



Noise Impact Assessment
1869 Maple Grove Road
Ottawa, Ontario

Client:

10886378 Canada Incorporated
190 Lisgar Street
Ottawa, ON K2P 0CA

Submitted for:

Zoning By-law Amendment, Plan of Subdivision

Project Name:

1869 Maple Grove Road

Project Number:

OTT-00254810-A0

Prepared By:

EXP

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Date Submitted:

April 6, 2020

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Project Engineer

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Date Submitted:

April 6, 2020

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1 Introduction

1.1 Overview

EXP Services Inc. (EXP) was retained by 10886378 Canada Incorporated to undertake a noise impact assessment study in support of a Plan of Subdivision, Zoning By-law Amendment and Part Lot Control applications for a proposed residential development containing 18 town home units, located at 1869 Maple Grove Road in the City of Ottawa. The 0.41-hectare site is situated along Maple Grove Road as illustrated in **Figure 1-1** below.

Since the site is located within 100m of Maple Grove Road, which is as an undivided 2-Lane Major Collector (2-UMCU) roadway, a noise impact assessment due to traffic is required.



Figure 1-1 - Site Location

This report assesses noise impact from surface transportation sources only. No stationary noise sources were noted at the site which would exceed the sound level criteria, and therefore an assessment of stationary noise sources was not completed as part of project report.

This study was carried out in accordance with the Ministry of the Environment Conservation & Parks (MECP) Environmental Noise Control Guideline NPC-300 and the City of Ottawa's Environmental Noise Control Guidelines (COENCG). The findings of the study will address noise levels and recommend if noise abatement measures are necessary to bring noise levels to acceptable

levels. This noise impact study is prepared to address the following requirements as identified in Section 2.1 of the COENCG and Section 4.8.7 of the City of Ottawa's Official Plan (COOP):

Development proposals for new noise sensitive land uses are required to include a noise feasibility study and/or detailed noise study in the following locations:

- Mixed Use Centre, Town Centre and Mainstreets as identified on Schedule B;

or within

- 100 metres from the right-of-way of:
 - an existing or proposed arterial, collector or major collector road identified on Schedules E and F; or
 - a light rail transit corridor; bus rapid transit, or transit priority corridor identified on Schedule D;
- 250 metres from the right-of-way of:
 - an existing or proposed highway;
- 300 metres from the right of way of
 - a proposed or existing rail corridor or;
 - secondary main railway line;
- 500 metres from the right-of-way of:
 - a 400-series provincial highway, freeway or
 - a principle main railway line.

2 References

A summary of the documents that were referenced during the preparation of this report include the following:

- Ministry of the Environment Technical Document, ORNAMENT, Ontario Road Noise Analysis Method for Environment and Transportation, Sept 1999.
- Ministry of the Environment Publication NPC-300, Stationery and Transportation Sources-Approvals and Planning, August 2013.
- City of Ottawa Official Plan (COOP), 2013.
- City of Ottawa Transportation Master Plan (COTMP), November 2013.
- City of Ottawa Environmental Noise Control Guidelines (COENCG), January 2016.

3 Sound Level Criteria

Ministry of the Environment and the City of Ottawa Guidelines place limitations on indoor and outdoor sound levels from road traffic which are summarized in Table 3-1 below. Noise criteria is taken from Tables 2.2a and 2.2b from the COENCG.

Table 3-1: MECP and City of Ottawa Indoor and Outdoor Criteria for Noise from Road Traffic

Location	Space	Time Period	Equivalent Level Leq (dBA)
Indoors	Sleeping quarters of residences, hospitals, schools, nursing / retirement homes, etc.	Nighttime 23:00 to 07:00	40
	Sleeping quarters of hotels/motels	Nighttime 23:00 to 07:00	45
	Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Daytime 07:00 to 23:00	45
	Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Nighttime 23:00 to 07:00	40
	General offices, reception areas, retail stores, etc.	Daytime 07:00 to 23:00	50
Outdoors	Outdoor Living Areas	Daytime 07:00 to 23:00	55

The basic physical measurement of noise used in this report is the A-weighted sound level measured in dBA, which is an overall measurement of sound over a full range of frequencies. Because noise from roadway traffic fluctuates over the audible range of hearing, it is convenient to describe noise in terms of an equivalent 24-hour sound level (denoted as Leq). MECP Guidelines require that traffic noise be evaluated in relation to specific locations during certain time periods.

In general, noise levels are predicted for outdoor living areas (generally the backyard of a residential home) during the day and for indoor areas (living areas during the day and bedrooms) during the nighttime. A summary of these requirements is shown

Table 3-2: Outdoor, Ventilation & Warning Clause Requirements Road Noise, Daytime (0700-2300)

Assessment Location	Leq (16 Hr) (Dba)	Ventilation Requirements	Outdoor Control Measures	Warning Clause
Outdoor Living Area (OLA)	Less than or equal to 55 dBA	N/A	None required	Not required
	Greater than 55 dBA to less than or equal to 60 dBA	N/A	Control measures (barriers) may not required but should be considered	Required if resultant Leq exceeds 55 dBA, Type A
	Greater than 60 dBA	N/A	Control measures (barriers) required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible	Required if resultant Leq exceeds 55 dBA, Type B

Plane of Living Room Window	Greater than 50 dBA to less than or equal to 55 dBA	None required	N/A	Not required
	Greater than 55 dBA to less than or equal to 65 dBA	Forced air heating with provision for central air conditioning	N/A	Required Type C
	Greater than 65 dBA	Central air conditioning	N/A	Required Type D

Table 3-3: Ventilation and Warning Clause Requirements Road Noise, Nighttime (2300-0700)

Assessment Location	Leq (8 Hr) (Dba)	Ventilation Requirements	Warning Clause
Plane of Bedroom Window	Greater than 50 dBA to less or equal to 60 dBA	Forced air heating with provision for central air conditioning	Required Type C
	Greater than 60 dBA	Central air conditioning	Required Type D

Table 3-4: Building Component Requirements Road Noise, Daytime (0700-2300)

Assessment Location	Noise Source	Leq (16 Hr) (Dba)	Warning Clause
Plane of Living Room Window	Road	Less than or equal to 65 dBA	Building compliant with Ontario Building Code
		Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

Table 3-5: Building Component Requirements Road Noise, Nighttime (2300-0700)

Assessment Location	Noise Source	Leq (8 hr) (dBA)	WARNING CLAUSE
Plane of Bedroom Window	Road	Less than or equal to 60 dBA	Building compliant with Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

The warning clauses referred to above are contained in Table 3-6 below. Ministry of the Environment warning clauses and City of Ottawa specific warning clauses (red italics) are shown. Where applicable, these clauses are to be inserted on all Offers/Agreements of Purchase and Sale or Leases to notify potential purchasers and tenants of these environmental concerns. The City of Ottawa warning clauses were taken from Table A1 of the COENCG.

Table 3-6: MECP Warning Clauses

Type A	<p>“Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally 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.”</p> <p><i>“Purchasers/tenants are advised that sound levels due to increasing road/rail/Light Rail/transitway traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and the Ministry of the Environment.”</i></p>
Type B	<p>“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 traffic (rail traffic) (air 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.”</p> <p><i>“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/rail/Light Rail/transitway traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.”</i></p>
Type C	<p>“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”</p> <p><i>“This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment.”</i></p>
Type D	<p>“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.”</p> <p><i>“This dwelling unit has been supplied with a central air conditioning system and other measures 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 City and the Ministry of the Environment.”</i></p>
Type E	<p>“Purchasers/tenants are advised that due to the proximity of the adjacent industry (facility) (utility), noise from the industry (facility) (utility) may at times be audible.”</p> <p><i>“Purchasers/tenants are advised that due to the proximity of the adjacent industry (facility) (utility), noise from the industry (facility) (utility) may at times interfere with outdoor activities.”</i></p>

3.1 Vehicular Traffic Noise

The site is located within 100 meters from the right-of-way of an existing 2 lane major collector roadway (Maple Grove Road) therefore a noise assessment is required.

Figure 2 in Appendix A illustrates the noise source and receiver locations used. In general, noise levels are predicted at the building façade or plane of window (POW) during the daytime and nighttime.

The predicted noise levels were used to dictate the action required to achieve the recommended sound abatement requirements. The mitigation of the indoor sound levels is achieved by selection of building architectural components (walls, windows, doors), based on the noise reduction required to meet the indoor noise level criteria. The 16-hour daytime and 8-hour nighttime sound levels were calculated at five (5) locations around the site. The results of the predicted noise levels at these locations stipulate the ventilation, building code and associated warning clause requirements. There were no receiver locations that were assessed

as outdoor living areas as there were no outdoor amenity areas that met the requirements to be considered as an Outdoor Living Area (OLA).

STAMSON file names used were denoted based on the receiver used location.

3.2 Aircraft/Airport Noise

The site is located outside the Airport Vicinity Development Zone and outside the Airport Operating Influence Zone as per Schedule K of the Ottawa Official Plan. The site is also outside both the 25 NEF and NEP contours therefore noise from air traffic does not impact this site.

4 Road Noise Prediction Procedures

All noise levels have been predicted using MECP's software and methodology. STAMSON Version 5.03 (1999), which is based on the Ontario Road Noise Analysis Method for Environment and Transportation ("ORNAMENT") Model, was used for all calculations in this report. Detailed output files are attached in Appendix D for reference. In addition to the traffic data that was used in the analysis, theoretical noise predictions were based on the following information:

- Truck traffic on Maple Grove Road Rd consists of 5% heavy trucks, 7% medium trucks.
- The Day/Night split used was 92% and 8%.
- Intermediate surfaces between the source and receiver locations were assessed as an absorptive ground surface.
- Topography was assessed as flat/gentle slope between the noise source and the receivers.
- Road pavement and road gradient was assessed as typical asphalt or concrete and flat grade.

Traffic information used for this study was obtained from the review of the City of Ottawa's Noise Control Guidelines. Road and traffic parameters used in our analysis are summarized in Table 4-1 below.

Table 4-1: Traffic and Road Parameters

Traffic Parameters	Maple Grove Road
R.O.W. WIDTH (m)	Approx. 10-12 m
Roadway Type	2 Lane Major Collector (4-UMCU)
Posted Speed Limit (km/hr)	50 km/hr
Passenger Cars	88%
Medium trucks (%)	7%
Heavy trucks (%)	5%
A.A.D.T. (veh/day) both directions	8,000
Day/night split (%)	92 / 8
Vehicles day/night split (total)	8,939 / 777 (9715)
Medium trucks day/night split (total)	711 / 22 (773)
Heavy trucks day/night split (total)	508 / 44 (552)

Based on the proposed site, the ground between the proposed blocks and Maple Grove Road would be considered as a reflective surface due to the surface being comprised of mostly asphalt and concrete.

Different receiver heights will be considered as these units are not considered as typical homes, where the stacked town homes have 3 floors, including a living space on the top floor as well as the basement.

Since the site is being modeled under reflective conditions, the height of the receiver location does not matter as the noise levels will remain the same at any height when modeling with Stamson. However, it is affected when there is a noise wall which is situation with an existing noise wall adjacent to the west side of the site. The receiver height that is highest for either living room areas and bedroom areas shall be used in order to obtain the worst-case scenario.

Noise levels are assessed at different receiver heights since the limits are stacked having 3 above grade floors. Receiver heights were assessed at the center of the windows for modelling with Stamson, source and receiver were assumed to be elevated with a reflective surface. This ensures that no ground absorption is applied to the mediated results. Therefore, when ground absorption is applied, the height of the receiver, and the results are the same for all floors. Thus, a conservative assumption amplifies the prediction of sound levels on all floors.

5 Summary of Results

The anticipated noise levels at the assessed receiver locations range from approximately 67.1-48.6 dBA during the daytime and between 59.5-41.0 dBA during the nighttime.

A summary of predicted noise levels for various assessment locations is summarized below in Table 5-1 below. Detailed results and output from STAMSON Version 5.03 are contained in Appendix D.

Noise levels were only assessed at the building façade, as there were no amenity areas that met the definition of an OLA. Sewage Flows within the property were estimated in order to compare with developed conditons. **Table 5-1** below summarizes the approxiamete sewage flows generated from the proposed properties, based on a commerical flow and infiltration allowance.

Table 5-1: Summary of Anticipated Noise Levels

Receiver Location	Block Number	Receptor Type	Unattenuated Noise Level Leq (dBA)	
			Daytime (07:00 – 23:00)	Nighttime (23:00– 07:00)
R1	Block 3	Façade	67.12	59.52
R2	Block 3	Façade	60.53	52.93
R3	Block 3	Façade	56.44	48.84
R4	Block 3	Façade	60.96	53.36
R5	Block 1	Façade	48.59	40.99

6 Mitigation Measures

Table 6-1 below summarizes the requirements for ventilation, outdoor control measures and building components for all assessment locations.

Table 6-1: Summary of Requirements based on Receiver Location

Receiver Location	Outdoor Control Measures Warning Clause	Ventilation Requirement		*Building Component Requirement	
		Plane of Living Room Windows (Daytime)	Plane of Bedroom Windows (Nighttime)	Plane of Living Room Windows (Daytime)	Plane of Bedroom Windows (Nighttime)
R1	N/A	Type D	Type C	Non-Compliant	Compliant
R2	N/A	Type C	Type C	Compliant	Compliant
R3	N/A	Type C	None	Compliant	Compliant
R4	N/A	Type C	Type C	Compliant	Compliant
R5	N/A	None	None	Compliant	Compliant
<p><i>*Building Code Requirements.</i> <i>Required = Building components must be designed to achieve indoor sound levels criteria, or</i> <i>Compliant = Building compliant with Ontario Building Code</i></p>					

7 Recommendations

We recommend that this application for the proposed development at 1869 Maple Grove Road be approved from a “Noise Study” assessment perspective, based on the following:

As the anticipated nighttime noise levels exceeding acceptable levels due to road traffic, building components for windows/walls etc., will need to be designed to reduce indoor noise levels to acceptable levels. The recommended AIF requirements for the exterior window and walls of individual residential blocks is provided in Table 6-2. It is also recommended that a qualified acoustic consultant inspect the building plans to certify that construction will be adequate in this regard.

Block 3 (Front of Block Facing Maple Grove as Identified in Figure A2)

A requirement for Central Air Conditioning Type “D” Warning Clause for the indoor areas is required for these units. The following Notices on Title for these residential lots shall be included in all Agreements of Purchase and Sale in accordance with the terms specified by the Development Agreement:

Type D Warning Clause: “This dwelling unit has been supplied with a central air conditioning system and other measures 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 City and the Ministry of the Environment.”

Block 3 (All Other Sides of Block Not Facing Maple Grove as Identified in Figure A2)

A requirement for Central Air Conditioning Type “C” Warning Clause for the indoor areas is required for these units. The following Notices on Title for these residential lots shall be included in all Agreements of Purchase and Sale in accordance with the terms specified by the Development Agreement:

Type C Warning Clause: “This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment.”

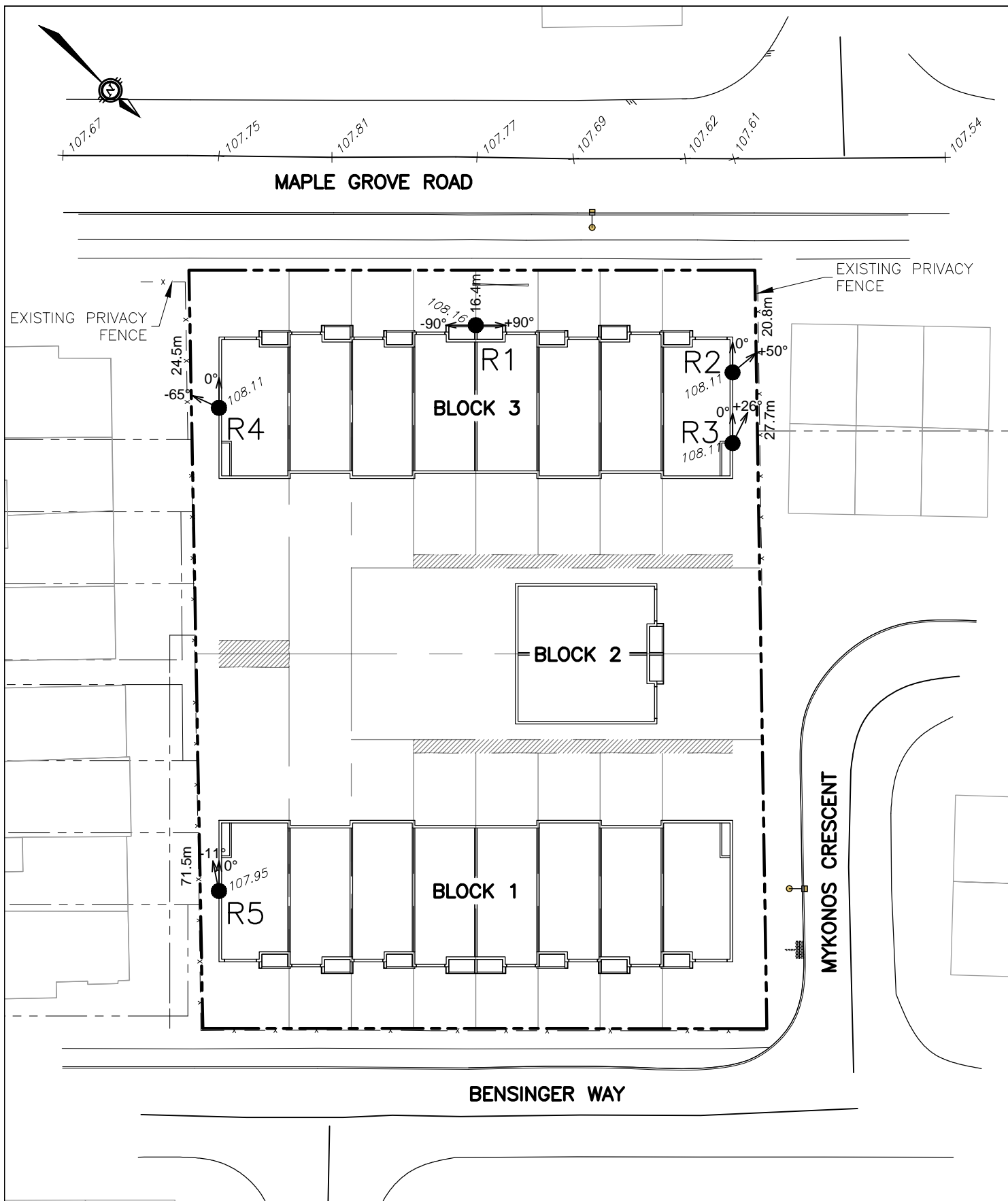
8 Legal Notification

This report was prepared by EXP Services Inc. for the account of 10886378 Canada Incorporated.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Appendix A - Figures

Figure A1 – Source/Receiver Locations for Building Facade



exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
www.exp.com



DESIGN	MZG
DRAWN	MZG
DATE	28-02-20
FILE NO	OTT-00254810-A0

1869 MAPLE GROVE ROAD
GNCR DEVELOPMENTS

NOISE SOURCE/RECEIVER
LOCATIONS

SCALE	1:500
SKETCH NO	

FIG A1

Appendix B –Tables

Table B1- Noise Source/Receiver Data

Table B2- Summary of Warning Clauses

TABLE B1 - SOURCE/Combined Stamson DATA

Location	Assessment Location	Noise Source	Block Number	Angles		Source to Receiver Distance (m)	Source Ground Elev (m)	Receiver Ground Elev (m)	Source-Receiver Ground, e (m)	Receiver Height (m) (DayTime)	Receiver Height (m) (Night Time)	Combined Equivalent Noise Level Leq (dBa)	
				From	To							Daytime (7:00-23:00)	Nighttime (23:00-7:00)
R1	Façade	Maple Grove	Block 3	-90	90	16.4	107.77	108.16	0.39	1.5	4.5	67.12	59.52
R2	Façade		Block 3	0	50	20.8	107.61	108.11	0.50	1.5	4.5	60.53	52.93
R3	Façade		Block 3	0	26	27.7	107.61	108.11	0.50	1.5	4.5	56.44	48.84
R4	Façade		Block 3	-65	0	24.5	107.75	108.11	0.36	1.5	4.5	60.96	53.36
R5	Façade		Block 1	-11	0	71.5	107.75	107.95	0.20	1.5	4.5	48.59	40.99

AADT = 12,000

2-lane Major Collector (2-UMCU)

Speed limit = 50km/hr

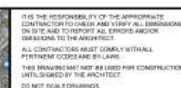
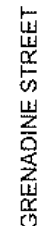
TABLE B2- SUMMARY OF WARNING CLAUSES - SORTED BY RECEIVER LOCATIONS

Receiver Location	Outdoor Control Measures Warning Clause	Ventilation Requirement			*Building Component Requirement		
		Plane of Living Room Windows (Daytime)	Plane of Bedroom Windows (Nighttime)	Governing Warning Clause Requirement	Plane of Living Room Windows (Daytime)	Plane of Bedroom Windows (Nighttime)	Governing BC Requirement
R1	N/A	Type D	Type C	Type D	Non-Compliant	Compliant	Non-Compliant
R2	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R3	N/A	Type C	None	Type C	Compliant	Compliant	Compliant
R4	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R5	N/A	None	None	None	Compliant	Compliant	Compliant

*Compliant - compliant with Ontario Building Code

*Non-Compliant - not compliant with Ontario Building Code

Appendix C – Architectural Plan



20 INDICATES EVALUATING NOTES, LISTED ON EACH SHEET.
 30 INDICATES ASSEMBLY TYPE, REFER TO TYPICAL ASSEMBLY SCHEDULE.
 40 INDICATES WINDOW TYPE, REFER TO WINDOW ELEVATIONS AND DETAILS ON A400 SERIES.
 50 INDICATES DOOR TYPE, REFER TO DOOR SCHEDULE AND DETAIL ON A400 SERIES.
 60 DETAIL NUMBER
 70 TITLE
 80 INDEX
 90 DETAIL REFERENCE PAGE
 100 DETAIL CROSS REFERENCE PAGE

1	TRANSFORMER
2	RESERVED
3	CONCRETE SIDEWALK BUILT TO CITY OF OTTAWA STANDARDS
4	BUS STOP TO POTENTIALLY BE RELOCATED
5	EXISTING LIGHT STANDARD (EXACT LOCATION TO BE CONFIRMED BY SURVEYOR)
6	EXISTING UTILITY POLE (EXACT LOCATION TO BE CONFIRMED ON SURVEY DRAWING)
7	1300mm WIDE REAR YARD ACCESS BASEMENT (TO BE CONFIRMED ON SURVEY DRAWING)
8	150mm WIDE MOUNTABLE CURB
9	EXISTING LIGHT STANDARD TO BE RELOCATED
10	NEW FRIHYDRANT (EXACT LOCATION TO BE CONFIRMED BY CIVIL ENGINEER)
11	COMMON MAIL BOXES
12	PROVIDE DEPRESSED SIDEWALK
13	RESERVED
14	RESERVED
15	RESERVED
16	RESERVED
17	RESERVED
18	RESERVED
19	RESERVED
20	RESERVED

4	REFER TOTYPICALASSEMBLES SHEET FOR WALL PARTITION. REFER TOEFL AND FLOOR TYPES.
5	FOR DOOR TYPES AND HANDING REQUIREMENT REFER TO DOOR SCHEDULE ON ARCH SERIES.
6	ALL INTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF STUD.
7	ALL EXTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF STUD.
8	ALL RETENTION WALLS ARE TO BE TYPE "BT" UNLESS NOTED OTHERWISE.
9	ALL INTERIOR PARTITIONS ARE TO BE TYPE "BT" UNLESS NOTED OTHERWISE.
10	ALL REINFORCED CONCRETE SUSPENDED SLABS, COLUMNS (ISANI) HAVE MAX. AREA PER SQ. M ARE DETERMINED BY DRC 2.2. ANALYST OF ARCH.

UNIT ENTRY POINT

GEODETIC ELEVATION MARKER

TOP OF CURB MARKER

FIRE HYDRANT

UTILITY POLE

LIGHT STANDARD

PROPERTY LINE

SETBACK LINE

SUBSIDIZED PROPERTY LINE

BASEMENT OUTLINE

NEW 2.54 M PRIVACY FENCE

PROPOSED BUILDING OUTLINE

NEW PRIVATE DRIVEWAY

PUBLIC SIDEWALKS

1. DEDICATED SNOW STORAGE WILL NOT BE PROVIDED ON THIS SITE - AS ALL UNITS FRONT ONTO PUBLIC STREETS, STREET SNOW REMOVAL WILL BE THE RESPONSIBILITY OF THE CITY OF OTTAWA.
2. AS ALL UNITS FRONT ONTO PUBLIC STREETS, ALL UNITS SHOULD BE ELIGIBLE FOR CITY GARBAGE COLLECTION
3. BLOCK 2 WILL REQUIRE A JOINT USE MAINTENANCE AGREEMENT GIVEN THE SHARED DRIVEWAY
4. EXISTING BUILDING TO BE DEMOLISHED PRIOR TO CONSTRUCTION

DATE L.M.	CHECKED R.V.
SCALE 1:200	SHEET No. SP-00
PROJECT No. 1921	

Appendix D – STAMSON Output

STAMSON 5.0 NORMAL REPORT Date: 20-02-2020 11:52:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 16.40 / 16.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 67.12 + 0.00) = 67.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 67.51 0.00 -0.39 0.00 0.00 0.00 0.00 67.12

Segment Leq : 67.12 dBA

Total Leq All Segments: 67.12 dBA

^
Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 59.52 + 0.00) = 59.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 59.91 0.00 -0.39 0.00 0.00 0.00 0.00 59.52

Segment Leq : 59.52 dBA

Total Leq All Segments: 59.52 dBA

^

TOTAL Leq FROM ALL SOURCES (DAY): 67.12
(NIGHT): 59.52

^
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STAMSON 5.0 NORMAL REPORT Date: 20-02-2020 12:14:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R2.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.80 / 20.80 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 60.53 + 0.00) = 60.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 50 0.00 67.51 0.00 -1.42 -5.56 0.00 0.00 0.00 60.53

Segment Leq : 60.53 dBA

Total Leq All Segments: 60.53 dBA

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Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 52.93 + 0.00) = 52.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 50 0.00 59.91 0.00 -1.42 -5.56 0.00 0.00 0.00 52.93

Segment Leq : 52.93 dBA

Total Leq All Segments: 52.93 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 60.53
(NIGHT): 52.93

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STAMSON 5.0 NORMAL REPORT Date: 20-02-2020 12:28:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R3.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : 0.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.70 / 27.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 56.44 + 0.00) = 56.44 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 26 0.00 67.51 0.00 -2.66 -8.40 0.00 0.00 0.00 56.44

Segment Leq : 56.44 dBA

Total Leq All Segments: 56.44 dBA

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Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 48.84 + 0.00) = 48.84 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 26 0.00 59.91 0.00 -2.66 -8.40 0.00 0.00 0.00 48.84

Segment Leq : 48.84 dBA

Total Leq All Segments: 48.84 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 56.44
(NIGHT): 48.84

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STAMSON 5.0 NORMAL REPORT Date: 20-02-2020 12:29:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R4.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : -65.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 24.50 / 24.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 60.96 + 0.00) = 60.96 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-65 0 0.00 67.51 0.00 -2.13 -4.42 0.00 0.00 0.00 60.96

Segment Leq : 60.96 dBA

Total Leq All Segments: 60.96 dBA

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Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 53.36 + 0.00) = 53.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-65 0 0.00 59.91 0.00 -2.13 -4.42 0.00 0.00 0.00 53.36

Segment Leq : 53.36 dBA

Total Leq All Segments: 53.36 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 60.96
(NIGHT): 53.36

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STAMSON 5.0 NORMAL REPORT Date: 20-02-2020 12:30:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R5.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: (day/night)

Angle1 Angle2 : -11.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.50 / 71.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 48.59 + 0.00) = 48.59 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-11 0 0.00 67.51 0.00 -6.78 -12.14 0.00 0.00 0.00 48.59

Segment Leq : 48.59 dBA

Total Leq All Segments: 48.59 dBA

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Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 40.99 + 0.00) = 40.99 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-11 0 0.00 59.91 0.00 -6.78 -12.14 0.00 0.00 0.00 40.99

Segment Leq : 40.99 dBA

Total Leq All Segments: 40.99 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 48.59
(NIGHT): 40.99

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