirt, Division of Building Research, National Research Council of Canada, September, 1985.
5. “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, Ontario Ministry of the Environment and Climate Change, Publication NPC-300, August, 2013, released October 21, 2013 (updated final version #22).
6. “Impulse Vibration Residential Buildings”, Ontario Ministry of Environment, Publication NPC-207 (Draft), November, 1983.
7. “General Guidelines for the Preparation of Acoustical Reports in the Region of Peel”, Region of Peel, November, 2012 (Updated August 2020).
8. “Guidelines for New Development in Proximity to Railway Operations”, Railway Association of Canada and Federation of Canadian Municipalities, May 2013.

TABLE 1
PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET
CITY OF MISSISSAUGA

SUMMARY OF TRAFFIC INFORMATION

A. Road Traffic

ROAD	QUEEN STREET SOUTH
AADT* (Ultimate)	18,200
No. of Lanes	2
Speed (km/hr)	40
Medium Truck (%)	0.55
Heavy Trucks (%)	0.45
Gradient (%)	2
Day/Night Split (%)	90/10

* AADT: Annual Average Daily Traffic.

B. Rail Traffic (Galt Subdivision)

CP GALT SUBDIVISION	FREIGHT [#]		GO ^{##}	
	DAY	NIGHT	DAY	NIGHT
No. of Trains	9	8	20	2
Average No. of Locomotives	4	4	1	1
Average No. of Cars	151	151	10	10
Speed (km/h)	80	80	80	80

[#] This data has been escalated by 2.5% annually to the Year 2034 for use in the analysis.

^{##} Projected data. No escalation factor used in the analysis.

TABLE 2
PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET

CITY OF MISSISSAUGA

PREDICTED UNMITIGATED SOUND LEVELS
OUTDOORS DUE TO ROAD AND RAIL TRAFFIC

Building	Location*	Source	Distance (m)**	Leq (dBA)			
				Day (7:00 a.m. to 11:00 p.m.)		Night (11:00 p.m. to 7:00 a.m.)	
				Separate	Combined	Separate	Combined
Building 1A	North Façade	Road	55	50	57	43	58
		Rail	145	56		58	
	6 th Floor Rooftop OLA (OLA2)	Road	75	37	45	--	--
		Rail	130	44		--	
Building 1B	West Façade	Road	85	39	60	33	62
		Rail	115	60		62	
	3 rd Floor Rooftop OLA (OLA1)	Road	25	45	46	--	--
		Rail	180	42		--	
Building 2A	West Façade	Road	160	30	70	23	72
		Rail	40	70		72	
	6 th Floor Rooftop OLA (OLA5)	Road	150	31	57	--	--
		Rail	50	57		--	
	8 th Floor Rooftop OLA (OLA4)	Road	105	37	50	--	--
		Rail	95	50		--	

* As the sound level predictions due to rail noise govern the requirements, the façades with most exposure to the rail line have been reported in Table 2, above. See Figures 3 to 5 for additional details on the sound level predictions. Wall receiver is representative of the worst case location on the respective façade. The OLA receiver is located at a height of 1.5 m above the roof.

** Distances are approximate.

TABLE 2 - Continued

PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT

120, 128 AND 142 TO 158 QUEEN STREET SOUTH

AND 169 CRUMBIE STREET

CITY OF MISSISSAUGA

**PREDICTED UNMITIGATED SOUND LEVELS
OUTDOORS DUE TO ROAD AND RAIL TRAFFIC**

Building	Location*	Source	Distance (m)**	Leq (dBA)			
				Day (7:00 a.m. to 11:00 p.m.)		Night (11:00 p.m. to 7:00 a.m.)	
				Separate	Combined	Separate	Combined
Building 3A	West Façade	Road	165	26	71	19	73
		Rail	40	71		73	
	6 th Floor Rooftop OLA (OLA8)	Road	155	27	54	--	--
		Rail	50	54		--	
Building 3B	West Façade	Road	165	26	71	20	73
		Rail	40	71		73	
	6 th Floor Rooftop OLA (OLA7)	Road	155	33	54	--	--
		Rail	50	54		--	
Building 3C	West Façade	Road	165	27	71	20	73
		Rail	40	71		73	
	6 th Floor Rooftop OLA (OLA6)	Road	155	33	55	--	--
		Rail	50	55		--	
Building 3D	West Façade	Road	165	32	71	25	73
		Rail	40	71		73	
Building 4	North Façade	Road	30	50	60	45	62
		Rail	175	60		62	
	3 rd Floor Rooftop OLA (OLA3)	Road	25	46	51	--	--
		Rail	180	49		--	

* As the sound level predictions due to rail noise govern the requirements, the façades with most exposure to the rail line have been reported in Table 2, above. See Figures 3 to 5 for additional details on the sound level predictions. Wall receiver is representative of the worst case location on the respective façade. The OLA receiver is located at a height of 1.5 m above the roof.

** Distances are approximate.

TABLE 3

PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT

120, 128 AND 142 TO 158 QUEEN STREET SOUTH

AND 169 CRUMBIE STREET

CITY OF MISSISSAUGA

**SUMMARY OF MINIMUM NOISE ABATEMENT MEASURES
DUE TO TRANSPORTATION NOISE SOURCES**

Buildings (Units)	Air Conditioning ⁽¹⁾	Exterior Wall STC Rating ⁽²⁾	Window STC Rating ⁽³⁾	Sound Barrier ⁽⁴⁾	Warning Clause ⁽⁵⁾
Buildings 1A (all units), 1B (all units) and 4 (all units)	Mandatory*	Up to STC 42**	Up to STC 37**	No***	A, B, C, D, E, F#
Buildings 2A (all units) and 3A (all units, including the shared podium) to 3D (all units, including the shared podium)	Mandatory	Brick Veneer**	Up to STC 46**	No***	A, B, C, D, E, F#

- * See Section 5.1.1 for details. All dwelling designs are anticipated to include central air conditioning. Mandatory central air conditioning would be required as a condition of the Class 4 designation.
- ** Denotes construction that exceeds minimum structural and safety requirements of standard construction to address transportation sources.
- *** See Section 5.1.2 regarding the required construction of the standard height railing.
- # Warning Clause F would be required as a condition of the Class 4 designation.

See Notes to Table 3 on following pages. See Section 5.2 for discussions regarding the Class 4 designation to address stationary noise sources.

NOTES TO TABLE 3

1. Means must be provided to allow windows to remain closed for noise control purposes.
2. STC – Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on preliminary calculations using standard assumptions. See text for details.
3. STC – Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on preliminary calculations using standard assumptions. See text for details. A sliding glass walkout door should be considered as a window and be included in the percentage of glazing. Requirements are to be finalized once building plans are available.
4. Acoustic barriers must be of a solid construction with no gaps and have a minimum surface density of 20 kg/m². See Section 5.1.2 for details.
5. Suggested warning clauses to be included in the development agreement and to be included in offers of purchase and sale or lease agreements on designated buildings (units) are noted below. In addition to those noted, a proximity warning clause due to the CP Rail Yard is recommended for all proposed dwelling units, with language as stipulated by CP.

A. "Purchasers/tenants are advised that despite the inclusion of noise control features in this development area and within the dwelling units, noise due to increasing road and rail traffic may continue to be of concern, occasionally interfering with the activities of the occupants as the sound level may exceed the noise criteria of the Municipality and the Ontario Ministry of the Environment, Conservation and Parks. I, the purchaser hereby agree to place this clause in all subsequent offers of purchase and sale when I sell the property."

B. "Purchasers/tenants are advised that the dwelling unit was fitted with a central air conditioning system in order to permit closing of windows for noise control."

C. "Purchasers/tenants are advised that this residential unit is in proximity to the existing commercial buildings whose activities may at times be audible."

D. “Warning: Canadian Pacific Railway Company or its assigns or successors in interest has or have a right-of-way and facilities within 300 m 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 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). CP Rail will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid facility and right-of-way”.

E. “Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest operate commuter transit service within 300 metres from the land which is the subject hereof. In addition to the current use of these lands, there may be alterations to or expansions of the rail and other facilities on such lands in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit or any railway 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 dwellings. Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under these lands.”

F. “Purchasers/tenants are advised that sound levels due to the adjacent commercial buildings are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed. The residential area has been designated Class 4 as defined by the Ministry of the Environment, Conservation and Parks guidelines.”



N.T.S

**Proposed Mixed-Use Residential Development
 120, 128 and 142 to 158 Queen Street South and
 169 Crumbie Street
 City of Mississauga**

Date: March 2024

File: 06-062-03

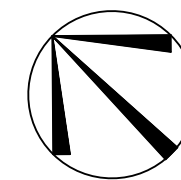
**KEY PLAN
 FIGURE 1**



Existing Mixed-Use/Commercial

Queen St S

Building 2B
(158 Queen St S)
2 Storeys



Existing Commercial

Existing Commercial/Residential

Existing Library

Public Park

William St

Market Square
(POPS)

Existing Residential

Existing Residential

25m Railway Setback

25m Railway Setback

2 Storey Above Ground Parking Garage

Crumbie St

V1

V2

V3

V4

CP Galt Subdivision

Existing/Future Residential

N.T.S.

Legend:

▲ Mandatory Central Air Conditioning and Warning Clause (See text, Table 3 and Notes to Table 3 for details)

● Provision for Adding Central Air Conditioning and Warning Clause (See text, Table 3 and Notes to Table 3 for details). Additionally, see the NOTES below.

○ Railway Vibration Measurement Locations

NOTES: All buildings/dwelling units require proximity Warning Clauses C, D, and E and a separate proximity warning clause due to the CP Rail Yard (See text, Table 3 and Notes to Table 3 for details).

All dwelling units will require mandatory central air conditioning and Warning Clause F if the development is designated Class 4.

It is anticipated that all dwelling units will be provided with central air conditioning, thereby satisfying the ventilation requirements due to transportation noise.

Proposed Mixed-Use Residential Development
120, 128 and 142 to 158 Queen Street South
and 169 Crumbie Street
City of Mississauga

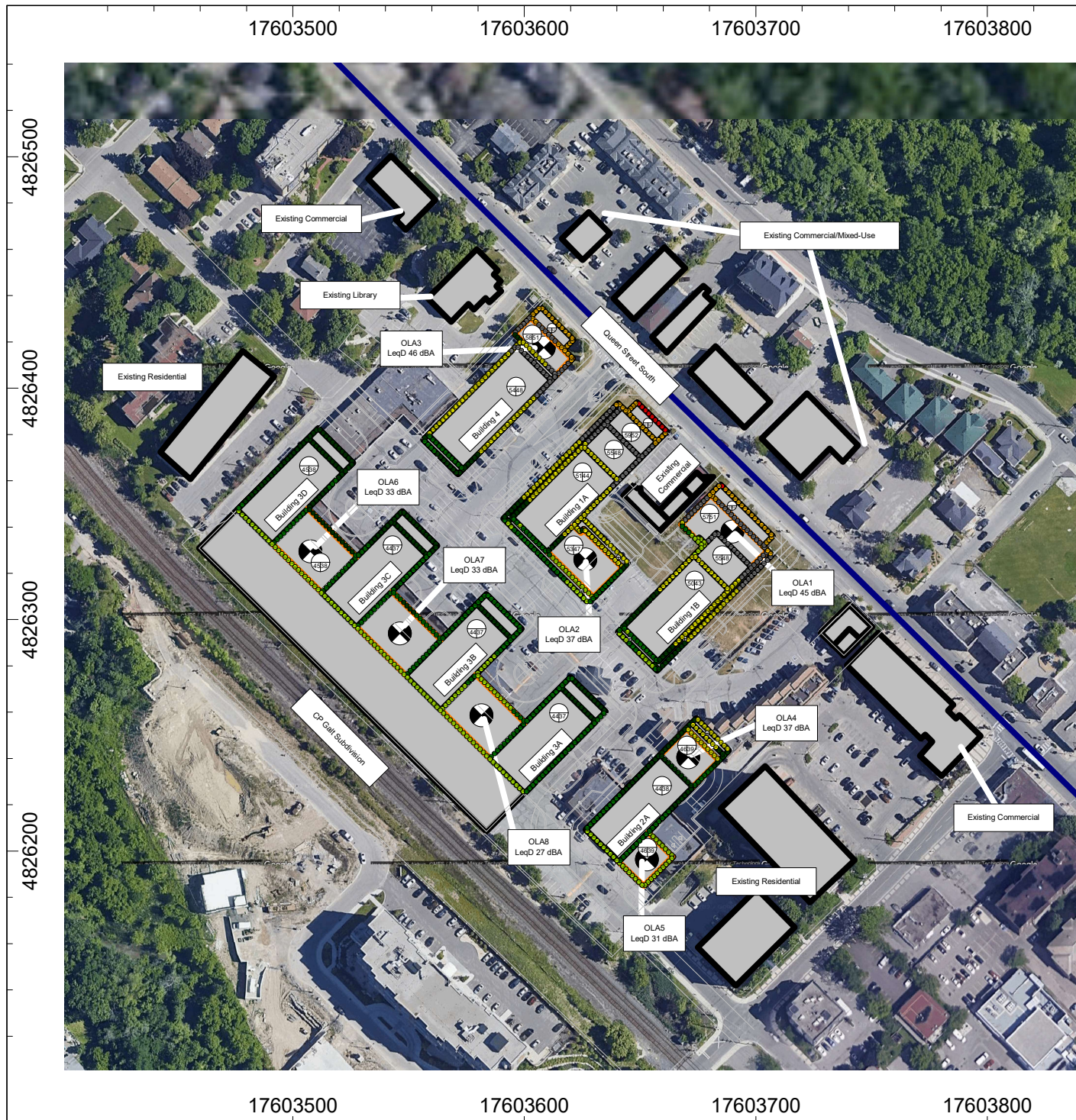
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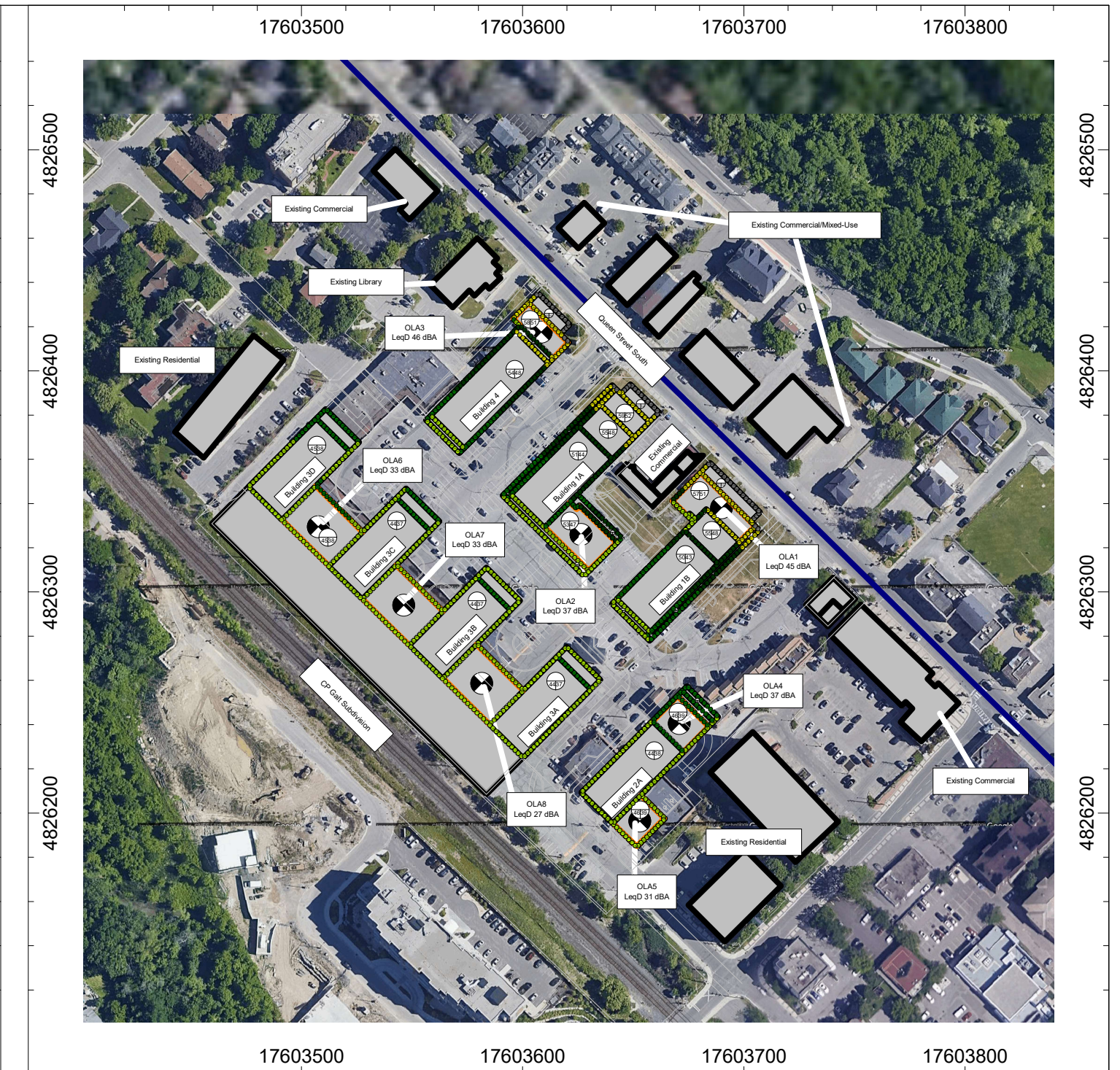


PLAN OF DEVELOPMENT
SHOWING MINIMUM
NOISE ABATEMENT
MEASURES

FIGURE 2



Daytime (7:00 a.m. to 11:00 p.m.)



Nighttime (11:00 p.m. to 7:00 a.m.)



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411 Confederation Parkway
Unit 19
Concord, Ontario L4K 0A8
Tel: 905-660-2444
Fax: 905-660-4110

Date: March 2024

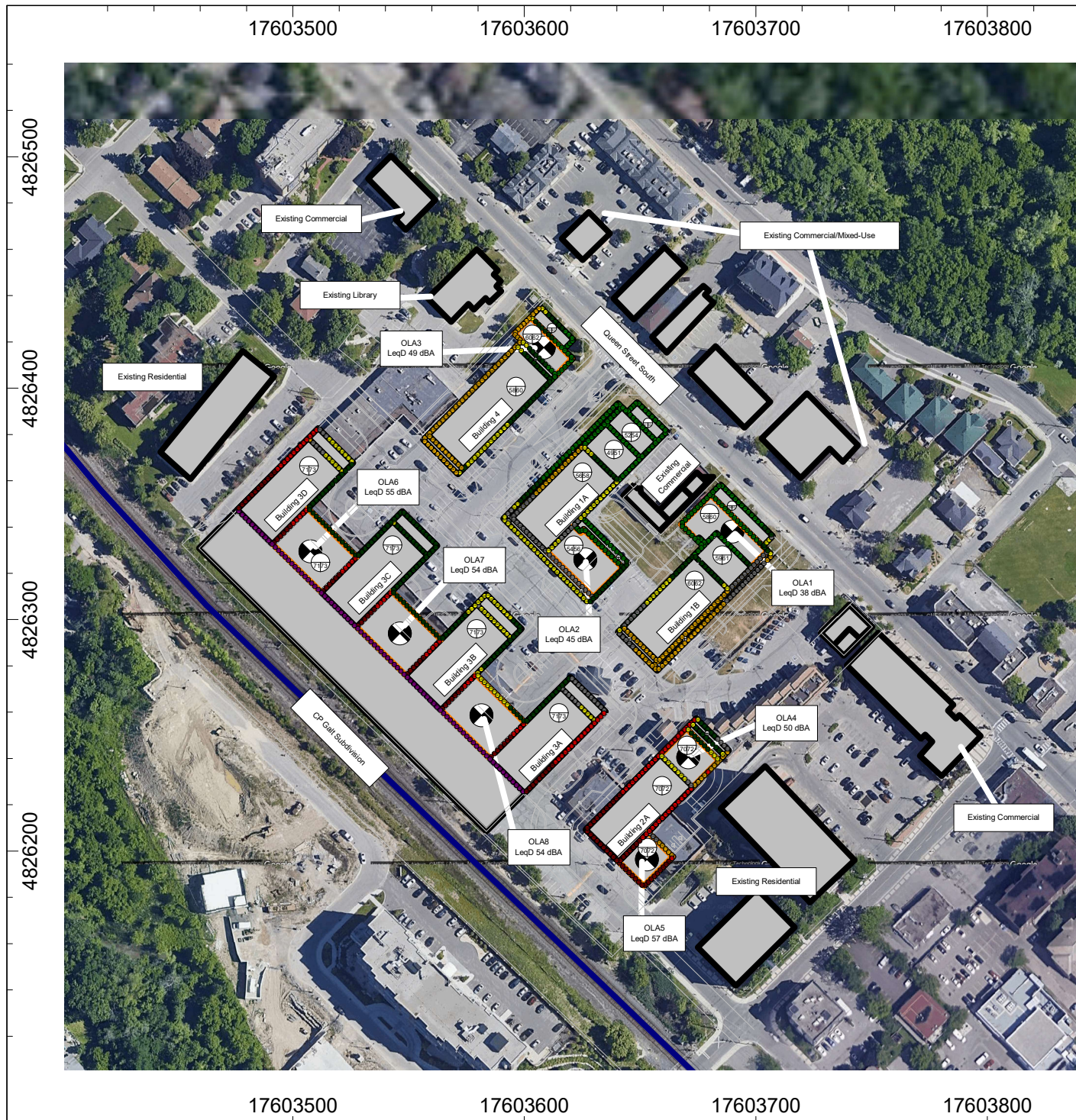
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PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET

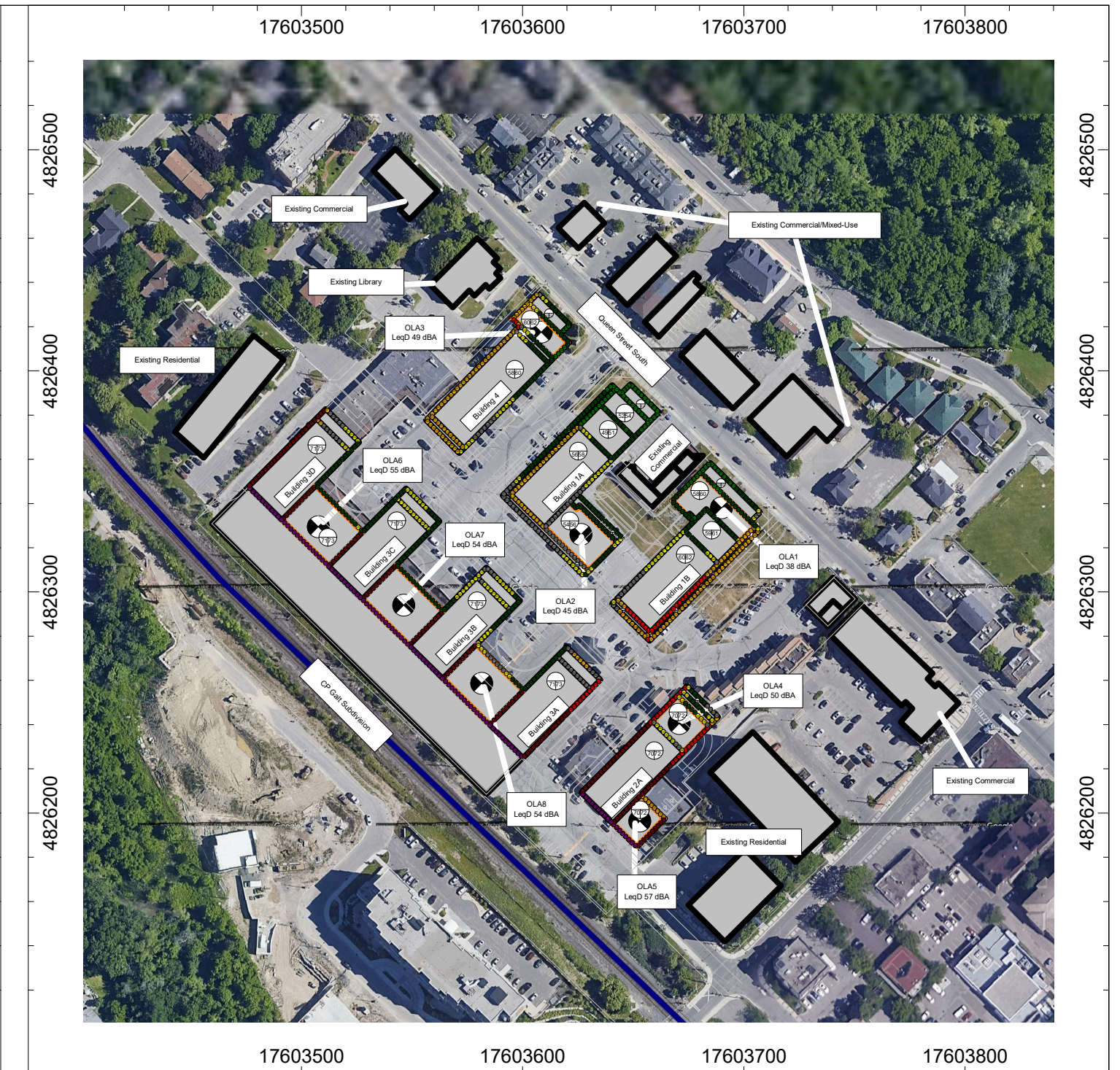
PLAN SHOWING ANALYZED SOURCES OF ROAD
NOISE AND PREDICTED SOUND LEVELS WITHOUT
MITIGATION MEASURES

FIGURE 3





Daytime (7:00 a.m. to 11:00 p.m.)



Nighttime (11:00 p.m. to 7:00 a.m.)



Jade Acoustics Inc.
411 Confederation Parkway
Unit 19
Concord, Ontario L4K 0A8
Tel: 905-660-2444
Fax: 905-660-4110

Date: March 2024

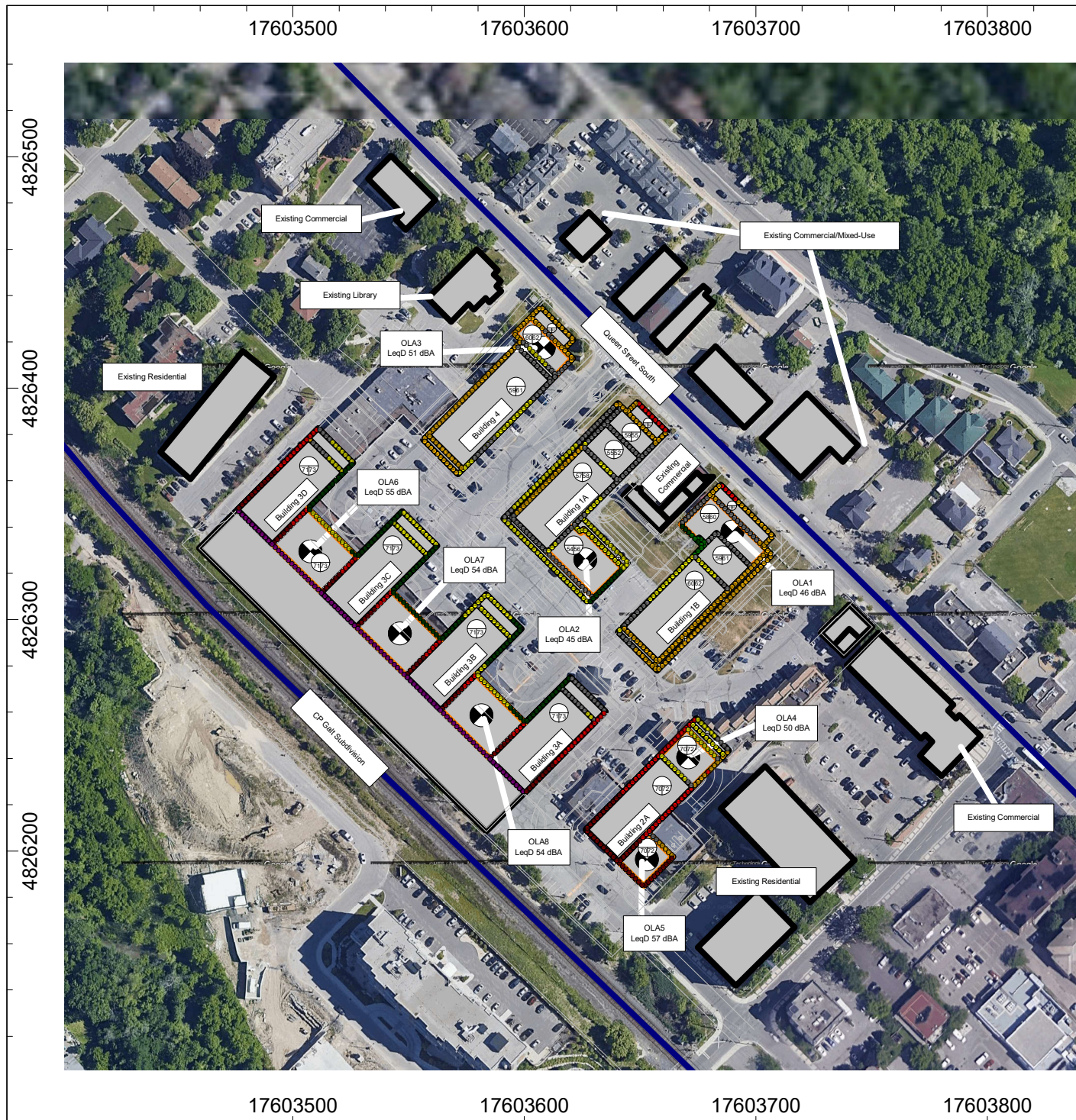
Jade File: 06-062-03

PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET

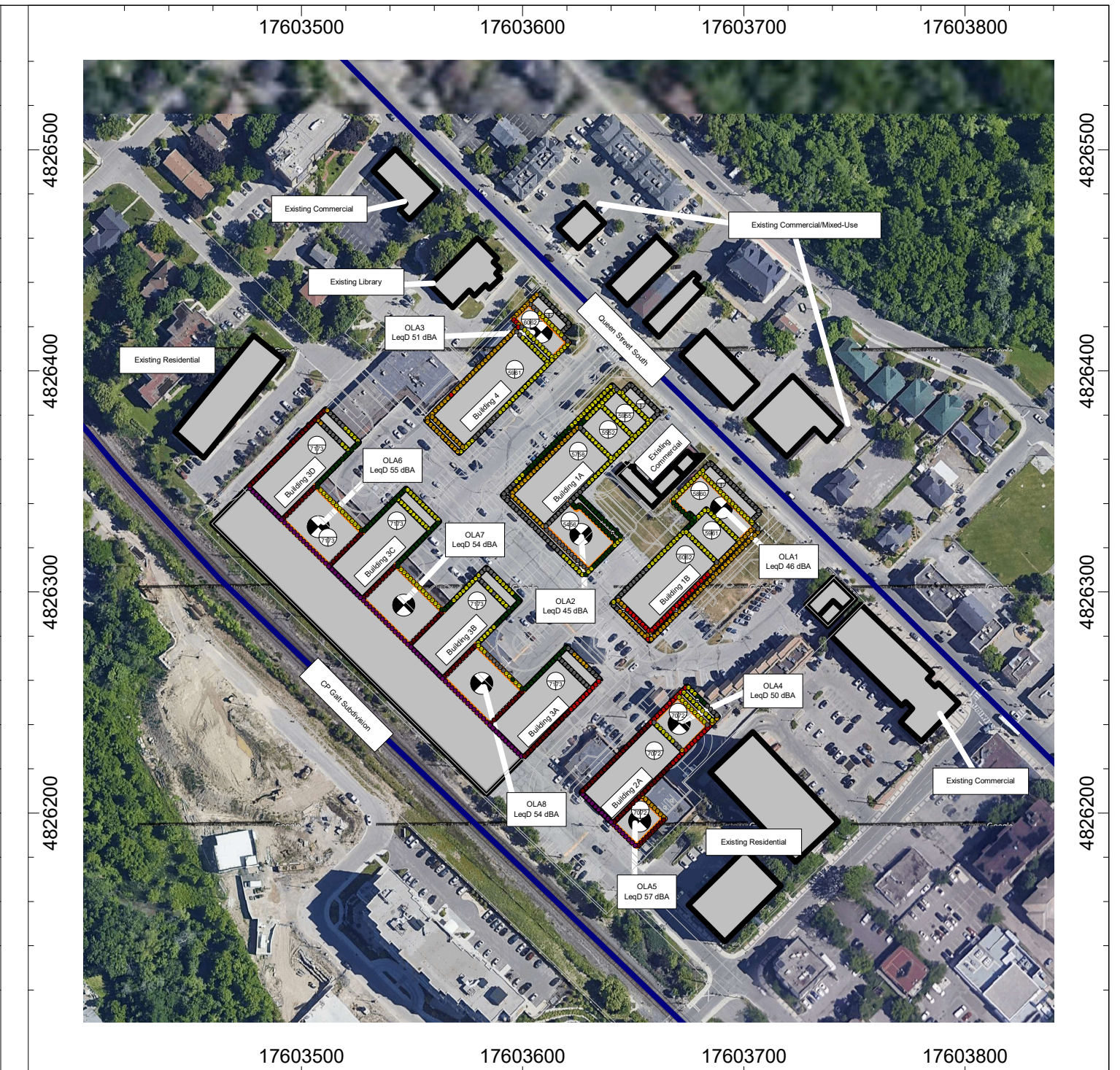
PLAN SHOWING ANALYZED SOURCES OF RAIL
NOISE AND PREDICTED SOUND LEVELS WITHOUT
MITIGATION MEASURES

FIGURE 4





Daytime (7:00 a.m. to 11:00 p.m.)



Nighttime (11:00 p.m. to 7:00 a.m.)



Jade Acoustics Inc.
411 Confederation Parkway
Unit 19
Concord, Ontario L4K 0A8
Tel: 905-660-2444
Fax: 905-660-4110

Date: March 2024

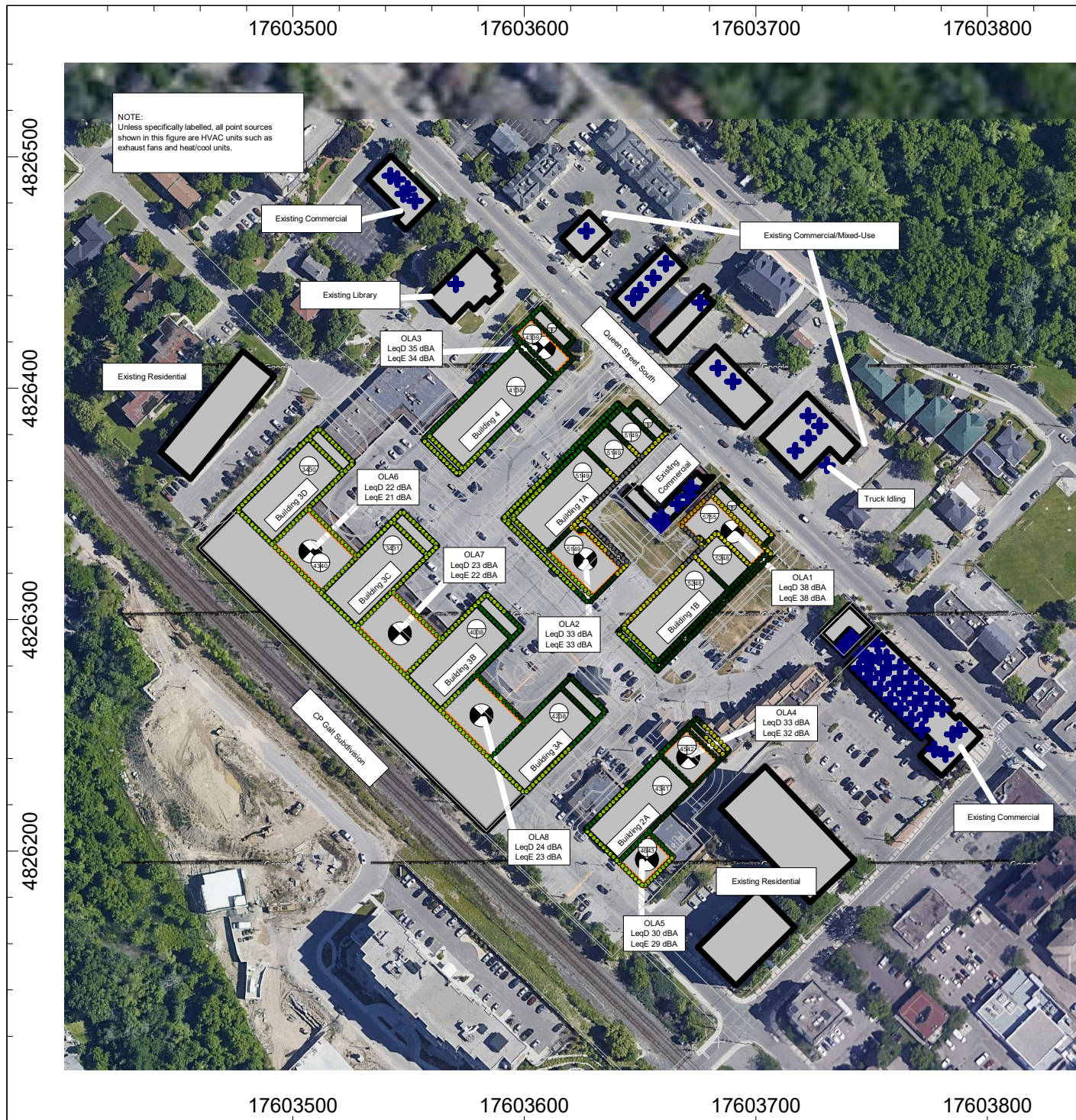
Jade File: 06-062-03

PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET

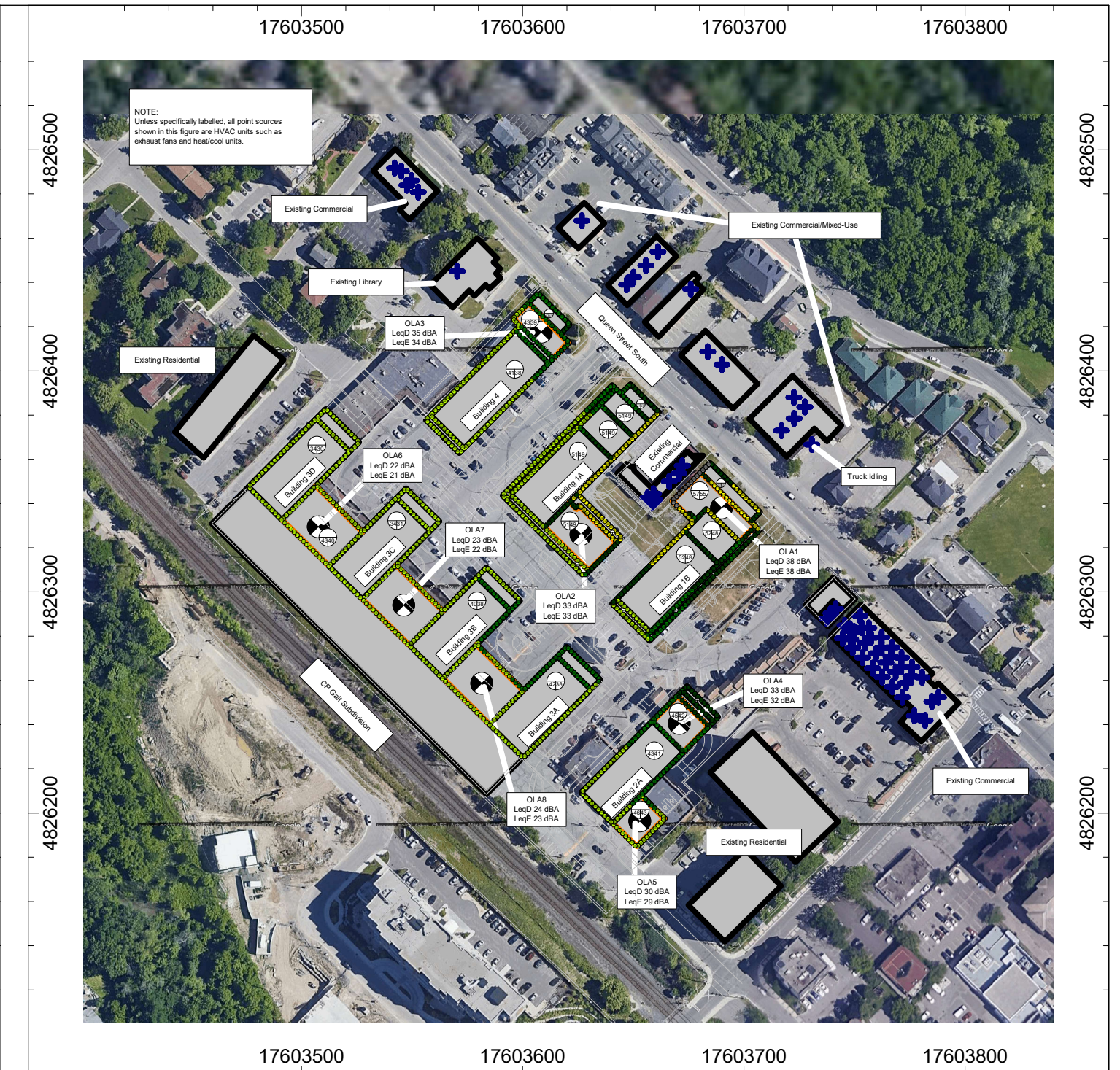
PLAN SHOWING ANALYZED SOURCES OF ROAD AND
RAIL NOISE AND PREDICTED SOUND LEVELS
WITHOUT MITIGATION MEASURES

FIGURE 5





Daytime (7:00 a.m. to 7:00 p.m.)



Nighttime (11:00 p.m. to 7:00 a.m.)



Jade Acoustics Inc.
411 Confederation Parkway
Unit 19
Concord, Ontario L4K 0A8
Tel: 905-660-2444
Fax: 905-660-4110

Date: March 2024

Jade File: 06-062-03

PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT
120, 128 AND 142 TO 158 QUEEN STREET SOUTH
AND 169 CRUMBIE STREET

PLAN SHOWING ANALYZED SOURCES OF
CONTINUOUS NOISE AND PREDICTED SOUND
LEVELS WITHOUT MITIGATION MEASURES

FIGURE 6



APPENDIX A

CORRESPONDENCE REGARDING TRAFFIC DATA

NOISE REPORT FOR PROPOSED DEVELOPMENT

Date:

REQUESTED BY:

Name: Michael Bechbache, P.Eng.

Company: Jade Acoustics Inc.

PREPARED BY:

Name: Naveda Dukhan

Tel#: 905-615-3200 ext

Location:

1. Thomas Street - McFarren Boulevard to Queen Street South
2. Queen Street South (1) - Britannia Road West to Main Street
3. Queen Street South (2) - Main Street to Thomas Street



ID# 604

ON SITE TRAFFIC DATA

Specific	Street Names				
	1.Thomas St	2. Queen St. South	Queen St. South		
AADT:	23000	17900	18200		
# of Lanes:	4 Lanes	2 Lanes	2 Lanes		
% Trucks:	3%	1%	1%		
Medium/Heavy Trucks Ratio:	55/45	55/45	55/45		
Day/Night Split:	90/10	90/10	90/10		
Posted Speed Limit:	50 km/hr	40 km/hr	40 km/hr		
Gradient Of Road:	2%	2%	2%		
Ultimate R.O.W:	20m-26m	55m	55m		

Comments:

Ultimate Traffic Only (2041)



800 - 1290 Central Parkway West
Mississauga, Ontario
Canada L5C 4R3

T 905 803 3429
E josie_tomei@cpr.ca

January 2, 2019

Via email: nik@jadeacoustics.com

Nik Vogel
Jade Acoustics Inc.
411 Confederation Parkway
Unit 19
Concord, ON L4K 4H1

Dear Sir/Madam:

**Re: Rail Traffic Volumes, CP Mileage 20.75, Galt Subdivision,
Tannery Street at CP Tracks, Mississauga**

This is in reference to your request for rail traffic data in the vicinity of Tannery Street at CP Tracks in the City of Mississauga. The study area is located at mile 20.75 of our Galt Subdivision, which is classified as a Principal Main Line line.

The information requested is as follows:

1. Number of freight trains between 0700 & 2300: 9
Number of freight trains between 2300 & 0700: 8
2. Maximum cars per train freight: 151
3. Number of locomotives per train: 2 (4 max.)
4. Maximum permissible freight train speed: 50 mph
5. There are 2 public grade crossings in the study area at Thomas Street and Tannery Street. The whistle signal is prohibited approaching all public grade crossings in the area, however, the whistle may be sounded if deemed necessary by the train crew for safety reasons at any time.
6. There are 2 main line tracks at this location, both with continuously welded rail.
7. Note, the above data is for freight only. Please contact Metrolinx directly for GO traffic data.

The information provided is based on recent rail traffic. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer needs.

Yours truly,

Josie Tomei SR/WA
Specialist Real Estate Sales & Acquisitions – Ontario

Michael Bechbache

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: Wednesday, November 1, 2023 4:21 PM
To: Michael Bechbache
Subject: RE: Request for Rail Traffic Information (JAI Job #22-039)

Good afternoon Mike,

Thanks for your patience. Further to your request dated October 12, 2023, I can confirm that the Rail-Data that was provided to you on November 23, 2021, is now outdated (we updated our Rail-Data Forecast around December 2022). Please see the updated information below:

The subject lands (in the vicinity of Joymar Drive and Thomas Street, Mississauga) are located within 300 metres of the Streetsville GO Station and the CP Galt Subdivision (which carries Milton GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains. The GO rail fleet combination on this Subdivision will consist of up to 1 locomotive and 10 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 22 trains. *The following Rail-Data is forecast to 2032. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive		1 Diesel Locomotive
Day (0700-2300)	20	Night (2300-0700)	2

The current track design speed near the subject lands is 50 mph (80 km/h).

There are *anti-whistling by-laws* in affect at Mississauga Rd, Thomas St, Tannery St, and Ontario St at-grade crossing.

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.

*At this time we do not expect the frequency of trains to increase beyond 2032. It is expected the number of passenger cars may increase during peak periods to increase capacity as required. Exact numbers are unknown at this time.

Best Regards,

Farah Faroque (she/her)

Project Analyst, Third Party Projects Review
10 Bay Street | Toronto | Ontario | M5J 2N8
T: 437.900.2291



From: Michael Bechbache <michael@jadeacoustics.com>
Sent: October 12, 2023 12:44 PM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Subject: RE: Request for Rail Traffic Information (JAI Job #22-039)

APPENDIX B

ENVIRONMENTAL NOISE CRITERIA

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MOE)

Reference: “Environmental Noise Guidelines Stationary and Transportation Sources – Approval and Planning”, Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).

SOUND LEVEL CRITERIA FOR ROAD AND RAIL NOISE

TABLE C-1

Sound Level Limit for Outdoor Living Areas

Road and Rail

Time Period	Leq (16) (dBA)
16 hr, 07:00 – 23:00	55

TABLE C-2

Indoor Sound Level Limits

Road and Rail

Type of Space	Time Period	Leq (dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00 – 23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00 – 07:00	45	40
Sleeping quarters	07:00 – 23:00	45	40
	23:00 – 07:00	40	35

SOUND LEVEL CRITERIA FOR AIRCRAFT NOISE

TABLE C-3

Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

TABLE C-4

**Indoor Aircraft Noise Limit
(Applicable over 24-hour period)**

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences, hospitals, nursing/retirement homes, schools, daycare centres, etc.	5
Sleeping Quarters	0

* The indoor NEF/NEP values in Table C-4 are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

SOUND LEVEL CRITERIA FOR STATIONARY SOURCES

TABLE C-5

**Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA)
Outdoor Points of Reception**

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

TABLE C-6

**Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA)
Plane of Window of Noise Sensitive Spaces**

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

TABLE C-7

**Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)
Outdoor Points of Reception**

Time of Day	Actual Number of Impulses in Period of One Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

TABLE C-8

**Exclusion Limit Values of Impulsive Sound Level (L_{LM} , dBAI)
Plane of Window – Noise Sensitive Spaces (Day/Night)**

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00-23:00)/ (23:00-07:00)	Class 2 Area (07:00-23:00)/ (23:00-07:00)	Class 3 Area (07:00-19:00)/ (19:00-07:00)	Class 4 Area (07:00-23:00)/ (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

SUPPLEMENTARY SOUND LEVEL LIMITS

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-4. Table C-9 and Table C-10 are expanded versions of Table C-2 and Table C-4, and present guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed. The sound level limits in Table C-9 and Table C-10 are presented as information, for good-practice design objectives.

TABLE C-9**Supplementary Indoor Sound Level Limits
Road and Rail**

Type of Space	Time Period	L _{eq} (Time Period) (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

TABLE C-10**Supplementary Indoor Aircraft Noise Limit
(Applicable over 24-hour period)**

Type of Space	Indoor NEF/NEP*
General offices, reception areas, retail stores, etc.	15
Individual or semi-private offices, conference rooms, etc.	10
Living/dining areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, daycare centres, places of worship, etc.	5
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0

- * The indoor NEF/NEP values in Table C-10 are not obtained from NEF/NEP contour maps. The values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustical insulation requirements.

ENVIRONMENTAL NOISE CRITERIA

REGION OF PEEL

Reference: “General Guidelines for the Preparation of Acoustical Reports in the Region of Peel”, November, 2012 (Updated August 2020).

ROAD TRAFFIC NOISE

TYPE OF SPACE	TIME PERIOD	SOUND LEVEL LIMIT Leq*
Outdoor living area	7:00 a.m. – 11:00 p.m.	Leq (16 hr.) = 55 dBA
Outside bedroom window	11:00 p.m. – 7:00 a.m.	Leq (8 hr.) = 50 dBA
Indoor (bedrooms, hospitals)	11:00 p.m. – 7:00 a.m.	Leq (8 hr.) = 40 dBA
Indoor (living rooms, hotels, private offices, reading rooms)	7:00 a.m. – 11:00 p.m.	Leq (16 hr.) = 45 dBA
Indoor (general offices, shops)	7:00 a.m. – 11:00 p.m.	Leq (16 hr.) = 50 dBA

* Leq, measured in A-weighted decibels (dBA), is the value of the constant sound level which would result in exposure to the same total sound level as would the specified time varying sound, if the constant sound level persisted over an equal time interval.

CP RAIL/METROLINX

RAILWAY NOISE GUIDELINES

Mitigation measures are required to achieve the following standards for noise for residential uses.

		Leq (dBA)	
		Day (16 hr.)	Night (8 hr.)
Noise	Sleeping Quarters	40	35
	Living Room	45	40
	Outdoor	55	N/A

Vibration

Ground-borne vibration transmission to be estimated through site testing and evaluation to determine if dwellings within 75 metres of the Railway R.O.W. will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, ± 3 dB with an RMS averaging time constant of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the dwelling.

APPENDIX C

SAMPLE CALCULATION OF PREDICTED SOUND LEVELS DUE TO ROAD AND RAIL TRAFFIC

Filename: stamcal.te Time Period: Day/Night 16/8 hours
Description: Road and Rail Noise PWL Calibration

Rail data, segment # 1: CP RAIL (day/night)

Train Type	! Trains	! Speed ! (km/h)	!# loc !/Train!	!# Cars! /Train!	! Eng type !	!Cont !weld
* 1. CP	! 13.0/11.6	! 80.0	! 4.0	!151.0	!Diesel!	! Yes
* 2. GO	! 20.0/2.0	! 80.0	! 1.0	! 10.0	!Diesel!	! Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train No	Name	! Unadj. ! Trains	! Annual % ! Increase	! Years of ! Growth
1.	CP	! 9.0/8.0	! 2.50	! 15.00
2.	GO	! 20.0/2.0	! 2.50	! 0.00

Data for Segment # 1: CP RAIL (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 25.00 / 25.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: CP RAIL (day)

LOCOMOTIVE (0.00 + 75.07 + 0.00) = 75.07 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.07	0.00	0.00	0.00	0.00	0.00	75.07

WHEEL (0.00 + 68.23 + 0.00) = 68.23 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.23	0.00	0.00	0.00	0.00	0.00	68.23

Segment Leq : 75.89 dBA

Total Leq All Segments: 75.89 dBA

Results segment # 1: CP RAIL (night)

LOCOMOTIVE (0.00 + 77.06 + 0.00) = 77.06 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 77.06 0.00 0.00 0.00 0.00 0.00 77.06

WHEEL (0.00 + 70.35 + 0.00) = 70.35 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 70.35 0.00 0.00 0.00 0.00 0.00 70.35

Segment Leq : 77.90 dBA

Total Leq All Segments: 77.90 dBA

Road data, segment # 1: QUEEN STREET (day/night)

Car traffic volume : 16216/1802 veh/TimePeriod *
Medium truck volume : 90/10 veh/TimePeriod *
Heavy truck volume : 74/8 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 18200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.55
Heavy Truck % of Total Volume : 0.45
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: QUEEN STREET (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 25.00 / 25.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: QUEEN STREET (day)

Source height = 0.82 m

ROAD (0.00 + 61.13 + 0.00) = 61.13 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 61.13 0.00 0.00 0.00 0.00 0.00 0.00 61.13

Segment Leq : 61.13 dBA

Total Leq All Segments: 61.13 dBA

Results segment # 1: QUEEN STREET (night)

Source height = 0.81 m

ROAD (0.00 + 54.56 + 0.00) = 54.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	54.56	0.00	0.00	0.00	0.00	0.00	0.00	54.56

Segment Leq : 54.56 dBA

Total Leq All Segments: 54.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 76.03
(NIGHT): 77.92

Note the above overall Leq values do not reflect predicted sound levels. The respective road and rail reference sound levels (with necessary corrections) are applied in CadnaA to represent the source sound power emissions.

Transportation Noise

Line sources

Name	Sel.	M.	ID	Result: P.W.L.			Result: P.W.L.			Lw / Li		Correction			Sound Reduction		Attenuation	Operating Time			KB	Freq.	Direct.	Moving Pt. Src							
				Day (dBA)	Evening (dBA)	Night (dBA)	Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value	norm.	Day (dBA)	Evening (dBA)	Night (dBA)	R		Area (m ²)	Day (min)	Special (min)				Night (min)	Number	Day	Evening	Night	Speed (km/h)		
CP Galt Subdivision			10001011	120.5	120.5	122.5	90.8	90.8	92.8	Lw	90.81		0	0	2							0	500	(none)							
Queen Street South			10001001	104.2	104.2	97.6	76.1	76.1	69.5	Lw	76.06		0	0	4.6							0	500	(none)							

Receivers

Name	Sel.	M.	ID	Level Lr			Limit Value			Land Use			Height (m)	Coordinates (m)		
				Day (dBA)	Night (dBA)	Evening (dBA)	Day (dBA)	Night (dBA)	Evening (dBA)	Type	Auto	Noise Type		X	Y	Z
OLA1			1011	45.6	42.2	45.6	0	0	0	x	Total	1.5 g	17603689.93	4826238.63	18.3	
OLA2			1011	45.3	46.7	45.3	0	0	0	x	Total	1.5 g	17603626.37	4826236.03	25.6	
OLA3			1011	50.8	51.3	50.8	0	0	0	x	Total	1.5 g	17603608.44	4826237.51	35.1	
OLA4			1011	50.5	52.3	50.5	0	0	0	x	Total	1.5 g	17603620.83	4826240.51	32.7	
OLA5			1011	57.3	59.3	57.3	0	0	0	x	Total	1.5 g	17603652.99	4826196.34	25.4	
OLA6			1011	54.6	56.4	54.6	0	0	0	x	Total	1.5 g	17603507.59	4826229.52	23.9	
OLA7			1011	53.6	55.6	53.6	0	0	0	x	Total	1.5 g	17603546.27	4826294.01	23.9	
OLA8			1011	54	56	54	0	0	0	x	Total	1.5 g	17603581.44	4826258.67	23.9	

APPENDIX D

SAMPLE CALCULATION OF SOUND LEVELS DUE TO STATIONARY SOURCES - CADNAA

Stationary Noise - Continuous

Point sources

Name	Sel.	M.	ID	Result: PWL			Lw / Li		Correction			Sound Reduction		Attenuation			Operating Time			RD	Freq.	Direct.	Height	Coordinates			
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area	Day	Special	Night	Day	Special					Night	X	Y	Z
				(dBA)	(dBA)	(dBA)			(dBA)	(dBA)	(dBA)		(m²)	(min)	(min)	(min)	(dB)	(dB)	(dB)					(m)	(m)	(m)	(m)
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603727.6	4826383.68	6.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603727.2	4826379.53	6.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603717.4	4826371.99	6.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603690.1	4826462.92	9		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603683.4	4826468.68	9		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603707.4	4826445.01	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603523.4	4826440.89	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603647.7	4826483.9	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603549.7	4826466.03	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603611.4	4826491.71	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603661.1	4826453.87	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603655.7	4826447.68	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603650.1	4826442.3	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603647.7	4826438.93	7.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603779.4	4826265.99	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603765.4	4826261.26	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603762.9	4826259.47	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603767.2	4826257.06	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603771.7	4826252.33	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603777.4	4826244.04	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603783.1	4826230.39	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603787.9	4826232.33	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603791.5	4826231.88	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603765.9	4826231.89	10.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603748.3	4826233.42	10.5		
EF			000000001	78.3	78.3	78.3	Lw	EF			0	0	0			60	60	0	0	(none)	1.5	g	17603722.6	4826388	6.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603753.3	4826283.82	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603749.9	4826282.09	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603757.5	4826279.27	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603748.5	4826278.67	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603762.9	4826274.71	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603754.9	4826276.78	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603766.8	4826270.64	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603759.8	4826272.26	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603771.1	4826266.02	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603764.2	4826268.09	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603752.4	4826289.28	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603768.6	4826283.82	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603775.6	4826281.79	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603773.2	4826258.52	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603765.6	4826283.73	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603744.7	4826279.08	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603762.3	4826279.42	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603749.3	4826274.73	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603766.6	4826274.92	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603753.7	4826270.27	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603771.3	4826270.24	10.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603758.2	4826265.48	10.5		
Truck idling			000000001	100.4	100.4	100.4	Lw	TI			0	0	0			3	3	3	0	(none)	2.4	f	17603730.7	4826386.67	2.4		
EF			000000001	78.3	78.3	78.3	Lw	EF			0	0	0						0	(none)	1.5	g	17603676.4	4826436.99	6.5		
AC			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603626.6	4826447.85	6.5		
Carrier 48TE006			000000001	80.8	80.8	80.8	Lw	Carrier48TE006			0	0	0			60	42	24	0	(none)	0.75	g	17603656.4	4826342.49	4.75		
ArmstrongAirHVAC			000000001	80.8	80.8	80.8	Lw	Carrier48TE006			0	0	0			60	42	24	0	(none)	0.75	g	17603659.8	4826341.89	4.75		
Carrier48TC			000000001	77.8	77.8	77.8	Lw	Carrier48TC			0	0	0			60	42	24	0	(none)	0.75	g	17603659.1	4826344.39	4.75		
FloorEF			000000001	77.3	77.3	77.3	Lw	FloorDR25			0	0	0						0	(none)	0.25	g	17603666.5	4826350.01	6.25		
GoodmanVK13			000000001	77.2	77.2	77.2	Lw	GoodmanVK133860			0	0	0			60	42	24	0	(none)	0.5	g	17603670.7	4826353.57	6.5		
Dalkin AC			000000001	58.2	58.2	58.2	Lw	Dalkin			0	0	0			60	42	24	0	(none)	0.5	g	17603658.4	4826340.12	4.5		
EF			000000001	78.3	78.3	78.3	Lw	EF			0	0	0						0	(none)	1.5	g	17603739.4	4826280.32	4.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603737.5	4826287.99	4.5		
GoodmanGP36			000000001	75.2	75.2	75.2	Lw	GAC			0	0	0			60	42	24	0	(none)	1.5	g	17603741.5	4826292.33	4.5		
EF			000000001	78.3	78.3	78.3	Lw	EF			0	0	0						0	(none)	1.5	g	17603672.1	4826357	7.		

Stationary Noise - Continuous

Buildings

Name	Set.	M.	ID	RB	Residents	Absorption	Height
							Begin
							(m)
Proposed 23T			0221	x	0	0.37	9.6 r
Proposed 30T			0221	x	0	0.37	13.6 r
Proposed 43T			0221	x	0	0.37	17.6 r
Proposed 83T			0221	x	0	0.37	31.1 r
Proposed 23T			0221	x	0	0.37	8.5 r
Proposed 63T			0221	x	0	0.37	22.4 r
Proposed 103T			0221	x	0	0.37	35.6 r
Proposed 143T			0221	x	0	0.37	42.2 r
Proposed 183T			0221	x	0	0.37	52.4 r
Proposed 193T			0221	x	0	0.37	52.4 r
Proposed 43T			0221	x	0	0.37	16.6 r
Proposed 63T			0221	x	0	0.37	23.9 r
Proposed 83T			0221	x	0	0.37	31.2 r
Proposed 103T			0221	x	0	0.37	35.6 r
TanneryPlaza			0221		0	0.21	9 r
Dollarama			0221		0	0.21	5 g
Existing mixed-use			0221		0	0.21	7.5 g
Existing Commercial			0221		0	0.37	6 r
Existing Commercial			0221		0	0.37	6 r
Existing Library			0221		0	0.37	8 r
Existing Residential			0221		0	0.37	20 r
Existing Residential			0221		0	0.37	25 r
Existing Residential			0221		0	0.37	10 r
Existing Commercial			0221		0	0.37	5 r
Existing Commercial			0221		0	0.37	5 r
Restaurant			0221		0	0.37	3 g
Restaurant2ndfloor			0221		0	0.37	8.5 r
Gino Pizza			0221		0	0.37	4 r
slopped roof			0221		0	0.21	
slopped roof			0221		0	0.21	
Proposed 13T			04011	x	0	0.37	7.2 r
Proposed 23T			04011	x	0	0.37	10.9 r
Proposed 43T			04011	x	0	0.37	18.8 r
Proposed 63T			04011	x	0	0.37	24.1 r
Proposed 93T			04011	x	0	0.37	36 r
Proposed 133T			04011	x	0	0.37	49.5 r
Proposed 13T			04011	x	0	0.37	7.5 r
Proposed 23T			04011	x	0	0.37	10.8 r
Proposed 43T			04011	x	0	0.37	18.8 r
Proposed 93T			04011	x	0	0.37	36 r
Proposed 133T			04011	x	0	0.37	49.5 r

APPENDIX E

SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION

