Environmental Noise Assessment

9229 5 Sideroad

Proposed Residential Development

Town of Caledon

January 22, 2021
Project: 120-0460

Prepared for

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Version History

Version #	Date	Comments
1.0	January 22, 2021	Issued as Final Report

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9229 5 Sideroad

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EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Assessment report addressing the potential noise impact from the existing environment onto the proposed residential development. The proposed development will consist of 67 lots for detached dwellings and includes 17 part blocks that will be combined with adjacent development lands to create full lots for detached dwellings.

The significant transportation noise sources in the vicinity are road traffic on Queensgate Boulevard and Landsbridge Street, and rail traffic on the CPR Mactier Subdivision.

The sound levels on site have been determined and compared with the applicable Ministry of the Environment, Conservation and Parks (MECP), Region of Peel and Town of Caledon noise guideline limits to determine the need for noise mitigation.

To meet the applicable transportation noise source guideline limits:

- The dwellings on Lot 58, BL-71 and BL-72, will require the provision for adding air conditioning at a later date; and
- A 1.8 m high sound barrier is required along Queensgate Boulevard to protect the rear yards of Lot 58 and BL-72. Figure 2 shows the location of the sound barrier.

There are no stationary sources in the vicinity with the potential to impact the site.

1.0 INTRODUCTION

VCL has been retained to prepare an Environmental Noise Assessment report for the proposed residential development in support of the Zoning By-law Amendment (ZBA) application submission to the Town of Caledon and the Regional Municipality of Peel.

The potential sound levels from the nearby transportation sources have been predicted on site and compared to the applicable MECP, Region of Peel and Town of Caledon noise guideline limits. Where sound level excesses above these guideline limits occur, noise mitigation measures have been recommended.

1.1 THE SITE AND SURROUNDING AREA

The site is located at 9229 5 Sideroad, in the Town of Caledon. The site is bounded by:

- Queensgate Boulevard and existing residential dwellings on Richelieu Court with existing detached residential dwellings beyond, to the north;
- Autumn Oak Court and St. John the Baptist Elementary School, with existing detached residential dwellings beyond, to the east;
- Pembrook Street and RJA Potts Memorial Park, with existing detached residential dwellings beyond, to the south; and
- Existing detached residential dwellings, to the west.

The site currently has a single dwelling on it that will be demolished as part of the development.

A Key Plan is included as Figure 1.

This report was prepared using the Draft Plan of Proposed Subdivision, prepared by KLM Planning Partners Inc., dated December 8, 2020. The Draft Plan of Proposed Subdivision is included as Figure 2.

1.2 THE PROPOSED DEVELOPMENT

The proposed development will consist of lots for 67 detached dwellings and 17 part blocks that can be combined with adjacent lands to create lots for detached dwellings. It is understood that all dwellings will be two storeys. The dwellings will have grade level rear yard outdoor amenity areas.

2.0 NOISE SOURCES

2.1 TRANSPORTATION NOISE SOURCES

The main noise sources with the potential to impact the site are road traffic on Queensgate Boulevard and Landsbridge Street, and rail traffic on the CPR Mactier Subdivision. Traffic volumes on other surrounding roadways are low and are not expected to have a significant noise impact at the subject site and have not been considered further.

The road and rail traffic data correspondence is included as Appendix A and is summarized in Tables 1A and 1B.

2.1.1 Road Traffic

Turning movement count (TMC) data applicable to year 2018 for Queensgate Boulevard at Landsbridge Street was obtained from NexTrans Consulting Engineers, the traffic consultant retained for this project. The daily (24-hour) volumes were calculated by multiplying the 8-hour TMC data by a factor of 2.2 (that is, the peak 8-hour period consists of 45% of the total daily traffic volume). A growth rate of 2%, compounded annually, was used to obtain future (year 2041) traffic volumes. For the analysis, the heavy truck volume was obtained from the TMC. Since the TMC

does not indicate any medium trucks, no medium trucks were included in the assessment. A day/night split of 90%/10% was used for both roads as is typical for well-travelled roadways.

2.1.2 Rail Traffic

The rail noise source with potential for impact on the proposed development is rail traffic on the CPR Mactier Subdivision. Rail traffic data for 2016 for the CPR Mactier Subdivision was obtained directly from CPR (see Appendix A) for a location to the west of this site. As CPR is no longer providing current rail data, the rail data used in the assessment is the best available to us at this time. The rail traffic data was escalated to the year 2041 using a growth rate of 2.5% compounded annually. This escalation rate is suggested by the railway authorities when preparing environmental noise studies.

2.2 STATIONARY NOISE SOURCES

The existing St. John the Baptist Elementary School is located at 299 Landsbridge Street, approximately 140 m east of the subject site. The main noise source at this facility is the rooftop mechanical equipment. The existing sports field to the west of the school is not considered a stationary source under MECP guidelines and was not included in the assessment.

Based on aerial imagery and observations during the site visit, there are acoustic screens around the rooftop mechanical units. Due to the distance separation and the screening provided by the acoustic screens, noise from this facility is not expected to have a significant impact at the subject site. This was confirmed during a site visit by VCL staff on November 20, 2020 when no noise from the school was audible at the subject site. Thus, this facility has not been considered further in this assessment.

3.0 ENVIRONMENTAL NOISE GUIDELINES

3.1 MECP PUBLICATION NPC-300

The applicable noise guidelines for new residential development are those in MECP Publication NPC-300, *"Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning"*.

The environmental noise guidelines of the MECP (Publication NPC-300) are discussed briefly below and summarized in Appendix B.

3.1.1 Transportation Noise Sources

3.1.1.1 Architectural Elements

In the daytime (0700 to 2300 hours), the indoor criterion for road noise is $L_{eq,Day}$(1) of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At nighttime (2300 to 0700 hours), the indoor criterion for road noise is $L_{eq,Night}$(2) of 45 dBA for sensitive spaces such as living/dining rooms and dens, and 40 dBA for bedrooms. The indoor criteria for rail noise

(1) $L_{eq\ Day}$ = 16-hour daytime (0700-2300) equivalent continuous sound level.
(2) $L_{eq\ Night}$ = 8-hour nighttime (2300-0700) equivalent continuous sound level

are 5 dBA lower than those for road noise; that is, 40 dBA for living/dining rooms, dens and bedrooms during the daytime and nighttime periods except for bedrooms where the nighttime indoor criterion is 35 dBA.

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve the above indoor sound level limits.

3.1.1.2 Ventilation

In accordance with the MECP noise guideline for road and rail traffic sources, if the daytime sound level ($L_{eq\ Day}$), at the exterior face of a noise sensitive 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 daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning at a later date. A warning clause advising the occupant of the potential interference with some activities is also required. At nighttime, air conditioning would be required when the sound level exceeds 60 dBA ($L_{eq\ Night}$) at a noise sensitive window (provision for adding air conditioning is required when greater than 50 dBA).

3.1.1.3 Outdoors

For outdoor amenity areas ("Outdoor Living Areas" – OLA's), the guideline objective is 55 dBA $L_{eq\ Day}$, with an excess not exceeding 5 dBA considered acceptable if it is not feasible to achieve the 55 dBA objective for technical, economic or administrative reasons, provided warning clauses are registered on title.

The point of assessment for an OLA is 1.5 m above grade, 3 m from the rear facade aligned with the midpoint of the relevant facade.

3.2 REGION OF PEEL

The Region of Peel noise guidelines are essentially the same as the MECP noise guidelines for transportation noise sources except that the nighttime sound level for triggering the air conditioning requirement is one dBA more stringent (i.e., less than) the sound level specified by the MECP, i.e., mandatory air conditioning for nighttime sound levels of 60 dBA or greater, and the provision for adding air conditioning for levels between 51 to 59 dBA inclusive.

A maximum desirable sound barrier height of 4.0 m (relative to roadway centreline) is indicated with a maximum acoustic fence component height of 2.4 m, although a height no more than 2.0 m is preferred.

3.3 TOWN OF CALEDON

For transportation noise sources, the Town of Caledon's general policy is not to accept the 5 dBA excess above the 55 dBA objective in OLA's. However, an excess may be acceptable if unreasonably high sound barriers are needed to meet the 55 dBA objective.

The Town's maximum acoustic fence height is 2.4 m. Higher barriers can be achieved using a combination of an acoustic fence and a berm. The maximum permitted sound barrier height according to the Town's Development Standards is 4.8 m (2.4 m fence atop a 2.4 m berm).

Road traffic noise levels are to be calculated using a minimum 20-year traffic forecast and a speed of 10 kph over the posted speed limit.

3.4 FEDERATION OF CANADIAN MUNICIPALITIES AND RAILWAY ASSOCIATION OF CANADA

The standard mitigation requirements of the Federation of Canadian Municipalities and the Railway Association of Canada (FCM/RAC) suggest a dwelling setback of 30 m for a residential development adjacent to a principal main line, if in combination with a safety berm at least 2.5 m above the property line grade. A 5.5 m high sound barrier is also suggested (e.g., 3.0 m high acoustic fence atop a 2.5 m high safety berm). Due to the distance separation (more than 300 m) and the intervening dwellings between the site and the CPR Mactier Subdivision, a safety berm is not required for the development.

Warning clauses specific to the railway are to be provided for all dwellings within 300 m of the right-of-way. The site is greater than 300 m setback from the rail line. Thus, the FCM/RAC warning clauses are not required for the development.

Aside from the "standard" requirements regarding the setback of dwellings and safety berm/sound barrier configuration, the sound level design objectives of FCM/RAC are similar to those of the MECP.

4.0 NOISE IMPACT ASSESSMENT

The sound levels at the dwelling facades were assessed at a height of 4.5 m above grade. This corresponds to a second-storey bedroom window, the worst case location. The sound levels in the rear yard OLA's were assessed at a standing height of 1.5 m above grade, 3 m from the dwelling, at a point aligned with the midpoint of the rear facade. Since dwelling locations are currently not known, the midpoint of the dwelling was assumed to be the midpoint of the lot.

Inherent screening of each building face due to its orientation to the noise source as well as screening provided by the subject development itself was taken into account. Screening from the existing neighbouring buildings was also included.

The highest unmitigated daytime/nighttime sound levels of 64 dBA/57 dBA are predicted to occur at the north facades of the dwellings adjacent to Queensgate Boulevard (Lot 58 and BL-72). The highest unmitigated OLA daytime sound level of 60 dBA is predicted to occur at the OLA's of these dwellings which side towards Queensgate Boulevard.

Table 2 summarizes the unmitigated daytime and nighttime sound level predictions.

Appendix C contains a sample sound level calculation.

5.0 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which can be treated separately for the most part:

a) architectural elements to achieve acceptable indoor noise guidelines for transportation sources; and

b) design features to protect the OLA's.

Noise abatement requirements are summarized in Table 3 and in the notes to Table 3.

5.1 INDOORS

5.1.1 Architectural Requirements

The indoor noise guidelines can be achieved by using appropriate construction for exterior walls, windows and doors. To determine the worst case architectural requirements for the residential dwellings, exterior wall and window areas were assumed to be 80% and 30%, respectively, of the associated floor area, on the facades of a corner room.

For all dwellings in this development, exterior wall and window construction meeting the minimum non-acoustical requirements of the Ontario Building Code (OBC) will be sufficient to achieve the indoor noise guideline criteria of the MECP.

The final sound isolation requirements should be reviewed when architectural plans are developed. This is typically required by the municipality at the time of building permit application.

5.1.2 Ventilation Requirements

Based on the daytime and nighttime sound levels, the dwellings on Lot 58, BL-71 and BL-72 require the provision for adding air conditioning at a later date. This typically takes the form of a ducted, forced air heating system, suitably sized to accommodate air conditioning.

The remaining dwellings do not have special ventilation requirements for noise control purposes.

5.2 OUTDOORS

The unmitigated daytime OLA sound levels at Lot 58 and BL-72 are predicted to exceed the 55 dBA objective. Thus, sound barriers are required. A 1.8 m high sound barrier is predicted to mitigate the daytime OLA sound levels to 55 dBA and is recommended.

The sound barriers must be of solid construction with no gaps, cracks or holes and must have a minimum surface weight of 20 kg/m^2. A variety of materials are available, including concrete, masonry, glass, wood, specialty composite materials, or a combination of the above.

The unmitigated daytime OLA sound levels at the remaining dwellings are predicted to be at or below the 55 dBA objective. Thus, sound barriers are not required for noise control purposes.

6.0 WARNING CLAUSES

Warning clauses are a tool to inform prospective owners/occupants of potential annoyance due to existing noise sources. Where the guideline sound level limits are exceeded, appropriate warning clauses should be registered on title or included in the development agreement that is registered on title. The warning clauses should also be included in agreements of Offers of Purchase and Sale and lease/rental agreements to make future occupants aware of the potential noise situation.

Table 3 and the notes to Table 3 summarize the warning clauses for the site.

7.0 CONCLUSIONS

With the incorporation of the recommended noise mitigation measures, the applicable Town of Caledon, Peel Region, MECP and FCM/RAC noise guidelines can be met and a suitable acoustical environment provided for the occupants.

The approvals and administrative procedures are available to ensure that the noise requirements are implemented.

8.0 REFERENCES

1. PC STAMSON 5.04, “Computer Program for Road Traffic Noise Assessment”, Ontario Ministry of the Environment.

2. Building Practice Note No. 56: "Controlling Sound Transmission into Buildings", by J. D. Quirt, Division of Building Research, National Council of Canada, September 1985.

3. “Stationary and Transportation Sources – Approval and Planning”, Ontario Ministry of the Environment, Publication NPC-300, August 2013.

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TABLE 1A: ROAD TRAFFIC DATA(1)

Roadway	Year	24-Hour Volume	% Trucks		Speed Limit (kph)(2)	Day/Night Split (%)
			Medium	Heavy		
Queensgate Boulevard	2018 (2041)	8 648 (13 637)	0.0	1.8	50	90/10
Landsbridge Street	2018 (2041)	2 147 (3 386)	0.0	3.8	40	90/10

Notes:

(1) Obtained from the NexTrans Consulting Engineers in the form of a Turning Movement Count (TMC). Traffic volumes were projected to the year 2041 using a growth rate of 2%, compounded annually. The future volume is shown in brackets. The heavy truck percentage was obtained from the TMC. The TMC does not indicate any medium trucks. Thus, no medium trucks were included in the assessment. The day/night split is assumed.

(2) Posted speed limit shown. Vehicle speeds of 60 kph and 50 kph (10 kph higher than the posted speed limit) were used in the analysis, per Town of Caledon guidelines

TABLE 1B: RAIL TRAFFIC DATA

Source	Period	Train Type	# of Trains	Maximum # of Cars/Train	Maximum # of Locos/Train	Maximum Speed (kph)
CPR Mactier Subdivision(1)	Daytime	Freight	9 (16.7)	188	4	88
	Nighttime	Freight	5 (9.3)	188	4	88

Note:

(1) Data obtained from CPR for the year 2016. Values shown in brackets have been extrapolated to the Year 2041 using a growth rate of 2.5%, compounded annually.

TABLE 2: PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS(1)

Location(2)	Source	Distance (m)(3)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 1 North Facade	Queensgate Boulevard	72	48	41
Lot 25 South Facade	CPR Mactier	427	46	46
BL - 71 East Facade	Queensgate Boulevard	32	56	50
BL - 72 North Facade	Queensgate Boulevard	17	64	57
BL - 73 West Facade	Queensgate Boulevard	39	55	48
BL - 76 East Facade	Landsbridge Street	250	40	33
BL - 72 (OLA)	Queensgate Boulevard	22	60	-

Notes:

(1) Facades were assessed at the top floor windows. OLAs were assessed at 1.5 m above grade.

(2) See Figure 2.

(3) Distance indicated is from the centreline of the noise source to the facade or OLA.

TABLE 3: MINIMUM NOISE ABATEMENT MEASURES

Location	Air Conditioning(1)	Exterior Wall(2)	Exterior Window(2)	Sound Barrier(3)	Warning Clauses(4)
Lot 58, BL-71 and BL-72	Provision for adding	No special acoustical requirements	No special acoustical requirements	1.8 m	A + B + C
Lots 26 to 46 and BL - 76 to BL - 79	No special acoustical requirements	No special acoustical requirements	No special acoustical requirements	None	D
All Other Lots	No special acoustical requirements	No special acoustical requirements	No special acoustical requirements	None	None

Notes:

(1) Where methods must be provided to allow windows to remain closed for noise control purposes, a commonly used technique is that of air conditioning.

(2) STC - Sound Transmission Class Rating (Reference ASTM-E413). Analyses were based upon the assumption that all wall and window areas are as indicated in Section 5.1.1 of text. Requirements should be checked once floor plans have been finalized and exterior wall construction details are defined.

(3) Sound barriers must be of solid construction with no gaps cracks or holes and must have a minimum surface density of 20 kg/m².

(4) Standard example warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:

A. "Purchasers are advised that despite the inclusion of noise control features in this development area and within the building units, noise levels from increasing road traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the noise level exceeds the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria."

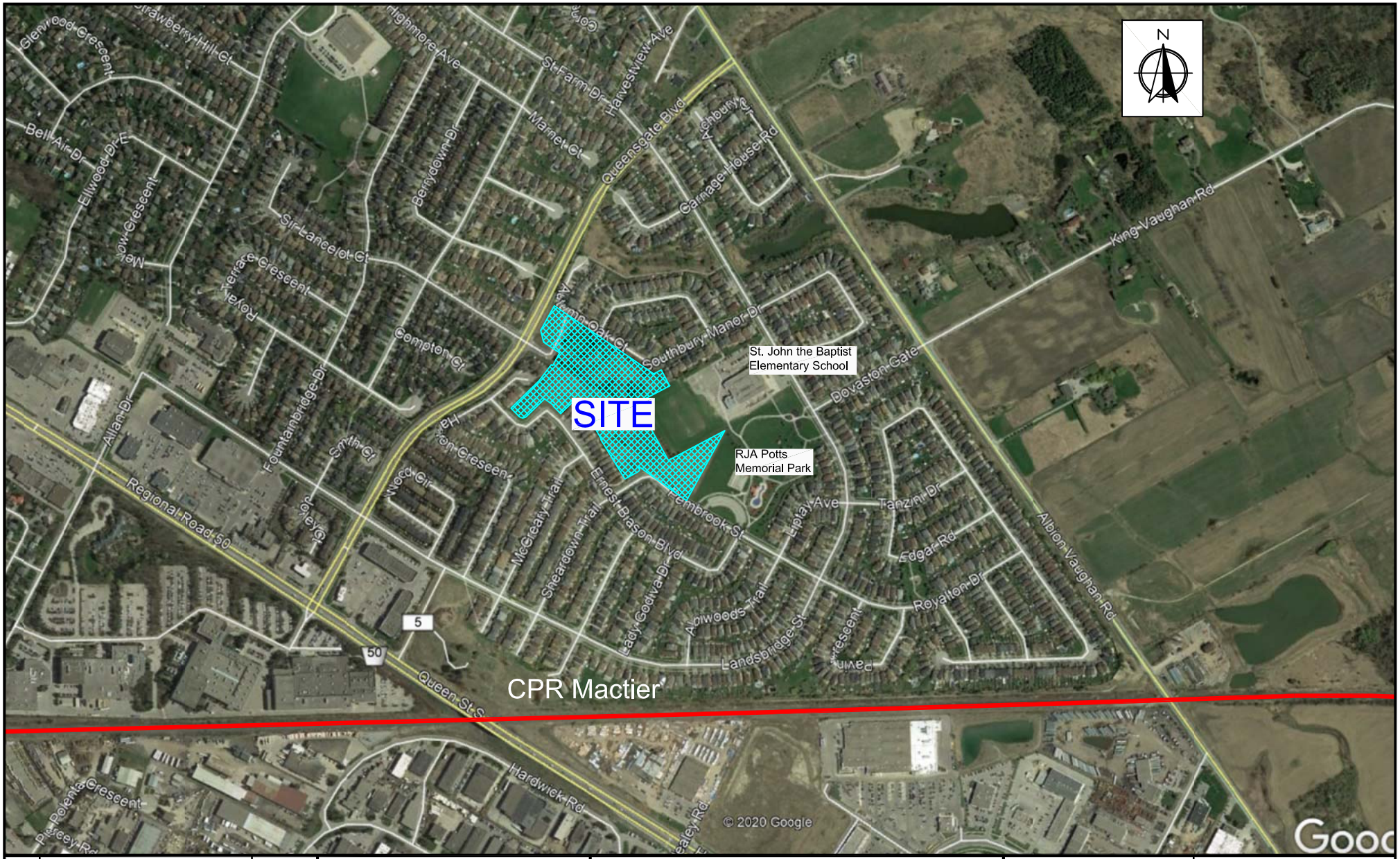
B. "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks."

C. "Purchasers/tenants are advised that a noise barrier wall is located at the rear/side of this property. The owner of this property also owns his/her section of the noise barrier wall. The noise barrier wall is not in public ownership. Monitoring, maintenance, inspection, repair and replacement of this noise barrier wall, including any associated costs, are the sole responsibility of the property owner. The Town of Caledon is in no way responsible for this noise barrier wall. Should this noise barrier wall fall, it is the property owner's responsibility to repair or replace his/her section of the wall, at his/her cost. If the property owner fails to maintain the noise barrier wall, the Town of Caledon will notify the requirement to repair in writing. If the property owner does not comply with the Town's request, the Town will correct the deficiency and bill the property owner accordingly."

D. "Purchasers/occupants are advised that due to the proximity of the existing school, noise from this facility may at times be audible."

(5) Conventional ventilated attic roof construction meeting OBC requirements is satisfactory.

(6) All exterior doors shall be fully weatherstripped.



No.	Revision/Issue	Date

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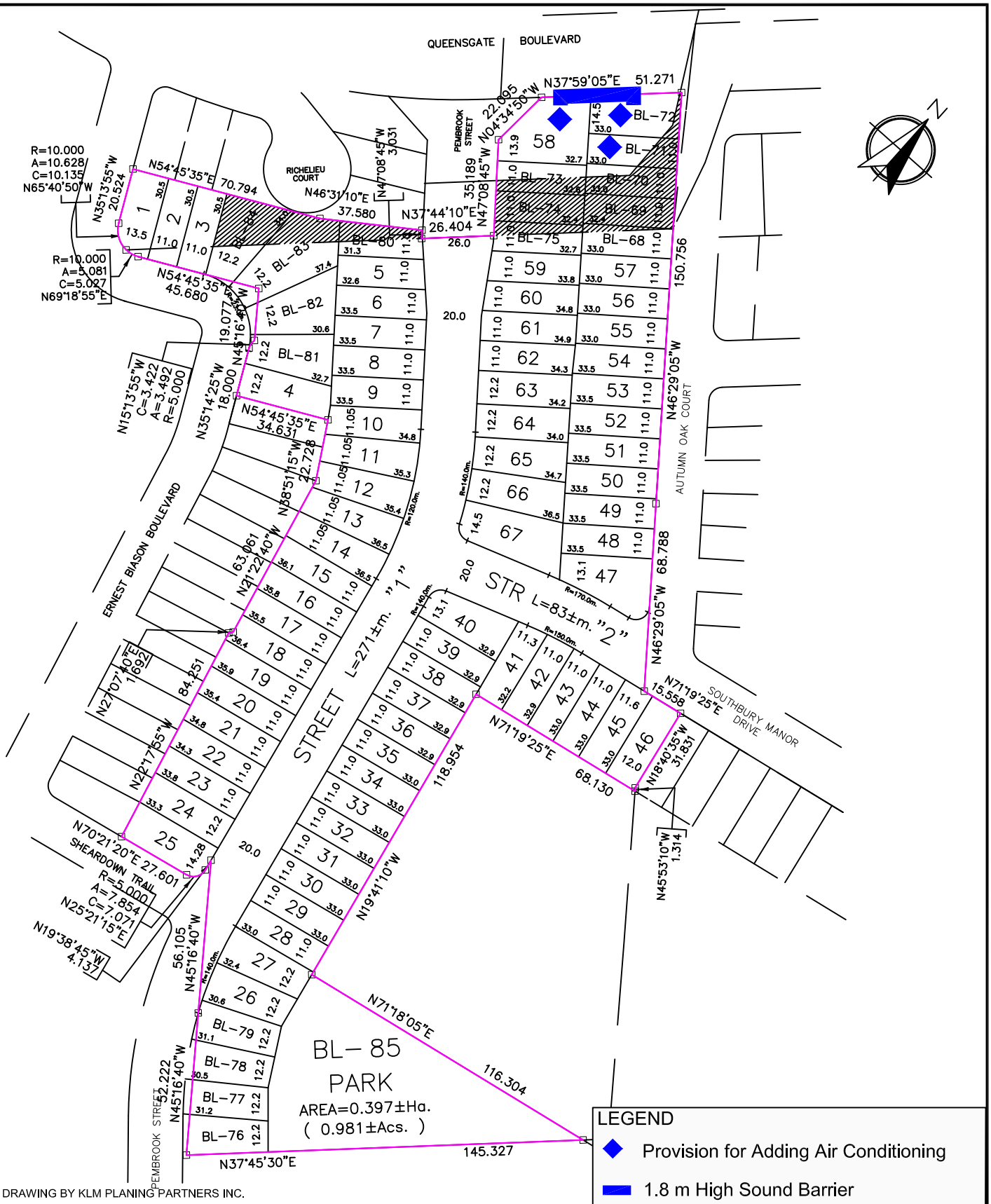
Title: Key Plan	Project No.: 120-0460	Date: Dec. 18, 2020
Project Name: 9229 5 Sideroad, Caledon	Scale: N.T.S.	Figure: 1



No.	Revision/Issue	Date

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Title	Project No.	Date
Draft Plan	120-0460	Dec. 23, 2020
Project Name	**Scale**	**Figure**
9229 5 Sideroad, Caledon	N.T.S.	2

APPENDIX A
ROAD TRAFFIC DATA

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Turning Movement Count (49 . QUEENSGATE BLVD & LANDSBRIDGE ST)

Start Time	N Approach SANT FARM DR						E Approach QUEENSGATE BLVD						S Approach LANDSBRIDGE ST						W Approach QUEENSGATE BLVD						Int. Total (15 min)	Int. Total (1 hr)
	Left N:E	Thru N:S	Right N:W	U-Turn N:N	Peds N:	Approach Total	Left E:S	Thru E:W	Right E:N	U-Turn E:E	Peds E:	Approach Total	Left S:W	Thru S:N	Right S:E	U-Turn S:S	Peds S:	Approach Total	Left W:N	Thru W:E	Right W:S	U-Turn W:W	Peds W:	Approach Total		
07:00:00	46	1	17	0	0	64	1	20	4	0	0	25	6	3	11	0	1	20	2	18	2	0	1	22	131	
07:15:00	33	4	15	0	0	52	3	41	6	0	1	50	5	2	13	0	0	20	0	16	2	0	0	18	140	
07:30:00	47	0	20	0	0	67	2	49	5	0	0	56	8	2	10	0	0	20	3	18	2	0	3	23	166	
07:45:00	49	3	15	0	0	67	3	62	11	0	0	76	8	2	19	0	0	29	3	20	5	0	0	28	200	637
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08:15:00	33	4	6	0	1	43	6	55	24	0	2	85	3	2	15	0	1	20	2	20	1	0	14	23	171	697
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BREAK																										
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13:00:00	12	2	8	0	0	22	2	28	10	0	0	40	5	2	1	0	0	8	5	19	5	0	0	29	99	383
13:15:00	14	5	4	0	0	23	0	24	15	0	0	39	3	2	2	0	0	7	9	31	3	0	0	43	112	410
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Grand Total	653	142	282	0	8	1077	114	1118	641	0	8	1873	194	128	216	1	18	539	257	1189	181	0	65	1627	**5116**	-
Approach%	60.6%	13.2%	26.2%	0%		-	6.1%	59.7%	34.2%	0%		-	36%	23.7%	40.1%	0.2%		-	15.8%	73.1%	11.1%	0%		-	**-**	-
Totals %	12.8%	2.8%	5.5%	0%		21.1%	2.2%	21.9%	12.5%	0%		36.6%	3.8%	2.5%	4.2%	0%		10.5%	5%	23.2%	3.5%	0%		31.8%	**-**	-
Heavy	16	4	4	0		-	4	18	15	0		-	5	12	5	0		-	6	14	7	0		-	**-**	-
Heavy %	2.5%	2.8%	1.4%	0%		-	3.5%	1.6%	2.3%	0%		-	2.6%	9.4%	2.3%	0%		-	2.3%	1.2%	3.9%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 07:45 AM - 08:45 AM Weather: Partly Cloudy (-3.1 °C)

Start Time	N Approach SANT FARM DR						E Approach QUEENSGATE BLVD						S Approach LANDSBRIDGE ST						W Approach QUEENSGATE BLVD						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
07:45:00	49	3	15	0	0	67	3	62	11	0	0	76	8	2	19	0	0	29	3	20	5	0	0	28	200
08:00:00	47	4	8	0	0	59	4	33	11	0	1	48	6	2	16	0	0	24	5	21	3	0	2	29	160
08:15:00	33	4	6	0	1	43	6	55	24	0	2	85	3	2	15	0	1	20	2	20	1	0	14	23	171
08:30:00	30	18	16	0	1	64	13	59	31	0	0	103	13	16	7	0	10	36	4	21	3	0	10	28	231
Grand Total	159	29	45	0	2	233	26	209	77	0	3	312	30	22	57	0	11	109	14	82	12	0	26	108	**762**
Approach%	68.2%	12.4%	19.3%	0%		-	8.3%	67%	24.7%	0%		-	27.5%	20.2%	52.3%	0%		-	13%	75.9%	11.1%	0%		-	**-**
Totals %	20.9%	3.8%	5.9%	0%		30.6%	3.4%	27.4%	10.1%	0%		40.9%	3.9%	2.9%	7.5%	0%		14.3%	1.8%	10.8%	1.6%	0%		14.2%	**-**
PHF	0.81	0.4	0.7	0		0.87	0.5	0.84	0.62	0		0.76	0.58	0.34	0.75	0		0.76	0.7	0.98	0.6	0		0.93	**-**
Heavy	6	0	1	0		7	1	4	7	0		12	1	4	1	0		6	3	5	1	0		9	**-**
Heavy %	3.8%	0%	2.2%	0%		3%	3.8%	1.9%	9.1%	0%		3.8%	3.3%	18.2%	1.8%	0%		5.5%	21.4%	6.1%	8.3%	0%		8.3%	**-**
Lights	153	29	44	0		226	25	205	70	0		300	29	18	56	0		103	11	77	11	0		99	**-**
Lights %	96.2%	100%	97.8%	0%		97%	96.2%	98.1%	90.9%	0%		96.2%	96.7%	81.8%	98.2%	0%		94.5%	78.6%	93.9%	91.7%	0%		91.7%	**-**
Single-Unit Trucks	0	0	0	0		0	0	1	1	0		2	0	0	0	0		0	0	3	1	0		4	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.5%	1.3%	0%		0.6%	0%	0%	0%	0%		0%	0%	3.7%	8.3%	0%		3.7%	**-**
Buses	6	0	1	0		7	1	3	6	0		10	1	4	1	0		6	3	2	0	0		5	**-**
Buses %	3.8%	0%	2.2%	0%		3%	3.8%	1.4%	7.8%	0%		3.2%	3.3%	18.2%	1.8%	0%		5.5%	21.4%	2.4%	0%	0%		4.6%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	11	-	-	-	-	-	25	-	**-**
Pedestrians%	-	-	-	-	4.8%		-	-	-	-	7.1%		-	-	-	-	26.2%		-	-	-	-	59.5%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	2.4%		**-**

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 11:15 AM - 12:15 PM Weather: Partly Cloudy (-0.2 °C)

Start Time	N Approach SANT FARM DR						E Approach QUEENSGATE BLVD						S Approach LANDSBRIDGE ST						W Approach QUEENSGATE BLVD						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
11:15:00	21	0	6	0	0	27	1	22	9	0	0	32	7	0	1	0	0	8	5	28	6	0	0	39	106
11:30:00	12	3	5	0	0	20	0	23	7	0	0	30	6	2	2	0	0	10	7	27	4	0	0	38	98
11:45:00	14	3	8	0	0	25	2	21	12	0	0	35	4	1	5	1	0	11	6	29	4	0	0	39	110
12:00:00	11	1	6	0	0	18	0	22	12	0	0	34	7	1	2	0	0	10	7	32	6	0	0	45	107
Grand Total	58	7	25	0	0	90	3	88	40	0	0	131	24	4	10	1	0	39	25	116	20	0	0	161	**421**
Approach%	64.4%	7.8%	27.8%	0%		-	2.3%	67.2%	30.5%	0%		-	61.5%	10.3%	25.6%	2.6%		-	15.5%	72%	12.4%	0%		-	**-**
Totals %	13.8%	1.7%	5.9%	0%		21.4%	0.7%	20.9%	9.5%	0%		31.1%	5.7%	1%	2.4%	0.2%		9.3%	5.9%	27.6%	4.8%	0%		38.2%	**-**
PHF	0.69	0.58	0.78	0		0.83	0.38	0.96	0.83	0		0.94	0.86	0.5	0.5	0.25		0.89	0.89	0.91	0.83	0		0.89	**-**
Heavy	1	0	0	0		1	0	2	1	0		3	0	0	0	0		0	0	0	1	0		1	**-**
Heavy %	1.7%	0%	0%	0%		1.1%	0%	2.3%	2.5%	0%		2.3%	0%	0%	0%	0%		0%	0%	0%	5%	0%		0.6%	**-**
Lights	57	7	25	0		89	3	86	39	0		128	24	4	10	1		39	25	116	19	0		160	**-**
Lights %	98.3%	100%	100%	0%		98.9%	100%	97.7%	97.5%	0%		97.7%	100%	100%	100%	100%		100%	100%	100%	95%	0%		99.4%	**-**
Single-Unit Trucks	1	0	0	0		1	0	2	1	0		3	0	0	0	0		0	0	0	1	0		1	**-**
Single-Unit Trucks %	1.7%	0%	0%	0%		1.1%	0%	2.3%	2.5%	0%		2.3%	0%	0%	0%	0%		0%	0%	0%	5%	0%		0.6%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 05:00 PM - 06:00 PM Weather: Mostly Cloudy (3.5 °C)

Start Time	N Approach SANT FARM DR						E Approach QUEENSGATE BLVD						S Approach LANDSBRIDGE ST						W Approach QUEENSGATE BLVD						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
17:00:00	19	2	10	0	0	31	6	32	31	0	0	69	6	5	10	0	0	21	20	76	11	0	1	107	228
17:15:00	13	2	3	0	0	18	9	47	35	0	0	91	5	4	7	0	0	16	15	66	7	0	0	88	213
17:30:00	18	8	9	0	1	35	8	41	40	0	0	89	6	6	7	0	0	19	16	73	9	0	1	98	241
17:45:00	22	7	16	0	0	45	9	46	53	0	0	108	8	7	13	0	0	28	12	47	9	0	1	68	249
Grand Total	72	19	38	0	1	129	32	166	159	0	0	357	25	22	37	0	0	84	63	262	36	0	3	361	**931**
Approach%	55.8%	14.7%	29.5%	0%		-	9%	46.5%	44.5%	0%		-	29.8%	26.2%	44%	0%		-	17.5%	72.6%	10%	0%		-	**-**
Totals %	7.7%	2%	4.1%	0%		13.9%	3.4%	17.8%	17.1%	0%		38.3%	2.7%	2.4%	4%	0%		9%	6.8%	28.1%	3.9%	0%		38.8%	**-**
PHF	0.82	0.59	0.59	0		0.72	0.89	0.88	0.75	0		0.83	0.78	0.79	0.71	0		0.75	0.79	0.86	0.82	0		0.84	**-**
Heavy	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	3	0	0		3	**-**
Heavy %	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		0.8%	**-**
Lights	72	19	38	0		129	32	165	159	0		356	25	22	37	0		84	63	259	36	0		358	**-**
Lights %	100%	100%	100%	0%		100%	100%	99.4%	100%	0%		99.7%	100%	100%	100%	0%		100%	100%	98.9%	100%	0%		99.2%	**-**
Single-Unit Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	3	0	0		3	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		0.8%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	**-**
Pedestrians%	-	-	-	-	25%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	75%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 07:45 AM - 08:45 AM **Weather: Partly Cloudy (-3.1 °C)**

	Bicycles on Crosswalk	Pedestrians
N	0	2
S	0	11
E	0	3
W	1	25

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 11:15 AM - 12:15 PM Weather: Partly Cloudy (-0.2 °C)

	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
E	0	0
W	0	0

Spectrum

Turning Movement Count
Location Name: QUEENSGATE BLVD & LANDSBRIDGE ST
Date: Thu, Mar 22, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 05:00 PM - 06:00 PM **Weather: Mostly Cloudy (3.5 °C)**

	Bicycles on Crosswalk	Pedestrians
N	0	1
S	0	0
E	0	0
W	0	3

Real Estate and Facility Management
800 – 1290 Central Parkway West
Mississauga, ON, L5C 4R3
www.cpr.ca

April 22, 2016

Via e-mail: Anthony@valcoustics.com

Valcoustics Canada Ltd.
30 Wertheim Court, Unit 25
Richmond Hill, Ontario L4B 1B9

Dear Sir/Madam:

Re: Rail Traffic Volumes, CP Mileage 20.48, Mactier Subdivision
Highway 50/Queen Street, Town of Caledon (Bolton), ON

This is in reference to your request for rail traffic data for a noise study in the vicinity of where Highway 50 intersects with the CP Rail corridor, being mile 20.48 of our Mactier Subdivision. The Mactier Subdivision is classified as a Principal Main Line.

The information requested is as follows:

1. Number of freight trains 0700 to 2300: 9
   Number of freight trains 2300 to 0700: 5

2. Average number of cars per train freight: 80
   Maximum cars per train freight: 188

3. Number of Locomotives per train: 2 (4 max)

4. Maximum permissible speed: 55 mph (88 kph)

5. The whistle signal is not routinely through the study area. Please note that the whistle may be sounded if deemed necessary by the train crew for safety reasons at any location.

6. There is one main line track with welded joints in the vicinity of the study area and one passing track with bolted joints along with an additional siding track north of the study area. Due to the additional tracks, trains will meet numerous times a day at in this area which may cause longer than usual train idling time while awaiting other trains to pass by.

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

Yours truly,

J Tomei

Josie Tomei
Specialist Real Estate Sales
& Acquisitions – Ontario
905-803-3429. josie_tomei@cpr.ca

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP)

Reference: MECP Publication NPC-300, October 2013: *"Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning"*.

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30#
	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	55* dBA
		19:00 to 23:00(4)	55* dBA

…./cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
		23:00 to 07:00(1)	45* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	50* dBA
		23:00 to 07:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	45* dBA
		23:00 to 07:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	60* dBA
		19:00 to 23:00(4)	60* dBA
		23:00 to 07:00(4)	55* dBA

\# may not apply to in-fill or re-development.
* or the minimum hourly background sound exposure $L_{eq(1)}$, due to road traffic, if higher.
(1) Class 1 Area: Urban.
(2) Class 2 Area: Urban during day; rural-like evening and night.
(3) Class 3 Area: Rural.
(4) Class 4 Area: Subject to land use planning authority's approval.

Reference: MECP Publication ISBN 0-7729-2804-5, 1987: *"Environmental Noise Assessment in Land-Use Planning"*.

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

APPENDIX C

SAMPLE SOUND LEVEL CALCULATION

```
STAMSON 5.04        NORMAL REPORT        Date: 20-01-2021 10:35:21
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS/ NOISE ASSESSMENT

Filename: 72_nf.te             Time Period: Day/Night 16/8 hours
Description: Block 72 - North Facade


Road data, segment # 1: Queensgate (day/night)
----------------------------------------------
Car traffic volume  : 12052/1339  veh/TimePeriod  *
Medium truck volume :     0/0     veh/TimePeriod  *
Heavy truck volume  :   221/25    veh/TimePeriod  *
Posted speed limit  :    60 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):   8648
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   1.80
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Queensgate (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  :  17.00 / 17.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Queensgate (day)
-------------------------------------

Source height = 1.16 m

ROAD (0.00 + 63.70 + 0.00) = 63.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  65.88   0.00  -0.86  -1.32   0.00   0.00   0.00  63.70
-------------------------------------------------------------------------------

Segment Leq : 63.70 dBA

Total Leq All Segments: 63.70 dBA
```

```
Results segment # 1: Queensgate (night)
---------------------------------------

Source height = 1.16 m

ROAD (0.00 + 57.20 + 0.00) = 57.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  59.38   0.00  -0.86  -1.32   0.00   0.00   0.00  57.20
-------------------------------------------------------------------------------

Segment Leq : 57.20 dBA

Total Leq All Segments: 57.20 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.70
                           (NIGHT): 57.20
```