May 7, 2019 Reference No. 11185666

Mr. Kasra Modares
Balder Corporation
5140 Yonge Street, Suite 1530
Toronto, Ontario
M2N 6L7

Dear Mr. Modares:

Re: Noise & Vibration Land-Use Compatibility Study
Proposed 4 Storey Apartment – 325 University Avenue West, Cobourg, Ontario

1. Introduction

GHD was retained by Balder Corporation (325 University Avenue West) (Applicant) to complete a Noise & Vibration Land-Use Compatibility Study (Study) in support of the proposed 4 storey residential development (Development) located at 325 University Avenue West, Cobourg, Ontario (Site).

The Development will consist of a four-storey apartment building. GHD has evaluated noise impacts for residents and minimum design requirements to ensure that the noise sensitive spaces of the building meets the Ministry of the Environment, Conservation, and Parks (MECP) land use planning guidelines and requirements.

This Study has determined that the potential environmental noise impact at the Site from road and rail traffic is significant. The Development will require upgraded building exterior components, provisions for central air conditioning, and noise warning clauses to meet the applicable noise criteria. Noise control requirements for the Site were based on road and rail volumes forecast to the year 2029.

Since the Site is setback more than 75 metres (m) from the closest rail lines, ground-borne vibration is anticipated to be insignificant at the Site, and has not been assessed (as per CP and CN guidelines).

This Study has determined that the stationary noise impact from the nearby industrial and commercial facilities are insignificant.

The Study was prepared consistent with MECP NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning", August 2013.

The following attachments were included in support of this Study:

- Attachment A – Site Plan with Predicted Sound Levels and Noise Control Recommendations, and Zoning Information
- Attachment B – Noise Modelling Results
- Attachment C – Traffic Data & Sample STAMSON Calculation
- Attachment D – Stationary Noise Source Summary Table and Noise Contour Plots

2. Land Development and Site Conditions

The Development consists of a single apartment building (up to 15.6 m height). There are two significant roadways abutting the North, and East sides of the Site: University Avenue West, and William Street respectively. Additionally, King Street West is to the South of the Site and Margaret Street is to the West of the Site. Also of note are the two rail lines owned by CP and CN to the North of the Site. A site plan and zoning maps are provided in Attachment A as Figures A.1, A.2 and A.3 respectively.

GHD personnel visited the Site to make observations of the Site and surrounding environment, as well as to conduct sound pressure level measurements to validate the analysis. The properties surrounding the Site are light industrial-zoned land to the North, and residential-zoned land to the South, East, and West. A zoning map is provided in Attachment A. The Site and surrounding area is essentially flat.

The existing surrounding commercial/industrial land uses are as follows:

- Cobourg Water Pollution Plant
- Commercial Building (currently unoccupied, formerly Home Hardware Building Centre)
- Krown Cobourg
- Benson Autoparts
- Goodyear Select Automotive
- Convenience K

The Site is located in an Acoustical Class 1 area defined by NPC-300 as an area with an acoustical environment typical of a major population center, where background sound levels are dominated by the activities of people, usually road traffic.

3. Sound Level Criteria

There are two separate noise impact evaluations considered in this Study. Each evaluation has different criteria and/or assessment methodology. The separate noise evaluations are as follows:

1. Road and Rail Traffic Noise
2. Stationary Noise

3.1 Road and Rail Traffic Noise Criteria

Under NPC-300, road and rail traffic noise impacts are evaluated separately for exterior noise and interior noise based on the average day (16 Hours) and night (8 Hours) noise impacts.

The outdoor sound level limits for road and rail traffic noise are as follows, expressed in terms of A-weighted equivalent sound levels (L_{EQ}):

Road and Rail Traffic – Outdoor Sound Level Limits

Receiver Category	Sound Level Limit (L_{EQ})	
	Day (07:00 to 23:00)	Night (23:00 to 07:00)
Plane-of-Window (POW)	55 dBA	50 dBA
Outdoor Living Area (OLA)	55 dBA	N/A

For Plane-of-Window receptors (POWs), road and rail traffic sound levels exceeding the corresponding criteria above would require additional provisions for MECP compliance. Depending on the magnitude of the exceedances, additional provisions may include ventilation requirements, requirements for building envelope elements, and/or special warning clauses.

For Outdoor Living Areas (OLAs), road and rail traffic sound levels exceeding the daytime limit indicated above would require design of noise barriers to achieve the target, and/or warning clauses. As per NPC-300, private terraces/balconies that are minimum 4 m in depth are only considered OLAs if they are the only outdoor living area for the occupant.

If POW sound levels from future roads exceed 65 dBA during the day or 60 dBA at night, or future rail traffic sound levels at POWs exceed 60 dBA during the day or 55 dBA at night, building envelope components must be designed to achieve the indoor sound level criteria from Table C-2 of NPC-300, as summarized below:

Road Traffic – Indoor Sound Level Limits

Receiver Category	Sound Level Limit (L_{EQ})	
	Day (07:00 to 23:00)	Night (23:00 to 07:00)
Indoor Living Area (excluding sleeping quarters)	45 dBA	45 dBA
Sleeping Quarters	45 dBA	40 dBA

Rail Traffic – Indoor Sound Level Limits

Receiver Category	Sound Level Limit (L_{EQ})	
	Day (07:00 to 23:00)	Night (23:00 to 07:00)
Indoor Living Area (excluding sleeping quarters)	40 dBA	40 dBA
Sleeping Quarters	40 dBA	35 dBA

3.2 Stationary Noise Criteria

NPC-300 defines stationary noise sources as sound generated by sources that are normally operated within the property lines of a facility. The noise impact from stationary sources is evaluated based on operations during a predictable worst-case hour, at the worst-case point(s)-of-reception (PORs).

As mentioned above, the Site is located in a Class 1 acoustic environment as defined by NPC-300. Accordingly, the Class 1 minimum exclusionary sound level limits would be the minimum criteria used to

assess stationary noise impacts at the Site. The limits are expressed in terms of A-weighted 1-hour equivalent sound levels (L_{EQ}):

Stationary Noise Level Limits (Class 1)

Receiver Category	Sound Level Limit	
	Day (07:00 to 23:00)	Night (23:00 to 07:00)
Plane of Window (POW)	50 dBA	45 dBA
Outdoor Point of Reception	50 dBA	N/A

4. Noise Impact Assessment

4.1 Road and Rail Traffic Noise Assessment

4.1.1 Road and Rail Traffic Noise Modelling Methodology

Future (2029) and rail traffic sound levels at the proposed development were predicted using CadnaA, a commercially available noise propagation modelling software. Roadways and railways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road and rail traffic noise model of the MECP. These predictions were validated and are generally equivalent to those made using the MECP's ORNAMENT or STAMSON v5.04 road and rail traffic noise models. The computer model input parameters include, among other data, the number of road and rail segments, number of house rows, the positional relationship of the receptor to a noise source or barrier in terms of distance, elevation and angle, the basic site topography, the ground surface type, traffic volumes, traffic composition and speed limit.

The predicted sound levels are based on the 1-hour equivalent sound level, designated as L_{EQ}, and is adjusted by the model program to the 16-hour daytime and the 8-hour nighttime equivalent sound level. The applicable noise criteria for noise sensitive spaces are specified in terms of the 16-hour daytime period (7:00 a.m. to 11:00 p.m.) and 8-hour nighttime period (11:00 p.m. to 7:00 a.m.) enabling a direct comparison between the model output and the noise criteria.

4.1.2 Road Traffic Modelling Parameters

The following information was used to model the road traffic noise impacts on the Development and was provided by the Town of Cobourg. The Town of Cobourg provided Annual Average Daily Traffic (AADT) counts for the year 2016, and advised that forecasted AADT values for the year 2029 were to be calculated with an assumed annual growth rate of 2.5 percent. The commercial vehicle rates and day-night splits were based on the MECP's default rates for arterial roads and were applied to all roads. Road traffic data for Margaret Street to the southwest of the Site was not available, so road traffic volumes on Margaret Street were assumed to be the same as University Avenue West. Road traffic data and correspondence between GHD and the Town of Cobourg are provided in Attachment C.

University Avenue West

- 2029 Average Annual Daily Traffic (AADT): 15,103 vehicles
- Commercial vehicle rates (Day/Night):
  - 2.0% percent medium trucks
  - 2.0% percent heavy tucks
- Posted Speed Limit: 50 kilometers per hour (km/h)
- Day and night splits: 92 percent day and 8 percent night

King Street West

- 2029 Average Annual Daily Traffic (AADT): 14,390 vehicles
- Commercial vehicle rates (Day/Night):
  - 2.0% percent medium trucks
  - 2.0% percent heavy tucks
- Posted Speed Limit: 50 kilometers per hour (km/h)
- Day and night splits: 92 percent day and 8 percent night

William Street

- 2029 Average Annual Daily Traffic (AADT): 26,333 vehicles
- Commercial vehicle rates (Day/Night):
  - 2.0% percent medium trucks
  - 2.0% percent heavy tucks
- Posted Speed Limit: 50 kilometers per hour (km/h)
- Day and night splits: 92 percent day and 8 percent night

4.1.3 Rail Traffic Modelling Parameters

The following information was used to model the rail traffic noise impacts on the Development and was provided by Canadian Pacific (CP) and Canadian National (CN). CP provided Rail Traffic Volume data for 2018, and advised that forecasted rail traffic volumes for the year 2029 were to be calculated with an assumed annual growth rate of 2.5%. For CN, data from 2015 for their Kingston subdivision at Oshawa (approximately 40 miles west of the Site) was used, and forecasted rail traffic volumes for the year 2029 were calculated with an assumed annual growth rate of 2.5%. Rail traffic data and correspondence between GHD and CP are included in Attachment C.

Canadian Pacific – Belleville Subdivision (Mile 135.53)

- 2029 Freight Train Volumes:
  - Train count (Day): 7 trains

- Train count (Night): 4 trains
- Maximum cars per train freight: 212
- Number of locomotives per train: 2 – 4
- Maximum permissible train speed: 72 kilometers per hour (km/h)

Canadian National – Kingston Subdivision (Mile 300.40)

- 2029 Freight Train Volumes:
  - Train count (Day): 17 trains
  - Train count (Night): 7 trains
  - Maximum cars per train freight: 140
  - Number of locomotives per train: 4
  - Maximum permissible train speed: 64 kilometers per hour (km/h)
- 2029 Way Freight Train Volumes:
  - Train count (Day): 1 trains
  - Train count (Night): 1 trains
  - Maximum cars per train freight: 25
  - Number of locomotives per train: 4
  - Maximum permissible train speed: 64 kilometers per hour (km/h)
- 2029 Passenger Train Volumes:
  - Train count (Day): 41 trains
  - Train count (Night): 0 trains
  - Maximum cars per train freight: 10
  - Number of locomotives per train: 2
  - Maximum permissible train speed: 64 kilometers per hour (km/h)

4.1.4 Road and Rail Traffic Noise Modelling Results

GHD calculated future road and rail traffic sound levels at OLAs and POWs throughout the Development for daytime and nighttime periods.

Plane of Window Evaluations

NPC-300 defines POWs as the centre of a window/door of a noise sensitive space (i.e., such as a living space in a residential development). For the purposes of this Study, a typical floor height of 3 m has been assumed, such that the POW assessment points are at heights of 1.5 m, 4.5 m, 7.5 m, etc. above grade.

GHD evaluated road and rail traffic sound levels at all of the façades of each building in the Development using the methodology described in Section 4.1.1 of this report. The maximum predicted road and rail traffic sound levels at the worst-case POWs are up to 64 dBA during the day, and up to 60 dBA at night.

The results are summarized in Table B.1 and Figure A.1, and a sample calculation is provided in Attachment C.

Outdoor Living Area Evaluations

NPC-300 defines OLAs as backyards, front yards, gardens, terraces or patios, balconies, and elevated terraces. NPC-300 stipulates that in order to be considered an Outdoor Living Area (OLA), elevated terraces or balconies must have a minimum depth of 4 meters.

Based on site plans provided by the Applicant, it is understood that there are no OLAs for the residents of the retirement home. While each suite in the building does have access to a balcony, these balconies have a depth smaller than 4 meters, and so they do not qualify as OLAs. If OLAs are indicated in subsequent site plans the Study may have to be revised.

4.1.5 Plane-of-Window Noise Control Requirements (NPC-300, Sections C7.1.2 and C7.1.3)

This section describes the Noise Control Measures required to allow the development to meet the applicable MECP noise criteria for indoor living spaces. The need for noise controls was determined based on NPC-300 sound level limits for predicted POW sound levels from future road and rail traffic. For any excesses, NPC-300 specifies the following controls to protect the residents against future road and rail noise impacts, dependent on the sound levels at the POW assessment points:

Road and Rail Traffic – Plane of Window Noise Control Requirements

Daytime Level (dBA)	Nighttime Level (dBA)	Minimum Ventilation Requirements	Warning Clauses	Special Building Components
55 or lower	50 or lower	Not required	N/A	Not Required
56 to 60	51 to 55	Design with Provision for Adding Central Air Conditioning at Occupant's Discretion	Type C	Not Required
61 to 65	56 to 60			Yes
66 or higher	61 or higher	Central Air Conditioning Required	Type D	

Plane of Window – Ventilation Requirements

As mentioned in Section 4.1.2 and summarized in Table B.1, the maximum predicted future road and rail traffic sound levels at the worst-case POW assessment points are up to 64 dBA during the day and 60 dBA at night. For all suites with future road and rail traffic sound levels at POWs exceeding 55 dBA during the day and 50 dBA at night, central air conditioning should be provided with a warning clause Type C.

Ventilation requirements and associated warning clauses for suites at the various facades are indicated in Figure A.1 and summarized in Table B.1.

Indoor Living Areas – Building Components

As mentioned in Section 4.1.2 and summarized in Table B.1, the maximum predicted future road and rail traffic sound levels at the worst-case POW assessment points are up to 64 dBA during the day and 60 dBA at night. As per NPC-300, these sound levels are sufficiently high that the design of special building components is required to achieve the applicable indoor sound level criteria for living spaces (i.e., standard Ontario Building Code compliant façade elements are insufficient).

The Sound Transmission Class (STC) requirements for the windows and exterior walls of suites at the various facades are indicated in Figure A.1 and summarized in Table B.1.

4.2 Stationary Noise Impact Assessment

Stationary noise impacts were evaluated using CadnaA acoustical modelling software (CadnaA), version 2019. CadnaA is the industry standard for noise modelling for industrial and commercial facilities, and is based on ISO standard 9613-2 "Acoustics – Attenuation of Sound during Propagation Outdoors".

4.2.1 Noise Impact Summary – From Nearby Industrial/Commercial Facilities to Site

There are several industrial/commercial facilities in the vicinity of the site. Under the provisions of the Environmental Protection Act, all facilities which may emit a contaminant to the environment, including sound and vibration, must obtain an Environmental Compliance Approval (ECA) to operate. A review of ECA's for facilities within 300 m of the proposed development did not indicate any approvals nearby and for the purposes of this Study, GHD assessed noise emissions from the closest facilities as mentioned in section 2: Commercial Building (currently unoccupied, formerly Home Hardware Building Centre), Krown Cobourg, Benson Autoparts, Goodyear Select Automotive, and Convenience K. The Cobourg Water Pollution Plant was observed during the site visit to be an insignificant source of noise emissions. Personnel from the Cobourg Water Pollution Plant also confirmed that there is no history of noise complaints.

Any existing industrial/commerical uses surrounding the Site must show compliance with NPC-300 limits at the existing residential areas and approved heights of any vacant residential lots, and by doing so will show compliance at the proposed Site as a consequence.

GHD has identified potential stationary noise sources primarily being Heating Ventilation and Air Conditioning (HVAC) Units (on most commercial buildings surrounding the site) and Air Make-up Units (AMU) which were estimated based on representative sound data for equipment that is expected to be comparable. Representative sound power level data for the HVAC and AMU units was taken from GHD's extensive library based on previous experience modelling similar units and was assumed to operate continuously during daytime hours and on a 50 percent duty cycle at night (60 minutes/30 minutes per hour) to account for the lower cooling demand during the nighttime period.

The predicted worst-case on-site noise impacts from the nearby industrial/commercial facilities are 45 dBA in the day and 42 dBA in the night, which are within the applicable noise level limits of the MECP. A plot of the nighttime noise level contours is included as Attachment F. Regardless, the MECP recommends warning clause Type E (included in section 5.3 of this Study) for new residential developments near industrial/commercial facilities.

Sound power levels of all off-site stationary sources used in the predictions and a noise contour plot are provided in Attachment D.

4.2.2 Noise Impact Summary – Self-Contamination

The building ventilation systems associated with the Site have not been designed at this time. Such equipment has the potential to result in noise impacts on noise sensitive spaces within the development itself.

On-site noise impacts from all mechanical equipment, including but not limited to any required chillers, cooling towers, exhaust fans, and make up air handling units, should comply with the guideline limits contained in NPC-300 Section B. These criteria generally limit noise from stationary sources relative to the ambient sound exposures.

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

5. Noise Control Recommendations

5.1 Building Exterior Components

Predicted future road and rail traffic sound levels at the building façades are up to 64 dBA during the day, and up to 60 dBA at night. These sound levels are significant, requiring that the building exterior components be designed with sufficient sound insulation performance to achieve the applicable indoor sound level criteria. For windows on the worst-impacted façade (North and East façades), ratings of at least STC-31 for windows and STC-44 for exterior walls are required. STC rating requirements for each façade of the building are summarized in Table B.1 attached.

5.2 Warning Clauses

As mentioned above, based on GHD's assessment of noise impacts from nearby transportation and industrial/commercial sources, Noise Warning Clauses are recommended for some residences as per NPC-300. GHD recommends that the following Noise Warning Clauses be included in the Offers of Purchase and Sale, lease/rental agreements and/or condominium declarations (where indicated in Figure A.1 and Table B.1):

Warning Clause Type C: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Ministry of the Environment, Conservation and Parks."

Warning Clause Type E: "Purchasers/tenants are advised that due to the proximity of the adjacent industrial/commercial facilities, noise from the facilities may at times be audible."

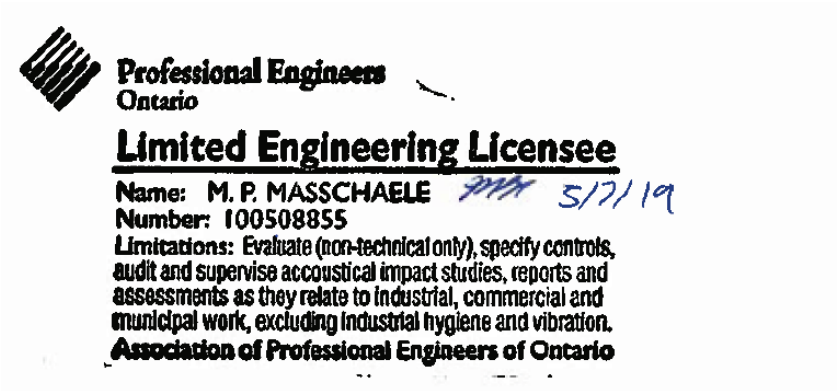
6. Conclusions

The results of the road and rail traffic modelling indicate that the Development will require that suites be provided with upgraded building exterior components, provisions for central air conditioning, and warning clauses to meet the applicable MECP noise criteria depending on the building façade upon which they are located.

The results of this Study indicate that the potential stationary noise impacts from existing off-site adjacent industrial and commercial areas will be below the applicable NPC-300 noise exclusion limits. Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

GHD

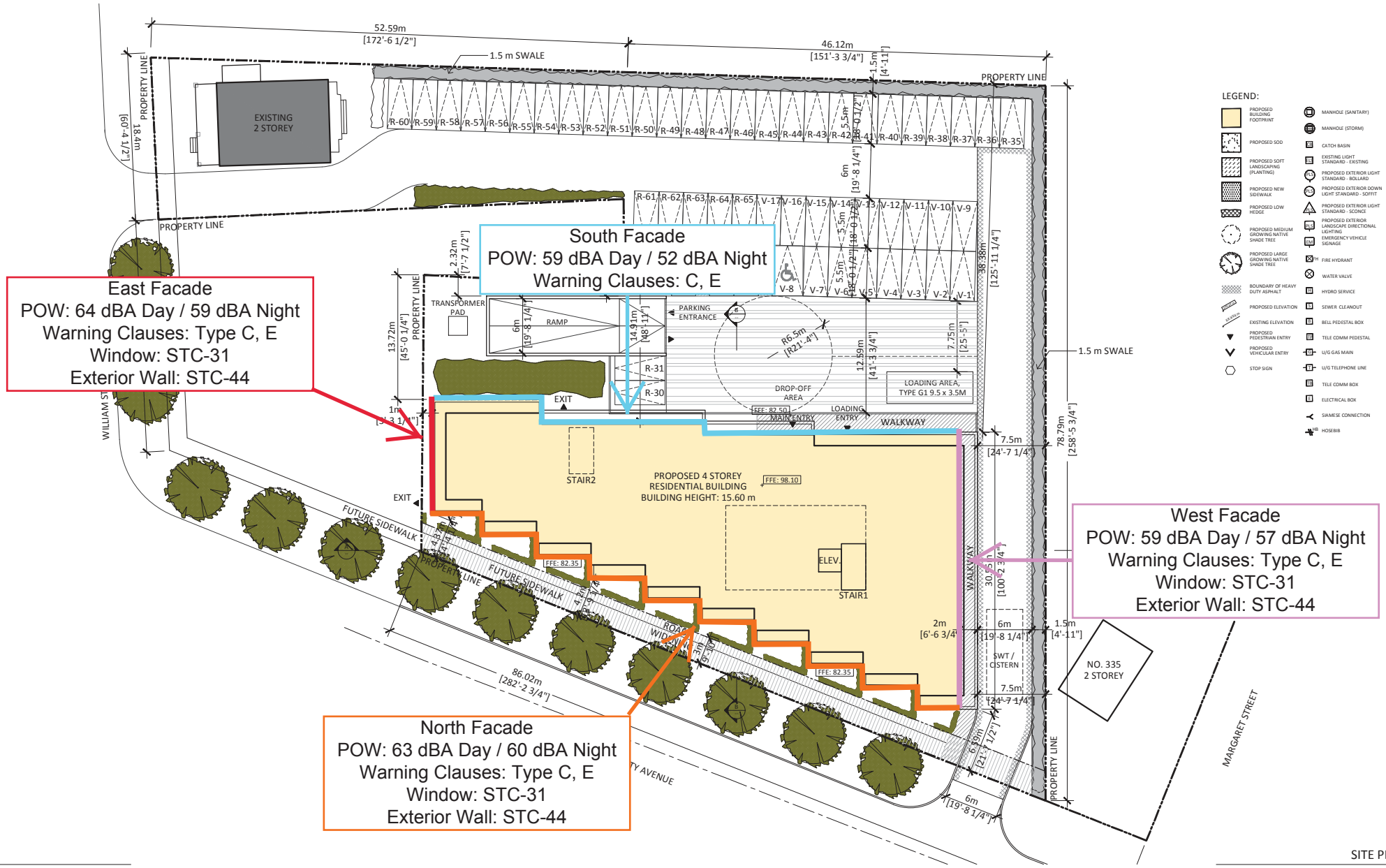


Michael Masschaele, BES LEL

NN/mg/1

Encl.

Attachment A
Site Plan with Predicted Sound Levels and Noise Control Recommendations, and Zoning Information



20 De Boers Drive, suite 525
Toronto, Ontario, M3J 0H1
t. 416 901 6528 f. 416 901 8962
www.studiojci.com

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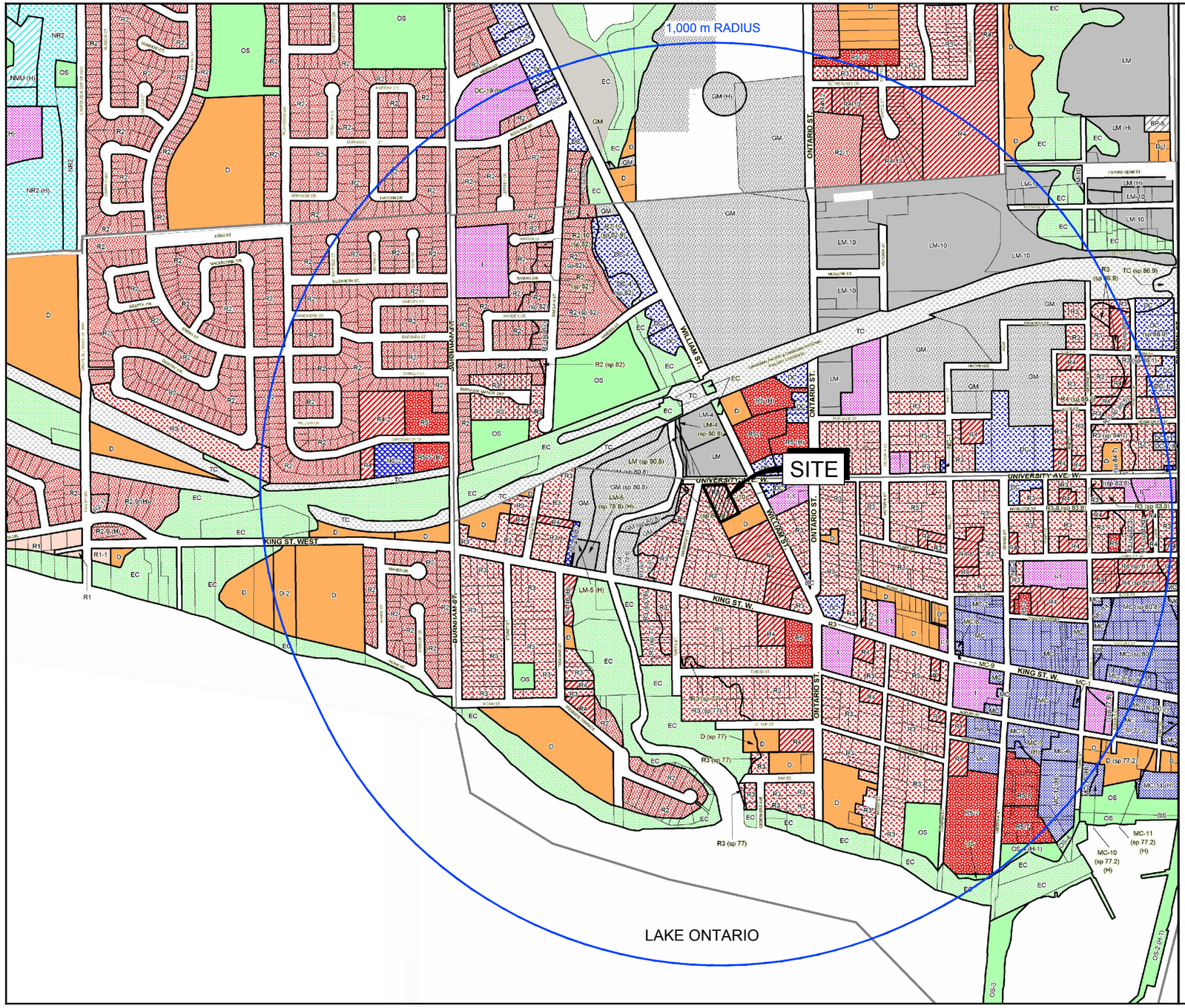
SITE PLAN

Address: 315-325 UNIVERSITY AVE W., COBOURG, ON

Scale: 1 : 400

Date: APR.30, 2019

Figure A.1
Site Plan with Predicted Sound levels and Noise Control Recommendations



LEGEND - ZONING

- R1 - RESIDENTIAL 1
- R2 - RESIDENTIAL 2
- R3 - RESIDENTIAL 3
- R4 - MULTIPLE RESIDENTIAL 4
- R5 - HIGH DENSITY RESIDENTIAL 5
- NC - NEIGHBOURHOOD COMMERCIAL
- SC - SHOPPING CENTRE COMMERCIAL
- DC - DISTRICT COMMERCIAL
- MC - MAIN CENTRAL COMMERCIAL
- LM - LIGHT INDUSTRIAL
- GM - GENERAL INDUSTRIAL
- BP - BUSINESS PARK
- I - INSTITUTIONAL
- OS - OPEN SPACE
- EC - ENVIRONMENTAL CONSTRAINT
- RU - RURAL
- D - DEVELOPMENT
- TC - TRANSPORTATION CORRIDOR
- NR1 - NEIGHBOURHOOD RESIDENTIAL 1
- NR2 - NEIGHBOURHOOD RESIDENTIAL 2
- NMU - NEIGHBOURHOOD MIXED USE
- B - URBAN RURAL TRANSITION

Source: The Corporation of the Town of Cobourg, Zoning By-law No. 85-2003, Schedule A, Maps 1, 2, and 7.

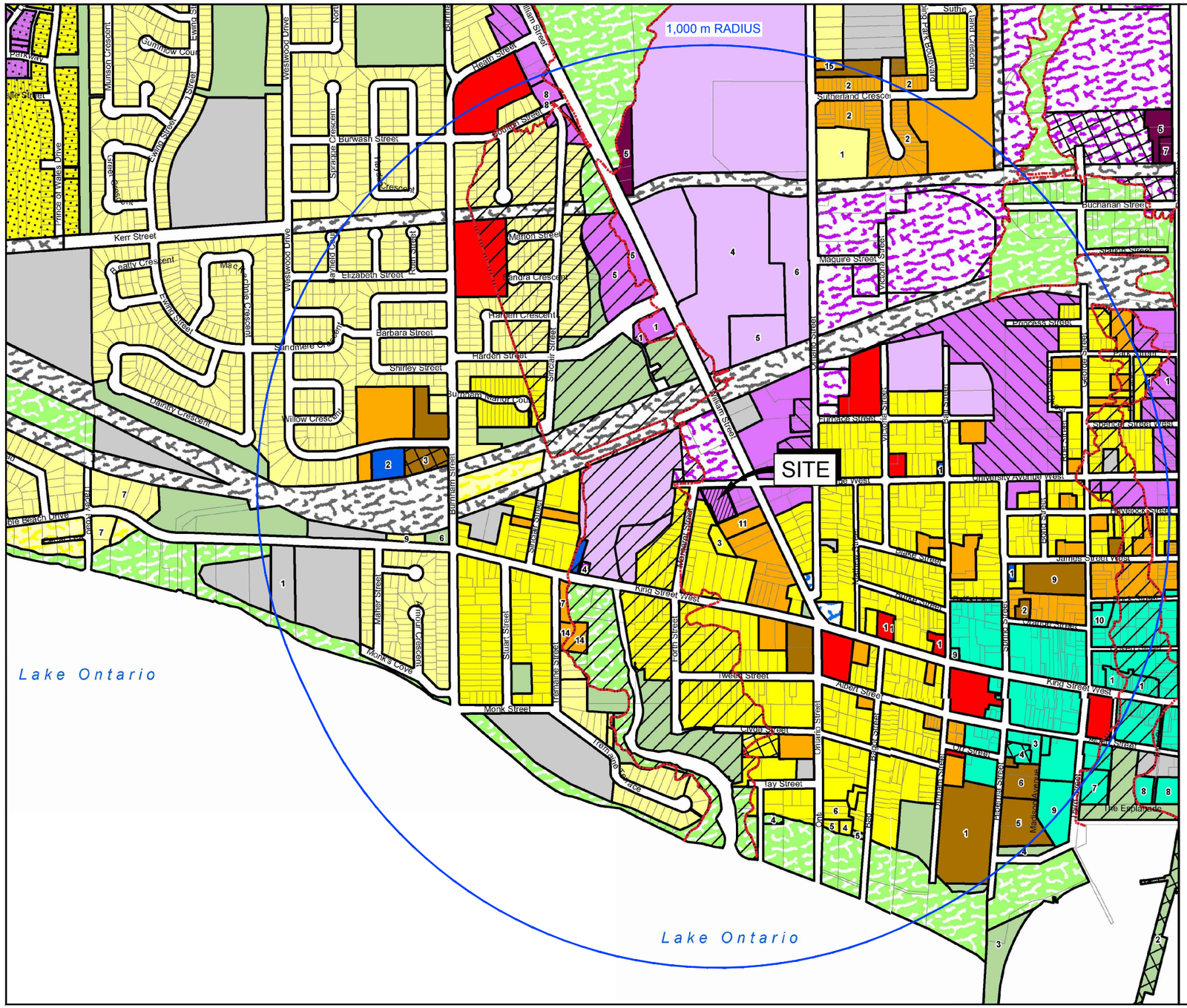
BALDER CORPORATION
325 UNIVERSITY AVENUE WEST, COBOURG, ONTARIO

11185666-02
Nov 21, 2018

LAND USE ZONING DESIGNATION PLAN

FIGURE A.2

CAD File: P:\drawings\11185000s\11185666\11185666-corr\11185666-02(MODA002)\11185666-02(MODA002)GN\11185666-02(MODA002)GN-WA001.DWG



Source: The Corporation of the Town of Cobourg, Zoning By-law Update 2013, Maps 1, 2, 4, and 5.

BALDER CORPORATION
325 UNIVERSITY AVENUE WEST, COBOURG, ONTARIO

11185666-02
Nov 21, 2018

DRAFT ZONING BY-LAW UPDATE

FIGURE A.3

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Attachment B
Noise Modelling Results

Table B.1

Road and Rail Noise Modelling Results
325 University Avenue West
Cobourg, Ontario

Worst-Case Receptor Description	Unmitigated Sound Level at Receptor (Day) (Average L_{EQ})	Unmitigated Sound Level at Receptor (Night) (Average L_{EQ})	Ventilation Requirements NPC-300	Recommended Warning Clauses NPC-300 (1)	Physical Noise Mitigation Controls (2)
North Façade	63 (dBA)	60 (dBA)	Provisions for Air Conditioning	Type C	Windows: STC-31, Exterior Walls: STC-44
South Façade	59 (dBA)	52 (dBA)	Provisions for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade	64 (dBA)	59 (dBA)	Provisions for Air Conditioning	Type C	Windows: STC-31, Exterior Walls: STC-44
West Façade	59 (dBA)	57 (dBA)	Provisions for Air Conditioning	Type C	Windows: STC-31, Exterior Walls: STC-44

Notes:

(1) Warning Clause Type D should be used to replace Warning Clause Type C for any residences supplied with central air conditioning already installed.
(2) Compliance with the Ontario Building Code is approximately equivalent to a minimum STC rating of 25 for windows and 37 for walls.

Attachment C
Traffic Data & Sample STAMSON Calculation

From: Neil Stewart <nstewart@cobourg.ca>
Sent: Tuesday, October 30, 2018 1:10 PM
To: Naveen Nirmalaraj <Naveen.Nirmalaraj@ghd.com>
Cc: Ted Sokay <tsokay@cobourg.ca>
Subject: Traffic Counts

Hi Naveen,

You request for traffic information was forwarded to me.

The following AADT traffic counts are from 2016.

University Avenue:

East of Ontario Street – 9,645

West of Division Street – 11,115

West of William Street – 1,585

King Street West:

East of Ontario Street – 7,320

West of Division Street – 7,330

West of William Street – 3,380

William Street:

South of University Avenue – 6,495

North of King Street – 6,070

North of the Railway – 13,085

I hope this helps.

Neil Stewart, CET
Engineering Technician
Public Works Division
Town of Cobourg

From: Neil Stewart <nstewart@cobourg.ca>
Sent: Wednesday, October 31, 2018 12:54 PM
To: Naveen Nirmalaraj <Naveen.Nirmalaraj@ghd.com>
Subject: RE: Traffic Counts

Hi Naveen,

2.5% growth rate will be acceptable.

I am sorry, but we have no data for vehicle type is our traffic counts.

Neil Stewart, CET
Engineering Technician
Public Works Division
Town of Cobourg
905-372-9971

From: Naveen.Nirmalaraj@ghd.com [mailto:Naveen.Nirmalaraj@ghd.com]
Sent: Tuesday, October 30, 2018 2:43 PM
To: Neil Stewart <nstewart@cobourg.ca>
Cc: Ted Sokay <tsokay@cobourg.ca>
Subject: RE: Traffic Counts

Hi Neil,

Thank you for your prompt response. If it's possible, could you please indicate what traffic volume growth rate we should assume (our typical assumption is 2.5% per year)? Additionally, would you have the commercial vehicle percentages for these roads (i.e., medium trucks, heavy trucks)?

Thank you kindly,

Naveen Nirmalaraj
Junior Acoustical Consultant

GHD
Proudly employee owned
T: +1 519 340 4414 | E: naveen.nirmalaraj@ghd.com
455 Phillip St Waterloo Ontario N2L 3X2 Canada | www.ghd.com

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Naveen Nirmalaraj

From: Neil Stewart <nstewart@cobourg.ca>
Sent: Wednesday, November 7, 2018 2:18 PM
To: Naveen Nirmalaraj
Subject: RE: Traffic Counts

Hi Naveen,

I have no traffic Data to Margaret Street.

I am sorry, but the Town would not make any recommendations on how to use or interpret the data we provide.

If traffic counts on Margaret Street are required, it would be your responsibility to obtain that data.

Neil Stewart, CET
Engineering Technician
Public Works Division
Town of Cobourg
905-372-9971

From: Naveen.Nirmalaraj@ghd.com [mailto:Naveen.Nirmalaraj@ghd.com]
Sent: Tuesday, November 06, 2018 6:02 PM
To: Neil Stewart <nstewart@cobourg.ca>
Subject: RE: Traffic Counts

Hi Neil,

Thank you for the data. We can make assumptions for the commercial vehicle percentages.

I was wondering if you would also have traffic counts for Margaret Street between University Avenue West and King Street West. If this data is not available, would it be safe to assume that I could use the same count for "University Avenue West – west of William Street" (1,585)? Please let me know if you have the data, or if I can make this assumption.

Thanks,

Naveen Nirmalaraj
Junior Acoustical Consultant

GHD
Proudly employee owned
T: +1 519 340 4414 | E: naveen.nirmalaraj@ghd.com
455 Phillip St Waterloo Ontario N2L 3X2 Canada | www.ghd.com

Dear Joey:

Re: Train Traffic Data – CN Kingston Subdivision near 143 Bloor Street in Oshawa, ON

The following is provided in response to Joey's 2015/10/01 request for information regarding rail traffic in the vicinity of Bloor St in Oshawa at approximately Mile 300.40 on CN's Kingston 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	12	140	40	4
Way Freight	1	25	40	4
Passenger	30	10	40	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	5	140	40	4
Way Freight	1	25	40	4
Passenger	0	10	40	2

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

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There is 0 at-grade crossing in the immediate vicinity of the study area at Mile 300.40 (Bloor Street). Anti-whistling bylaws ARE NOT in effect at this crossing. 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

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

T 905 803 3429
E josie_tomei@cpr.ca

November 19, 2018

Via email: naveen.nirmalaraj@ghd.com

Naveen Nirmalaraj
GHD Limited
455 Phillips Street
Waterloo, ON N2L 3X2

Dear Sir/Madam:

Re: Rail Traffic Volumes, CP Mileage 135.53, Belleville Subdivision, 325 University Avenue West, Cobourg

This is in reference to your request for rail traffic data in the vicinity of 325 University Avenue West in the Town of Cobourg. The study area is located at mile 135.53 of our Belleville Subdivision, which is classified as a Principal Main line.

The information requested is as follows:

1. Number of freight trains between 0700 & 2300: 5
   Number of freight trains between 2300 & 0700: 3
2. Maximum cars per train freight: 212
3. Number of locomotives per train: 2 – 4
4. Maximum permissible train speed: 45 mph
5. The whistle signal is prohibited approaching public grade crossings through the study area (only 1 at Ontario Street), however, the whistle may be sounded if deemed necessary by the train crew for safety reasons at any time.
6. There is 1 mainline track with continuously welded rail through this area.

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

Naveen Nirmalaraj

From: CP Proximity-Ontario <CP_Proximity-Ontario@cpr.ca>
Sent: Tuesday, November 20, 2018 2:18 PM
To: Naveen Nirmalaraj
Subject: RE: Cobourg ON

Hi Naveen,
We agree with your growth rate. Via does not operate on this line, it is only freight.

Josie

From: Naveen.Nirmalaraj@ghd.com <Naveen.Nirmalaraj@ghd.com>
Sent: Monday, November 19, 2018 5:08 PM
To: CP Proximity-Ontario <CP_Proximity-Ontario@cpr.ca>
Subject: RE: Cobourg ON

Hi Josie,

Thank you for the prompt response. If it's possible, could you please indicate what traffic volume growth rate we should assume (our typical assumption is 2.5% per year)? Additionally, just to confirm, do VIA trains use this portion of CP's track?

Thanks,

Naveen Nirmalaraj
Junior Acoustical Consultant

GHD
Proudly employee owned
T: +1 519 340 4414 | E: naveen.nirmalaraj@ghd.com
455 Phillip St Waterloo Ontario N2L 3X2 Canada | www.ghd.com

Connect

STAMSON 5.0 SUMMARY REPORT Date: 06-05-2019 24:11:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rdcal1.te Time Period: Day/Night 16/8 hours
Description: East Facade

Road data, segment # 1: Uni Ave W 1 (day/night)

Car traffic volume : 1883/328 veh/TimePeriod
Medium truck volume : 39/6 veh/TimePeriod
Heavy truck volume : 39/6 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Uni Ave W 1 (day/night)

Angle1 Angle2 : -20.00 deg 59.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.10 / 20.10 m
Receiver height : 10.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Uni Ave W 2 (day/night)

Car traffic volume : 11456/996 veh/TimePeriod
Medium truck volume : 239/21 veh/TimePeriod
Heavy truck volume : 239/21 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Uni Ave W 2 (day/night)

Angle1 Angle2 : 59.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.10 / 20.10 m
Receiver height : 10.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: King St W 1 (day/night)

Car traffic volume : 4015/349 veh/TimePeriod
Medium truck volume : 84/7 veh/TimePeriod
Heavy truck volume : 84/7 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: King St W 1 (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg

```
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 256.00 / 256.00 m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 4: King St W 2 (day/night)
------------------------------------------------
Car traffic volume  :  8695/756   veh/TimePeriod
Medium truck volume :   181/16    veh/TimePeriod
Heavy truck volume  :   181/16    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: King St W 2 (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 256.00 / 256.00 m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 5: William St 1 (day/night)
------------------------------------------------
Car traffic volume  :  7715/671   veh/TimePeriod
Medium truck volume :   161/14    veh/TimePeriod
Heavy truck volume  :   161/14    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 5: William St 1 (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 6: WIlliam St 2 (day/night)
------------------------------------------------
Car traffic volume  : 15542/1352  veh/TimePeriod
Medium truck volume :   324/28    veh/TimePeriod
Heavy truck volume  :   324/28    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 6: WIlliam St 2 (day/night)
------------------------------------------------
```

```
Angle1   Angle2          : -90.00 deg   90.00 deg
Wood depth               :      0       (No woods.)
No of house rows         :      0 / 0
Surface                  :      1       (Absorptive ground surface)
Receiver source distance :  38.00 / 38.00  m
Receiver height          :  10.50 / 10.50  m
Topography               :      1       (Flat/gentle slope; no barrier)
Reference angle          :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Uni Ave W 1	1.19	51.35	51.35
2.Uni Ave W 2	1.19	55.91	55.91
3.King St W 1	1.19	42.05	42.05
4.King St W 2	1.19	45.40	45.40
5.William St 1	1.19	53.46	53.46
6.WIlliam St 2	1.19	59.51	59.51
Total			62.29 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Uni Ave W 1	1.15	46.44	46.44
2.Uni Ave W 2	1.19	48.34	48.34
3.King St W 1	1.18	34.34	34.34
4.King St W 2	1.19	37.85	37.85
5.William St 1	1.19	45.87	45.87
6.WIlliam St 2	1.19	51.90	51.90
Total			54.98 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.29
(NIGHT): 54.98

STAMSON 5.0 SUMMARY REPORT Date: 23-11-2018 14:40:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: railcal.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	7.0/4.0	72.0	4.0	212.0	Diesel	Yes

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	1 (Absorptive ground surface)
Receiver source distance	40.00 / 40.00 m
Receiver height	1.50 / 1.50 m
Topography	1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	0.00

Rail data, segment # 2: CN Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	17.0/7.0	64.0	4.0	140.0	Diesel	Yes
2. Way Freight	1.0/1.0	64.0	4.0	25.0	Diesel	Yes
3. Passenger	41.0/0.0	64.0	2.0	10.0	Diesel	Yes

Data for Segment # 2: CN Rail (day/night)

Angle1 Angle2	-90.00 deg 90.00 deg
Wood depth	0 (No woods.)
No of house rows	0 / 0
Surface	1 (Absorptive ground surface)
Receiver source distance	84.00 / 84.00 m
Receiver height	1.50 / 1.50 m
Topography	1 (Flat/gentle slope; no barrier)
No Whistle	
Reference angle	0.00

Result summary (day)

	Loc Leq (dBA)	Wheel Leq (dBA)	Whistle Left Leq (dBA)	Whistle Right Leq (dBA)	Total Leq (dBA)
1.CP Rail	65.38	57.29	--	--	66.01
2.CN Rail	62.34	54.07	--	--	62.94
Total					67.75 dBA

Result summary (night)

	Loc Leq (dBA)	Wheel Leq (dBA)	Whistle Left Leq (dBA)	Whistle Right Leq (dBA)	Total Leq (dBA)
1.CP Rail	65.96	57.87	--	--	66.59
2.CN Rail	60.11	52.51	--	--	60.81
Total					67.61 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.75
(NIGHT): 67.61

Attachment D
Stationary Noise Source Summary Table and Noise Contour Plots

Table D.1

Noise Source Summary
Baldor Corporation
325 University Avenue West
Cobourg, Ontario

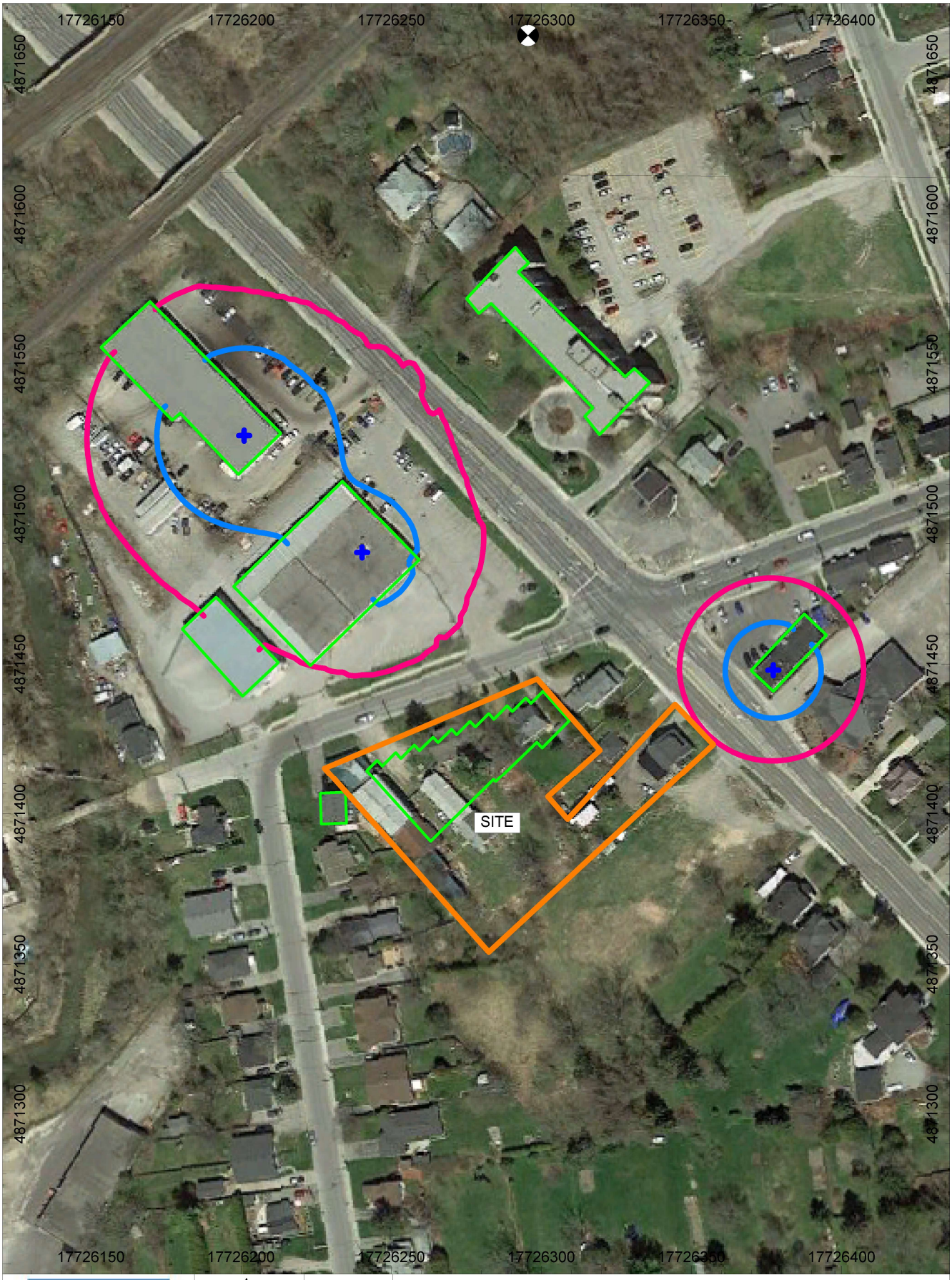
Cadna A ID	Source Description	Sound Power Level[1] (dBA)	Source Characteristics[2]	Source Location[3]	Noise Control Measures[4]	Source Type
NSE-01	Commercial Building HVAC	86.4	S	O	U	Point
NSE-02	Convenience K HVAC	86.4	S	O	U	Point
NSE-03	Goodyear AMU	91.0	S	O	U	Point

Notes:

[1] Sound Power Level (PWL) in dBA and includes +5 dBA total penalty if applicable.
[2] Sound characteristics:
- S – Steady
- Q – Quasi-steady impulsive
- I – Impulsive
- B – Buzzing
- T – Tonal
- C – Cyclic

[3] Source location:
- O – Outside of building
- I – Inside of building

[4] Noise control measures:
- S – Silencer, acoustic louvre, muffler
- A – Acoustic lining, plenum
- B – Barrier, berm, screening
- L – Lagging
- E – Acoustic enclosure
- O – Other
- U – Uncontrolled
- AC – Administrative control



NOISE AND VIBRATION LAND-USE COMPATIBILITY STUDY
PROPOSED SENIOR LIVING DEVELOPMENT - 325 UNIVERSITY AVE WEST

FIGURE D.1
OFF-SITE STATIONARY NOISE IMPACT CONTOUR MAP (10.5 M A.G.)
NIGHTTIME