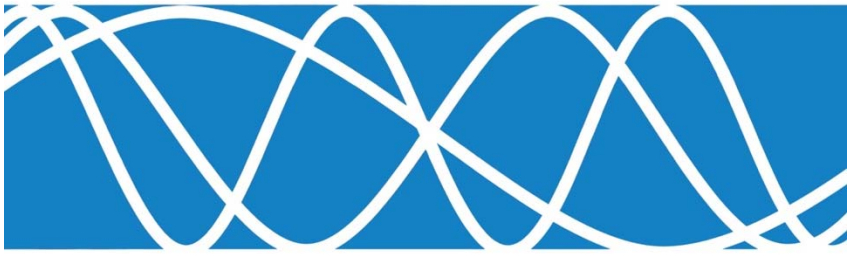
Noise Feasibility Study

Proposed Residential Development

North Birdie Smith

Udora, Ontario

December 28, 2024
HGC Project#: 02200336



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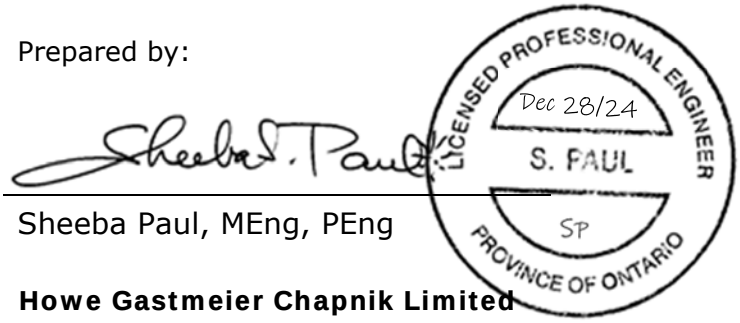
Version Control

Ver.	Date	Version Description	Prepared By
1	December 28, 2024	Noise Feasibility Study to support planning and approval process.	S. Paul

Prepared by:



Sheeba Paul, MEng, PEng

Howe Gastmeier Chapnik Limited

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Any conclusions and/or recommendations herein reflect the judgment of HGC based on information available at the time of preparation and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.

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1 INTRODUCTION & SUMMARY

HGC Engineering was retained by J&J Developments to conduct a Noise Feasibility Study for a proposed residential development located north of Birdie Smith Court in Udora, Ontario. The subject lands are identified as Part of Lot 35, Concession 6, in the Township of Uxbridge. The proposed development consists of 9 lots. This study is required by Durham Region as part of the planning and approvals process.

This report has been updated to reflect the latest site plan prepared by E.R. Garden Limited dated November 11, 2024 and the latest traffic volumes from the Region of Durham.

The primary sources of noise are road traffic on Ravenshoe Road and Durham Road 1 (Concession Road 7). Future traffic sound levels at the proposed building façades and outdoor living areas were predicted using road traffic data obtained from the Regional Municipality of Durham. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks (MECP) and the Region to develop noise control recommendations.

The results of this study indicate that with suitable noise control measures integrated into the design of proposed dwellings, it is feasible to achieve the MECP guideline sound levels. Dwellings with some exposure to Ravenshoe Road should be designed with a provision for the installation of central air conditioning in the future, at the occupant’s discretion. For all the dwelling units, building constructions meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the indoor spaces to comply with the MECP noise criteria. Noise warning clauses are recommended to inform future residents of the possible traffic noise impacts in the area.

2 SITE DESCRIPTION & NOISE SOURCES

2.1 Site Description

Figure 1 is a key plan indicating the location of the proposed site. The site is located south of an existing row of houses from Ravenshoe Road and west of an existing row of houses from Durham Road 1. A roadway is proposed from Durham Road 1. A proposed site plan of the development prepared by E.R. Garden Limited dated November 11, 2024, is shown in Figure 2. The proposed development will consist of 7 residential lots and a stormwater block.

The primary sources of noise impacting the site are road traffic on Ravenshoe Road and Durham Road 1. Existing two storey residences surround the proposed development.

3 TRAFFIC NOISE ASSESSMENT

3.1 Road Traffic Noise Criteria

Guidelines for acceptable levels of road noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", release date October 21, 2013, and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A weighted decibels [dBA].

Table 1: Applicable Sound Level Limits [dBA]

Space	Daytime [$L_{EQ-16hr}$] Road	Nighttime [L_{EQ-8hr}] Road
Outdoor Living Areas	55	--
Inside Living/Dining Rooms	45	45
Inside Bedrooms	45	40

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the time period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, or other area

where passive recreation is expected to occur. Small balconies are not considered OLAs for the purposes of assessment. Terraces greater than 4 m in depth (measured perpendicular to the building façade) are considered to be OLAs.

The guidelines in the MECP publication allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically, and administratively practical.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible excesses are also required when nighttime sound levels exceed 50 dBA at the plane of bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of bedroom or living/dining room window due to road traffic.

3.2 Traffic Data

3.2.1 Road Traffic Data

Traffic data for Ravenshoe Road and Durham Road 1 was obtained from the Region of Durham in the form of Ultimate Average Annual Daily Traffic (AADT) traffic values, and is provided in Appendix A.

For Ravenshoe Road an ultimate volume of 20 000 vehicles per day at an operating speed limit of 80 km/h was applied for the analysis. A commercial vehicle percentage of 4% for medium trucks and 6% for heavy trucks was applied. A day night split of 90%/10% and a road gradient of <2% was used.

For Durham Road 1 an ultimate volume of 6 000 vehicles per day at an operating speed limit of 50 km/h was applied for the analysis. A commercial vehicle percentage of 2.1% for medium trucks and 4.9% for heavy trucks was applied. A day night split of 90%/10% and a road gradient of <2% was used. Table 2 summarizes the traffic volume data used in this study.

Table 2: Ultimate Road Traffic Data

Roadway	Ultimate AADT	Day / Night Split [%]	Trucks Percentage (%)		Speed Limit [km/h]
			Medium	Heavy	
Ravenshoe Road	20 000	90 / 10	4	6	80
Durham Road 1 (Concession 7)	6 000	90 / 10	2.1	4.9	50

3.3 Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the study area in the future, sound level predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. STAMSON output is included in Appendix B.

Predictions of the traffic sound levels were chosen around the site to obtain an appropriate representation of future sound levels at various potential façades and in outdoor living areas. Sound levels were predicted at the plane of the top

storey bedroom and/or living/dining room windows during the daytime and nighttime hours to investigate ventilation and façade construction requirements. Figure 2 shows the site plan. The results of these predictions are summarized in Table 3.

Table 3: Predicted Future Sound Levels, Without Mitigation [dBA]

Lot No.	Description	Daytime at Façade dBA $L_{EQ(16)}$	Nighttime at Facade dBA $L_{EQ(8)}$	OLA dBA $L_{EQ(16)}$
1 – 4	Southernmost Properties	<55	<50	<55
5	Property with some exposure to Durham Road 1- East façade	56	<50	56
6	North Property with some exposure to Ravenshoe Road - North façade	58	51	58
7	North Property with some exposure to Ravenshoe Road - North façade	58	51	58

3.4 Discussion and Recommendations

The sound level predictions indicate that the future traffic sound levels will exceed MECP guidelines at many of the lots in the proposed development. The following discussion outlines the recommendations for ventilation requirements, upgraded building façade construction, and warning clauses to achieve the noise criteria stated in Table 1.

3.4.1 Outdoor Living Areas

The predicted daytime sound level will be up to 58 dBA in the rear yards of the northernmost properties (Lots 5, 6, 7). The predicted sound level at these OLAs exceed the MECPs limit of 55 dBA by 3 dBA. Physical mitigation is not required to address these excesses; however, warning clauses are recommended to inform future occupants of the sound level excesses due to traffic noise.

The remaining rear yards will have sound levels below the 55 dBA limit and mitigation is not required.

3.4.2 Indoor Living Areas and Ventilation Requirements

Provision for the Future Installation of Air Conditioning

The predicted sound levels at the plane of the windows on dwellings located in the northern most lots will be between 56 and 65 dBA during daytime hours and/or between 51 to 60 dBA during nighttime hours. To address these excesses, the MECP guidelines recommend that these dwellings should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Figure 3 indicates the lots requiring provision for the installation of air conditioning at the occupant's discretion. Inclusion of air conditioning will meet and exceed the requirements. The guidelines also recommend warning clauses for these units. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300, as applicable.

3.4.3 Building Façade Constructions

The predicted future sound levels outside the living room/dining room/bedroom windows of all dwellings will be less than 65 dBA during the daytime hours and less than 60 dBA during the nighttime hours. Any exterior façade constructions meeting the requirements of the Ontario Building Code will provide sufficient sound insulation for the indoor spaces.

3.4.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all dwelling units with anticipated road and rail traffic sound level excesses. Examples are provided below in the same order as outlined in NPC-300.

Suggested wording for future dwellings with minor sound level excesses is given below.

Type A:

> Purchasers/tenants are advised that sound levels due to increasing road traffic may on occasion 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.

Suitable wording for future dwellings requiring forced air ventilation systems is given below.

Type C:

> This dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.)

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

4 CONCLUSIONS AND SUMMARY

The following list and Table 4 and Figure 3 summarize the recommendations made in this report. The reader is referred to the previous sections of the report where these recommendations are applied and discussed in more detail.

1. The northerly dwellings should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. The location, installation and sound ratings of the air conditioning devices should comply with NPC 300.2.
2. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues.

Table 4: Summary of Noise Control Requirements and Noise Warning Clauses

Lot No.	Acoustic Barrier	Ventilation Requirements	Type of Warning Clause	Building Construction
5, 6, 7	--	Forced Air	A, C	OBC
All remaining dwellings	--	--	--	OBC

Note:
-- no specific requirement
OBC – meeting the minimum requirements of the Ontario Building Code
Note:
* The location, installation, and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300.
-- No specific requirement
OBC – meeting the minimum Ontario Building Code requirements
LRDR – Living Room / Dining Room
BR – Bedroom

4.1 Implementation

To ensure that the noise control recommendations outlined above are properly implemented, it is recommended that:

1. Prior to the issuance of occupancy permits for this development, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly incorporated, installed, and constructed.

5 REFERENCES

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

2. *Google Maps Aerial Imagery, Internet application: maps.google.com.*

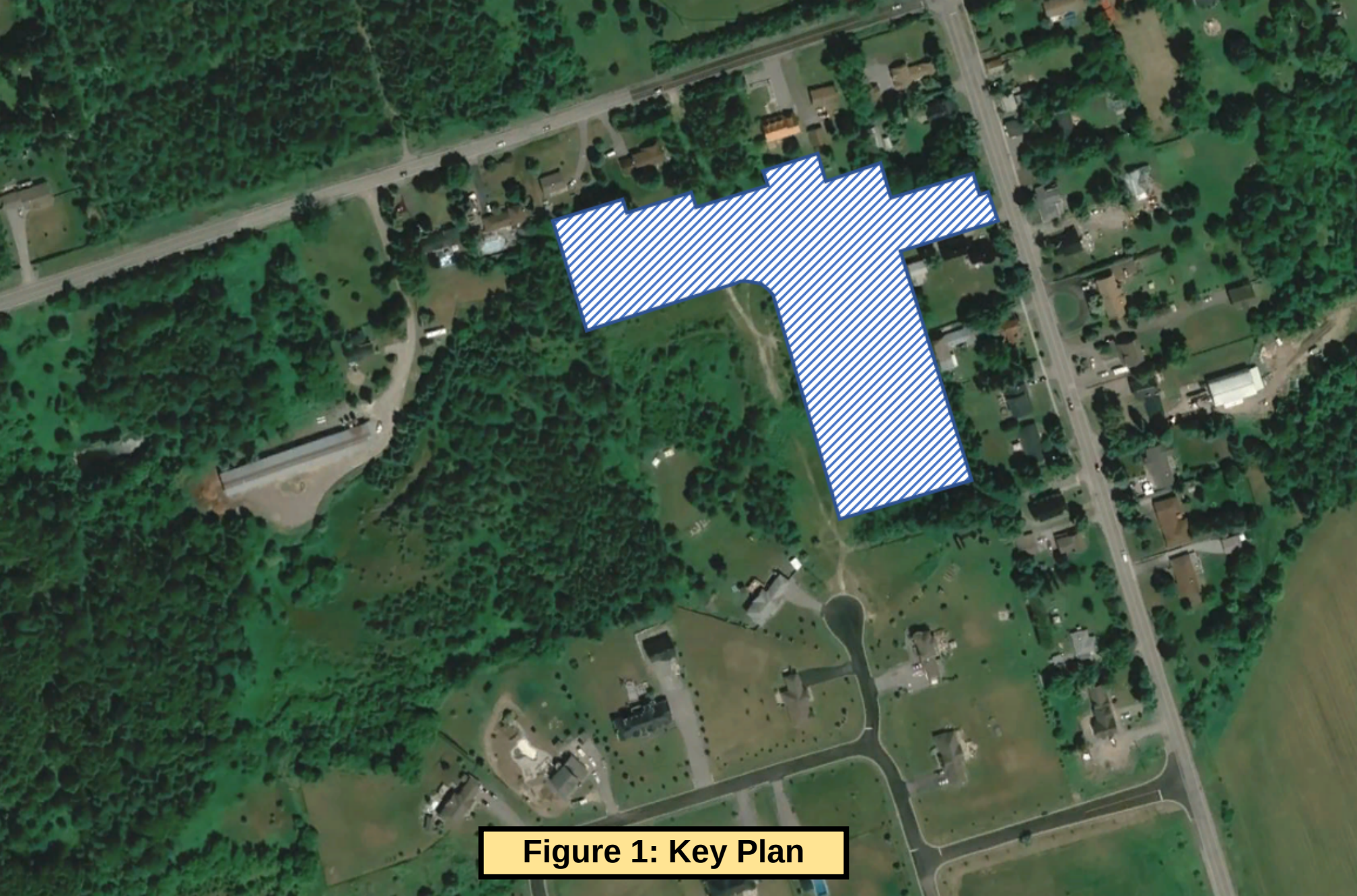
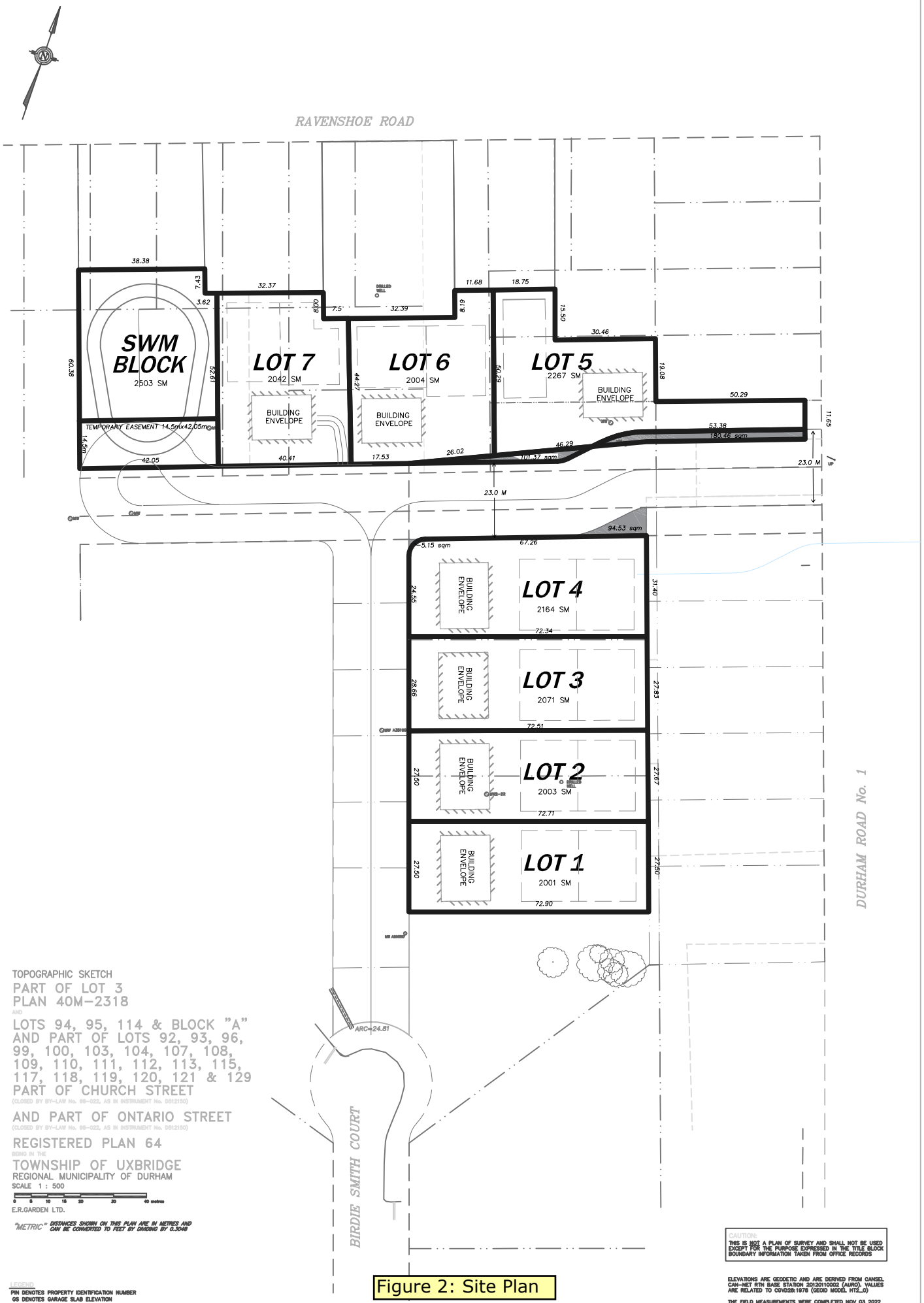


Figure 1: Key Plan



TOPOGRAPHIC SKETCH
PART OF LOT 3
PLAN 40M-2318
AND
LOTS 94, 95, 114 & BLOCK "A"
AND PART OF LOTS 92, 93, 96, 99, 100, 103, 104, 107, 108, 109, 110, 111, 112, 113, 115, 117, 118, 119, 120, 121 & 129
PART OF CHURCH STREET
(CLOSED BY BY-LAW No. 88-022, AS IN INSTRUMENT No. DR12150)
AND PART OF ONTARIO STREET
(CLOSED BY BY-LAW No. 88-022, AS IN INSTRUMENT No. DR12150)
REGISTERED PLAN 64
BEING IN THE
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM
SCALE 1 : 500
0 5 10 15 20 30 40 metres
E.R.GARDEN LTD.

"METRIC" DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

LEGEND
PIN DENOTES PROPERTY IDENTIFICATION NUMBER
GS DENOTES GARAGE SLAB ELEVATION
CSP DENOTES CORRUGATED STEEL PIPE
INV DENOTES PIPE INVERT ELEVATION
OBV DENOTES PIPE OBVERT ELEVATION
UP DENOTES UTILITY POLE
-OH- DENOTES OVERHEAD WIRE
GW DENOTES GUY WIRE
MW DENOTES MONITORING WELL
DENOTES DECIDUOUS TREE, TRUNK SIZE NOTED IN METRES

CAUTION:
THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE EXPRESSED IN THE TITLE BLOCK
BOUNDARY INFORMATION TAKEN FROM OFFICE RECORDS

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CANSEL CAN-NET RTN BASE STATION 20120110022 (AURO). VALUES ARE RELATED TO CGVD28:1978 (GEOID MODEL HT2_0)

THE FIELD MEASUREMENTS WERE COMPLETED NOV 03 2022

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E.R.GARDEN LIMITED
ONTARIO LAND SURVEYOR
1260 JOURNEY'S END CIRCLE, UNIT 1
NEWMARKET, ONTARIO L3Y 8Z7

DRAWN BY: R.D.
FILE No.

Figure 2: Site Plan

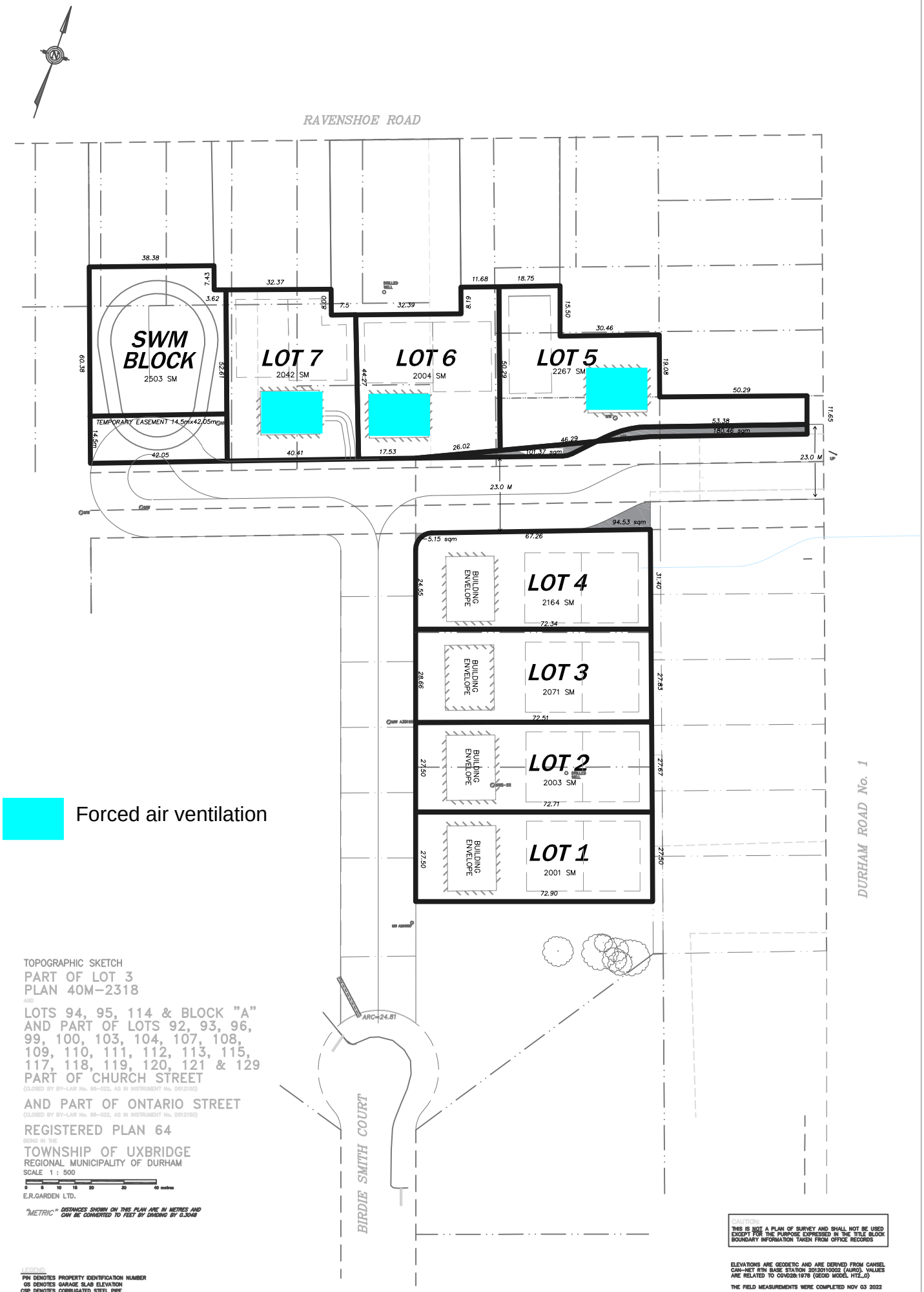

Figure 3: Site Plan Showing Ventilation Requirements

Appendix A
Road Traffic Data

Planning and Economic
Development Department

Planning Division

605 ROSSLAND RD. E.
4TH FLOOR
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Brian Bridgeman, MCIP, RPP, PLE
Commissioner of Planning and
Economic Development

The Regional Municipality of Durham

ROAD SEGMENT TRAFFIC FORECASTS FOR NOISE ANALYSES

This information is to be used as the basis for assessing the potential impacts of noise, generated by traffic on Provincial Highways and arterial roads, on proposed land uses that are sensitive (e.g., residential subdivisions). Arterial roads include existing and future Type A, B and C, as designated in the Durham Regional Official Plan.

Noise assessment reports recommend specific measures to be integrated into the design of sensitive developments to reduce road noise impacts to acceptable levels.

Provided For:

Name / Name of Firm: Sheeba Paul, HGC Noise Vibration Acoustics

Address: 2000 Argentia Road, PL 1, Suite 203, Mississagua ON L5N 1P7

Telephone: (905) 826-4044 Fax:

Location of Proposal:

approximately 75 meters southwest of the intersection of Ravenshoe Road and Concession Road 7, Udora, Uxbridge

Municipality: Lot(s): Concession:

Durham Region File No. (if available):

Name of Property Owner (if available):

Date Request Received: December 19, 2024 Received By: Anthony Caruso

Date Forecast Sent: December 20, 2024

Name of Road Segment	Forecasted AADT*	No. of Lanes	% of Trucks	Heavy : Medium Truck Ratio		Speed (km/h)
Ravenshoe Road (RR39 to RR1)	20,000	2	10	60	40	80

* Average Annual Daily Traffic. Forecast based on ultimate development according to the Durham Regional Official Plan.

Planning and Economic
Development Department

Planning Division

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Commissioner of Planning and
Economic Development

The Regional Municipality of Durham

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Noise assessment reports recommend specific measures to be integrated into the design of sensitive developments to reduce road noise impacts to acceptable levels.

Provided For:

Name / Name of Firm: Patrick Walsh, HGC Engineering

Address: 2000 Argentia Rd 1, Suite 203, Mississauga

Telephone: (905) 826-4044 Fax:

Location of Proposal:

691 Ravenshoe Rd, Udora

Municipality: Uxbridge Lot(s): Concession:

Durham Region File No. (if available):

Name of Property Owner (if available):

Date Request Received: May 11, 2022 Received By: Victor Copetti

Date Forecast Sent: May 17, 2022

Name of Road Segment	Forecasted AADT*	No. of Lanes	% of Trucks	Heavy : Medium Truck Ratio		Speed (km/h)
Ravenshoe Rd (west of Concession Rd 7)	10,000	2	10	60	40	60
Concession Rd 7 (south of Ravenshoe Rd)	6,000	2	7	70	30	50
	0	0	0	0	0	0
	0	0	0	0	0	0

* Average Annual Daily Traffic. Forecast based on ultimate development according to the Durham Regional Official Plan.

Appendix B
Sample STAMSON Calculations

```
STAMSON 5.0        NORMAL REPORT        Date: 23-12-2024 130:01:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 6.te                 Time Period: Day/Night 16/8 hours
Description:  Daytime and nighttime sound levels at Lot 6,     North
Property with some exposure to Ravenshoe Road - North façade

Road data, segment # 1: Ravenshoe Rd (day/night)
-----------------------------------------------
Car traffic volume  : 16200/1800  veh/TimePeriod  *
Medium truck volume :   720/80    veh/TimePeriod  *
Heavy truck volume  :  1080/120   veh/TimePeriod  *
Posted speed limit  :    80 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):  20000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   4.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Ravenshoe Rd (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  79.00 / 79.00  m
Receiver height           :   4.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Ravenshoe Rd (day)
---------------------------------------

Source height = 1.57 m

ROAD (0.00 + 58.35 + 0.00) = 58.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
---
   -90     90   0.57  73.63   0.00 -11.31  -1.30   0.00  -2.67   0.00
58.35
-------------------------------------------------------------------------------
---

Segment Leq : 58.35 dBA
```

```
Total Leq All Segments: 58.35 dBA

Results segment # 1: Ravenshoe Rd (night)
----------------------------------------

Source height = 1.57 m

ROAD (0.00 + 51.01 + 0.00) = 51.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.66  67.10   0.00 -11.96  -1.45   0.00  -2.67   0.00
51.01
-------------------------------------------------------------------------
---

Segment Leq : 51.01 dBA

Total Leq All Segments: 51.01 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.35
                           (NIGHT): 51.01
```

```
STAMSON 5.0        NORMAL REPORT        Date: 23-12-2024 130:01:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 6ola.te              Time Period: 16 hours
Description: Daytime sound level in the rear yard of Lot 6, with some
exposure to Ravenshoe Road

Road data, segment # 1: Ravenshoe Rd
----------------------------------
Car traffic volume  : 16200 veh/TimePeriod  *
Medium truck volume :   720 veh/TimePeriod  *
Heavy truck volume  :  1080 veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Ravenshoe Rd
----------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  75.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Ravenshoe Rd
----------------------------------

Source height = 1.57 m

ROAD (0.00 + 57.91 + 0.00) = 57.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.66  73.63   0.00 -11.59  -1.45   0.00  -2.67   0.00
57.91
-------------------------------------------------------------------------
---

Segment Leq : 57.91 dBA

Total Leq All Segments: 57.91 dBA

TOTAL Leq FROM ALL SOURCES:       57.91
```