TOWN OF AURORA
PLANNING AND DEVELOPMENT SERVICES
Development Planning Division
DATE: Aug. 12, 2021
RECEIVED

SUBMISSION No. 1

Environmental Noise Feasibility Study

Archerhill Court Redevelopment

Proposed Residential Development

In the Vicinity of Vandorf Sideroad and Bayview Avenue
Town of Aurora

August 06, 2021
Project: 121-0048

Prepared for

Highfair Investments Inc.

Prepared by

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VALCOUSTICS
Canada Ltd.

Revision History

Revision #	Date	Description of Changes
1.0	August 06 2021	Final – Issued to Client

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Environmental Noise Feasibility Study

Archerhill Court Redevelopment

Proposed Residential Development

In the Vicinity of Vandorf Sideroad and Bayview Avenue
Town of Aurora

EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study for the proposed Archerhill Court redevelopment in the Town of Aurora. The proposed development will consist of 146 lots of detached dwellings. Blocks A and B at the northeast and northwest corners of the site, respectively, will be kept as open spaces.

The significant transportation noise source in the vicinity is road traffic on Bayview Avenue and Vandorf Sideroad. There are no stationary noise sources in the vicinity with potential for significant impact at the subject site.

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

To meet the applicable transportation noise source guideline limits:

- Lots 54 to 63 require mandatory air conditioning to allow windows to remain closed for noise control purposes;
- Lots 1 to 9, 39 to 53 and 64 to 68 require the provision for adding air conditioning at a later date;
- Exterior wall construction meeting a Sound Transmission Class (STC) rating of 37 and exterior windows meeting STC 26 will be required for the lots backing towards to Bayview Avenue (Lots 39 to 64);
- Exterior wall and window construction meeting the minimum non-acoustical requirements of the Ontario Building Code (OBC) will be sufficient to meet indoor noise level criteria at all remaining lots;
- 3.0 m high sound barriers are required for the lots with rear yards backing towards Bayview Avenue (Lots 39 to 64); and
- 1.8 m high sound barriers are required for the lots with rear yards backing towards Vandorf Sideroad (Lots 1 to 9 and 65 to 68)

1.0 INTRODUCTION

VCL was retained to prepare an Environmental Noise Feasibility Study for the proposed residential development in support of the rezoning application submission to the Town of Aurora and the Regional Municipality of York. The potential sound levels and noise mitigation measures needed for the proposed development to comply with the MECP and York Region noise guideline requirements are outlined herein.

1.1 THE SITE AND SURROUNDING AREA

The site is the redevelopment of Archerhill Court, which is located at the northwest corner of Vandorf Sideroad and Bayview Avenue and is bounded by:

- Lands zoned EP (Environmental Protection) and O1 (Open Space), with existing single-family dwellings beyond, to the north;
- Bayview Avenue with existing single-family dwellings beyond, to the east;
- Vandorf Sideroad with existing single-family dwellings beyond, to the south; and
- Lands zoned EP (Environmental Protection) and O1 (Open Space) to the west.

A Key Plan is included as Figure 1.

The study is based on the Preliminary Concept Plan, prepared by miCAD inc., dated May 26, 2021. The Preliminary Concept Plan is shown as Figure 2.

The site is currently occupied by Archerhill Court and 14 detached dwellings that will be demolished as part of the development.

1.2 THE PROPOSED DEVELOPMENT

The proposed development will consist of 146 lots of detached dwellings. Blocks A and B at the northeast and northwest corners of the site, respectively, will be kept as open spaces.

2.0 NOISE SOURCES

2.1 TRANSPORTATION NOISE SOURCES

The transportation noise source with the potential for impact on the proposed development is road traffic on Bayview Avenue and Vandorf Sideroad. Traffic volumes on other surrounding roadways are anticipated to be minor and no significant noise impact is expected.

Ultimate traffic data for Bayview Avenue was obtained from the Region of York.

Current (year 2021) peak-hour traffic volumes for Vandorf Sideroad were obtained from The Municipal Infrastructure Group in an email received June 17, 2021. The 24-hour volumes were obtained by multiplying the higher of either the AM or PM peak hour volumes by a factor of 10. A growth rate of 2%, compounded annually, was used to obtain future (year 2031) traffic volumes. Medium and heavy trucks were assumed to be 3% and 2%, respectively, of the total traffic volume. A day/night split of 90%/10% was used, as is typical for well-travelled roadways.

Table 1 summarizes the traffic data used in the assessment. Appendix A contains the traffic data.

2.2 STATIONARY NOISE SOURCES

An existing industrial establishment (Kirchhoff Automotive) at 200 Vandorf Sideroad is located approximate 300 m away from the closest dwelling unit on the subject site. It is understood that the Kirchhoff Automotive facility operates under the Environmental Compliance Approval (ECA) from the MECP. There are existing dwellings located closer to this facility than the proposed development. It is not expected that this facility will create significant noise impact on the proposed development and therefore is not considered further in this report.

An existing industrial development at 5-35 Furbacher Lane is located approximately 300 m away from the closest dwelling unit on the subject site. The main noise sources associated with these facilities are the mechanical equipment as well as truck delivery activities. There are existing dwellings located at a similar distance to this facility compared to the proposed development. Based on this observation and the setback distance, this facility is not expected to create significant noise impact on the proposed development and therefore is not considered further in this report.

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, as provided in 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, the indoor criterion for road traffic noise is $L_{eq\ Day}$(1) of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night, the indoor criterion for road traffic 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 architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve these indoor sound level limits.

3.1.1.2 Ventilation

In accordance with the MECP noise guideline for road traffic sources, if the daytime sound energy 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

(1) 16-hour energy equivalent sound level (0700-2300 hours).
(2) 8-hour energy equivalent sound level (2300-0700 hours).

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 living areas (OLA's), the guideline is $L_{eq\ Day}$ (0700 to 2300 hours) of 55 dBA, with an excess not exceeding 5 dBA considered acceptable if it is technically not practicable to achieve the 55 dBA objective, providing warning clauses are registered on title. Note, a balcony is not considered an OLA, unless it is:

- the only OLA for the occupant;
- at least 4 m in depth; and
- unenclosed.

3.2 REGION OF YORK GUIDELINES

The Region of York requires noise attenuation fences adjacent to regional roads, be a minimum of 2.2 m high and up to a maximum of 3.0 m high, in situations where deemed appropriate. Also, any mitigation measures deemed necessary shall attempt to achieve a minimum reduction of 6 dBA against the daytime objective level of 55 dBA.

4.0 NOISE IMPACT ASSESSMENT

4.1 ANALYSIS METHOD

Using the road traffic data in Table 1, the sound levels, in terms of energy equivalent continuous sound pressure level over the daytime and nighttime periods ($L_{eq\ Day}$ and $L_{eq\ Night}$), were determined using STAMSON V5.04 – ORNAMENT, the computerized road traffic noise prediction model of the MECP.

The daytime and nighttime sound levels at the building facades were calculated at a height of 4.5 m above grade, representing the top floor (worst case) windows.

The daytime OLA sound levels at the rear yards were calculated at a standing height of 1.5 m above grade, 3 m from the rear wall and aligned with the midpoint of the applicable facade.

Inherent screening of each building face due to its orientation to the noise source, as well as that provided by the subject development itself was taken into account. To be conservative, screening from existing development in the vicinity was not included in the assessment.

4.2 RESULTS

The highest daytime/nighttime sound levels of 66 dBA/58 dBA are predicted to occur at the east facades of Lots 54 to 63, the lots closest to Bayview Avenue.

At the rear yards, the highest unmitigated daytime OLA sound level of 66 dBA is predicted to occur at Lots 54 to 63.

Table 2 summarizes the predicted sound levels outdoors at specific locations.

Sound level calculation details are included in Appendix C.

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 the notes to Table 3.

5.1 INDOORS

5.1.1 Architectural Requirements

The indoor noise guidelines for the transportation sources can be achieved by using appropriate construction for exterior walls, windows and doors. In determining the worst-case architectural requirements, wall and window areas were each assumed to be 80% and 30%, respectively, of the associated floor area, on each facade of a corner room with both facades exposed to the noise source.

Exterior walls meeting STC 37 and exterior windows meeting STC 26 will be sufficient to meet the indoor noise guideline limits at the lots backing towards to Bayview Avenue (Lots 39 to 64).

Exterior walls and windows meeting the minimum non-acoustical requirements of the OBC will be sufficient to achieve the indoor noise guideline criteria of the MECP for all remaining lots in the development.

It is expected that typical exterior wall and window construction meeting the minimum non-acoustical requirements of the OBC will meet the STC 37 and STC 26 requirements, respectively.

Note, the window frames themselves must also be designed to ensure that the overall sound isolation performance for the entire window unit meets the sound isolation requirement. This should be confirmed by the window manufacturer through the submission of acoustical test data.

The final sound isolation requirements should be reviewed when detailed architectural plans are developed. Wall and window constructions should also be reviewed at this point to ensure that they will meet the required sound isolation performance. This is typically required by the Town at the building permit application stage.

5.1.2 Ventilation Requirements

Based on the predicted sound levels:

- Lots 53 to 63 require mandatory air conditioning; and

- Lots 1 to 9, 39 to 54 and 64 to 68 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 central air conditioning.

There are no special ventilation requirements for the remaining lots for noise control purposes.

It is understood that air conditioning will be provided for all lots in the development, meeting or exceeding the ventilation requirements.

5.2 OUTDOORS

The sound barrier analysis was completed using the Preliminary Grading Figure, prepared by SCS Consulting Group, dated February 2021. The sound barrier requirements should be checked if the grading plan changes.

The unmitigated OLA sound levels in the rear yards of the dwelling units with exposure to the Vandorf Sideroad and Bayview Avenue are predicted to exceed 55 dBA. Thus, sound barriers are required.

The following sound barriers would mitigate the daytime OLA sound levels to the 55 dBA design objective of the MECP noise guideline:

- Up to 4.8 m high at the rear yards of Lots 39 to 64; and
- 1.8 m high at the rear yards of Lots 1 to 9 and 65 to 68;

The 4.8 m high barriers exceed the maximum sound barrier height (3.0 m) requirements from the Region of York. A 3.0 m high sound barrier will mitigate the daytime sound levels to 60 dBA for Lot 39 to 64. This is within maximum permitted under MECP guidelines and is recommended, provided a warning clause is registered on title.

The locations of the sound barriers are shown on Figure 2.

The sound barriers must be of solid construction with no gaps, cracks or holes (except for small openings required for water drainage) 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.

5.3 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.

6.0 CONCLUSIONS

With the incorporation of the recommended noise mitigation measures, the applicable MECP 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.

7.0 REFERENCES

1. "Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, August 2013.

2. Road and Rail Noise: Effects on Housing", Canada Mortgage and Housing Corporation, Publication NHA 5156, 81/10.

3. PC STAMSON 5.04, "Computer Program for Road Traffic Noise Assessment", Ontario Ministry of the Environment.

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

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TABLE 1 ROAD TRAFFIC DATA

Roadway	Year	24-Hour Volume	% Trucks		Day/Night (%)	Grade (%)	Speed Limit (kph)
			Medium	Heavy			
Bayview Avenue(1)	Ultimate	35 000	1	2	93/7	6	70
Vandorf Sideroad(2)	2021 (2031)	8 490 (10 349)	3	2	90/10	7	60

Notes:

(1) Ultimate traffic data provided by the Region of York.

(2) The 24-hour traffic volumes were calculated from the current (year 2021) peak hour traffic volumes provided by the traffic consultants for this project. The peak hour volumes were converted to 24-hour volumes using a factor of 10. Future (year 2031) volumes were obtained using a growth rate of 2%, compounded annually. The grade was calculated based on the Preliminary Grading Figure, prepared by SCS Consulting Group, dated February 2021. Truck percentages and day/night split were assumed.

TABLE 2 PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS

Location(1)	Source	Distance (m)(2)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Lot 7 (South Facade)	Bayview Avenue	198	51	43
	Vandorf Sideroad	32	61	54
	TOTAL	-	**61**	**54**
Lot 10 (South Facade)	Vandorf Sideroad	57	55	49
Lot 53 (East Facade)	Bayview Avenue	40	65	57
Lot 62 (East Facade)	Bayview Avenue	35	66	58
	Vandorf Sideroad	74	52	45
	TOTAL	-	**66**	**58**
Lot 64 (Southeast Facade)	Bayview Avenue	38	64	56
	Vandorf Sideroad	54	56	50
	TOTAL	-	**65**	**57**
Lot 7 (OLA)	Bayview Avenue	203	43	-
	Vandorf Sideroad	29	61	-
	TOTAL	-	**61**	-
Lot 51 (OLA)	Bayview Avenue	49	63	-
Lot 62 (OLA)	Bayview Avenue	32	66	-
	Vandorf Sideroad	78	52	-
	TOTAL	-	**66**	**-**
Lot 65 (OLA)	Bayview Avenue	71	52	-
	Vandorf Sideroad	31	60	-
	TOTAL	-	**61**	-

Notes:

(1) See Figure 2.

(2) Distance indicated is taken from the centreline of the noise source to the point of reception.

TABLE 3 MINIMUM NOISE ABATEMENT MEASURES

Location	Air Conditioning(1)	Exterior Wall(2)	Exterior Window(3)	Sound Barrier(4)	Warning Clauses(5)
Lots 54 to 63	Mandatory	STC 37	STC 26	3.0 m High	A + B
Lots 39 to 53 and 64	Provision for Adding	STC 37	STC 26	3.0 m High	A + C
Lots 1 to 9 and 65 to 68	Provision for Adding	No special acoustical requirements		1.8 m High	A + C
All remaining lots	None	No special acoustical requirements		None	None

Notes:

1) Where means must be provided to allow windows to remain closed for road noise control purposes, a commonly used technique is that of air central conditioning. Provision for adding air conditioning typically takes the form of a ducted ventilation system suitably sized to permit the addition of central air conditioning by the occupant.

2) STC - Sound Transmission Class Rating (Reference ASTM-E413).

   The requirements are based on the assumed percentages of wall and window area to associated floor area stated in Section 5.1.1.

3) STC - Sound Transmission Class Rating (Reference ASTM-E413). A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.

   The requirements are based on the assumed percentages of wall and window area to associated floor area stated in Section 5.1.1.

4) Sound barriers must be of solid construction with no gaps, cracks or holes and must meet a minimum surface density of 20 kg/m². Suitable material can include wood, concrete metal sandwich panel, glazing or a combination of these.

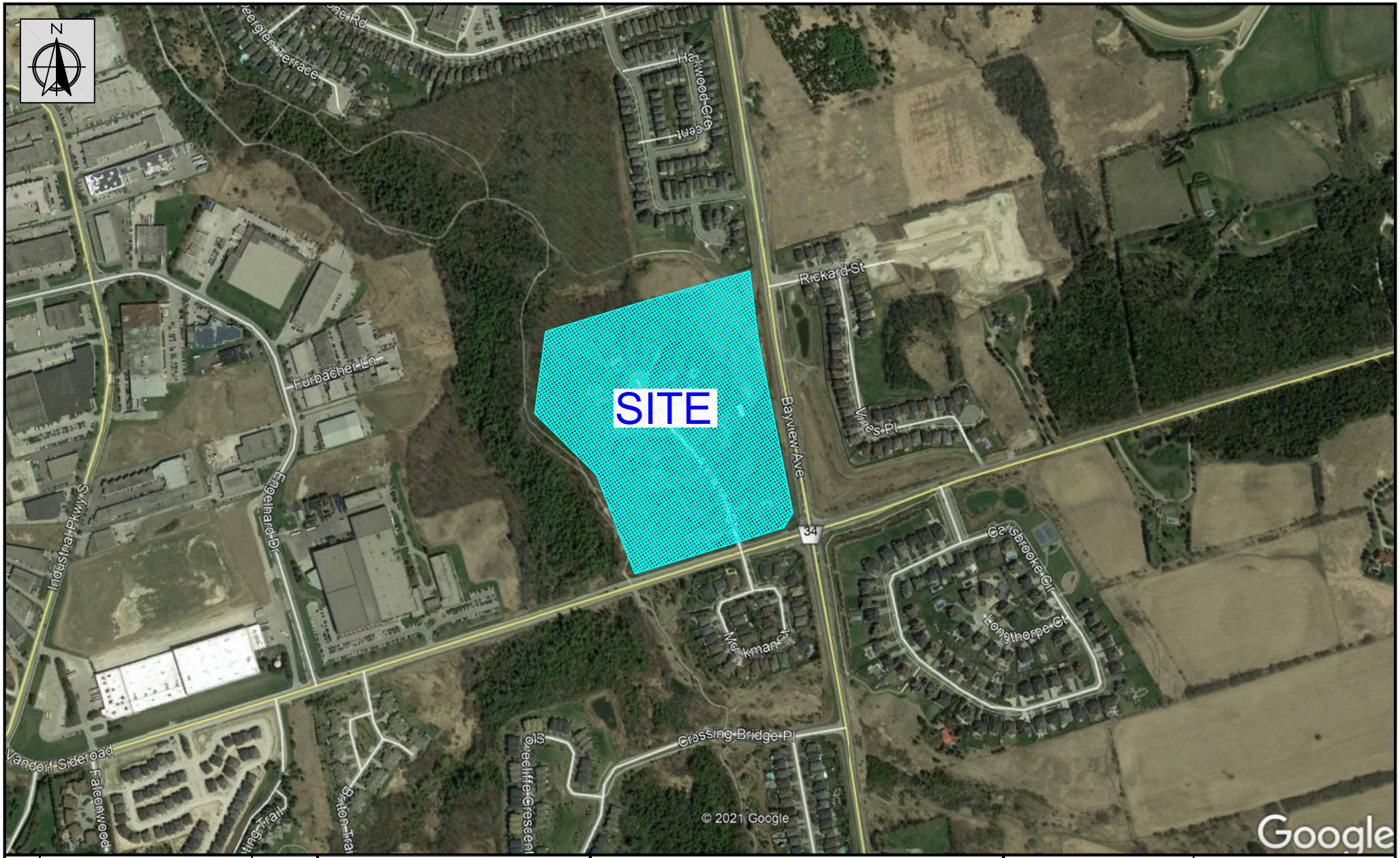
5) The warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:

   A. "Purchases/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 traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

   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 sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

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

6) All exterior doors shall be fully weather-stripped.



No.	Revision/Issue	Date

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Phone: (905) 764-5223
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Title
Key Plan

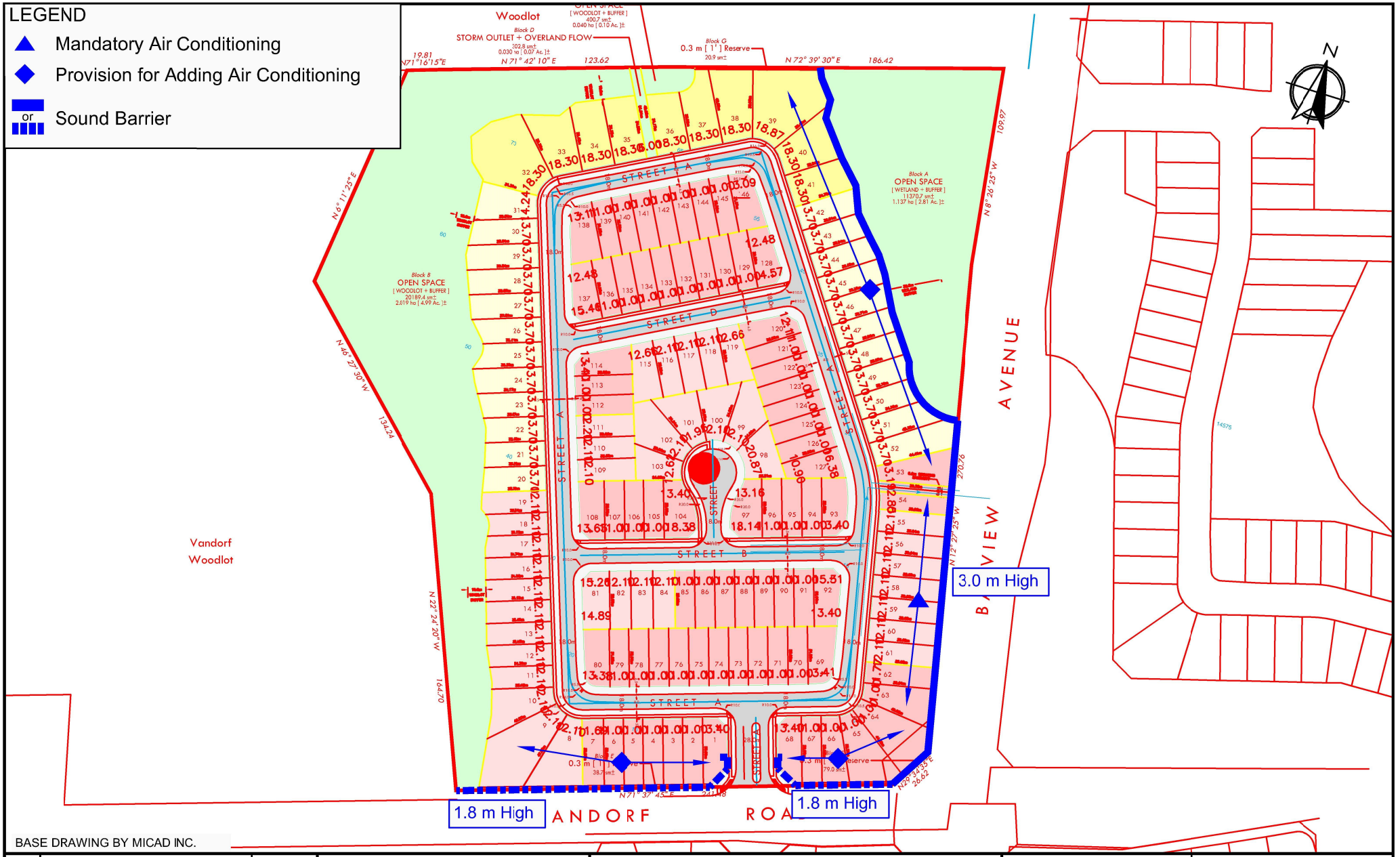
Project No.
121-0048

Date
August 6, 2021

Project Name
Archerhill Court Redevelopment, Aurora

Scale
N.T.S.

Figure
1



BASE DRAWING BY MICAD INC.

No.	Revision/Issue	Date

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Title	Project No.	Date
Preliminary Concept Plan	121-0048	August 6, 2021
Project Name	**Scale**	**Figure**
Archerhill Court Redevelopment, Aurora	N.T.S.	2

APPENDIX A
ROAD TRAFFIC DATA

Transportation Services Department
Transportation and Infrastructure Planning

March 3, 2021

Vivek Shankar
Valcoustics Canada Ltd.
30 Wertheim Court, Unit 25
Richmond Hill, ON L4B 1B9

Re: Request for Traffic Data
File No. T09, Forecasts - Aurora

As requested, the traffic data for your study are summarized below:

	Bayview Avenue
Section No.	34-22
Location	South of Wellington Street East
Existing AADT	18,000 (2018)
Ultimate AADT	35,000
No. of Lanes	2 (future 4)
Posted Speed	70 km/h
Trucks (Med/Heavy)	1% / 2%
Grade	Up to 6%
Day/Night Split	93/7
Planned ROW	Up to 36 m

I trust that this will be satisfactory for your study. The invoice will be mailed to you separately.

Sincerely,

Wenli Gao
Transportation Planning, Forecasting

WG/wg

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Brett Lipson

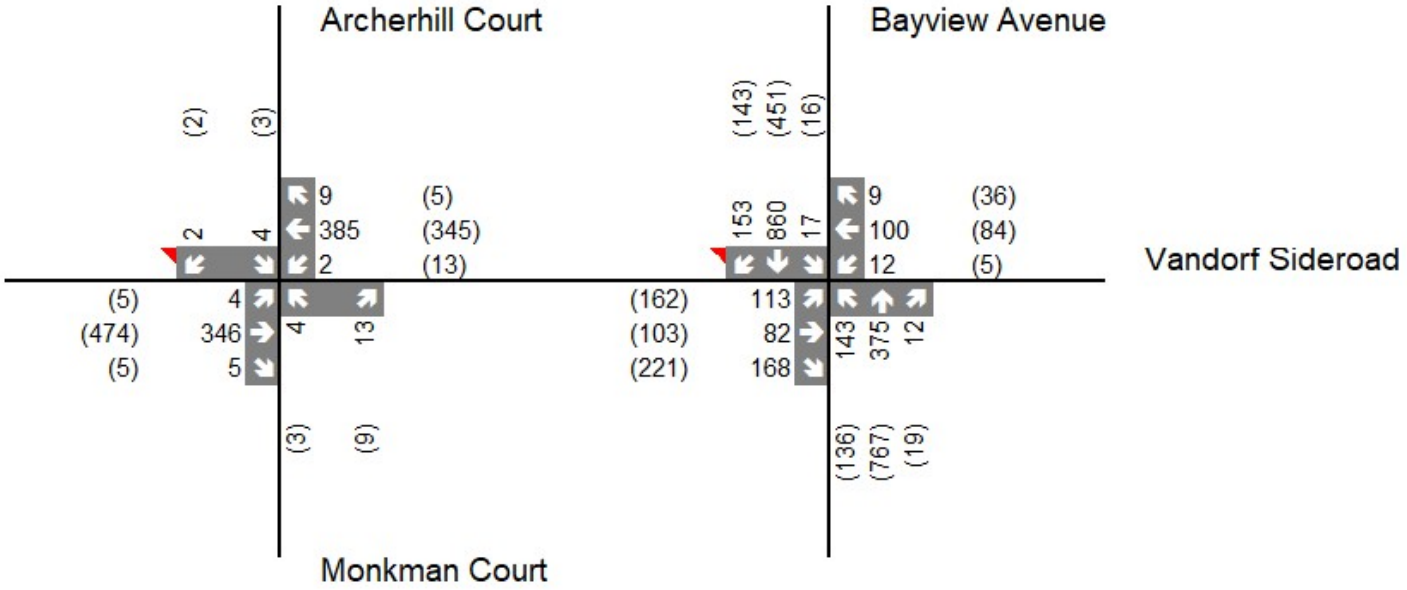
From: Alycia Gruchalla <AGruchalla@tmig.ca>
Sent: June 17, 2021 10:19 AM
To: Sam Du
Cc: Brett Lipson; Farah Ibrahim; Michael Dowdall; Chris Day
Subject: RE: 10187: RE: Archerhill Court Traffic Data

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Sam,

Please find the AM and (PM) peak hours we are using as our baseline (2021) traffic at the intersections of Vandorf at Archerhill and Bayview.

Due to current low traffic volumes associated with the Covid-19 pandemic, these volumes have been taken in part by the most recent TMCs completed, and in part based on historical TMC data with a growth rate applied to the volumes.



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 Source – 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: 03-08-2021 37:14:30
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: 62_ef.te             Time Period: Day/Night 16/8 hours
Description: Lot 62 - East Facade


Road data, segment # 1: Bayview (day/night)
-------------------------------------------
Car traffic volume  : 31574/2376  veh/TimePeriod  *
Medium truck volume :   326/24    veh/TimePeriod  *
Heavy truck volume  :   651/49    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     6 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   1.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  93.00

Data for Segment # 1: Bayview (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  :  35.00 / 35.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: Vandorf (day/night)
-------------------------------------------
Car traffic volume  :  8849/983   veh/TimePeriod  *
Medium truck volume :   279/31    veh/TimePeriod  *
Heavy truck volume  :   186/21    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     7 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8490
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Vandorf (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  :  74.00 / 74.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Bayview (day)
----------------------------------
Source height = 1.19 m

ROAD (0.00 + 65.76 + 0.00) = 65.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  72.89   0.00  -5.81  -1.32   0.00   0.00   0.00  65.76
-------------------------------------------------------------------------------
Segment Leq : 65.76 dBA

Results segment # 2: Vandorf (day)
----------------------------------
Source height = 1.19 m

ROAD (0.00 + 51.90 + 0.00) = 51.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.58  67.18   0.00 -10.95  -4.33   0.00   0.00   0.00  51.90
-------------------------------------------------------------------------------
Segment Leq : 51.90 dBA

Total Leq All Segments: 65.93 dBA

Results segment # 1: Bayview (night)
------------------------------------
Source height = 1.19 m

ROAD (0.00 + 57.53 + 0.00) = 57.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  64.66   0.00  -5.81  -1.32   0.00   0.00   0.00  57.53
-------------------------------------------------------------------------------
Segment Leq : 57.53 dBA

Results segment # 2: Vandorf (night)
------------------------------------
Source height = 1.19 m

ROAD (0.00 + 45.41 + 0.00) = 45.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.58  60.69   0.00 -10.95  -4.33   0.00   0.00   0.00  45.41
-------------------------------------------------------------------------------
Segment Leq : 45.41 dBA

Total Leq All Segments: 57.79 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.93
                           (NIGHT): 57.79
```