

June 30, 2022



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ENVIRONMENTAL NOISE IMPACT STUDY

Project: 22066

Proposed Residential Development

10249 Hunsden Sideroad
Bolton, Ontario

Prepared for:

Carrington Homes

101 Regent Street
Richmond Hill ON L4C 9P4

Prepared by:

A handwritten signature in blue ink, appearing to read "Iwona Stasiewicz".

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A handwritten signature in black ink, appearing to read "Nicholas Sylvestre-Williams".

Nicholas Sylvestre-Williams, M.Eng., P.Eng.

June 27, 2022

Table of Contents

Table of Contents	2
1 Introduction	3
2 Guidelines and Criteria	4
3 Rail Noise Levels and Groundborne Vibration	6
4 Results of Rail Noise Predictions	8
5 Recommendations	9
6 Conclusions	9
8 References	10

1 Introduction

Carrington Homes has retained the services of Aercoustics Engineering Limited (Aercoustics) to prepare an Environmental Noise Impact Study for a proposed residential development. The proposed development is to be located on the east side of Hunsden Sideroad in Bolton, Ontario. Figure 1 provides a key plan showing the proposed development location.



Figure 1: Key plan showing site location

The purpose of this study is to examine the existing and future noise environment in the development area and evaluate its impact potential on the future residential receptors. This report also investigates the noise control features that are required for the development in order to meet the noise guidelines of the Ontario Ministry of the Environment, Conservation and Parks (MECP) and to satisfy the requirements of the municipality.

The proposed development consists of 19 single family dwellings.

The noise impact potential of the surrounding land uses, including located in the vicinity transportation corridors, on the proposed project has been examined and is further discussed in this document in accordance with the MECP noise guidelines outlined in their publication, NPC-300.

The dominant traffic noise source in the subject study area is rail traffic on the CP Rail line located 330m to the east of the site. The road traffic on Hunsden Sideroad is not expected to have a significant impact on the overall acoustic environment of the site. The traffic volumes on this roadway are very low and are not expected to generate significant noise levels. Similarly, Mt Pleasant Road and Mt Wolfe Road due to low traffic volumes and significant separation distance between these two transportation corridors and the site are not expected to have negative impact on the overall acoustic environment of the development. Information/correspondence from the Town of Caledon regarding road traffic volumes on Hunsden Sideroad and Mt Wolfe Road is provided in Appendix A.

Aercoustics' personnel have conducted a site visit on March 1, 2022 and confirmed that all three roadways mentioned above do not produce significant noise emissions. The area is sparsely populated with low number of vehicles traveling on these transportation corridors. Also, it has been noted that there are no stationary noise sources located in the area.

There are no sources of ground borne vibration in the vicinity of the project.

2 Guidelines and Criteria

2.1 Road and Rail Traffic Noise - Outdoor Living Area (OLA)

MECP Guidelines recommend that equivalent noise levels (Leq) in outdoor living areas should not exceed 55 dBA. Predicted noise levels between 55 dBA and 60 dBA may be acceptable, provided that the future occupants of the buildings are made aware of the potential noise problems through appropriate warning clauses. Noise levels above 60 dBA are generally not acceptable.

All unenclosed balconies that are less than 4 m in depth and outside the exterior of the building façade are exempt from meeting the MECP outdoor noise criteria with regards to transportation noise sources. Should the depth of any future balconies and terraces be greater than 4 m, they will be subject to the MECP noise level limit of 55 dBA.

2.2 Road and Rail Traffic Noise - Indoor Living Spaces

Indoor noise levels are also examined with respect to the MECP Guidelines. According to NPC-300, bedrooms are normally required to meet an indoor Leq of 40 dBA. The recommended indoor sound limit for living or dining rooms is an Leq of 45 dBA. A major characteristic of railway noise is its high pass-by sound level for short periods and a major low frequency component produced by the operation of the diesel locomotive. This special character of the sound should be taken into account, particularly when assessing the indoor sound levels. Consequently, in order to account for the special character of railway sound, the indoor sound level limits for rail noise, are 5 dBA lower than the indoor sound level limits for road traffic noise. Retail or general office spaces must meet the indoor noise level of 50 dBA.

To achieve these levels, the MECP Guidelines provide a basis for the type of windows, exterior walls and doors that will be required based on projected outdoor noise levels.

It is also an MECP requirement that a central air conditioning system be installed for the dwelling(s) when the nighttime or daytime outdoor noise levels at the façade of the dwelling are above 60 dBA and 65 dBA, respectively. The provision for adding central air conditioning must be made if the nighttime sound level is greater than 50 dBA and less than or equal to 60 dBA on the outside face of a bedroom windows or greater than 55 dBA and less than or equal to 65 dBA on the outside face of a living/dining room window. This provision involves a ducted heating system sized to accommodate the addition of central air conditioning by the occupant. Further, the exterior wall of the first row of dwellings next to railway tracks are to be built to a minimum of brick veneer or masonry equivalent construction from the foundation to the rafters when the rail traffic Leq (24hr), estimated at a location of a nighttime receptor, is greater than 60dBA, and when the first row of dwellings is within 100 meters of the tracks.

The required limits as per NPC-300 are summarized in Table 2.1 below.

Table 2.1: Noise Criteria – Road and Rail Traffic

Type of Space	Time Period	Road Minimum LEQ (dBA)	Rail Minimum LEQ (dBA)
Living/dining, den areas of residences, hospitals, nursing homes, schools, day-care centres (Indoor)	07:00 – 23:00	45 dBA	40 dBA
Living/dining, den areas of residences, hospitals, nursing homes (Indoor)	23:00 – 07:00	45 dBA	40 dBA
Sleeping quarters (Indoor)	07:00 – 23:00	45 dBA	40 dBA
	23:00 – 07:00	40 dBA	35 dBA
Outdoor Living Areas (OLA)	07:00 – 23:00	55 dBA	55 dBA

3 Road and Rail Noise Levels

3.1 Road and Rail Noise Calculations Procedure

Noise level calculations were performed in accordance with the MECP Guidelines outlined in Reference 1, and by the Guidelines of the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT). Sample copies of the traffic noise predictions from MECP’s Road and Rail Traffic Noise Prediction Model STAMSON are included in Appendix A.

The equivalent sound levels (Leq’s) due to rail traffic on CP Rail line were calculated at receptor A as shown in Figure 2 of this report. The calculations were performed for both daytime and nighttime conditions at receiver heights representing ground floor level as well as the 2nd floor windows. This critical calculation location addresses outdoor living area(s) of the project as well.

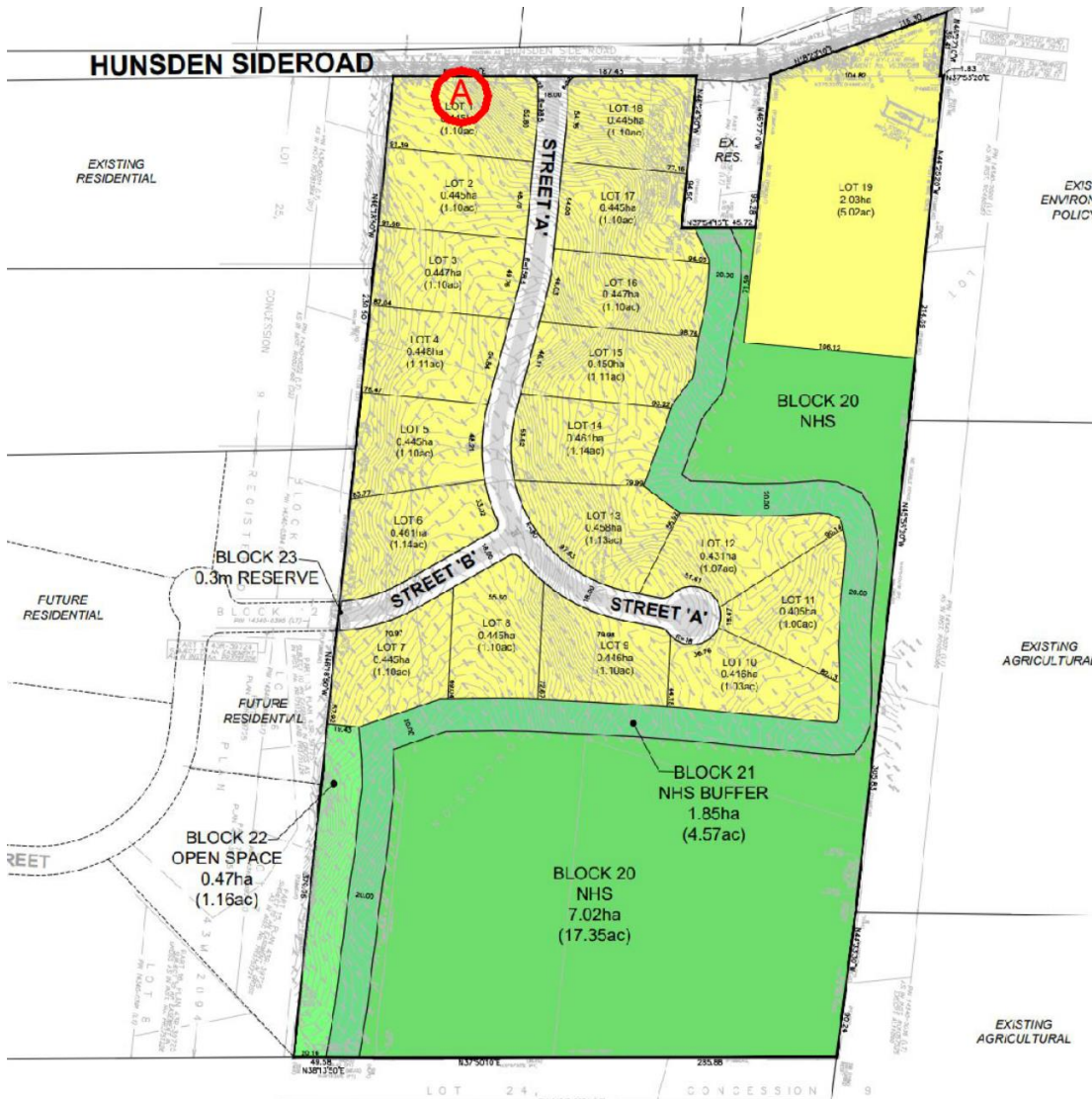


Figure 2: Noise calculation locations

3.2 Road Traffic Data

Hunsden Sideroad and Mt Wolfe road traffic data received from the Town of Caledon has been reviewed and it has been determined that due to the low traffic volumes on these transportation corridors, sounds generated by the road traffic will not have a significant effect on the overall acoustic environment of the proposed residences. It should be noted that Mt Pleasant Road appears to be very similar to Mt Wolfe Road, and is not expected to have significant impact on the project. Copies of the correspondence received from the township are included in Appendix A.

3.3 Rail Traffic Data

Predictions of rail traffic noise were based on the rail traffic data outlined in Table 3.1 below. It should be noted that CP Rail does not provide any information regarding rail traffic on its rail line; this is due to the change in their policies that has become effective in Fall of 2020. The CP Rail traffic volumes and maximum speed obtained from a Government of Canada site which provides Grade Crossing Inventory. The number of locomotives, number of cars as well as the day/time split of the trains were assumed based on the historic data regarding rail traffic data on the Mactier Subdivision of CP Rail. Copies of the relevant material is included in Appendix A.

Table 3.1: CP Rail Traffic Volumes

	Freight
Number of Trains – Day (07:00-23:00)	7
Number of Trains – Night (23:00-07:00)	5
Number (max) of Locomotives per Train	4
Number (max) of Cars per Train	179
Maximum Speed (km/hr)	55

4 Results of Rail Noise Predictions

Table 4.1 below lists the daytime and nighttime Leq’s due to rail traffic as predicted at critical location within the development, as shown on the site plan in Figure 2.

Table 4.1: Calculated Noise Levels Due to Rail Traffic

Calculation Location	Description	Leq (dBA)	Leq (dBA)
		Day Rail (Road – negligible)	Night Rail (Road – negligible)
A	West Facade	50	53
	OLA	50	n/a

Notes:

OLA – indicates Outdoor Living Area

The noise levels listed in the table above were used to determine the window glazing as well as exterior wall requirements for each designated point of reception. Glazing requirements should be verified once floor plans and architectural drawings are finalized.

Similarly, the noise control recommendations regarding outdoor living areas located within the proposed development have been based on the noise levels presented in the table above. These recommendations should also be confirmed based on the final siting and grading plans of the property under review.

5 Recommendations

5.1 Outdoor Living Areas

The rail noise level predictions, as listed in Table 4.1 above, indicate that the future noise levels at the critical outdoor points are within the applicable noise level limits and therefore no physical noise control measures are required to mitigate transportation noise at the outdoor living areas of the project.

5.2 Indoor Living Spaces

Indoor sound levels have been examined with respect to MECP Guidelines as summarized in Section 2.2 of this report. It has been assumed that the maximum window-to-floor ratios are 32% and 25% for the daytime and the nighttime indoor living spaces respectively.

Table 5.1: Recommended Window and or Sliding Door Glazing

Façade	Daytime Window STC	Nighttime Window STC
All Facades, All Lots	OBC	OBC

Note: OBC indicated window glazing meeting general requirements of Ontario Building Code/Window construction meeting STC 33.

Further, **provisions for central air conditioning system are required** for this residential development as the predicted nighttime noise levels are above 50dBA.

A warning clause is required, and sample wording is provided in Section 7 of this document.

6 Conclusions

The results of this study indicated that the outdoor living areas of the proposed dwellings will be exposed to transportation noise levels below 55dBA. Consequently, no noise barriers, as discussed in Section 5.1 of this document, will be required to mitigate transportation noise to the levels acceptable to MECP.

Window/sliding door glazing and wall construction meeting general requirements of the Ontario Building Code will also suffice for noise control reasons. Section 5.2 of the report discusses the building envelope components.

With the incorporation of the noise controls discussed in this report, the sound levels at the sensitive receptors of the proposed residential development will comply with the noise

guidelines of the MECP. As indicated the MECP implementation guidelines, where mitigation is required or noise may be a concern, future occupants will be advised through warning clauses.

7 Notes and Warning Clauses

1. Purchase and/or lease agreements shall include the following warning clause:

Warning Clause 1:

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

2. The general architectural plans, configuration/layout and grading of the site are integral parts of the noise control system. Any major deviations will require further analysis for verification purposes.

8 References

1. ORNAMENT – “Ontario Road Noise Analysis Method for Environmental and Transportation”, Ontario Ministry of the Environment, October, 1989.
2. “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning”, Ontario Ministry of the Environment and Climate Change, Publication NPC-300, August 2013 (updated final version #22).
3. Guidelines for New Development in Proximity to Railway Operations, prepared for The Federation of Canadian Municipalities and The Railway Association of Canada’ dated May 2013

Appendix A
Road and Rail Traffic Data, and
Sample of Rail Noise Predictions

Bank	TC Number/Railway C/Region	Province	Access	Jurisdiction	Mile	Subdivision	Spur Name	Location	Latitude	Longitude	Road Authority	Protection/Incident	Fatality	Injury	Total Train/Vehicles	D Train	Max Road	Spec/Lanes	Tracks	Is Urban		
6615	6614	24980 CP	ONT	ON	Public	F	30.46	Master	Junides Sideroad (2575 Sideroad)	43.9585	-79.8193	Caledon (ON)	Active - FL	0	0	0	12	115	60	2	2 N	
6695	6694	24981 CP	ONT	ON	Public	F	31.31	Master	Mount Pleasant Road (87th Line Road)	43.9979	-79.8121	Caledon (ON)	Active - FL	0	0	0	12	110	55	60	2	2 N

<https://open.canada.ca/data/en/dataset/d0f54727-6c0b-4e5a-aa04-ea1463cf9f4c>

Grade Crossings Inventory

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Contact Email: OpenData@open.canada.ca
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 Keywords: [Rail Safety](#) | [Grade Crossings](#) | [Railway](#)
 Subject: [Transport](#)
 Place of Publication: [Canada](#)
 Maintenance and

The list of grade crossings produced by this system provides an inventory of the location and characteristics of the railway crossings in Canada. It is part of the information that the Railway Safety Oversight Program uses in assessing risk and compliance with applicable regulatory requirements. This information is being made public as part of the Government of Canada's efforts to increase transparency and openness. Please refer to additional information for further context (PDF).

Publisher - Current Organization Name: Transport Canada
 Licence: [Open Government Licence - Canada](#)

Data and Resources

[Grade Crossings Inventory](#) [Download](#)
[Grade Crossings Inventory](#) [Download](#)
[Grade Crossings Inventory - Data Dictionary](#) [Download](#)
[Grade Crossings Inventory - Overview](#) [Download](#)



Volume by Day Report

Location... HUNSDEN SR btwn MOUNT PLEASANT RD & HUNSDEN SR

Municipality... Caledon

Start Hour	4/13/2016	4/14/2016	4/15/2016	Grand Total
0		1	2	3
1		0	2	2
2		0	0	0
3		0	0	0
4		1	0	1
5		0	1	1
6		4	8	12
7		11	9	20
8		3	7	10
9	1	6	12	19
10	0	9	6	15
11	0	5	4	9
12	5	7	7	19
13	0	6	18	24
14	0	13	4	17
15	1	16	1	18
16	0	9	4	13
17	1	9	0	10
18	0	11	0	11
19	2	4	6	12
20	12	5	1	18
21	6	0		6
22	0	2		2
23	2	1		3
Grand Total	30	123	92	245



Volume by Day Report

Location... MOUNT WOLFE RD btwn HUNSDEN SR & HIGH CREST RD

Municipality... Caledon

Start Hour	5/3/2017	5/4/2017	5/5/2017	5/6/2017	Grand Total
0		34	35	52	121
1		23	24	32	79
2		28	25	18	71
3		21	24	9	54
4		66	54	27	147
5		211	172	71	454
6		397	342	75	814
7		499	430	124	1053
8		303	324	171	798
9		192	204	219	615
10		160	161	212	533
11	94	142	173	231	640
12	143	145	180	238	706
13	180	168	213	254	815
14	207	224	240	251	922
15	315	329	348	272	1264
16	436	418	387	242	1483
17	471	456	451	235	1613
18	326	347	362	212	1247
19	208	203	216	150	777
20	150	141	138	104	533
21	139	111	107	100	457
22	97	91	82		270
23	65	51	88		204
Grand Total	2831	4760	4780	3299	15670

STAMSON 5.04 NORMAL REPORT Date: 06-04-2022 10:15:55

MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 22066rl.te Time Period: Day/Night 16/8 hours

Description: CP Rail at 330m

Rail data, segment # 1: frght 330m (day/night)

Train ! Trains ! Speed !# loc !# Cars! Eng !Cont
Type ! !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
* 1. freight ! 9.0/6.4 ! 55.0 ! 4.0 !179.0 !Diesel! No

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

Train type: ! Unadj. ! Annual % ! Years of !
No Name ! Trains ! Increase ! Growth !
-----+-----+-----+-----+
1. freight ! 7.0/5.0 ! 2.50 ! 10.00 !

Data for Segment # 1: frght 330m (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 : 330.00 / 330.00 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00
 Results segment # 1: frght 330m (day)

LOCOMOTIVE (0.00 + 49.13 + 0.00) = 49.13 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.58 71.73 -21.28 -1.33 0.00 0.00 0.00 49.13

WHEEL (0.00 + 43.61 + 0.00) = 43.61 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.66 67.35 -22.28 -1.46 0.00 0.00 0.00 43.61

Segment Leq : 50.20 dBA

Total Leq All Segments: 50.20 dBA

Results segment # 1: frght 330m (night)

LOCOMOTIVE (0.00 + 52.03 + 0.00) = 52.03 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.50 73.26 -20.07 -1.17 0.00 0.00 0.00 52.03

WHEEL (0.00 + 46.05 + 0.00) = 46.05 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.60 68.88 -21.48 -1.35 0.00 0.00 0.00 46.05

Segment Leq : 53.01 dBA

Total Leq All Segments: 53.01 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.20

(NIGHT): 53.01