



Noise Impact Assessment Oak Ridge Gate, Phase II Ottawa, Ontario

Type of Document:
Site Plan Submission

Client:
Ashcroft Homes

Project Number:
OTT-00245036-A0

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Date Submitted:
June 2018

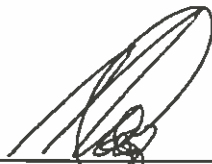
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Legal Notification

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Table of Contents

1	Introduction	1
2	References	1
3	Sound Level Criteria.....	2
3.1	Vehicular Traffic Noise.....	6
3.2	Aircraft/Airport Noise.....	6
3.3	Stationary Noise	6
4	Road Noise Prediction Procedures.....	7
5	Summary of Results	8
6	Mitigation Measures	9
7	Indoor Noise Control Measures	9
8	Recommendations	11

List of Appendices

Appendix A – Figures
 Appendix B – Tables
 Appendix C - Architectural Plan
 Appendix D – STAMSON Output

List of Figures

Figure 1 – Site Location Plan Appendix A
 Figure 2 – Source/Receiver Locations for Building Facade Appendix A

List of Tables

Table 3-1: Sound Limits For Indoor & Outdoor Living Areas Due To Road Traffic.....	2
Table 3-2: Outdoor, Ventilation & Warning Clause Requirements Road Noise, Daytime (0700-2300)	3
Table 3-3: Ventilation and Warning Clause Requirements Road Noise, Nighttime (2300-0700)	4
Table 3-4: Building Component Requirements Road Noise, Daytime (0700-2300)	4
Table 3-5: Building Component Requirements Road Noise, Nighttime (2300-0700)	4
Table 3-6: MOECC Warning Clauses.....	5
Table 4-1: Traffic and Road Parameters	7
Table 5-1: Summary of Anticipated Noise Levels	8
Table 6-1: Summary of Requirements based on Receiver Location	9
Table B1- Noise Source/Receiver Data.....	Appendix B

1 Introduction

Ashcroft Homes retained EXP Services Inc. (EXP) to undertake a noise impact assessment in support of a site plan application for a proposed residential development in the City of Ottawa. The proposal consists of 6 blocks containing 48 apartment units and 14 townhomes and is referred to as Oak Ridge Gate Phase II. The site is situated between Trim Road and Breezewood Street as shown on Figure 1 in Appendix A. As the site is located within 100m of an arterial roadway, a noise impact assessment is required.

This study was carried out in accordance with the Ministry of the Environment and Climate Change's (MOECC) 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'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 & Climate Change Publication NPC-300, Stationary and Transportation Sources Approvals and Planning, August 2013.
- City of Ottawa Official Plan (COOP), 2003, OPA 150 (2013), and OPA 180 (2017)
- City of Ottawa Transportation Master Plan (COTMP), November 2013.
- City of Ottawa Environmental Noise Control Guidelines (COENCG), January 2016.
- Road and Rail Noise: Effects on Housing, Canada Mortgage and Housing, 1981

3 Sound Level Criteria

City of Ottawa and MOECC 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: Sound Limits For Indoor & Outdoor Living Areas Due To Road Traffic

Location	Space	Time Period	Required Leq (dBA)
Indoors	Sleeping quarters of residences, hospitals, 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, and daycare centres, etc. (except schools or daycare centers)	Nighttime 23:00 to 07:00	45
	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). MOECC 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 in Tables 3-2 through 3-5.

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	L _{eq} (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	L _{eq} (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	L _{eq} (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 wording to be used for the warning clauses referred to in Tables 3-3 through 3-5 above are provided in Table 3-6 below. MOECC 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. MOECC warning clauses were taken from Section C8 of NPC-300 whereas City of Ottawa warning clauses were taken from Table A1 of the COENCG.

Table 3-6: MOECC 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><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 be audible.”</i></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>
Type F	<p><i>“Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) may interfere with outdoor activities as the sound levels exceed the sound level limits of the City and the Ministry of Environment.”</i></p> <p><i>“Purchasers/tenants are advised that due to the proximity of the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed.”</i></p>

3.1 Vehicular Traffic Noise

As the site is located within 100 meters from the right-of-way of an existing arterial roadway (Trim Road), per the City's guidelines a noise assessment is required.

Figure 2 in Appendix A illustrates the noise source and receiver locations used in this study. In general, noise levels are predicted at either the building façade or plane of window (POW) during the daytime and nighttime, and within the for Outdoor Living Areas (OLA) during the daytime.

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 two (2) OLA locations within the proposed site, and at five (5) building façade or plane of window (POW) locations. The results of the predicted noise levels at the seven (7) locations stipulate the ventilation, building code and associated warning clause requirements.

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.

3.3 Stationary Noise

A review of the surrounding building uses and the zoning of adjacent properties were completed to determine if there was a potential impact or influence from stationary noise sources. Typically, industrial and commercial land uses can be a potential stationary noise source. Stationary sources of noise include all sources of sound and vibration that will exist or operate within the site, excluding construction noise. The noise level criteria for stationary noise sources is the higher value between the exclusion limit values prescribed by the MOECC (and City of Ottawa) or the corresponding minimum hourly background /ambient sound level due to traffic. For OLA during the daytime and POW during the daytime or nighttime the exclusion limit values are 50 dBA and 45 dBA, respectively.

From our observations, there are no significant stationary noise sources have been identified that are likely to cause noise levels exceeding the MOECC and City of Ottawa requirements.

4 Road Noise Prediction Procedures

All noise levels have been predicted using MOECC'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 Trim Road 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	Trim Road
R.O.W. WIDTH (m)	Approx. 37 m
Roadway Type	4-lane Urban Arterial (4-UAD)
A.A.D.T. (veh/day)	35,000
Day/night split (%)	92 / 8
Medium trucks (%)	7
Heavy trucks (%)	5
Posted Speed Limit (km/hr)	60 km/hr

For receiver locations R1 through R4, noise levels were predicted at the building façade (or POW) since these apartment units do not have amenity or outdoor living areas. These apartment units have balconies; however, the balconies are less than 4m in depth and therefore are not classified as an OLA in accordance with NPC300. Receiver locations R1 and R2 face Trim Road, whereas receiver locations R1A, R1B, R2A and R2B are perpendicular to Trim Road.

For the two (2) townhome blocks, noise levels were predicted in the backyards of Blocks 6 and 7 since their amenity areas exceed the minimum 37m² to be defined as an OLA in accordance with NPC300.

5 Summary of Results

The anticipated noise levels at the assessed receiver locations range from approximately 48.9 dBA – 69.2 dBA during the daytime and between 42.1 dBA – 61.9 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. Please note that the unattenuated results consider an existing noise attenuation barrier in place on adjacent lots.

Table 5-1: Summary of Anticipated Noise Levels

Receiver Location	Receptor Type	Unattenuated Noise Level Leq (dBA)	
		Daytime (07:00 – 23:00)	Nighttime (23:00– 07:00)
R1	Façade	69.15	61.93
R1A	Façade	63.70	56.54
R1B	Façade	62.69	56.70
R2	Façade	69.09	61.79
R2A	Façade	64.32	57.12
R2B	Façade	62.85	55.68
R3	Façade	59.45	52.43
R4	Façade	59.91	52.92
R5	OLA	48.88	
R6	OLA	54.56	

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 D	Type D	Non-Compliant
R1A	N/A	Type C	Type C	Type C	Compliant
R1B	N/A	Type C	Type C	Type C	Compliant
R2	N/A	Type D	Type D	Type D	Non-Compliant
R2A	N/A	Type C	Type C	Type C	Compliant
R2B	N/A	Type C	Type C	Type C	Compliant
R3	N/A	Type C	Type C	Type C	Compliant
R4	N/A	Type C	Type C	Type C	Compliant
R5	N/A	None	None	None	
R6	N/A	None	None	None	
<p><i>*Building Code Requirements.</i> Required = Building components must be designed to achieve indoor sound levels criteria, or Compliant = Building compliant with Ontario Building Code</p>					

7 Indoor Noise Control Measures

When noise levels exceed 65 dBA during the daytime or 60 dBA during the nighttime as noted Tables 5-1 at the Plane of Window (POW) locations as noted in Table 5-1, then the building envelope (or building components) must be acoustically designed to ensure the indoor noise criteria is achieved. The indoor noise level required is 45 dBA during the daytime or 40 dBA during the nighttime as noted in Table 3-1. The appropriate building components are selected based on the Acoustic Insulation Factor (AIF), which is related to the difference in indoor and outdoor levels. The Acoustic Insulation Factor (AIF) needed to control the road traffic noise is calculated as follows:

$$AIF = L_{eq} \text{ outdoor façade} - L_{eq} \text{ indoor} + 10 \log C + 2$$

where:

$L_{eq} \text{ outdoor façade} =$	Outdoor façade sound level
$L_{eq} \text{ indoor} =$	Indoor objective sound level
$C =$	Number of building components forming envelope of room (typically equals 3 for a corner room and 2 for other rooms)

Table 7-1 below outlines the AIF required for various road traffic sound levels as well as the glazing requirements to meet MOECC guidelines. Based on the values below the nighttime sound levels require that both window and wall treatment comply with the Ontario Building Code.

Table 7-1 – AIF Values and Typical Building Treatments For Road Traffic Sound Levels

Daytime Façade Sound Level (dBa)	Nighttime Façade Sound Level (dBa)	Air Conditioning Requirement	AIF Required	Window Treatments	Wall Treatments
55 or less	50 or less	None	17 or less	None (OBC)	EW1
56 to 65	51 to 60	Provision	18 to 27	None (OBC)	EW1
66 to 68	61 to 63	Required	28 to 30	None (OBC)	EW2
69 to 70	64 to 65	Required	31 to 32	STC 31 to 32	EW3
71 to 72	66 to 67	Required	33 to 34	STC 33 to 34	EW4
73 to 78	68 to 73	Required	35 to 40	STC 35 to 40	EW5
79	74	Required	41	STC 41	EW5

Source: "Road and Rail Noise: Effects on Housing", NHA 5156, 08/86 CMHC, 1986

Building treatments are based upon an assumed window/floor ratio of 25% and wall/floor ratio of 80%.

AIF is based on 3 components (i.e. corner room location. For 2 components (ie only one exterior wall) AIF would be 2 points lower.

OBC window: Requires Ontario Building Code compliant construction.

EW1 denotes a typical metal or vinyl clad siding exterior wall. EW1R denotes an EW1 exterior wall with interior drywall mounted on resilient channels. EW2 denotes an EW1 exterior wall with an additional 25mm of rigid insulation. EW4 denotes a typical 20mm stucco clad exterior wall. EW5 denotes a typical brick veneer clad exterior wall.

Based on an assumed 25% window/floor and 80% wall/floor ratios, the wall and window component requirements were estimated based on the predicted sound levels at the building façade. Once detailed building architectural plans are finalized, it is recommended that an acoustical consultant review and/or design the building components to ensure that indoor noise levels will meet the requirements.

Based on the results of Table 5-1 and the formula above for the required AIF, the minimum acoustical performance for the exterior façade was based on the daytime and nighttime outdoor noise levels at each receiver, and an assumed window/floor ratio of 25% and wall/floor ratio 80%, the following summarizes the recommended building component requirements.

Units within Blocks 3 & 4 Facing Trim Road

Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria. The indoor sound level criterion for road traffic from 23:00 to 7:00 is 45 dBa and from 7:00 to 23:00 is 40dBa.

For units that have windows, doors or walls facing Trim Road shall be constructed with the exterior walls, windows and exterior doors containing sufficient acoustic insulation to ensure that the indoor sound levels from the traffic meet the guidelines.

- Window requirements AIF = 31 or STC = 31
- Exterior Wall Requirements AIF = 31 or STC = 37 (EW1)

It is also recommended that an acoustical consultant review the proposed building plans and provide final recommendations on the building components.

8 Recommendations

We recommend that this application for the proposed development at Oakridge Gate, Phase II be approved from a “Noise Impact” assessment perspective, based on the following:

No noise barrier is required for this site as the closest units to the noise source (Trim Road) are apartment units with no outdoor living area. The outdoor living areas for the townhomes on the east side of the development are shielded from the Trim Road noise source.

Units within Blocks 3 & 4 Facing Trim Road

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 units 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.”

Windows, walls and doors for units within Blocks 3 & 4 that face Trim Road shall be designed to meet indoor sound level criteria. Exterior walls, windows and doors shall contain sufficient acoustic insulation. A qualified acoustic consultant shall inspect the building plans to certify that construction will be adequate in this regard, and shall review the proposed building plans and provide final recommendations on the building components. Windows shall have a minimum STC = 31, with the exterior walls having a minimum STC = 37.

Units within Blocks 3 & 4 Not Facing Trim Road

A Provision 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 units 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.”

Blocks 2 & 5 as Identified in Figure 2

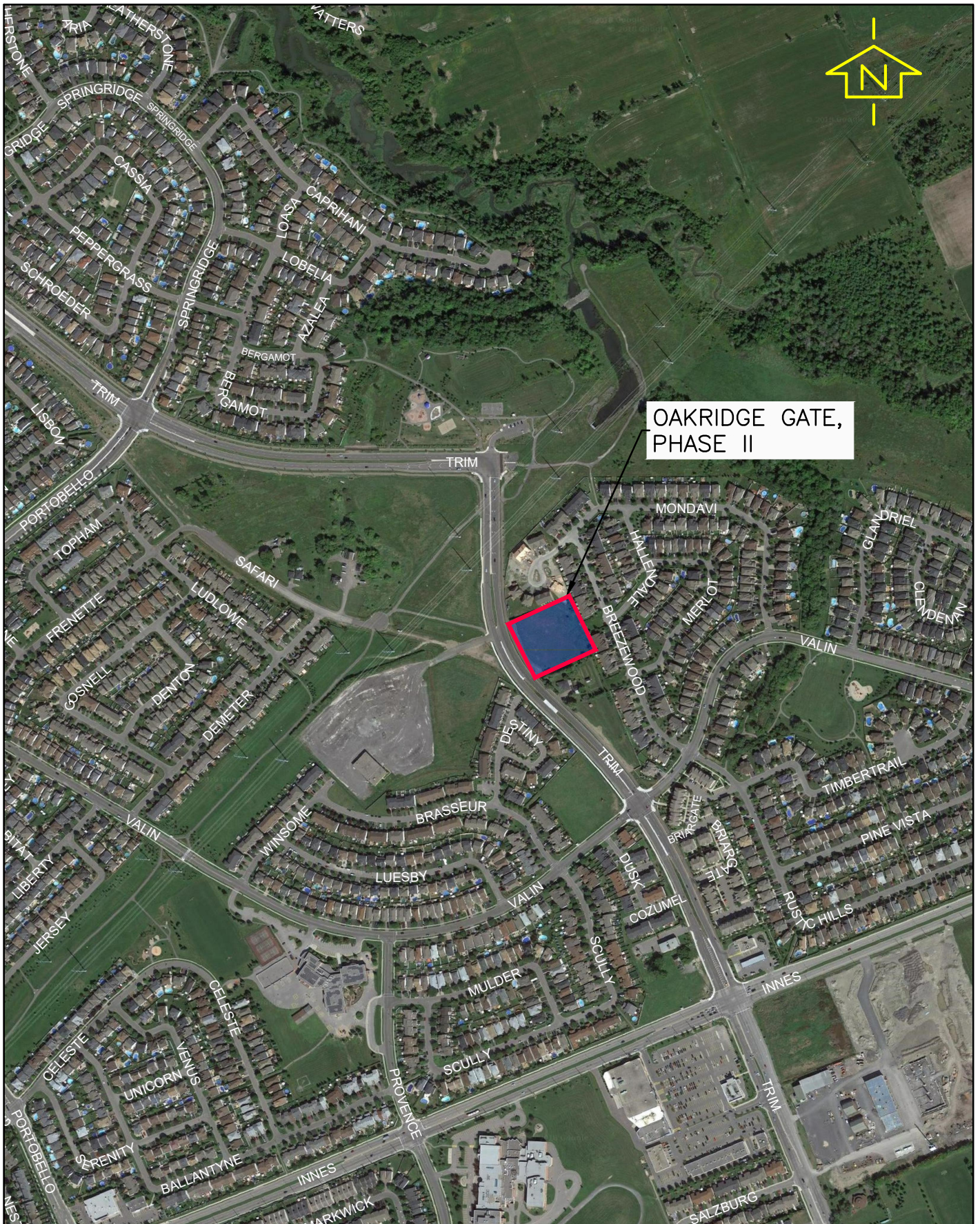
A Provision for Central Air Conditioning Type “C” Warning Clause for the indoor areas is required for these units. The following Notices on Title for these residential units shall be included in all Agreements of Purchase and Sale in accordance with the terms specified by the Development Agreement:


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.”

Appendix A – Figures

Figure 1 – Site Location Plan

Figure 2 – Source/Receiver Locations for Building Facade



exp Services Inc. 100-2650 Queensview Drive Ottawa, ON K2B 8H6 www.exp.com		DESIGN MZG	OAKRIDGE GATE, PHASE II ASHCROFT HOMES SITE LOCATION PLAN	SCALE 1: 7500
		DRAWN MZG		SKETCH NO
		DATE APR 2018		FIG 1
		FILE NO 245003		



exp Services Inc. 100-2650 Queensview Drive Ottawa, ON K2B 8H6 www.exp.com	DESIGN	MZG	OAKRIDGE GATE, PHASE II ASHCROFT HOMES	SCALE	1:1000
	DRAWN	MZG		SKETCH NO	
	DATE	JUNE 2018	RECEIVER LOCATIONS	FIG 2	
	FILE NO	245036			

Appendix B – Tables

Table B1- Noise Source/Receiver Data

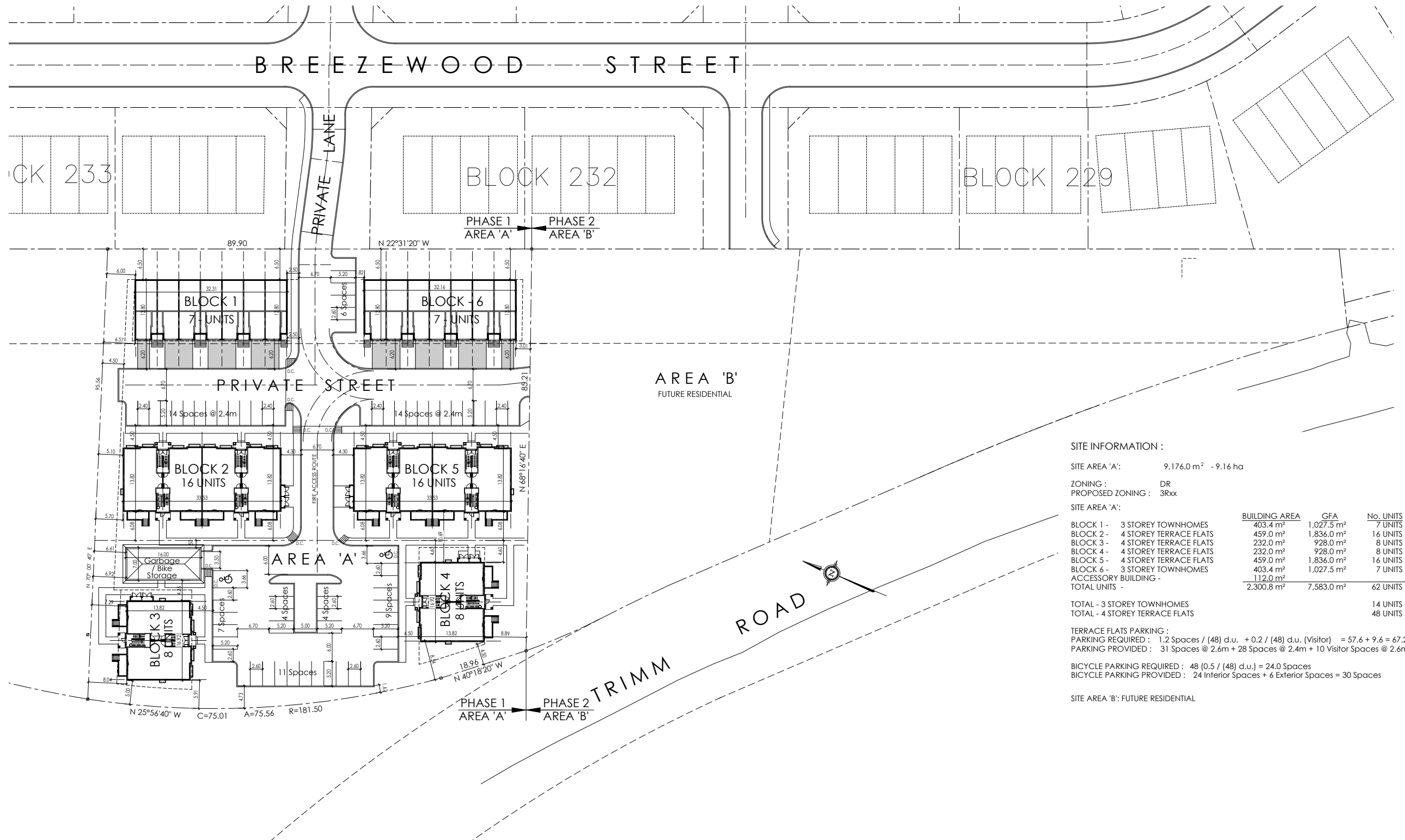
TABLE B1 - NOISE SOURCE/RECEIVER DATA

Location	Assessment Location	Angles		Source to Receiver Dist (m)	Source Ground Elev (m)	Receiver Ground Elev (m)	Barrier to Receiver Dist (m)	Barrier Base Elev (m)	Existing Height of Wall (m)	AADT (veh/day)	Speed Limit (km/h)	Combined Equivalent Noise Level Leq (dBA)	
		From	To									Daytime (7:00-23:00)	Nighttime (23:00-7:00)
R1	Façade	-90	90	18.4	87.39	88.1	4.4	87.37	2.50	17,500	60	69.15	61.93
				31.5	88.07		4.4			17,500	60		
R1A	Façade	-90	0	27.4	87.39	88.1				17,500	60	63.70	56.54
				40.2	88.07					17,500	60		
R1B	Façade	0	90	26.7	87.34	88.1	13.5	87.37	2.50	17,500	60	62.69	56.70
				39.5	87.87		13.5			17,500	60		
R2	Façade	-90	83	18.9	88.08	88.35				17,500	60	69.09	61.79
				31.0	88.54					17,500	60		
R2A	Façade	-90	0	24.7	87.40	88.35				17,500	60	64.32	57.12
				38.2	88.30					17,500	60		
R2B	Façade	0	72	29.5	87.60	88.35				17,500	60	62.85	55.68
				42.6	88.50					17,500	60		
R3	Façade	-49	23	54.4	87.47	88.45				17,500	60	59.45	52.43
				67.0	88.07					17,500	60		
R4	Façade	-81	47	51.6	87.52	88.35				17,500	60	59.91	52.92
				67.0	88.39					17,500	60		
R5	OLA	0	17	106.4	87.34	88.4				17,500	60	48.88	
				118.8	87.98					17,500	60		
R6	OLA	-90	0	95.4	87.63	88.4				17,500	60	54.56	
				107.6	88.24					17,500	60		

EXP Services Inc.

*Ashcroft Homes
Oakridge Gate, Phase II
OTT-00245036-A0
June 2018*

Appendix C - Site Plan



SITE INFORMATION :

SITE AREA 'A': 9,176.0 m² - 9.16 ha

ZONING : DR
PROPOSED ZONING : 3Rxx

SITE AREA 'A':

	<u>BUILDING AREA</u>	<u>GFA</u>	<u>No. UNITS</u>
BLOCK 1 - 3 STOREY TOWNHOMES	403.4 m ²	1,027.5 m ²	7 UNITS
BLOCK 2 - 4 STOREY TERRACE FLATS	459.0 m ²	1,836.0 m ²	16 UNITS
BLOCK 3 - 4 STOREY TERRACE FLATS	232.0 m ²	928.0 m ²	8 UNITS
BLOCK 4 - 4 STOREY TERRACE FLATS	232.0 m ²	928.0 m ²	8 UNITS
BLOCK 5 - 4 STOREY TERRACE FLATS	459.0 m ²	1,836.0 m ²	16 UNITS
BLOCK 6 - 3 STOREY TOWNHOMES	403.4 m ²	1,027.5 m ²	7 UNITS
ACCESSORY BUILDING -	112.0 m ²		
TOTAL UNITS -	2,300.8 m ²	7,583.0 m ²	62 UNITS

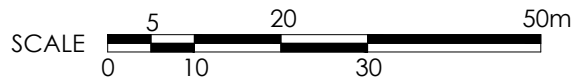
TOTAL - 3 STOREY TOWNHOMES	14 UNITS
TOTAL - 4 STOREY TERRACE FLATS	48 UNITS

TERRACE FLATS PARKING :
PARKING REQUIRED : 1.2 Spaces / (48) d.u. + 0.2 / (48) d.u. (Visitor) = 57.6 + 9.6 = 67.2 Spaces
PARKING PROVIDED : 31 Spaces @ 2.6m + 28 Spaces @ 2.4m + 10 Visitor Spaces @ 2.6m = 69 Spaces

BICYCLE PARKING REQUIRED : 48 (0.5 / (48) d.u.) = 24.0 Spaces
BICYCLE PARKING PROVIDED : 24 Interior Spaces + 6 Exterior Spaces = 30 Spaces

SITE AREA 'B': FUTURE RESIDENTIAL

NOTE:
SITE PLAN TO BE READ IN CONJUNCTION WITH :
- SITE SERVICING PLAN PREPARED BY _____
- LANDSCAPING PLAN PREPARED BY _____
BOUNDARIES DERIVED FROM: PLAN 4R - _____
PLAN PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
DATED _____. 20____
SITE BOUNDARIES TO BE CONFIRMED BY SURVEYOR.



M. David Blakely
Architect Inc.
2200 Prince of Wales Dr., Suite 101
Ottawa, Ontario K2E 6Z9
Phone (613) 226-8811 Fax (613) 226-7942

- GENERAL NOTES:
1. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS. ANY DISCREPANCY MUST BE REPORTED TO M. DAVID BLAKELY ARCHITECT INC.
 2. ALL WORK AND MATERIALS TO BE IN COMPLIANCE WITH ALL CODES, REGULATIONS AND BY-LAWS.
 3. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST THE PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED IN THE CONTRACT DOCUMENTS.
 4. DO NOT SCALE DRAWINGS.
 5. THIS DRAWING SHALL NOT BE USED FOR PERMIT OR CONSTRUCTION UNLESS THE DRAWING BEARS THE ARCHITECT'S SEAL AND SIGNATURE.
 6. THIS REPRODUCTION SHALL NOT BE ALTERED.



10.						20.					
9.						19.					
8.						18.					
7.						17.					
6.	12/07/18	PHASE TWO REMOVED FROM PLAN	SM			16.					
5.	04/07/18	FOR SITE PLAN, BOUNDARIES, SURVEY	SM			15.					
4.	14/12/17	BUILDING AREAS ADDED TO PLAN	SM			14.					
3.	13/10/17	REVISED MODEL TYPES	SM			13.					
2.	21/08/17	FOR REVIEW - PHASE TWO ADDED	SM			12.					
1.	12/07/17	FOR REVIEW	SM			11.					
No.	DATE	DESCRIPTION	INIT.			No.	DATE	DESCRIPTION	INIT.		
REVISIONS						REVISIONS					

A - DETAIL NUMBER
B - SHEET NUMBER (DETAIL REQUIRED)
C - SHEET NUMBER (DETAIL LOCATION)

SEAL

PROJECT
**PLANNED UNIT DEVELOPMENT
OAKRIDGE GATE
BREEZEWOOD STREET
OTTAWA, ONTARIO**

CLIENT

DATE
JULY, 2017

SCALE
1:400

SHEET No.
SP-1

DRAWN BY:
SBM

CHECKED
MDB

DRAWING TITLE
PRELIMINARY SITE PLAN

DATE
JULY, 2017

SCALE
1:400

SHEET No.
SP-1

DRAWN BY:
SBM

CHECKED
MDB

EXP Services Inc.

*Ashcroft Homes
Oakridge Gate, Phase II
OTT-00245036-A0
June 2018*

Appendix D – STAMSON Output

R1.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2018 15:54:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1WB (day/night)

Angle1 Angle2 : -90.00 deg 75.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 1EB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R1.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 1EB (day/night)

Angle1 Angle2 : 75.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 75.00 deg Angle2 : 90.00 deg
Barrier height : 2.50 m
Barrier receiver distance : 0.40 / 0.40 m
Source elevation : 87.39 m
Receiver elevation : 88.10 m
Barrier elevation : 87.37 m
Reference angle : 0.00

^
Road data, segment # 3: Seg 2WB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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 # 3: Seg 2WB (day/night)

Angle1 Angle2 : -90.00 deg 75.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R1.txt
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 31.50 / 31.50 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

^
 Road data, segment # 4: Seg 2EB (day/night)

 Car traffic volume : 14168/1232 veh/TimePeriod *
 Medium truck volume : 1127/98 veh/TimePeriod *
 Heavy truck volume : 805/70 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 10.00
 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 # 4: Seg 2EB (day/night)

 Angle1 Angle2 : 75.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 31.50 / 31.50 m
 Receiver height : 1.50 / 4.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 75.00 deg Angle2 : 90.00 deg
 Barrier height : 2.50 m
 Barrier receiver distance : 4.40 / 4.40 m
 Source elevation : 88.07 m
 Receiver elevation : 88.10 m
 Barrier elevation : 87.37 m
 Reference angle : 0.00

^
 Results segment # 1: Seg 1WB (day)

 Source height = 1.50 m

R1.txt
 ROAD (0.00 + 67.61 + 0.00) = 67.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	75	0.66	70.67	0.00	-1.47	-1.58	0.00	0.00	0.00	67.61

Segment Leq : 67.61 dBA

^
 Results segment # 2: Seg 1EB (day)

 Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	2.21	89.58

ROAD (0.00 + 48.16 + 0.00) = 48.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
75	90	0.51	70.67	0.00	-1.34	-15.56	0.00	0.00	-5.60	48.16

Segment Leq : 48.16 dBA

^
 Results segment # 3: Seg 2WB (day)

 Source height = 1.50 m

ROAD (0.00 + 63.73 + 0.00) = 63.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	75	0.66	70.67	0.00	-5.35	-1.58	0.00	0.00	0.00	63.73

Segment Leq : 63.73 dBA

^
 Results segment # 4: Seg 2EB (day)

 Source height = 1.50 m

R1.txt

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	2.23	89.60

ROAD (0.00 + 45.17 + 0.00) = 45.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
75	90	0.51	70.67	0.00	-4.87	-15.56	0.00	0.00	-5.07	45.17

Segment Leq : 45.17 dBA

Total Leq All Segments: 69.15 dBA

Results segment # 1: Seg 1WB (night)

Source height = 1.50 m

ROAD (0.00 + 60.23 + 0.00) = 60.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	75	0.57	63.07	0.00	-1.39	-1.45	0.00	0.00	0.00	60.23

Segment Leq : 60.23 dBA

Results segment # 2: Seg 1EB (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	5.15	92.52

ROAD (0.00 + 45.59 + 0.00) = 45.59 dBA

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

Page 5

R1.txt

75	90	0.42	63.07	0.00	-1.26	-14.77	0.00	0.00	-0.25	46.79*
75	90	0.57	63.07	0.00	-1.39	-16.08	0.00	0.00	0.00	45.59

* Bright Zone !

Segment Leq : 45.59 dBA

Results segment # 3: Seg 2WB (night)

Source height = 1.50 m

ROAD (0.00 + 56.56 + 0.00) = 56.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	75	0.57	63.07	0.00	-5.06	-1.45	0.00	0.00	0.00	56.56

Segment Leq : 56.56 dBA

Results segment # 4: Seg 2EB (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.81	92.18

ROAD (0.00 + 41.93 + 0.00) = 41.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
75	90	0.42	63.07	0.00	-4.58	-14.77	0.00	0.00	-0.85	42.88*
75	90	0.57	63.07	0.00	-5.06	-16.08	0.00	0.00	0.00	41.93

* Bright Zone !

Segment Leq : 41.93 dBA

Total Leq All Segments: 61.93 dBA

Page 6

R1.txt



TOTAL Leq FROM ALL SOURCES (DAY): 69.15
(NIGHT): 61.93



R1A.txt
STAMSON 5.0 NORMAL REPORT Date: 05-06-2018 14:42:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1A.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1WB (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 : 27.40 / 27.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 1EB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R1A.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 1EB (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 : 40.20 / 40.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1WB (day)

Source height = 1.50 m

ROAD (0.00 + 61.85 + 0.00) = 61.85 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.66 70.67 0.00 -4.34 -4.47 0.00 0.00 0.00 61.85

Segment Leq : 61.85 dBA

^
Results segment # 2: Seg 1EB (day)

Source height = 1.50 m

ROAD (0.00 + 59.09 + 0.00) = 59.09 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.66 70.67 0.00 -7.11 -4.47 0.00 0.00 0.00 59.09

Segment Leq : 59.09 dBA

Total Leq All Segments: 63.70 dBA

R1A.txt

▲

Results segment # 1: Seg 1WB (night)

Source height = 1.50 m

ROAD (0.00 + 54.65 + 0.00) = 54.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.07	0.00	-4.11	-4.31	0.00	0.00	0.00	54.65

Segment Leq : 54.65 dBA

▲

Results segment # 2: Seg 1EB (night)

Source height = 1.50 m

ROAD (0.00 + 52.03 + 0.00) = 52.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.07	0.00	-6.72	-4.31	0.00	0.00	0.00	52.03

Segment Leq : 52.03 dBA

Total Leq All Segments: 56.54 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 63.70
(NIGHT): 56.54

▲

▲

R1B.txt
STAMSON 5.0 NORMAL REPORT Date: 13-06-2018 09:39:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1b.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1WB (day/night)

Angle1 Angle2 : 0.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 26.70 / 26.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 2WB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R1B.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 2WB (day/night)

Angle1 Angle2 : 31.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 26.70 / 26.70 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 31.00 deg Angle2 : 90.00 deg
Barrier height : 2.50 m
Barrier receiver distance : 13.50 / 13.50 m
Source elevation : 87.34 m
Receiver elevation : 88.10 m
Barrier elevation : 87.37 m
Reference angle : 0.00

^
Road data, segment # 3: Seg 1EB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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 # 3: Seg 1EB (day/night)

Angle1 Angle2 : 0.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R1B.txt

Surface : 1 (Absorptive ground surface)
 Receiver source distance : 39.50 / 39.50 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

⬆
 Road data, segment # 4: Seg 2EB (day/night)

 Car traffic volume : 14168/1232 veh/TimePeriod *
 Medium truck volume : 1127/98 veh/TimePeriod *
 Heavy truck volume : 805/70 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
 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 # 4: Seg 2EB (day/night)

 Angle1 Angle2 : 31.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 39.50 / 39.50 m
 Receiver height : 1.50 / 4.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 31.00 deg Angle2 : 90.00 deg
 Barrier height : 2.50 m
 Barrier receiver distance : 13.50 / 13.50 m
 Source elevation : 87.87 m
 Receiver elevation : 88.10 m
 Barrier elevation : 13.50 m
 Reference angle : 0.00

⬆
 Results segment # 1: Seg 1WB (day)

 Source height = 1.50 m

R1B.txt

ROAD (0.00 + 58.73 + 0.00) = 58.73 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 0 31 0.66 70.67 0.00 -4.16 -7.78 0.00 0.00 0.00 58.73

Segment Leq : 58.73 dBA

⬆
 Results segment # 2: Seg 2WB (day)

 Source height = 1.50 m

Barrier height for grazing incidence

 Source ! Receiver ! Barrier ! Elevation of
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

 1.50 ! 1.50 ! 1.84 ! 89.21

ROAD (0.00 + 54.42 + 0.00) = 54.42 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 31 90 0.51 70.67 0.00 -3.78 -6.74 0.00 0.00 -5.73 54.42

Segment Leq : 54.42 dBA

⬆
 Results segment # 3: Seg 1EB (day)

 Source height = 1.50 m

ROAD (0.00 + 55.90 + 0.00) = 55.90 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 0 31 0.66 70.67 0.00 -6.98 -7.78 0.00 0.00 0.00 55.90

Segment Leq : 55.90 dBA

⬆
 Results segment # 4: Seg 2EB (day)

 Source height = 1.50 m

R1B.txt

Barrier height for grazing incidence

Source Height	! Receiver (m) !	Barrier Height	! Barrier (m) !	Elevation of Barrier Top	(m)
1.50	!	1.50	!	76.02	!
				89.52	

ROAD (0.00 + 56.49 + 0.00) = 56.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
31	90	0.51	70.67	0.00	-6.35	-6.74	0.00	0.00	-0.00	57.57*
31	90	0.66	70.67	0.00	-6.98	-7.19	0.00	0.00	0.00	56.49

* Bright Zone !

Segment Leq : 56.49 dBA

Total Leq All Segments: 62.69 dBA

Results segment # 1: Seg 1WB (night)

Source height = 1.50 m

ROAD (0.00 + 51.37 + 0.00) = 51.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.57	63.07	0.00	-3.93	-7.76	0.00	0.00	0.00	51.37

Segment Leq : 51.37 dBA

Results segment # 2: Seg 2WB (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height	! Receiver (m) !	Barrier Height	! Barrier (m) !	Elevation of Barrier Top	(m)
1.50	!	4.50	!	3.33	!
				90.70	

R1B.txt

ROAD (0.00 + 52.21 + 0.00) = 52.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
31	90	0.42	63.07	0.00	-3.56	-6.45	0.00	0.00	-3.49	49.58*
31	90	0.57	63.07	0.00	-3.93	-6.93	0.00	0.00	0.00	52.21

* Bright Zone !

Segment Leq : 52.21 dBA

Results segment # 3: Seg 1EB (night)

Source height = 1.50 m

ROAD (0.00 + 48.70 + 0.00) = 48.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.57	63.07	0.00	-6.60	-7.76	0.00	0.00	0.00	48.70

Segment Leq : 48.70 dBA

Results segment # 4: Seg 2EB (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height	! Receiver (m) !	Barrier Height	! Barrier (m) !	Elevation of Barrier Top	(m)
1.50	!	4.50	!	77.99	!
				91.49	

ROAD (0.00 + 49.54 + 0.00) = 49.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
31	90	0.42	63.07	0.00	-5.97	-6.45	0.00	0.00	-0.00	50.65*
31	90	0.57	63.07	0.00	-6.60	-6.93	0.00	0.00	0.00	49.54

* Bright Zone !

Segment Leq : 49.54 dBA

R1B.txt

Total Leq All Segments: 56.70 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 62.69
(NIGHT): 56.70



R2.txt
STAMSON 5.0 NORMAL REPORT Date: 09-05-2018 09:25:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (day/night)

Angle1 Angle2 : -90.00 deg 83.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 18.90 / 18.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 2SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R2.txt
24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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 # 2: Seg 2SB (day/night)

Angle1 Angle2 : -90.00 deg 83.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 31.00 / 31.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 67.51 + 0.00) = 67.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 83 0.66 70.67 0.00 -1.67 -1.49 0.00 0.00 0.00 67.51

Segment Leq : 67.51 dBA

^
Results segment # 2: Seg 2SB (day)

Source height = 1.50 m

ROAD (0.00 + 63.94 + 0.00) = 63.94 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 83 0.66 70.67 0.00 -5.23 -1.49 0.00 0.00 0.00 63.94

Segment Leq : 63.94 dBA

Total Leq All Segments: 69.09 dBA

R2.txt

▲

Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 60.15 + 0.00) = 60.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	83	0.57	63.07	0.00	-1.58	-1.35	0.00	0.00	0.00	60.15

Segment Leq : 60.15 dBA

▲

Results segment # 2: Seg 2SB (night)

Source height = 1.50 m

ROAD (0.00 + 56.77 + 0.00) = 56.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	83	0.57	63.07	0.00	-4.95	-1.35	0.00	0.00	0.00	56.77

Segment Leq : 56.77 dBA

Total Leq All Segments: 61.79 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 69.09
(NIGHT): 61.79

▲

▲

R2A.txt
STAMSON 5.0 NORMAL REPORT Date: 13-06-2018 09:42:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2a.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (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 : 24.70 / 24.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 2SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R2A.txt
24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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 # 2: Seg 2SB (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 : 38.20 / 38.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 62.60 + 0.00) = 62.60 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.66 70.67 0.00 -3.60 -4.47 0.00 0.00 0.00 62.60

Segment Leq : 62.60 dBA

^
Results segment # 2: Seg 2SB (day)

Source height = 1.50 m

ROAD (0.00 + 59.46 + 0.00) = 59.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.66 70.67 0.00 -6.74 -4.47 0.00 0.00 0.00 59.46

Segment Leq : 59.46 dBA

Total Leq All Segments: 64.32 dBA

R2A.txt

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Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 55.35 + 0.00) = 55.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.07	0.00	-3.40	-4.31	0.00	0.00	0.00	55.35

Segment Leq : 55.35 dBA

⬆

Results segment # 2: Seg 2SB (night)

Source height = 1.50 m

ROAD (0.00 + 52.38 + 0.00) = 52.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.07	0.00	-6.37	-4.31	0.00	0.00	0.00	52.38

Segment Leq : 52.38 dBA

Total Leq All Segments: 57.12 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 64.32
(NIGHT): 57.12

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R2B.txt
STAMSON 5.0 NORMAL REPORT Date: 13-06-2018 09:43:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2b.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (day/night)

Angle1 Angle2 : 0.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 29.50 / 29.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 2SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R2B.txt
24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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 # 2: Seg 2SB (day/night)

Angle1 Angle2 : 0.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 42.60 / 42.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 60.97 + 0.00) = 60.97 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 72 0.66 70.67 0.00 -4.88 -4.82 0.00 0.00 0.00 60.97

Segment Leq : 60.97 dBA

^
Results segment # 2: Seg 2SB (day)

Source height = 1.50 m

ROAD (0.00 + 58.32 + 0.00) = 58.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 72 0.66 70.67 0.00 -7.53 -4.82 0.00 0.00 0.00 58.32

Segment Leq : 58.32 dBA

Total Leq All Segments: 62.85 dBA

R2B.txt

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Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 53.74 + 0.00) = 53.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.57	63.07	0.00	-4.61	-4.72	0.00	0.00	0.00	53.74

Segment Leq : 53.74 dBA

⬆

Results segment # 2: Seg 2SB (night)

Source height = 1.50 m

ROAD (0.00 + 51.24 + 0.00) = 51.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.57	63.07	0.00	-7.12	-4.72	0.00	0.00	0.00	51.24

Segment Leq : 51.24 dBA

Total Leq All Segments: 55.68 dBA

⬆

TOTAL Leq FROM ALL SOURCES (DAY): 62.85
(NIGHT): 55.68

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R3.txt
STAMSON 5.0 NORMAL REPORT Date: 09-05-2018 09:35:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (day/night)

Angle1 Angle2 : -49.00 deg 23.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 54.40 / 54.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 1SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R3.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 1SB (day/night)

Angle1 Angle2 : -49.00 deg 23.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 67.00 / 67.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 57.13 + 0.00) = 57.13 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-49 23 0.66 70.67 0.00 -9.29 -4.25 0.00 0.00 0.00 57.13

Segment Leq : 57.13 dBA

^
Results segment # 2: Seg 1SB (day)

Source height = 1.50 m

ROAD (0.00 + 55.63 + 0.00) = 55.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-49 23 0.66 70.67 0.00 -10.79 -4.25 0.00 0.00 0.00 55.63

Segment Leq : 55.63 dBA

Total Leq All Segments: 59.45 dBA

R3.txt

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Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 50.07 + 0.00) = 50.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	23	0.57	63.07	0.00	-8.79	-4.22	0.00	0.00	0.00	50.07

Segment Leq : 50.07 dBA

⬆

Results segment # 2: Seg 1SB (night)

Source height = 1.50 m

ROAD (0.00 + 48.65 + 0.00) = 48.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	23	0.57	63.07	0.00	-10.21	-4.22	0.00	0.00	0.00	48.65

Segment Leq : 48.65 dBA

Total Leq All Segments: 52.43 dBA

⬆

TOTAL Leq FROM ALL SOURCES (DAY): 59.45
(NIGHT): 52.43

⬆

⬆

R4.txt
STAMSON 5.0 NORMAL REPORT Date: 09-05-2018 11:29:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (day/night)

Angle1 Angle2 : -83.00 deg -64.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 51.60 / 51.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 1SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R4.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 1SB (day/night)

Angle1 Angle2 : -20.00 deg 47.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 51.60 / 51.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 3: Seg 2NB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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 # 3: Seg 2NB (day/night)

Angle1 Angle2 : -83.00 deg -64.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 67.00 / 67.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

R4.txt

▲

Road data, segment # 4: Seg 2SB (day/night)

 Car traffic volume : 14168/1232 veh/TimePeriod *
 Medium truck volume : 1127/98 veh/TimePeriod *
 Heavy truck volume : 805/70 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 10.00
 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 # 4: Seg 2SB (day/night)

 Angle1 Angle2 : -20.00 deg 47.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 67.00 / 67.00 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲

Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 48.32 + 0.00) = 48.32 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -83 -64 0.66 70.67 0.00 -8.91 -13.44 0.00 0.00 0.00 48.32

Segment Leq : 48.32 dBA

▲

Results segment # 2: Seg 1SB (day)

Page 3

R4.txt

Source height = 1.50 m

ROAD (0.00 + 57.22 + 0.00) = 57.22 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -20 47 0.66 70.67 0.00 -8.91 -4.54 0.00 0.00 0.00 57.22

Segment Leq : 57.22 dBA

▲

Results segment # 3: Seg 2NB (day)

Source height = 1.50 m

ROAD (0.00 + 46.44 + 0.00) = 46.44 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -83 -64 0.66 70.67 0.00 -10.79 -13.44 0.00 0.00 0.00 46.44

Segment Leq : 46.44 dBA

▲

Results segment # 4: Seg 2SB (day)

Source height = 1.50 m

ROAD (0.00 + 55.33 + 0.00) = 55.33 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -20 47 0.66 70.67 0.00 -10.79 -4.54 0.00 0.00 0.00 55.33

Segment Leq : 55.33 dBA

Total Leq All Segments: 59.91 dBA

▲

Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 41.69 + 0.00) = 41.69 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

Page 4

R4.txt

```

-----
-83   -64   0.57  63.07   0.00  -8.42 -12.95   0.00   0.00   0.00  41.69
-----

```

Segment Leq : 41.69 dBA

Results segment # 2: Seg 1SB (night)

Source height = 1.50 m

ROAD (0.00 + 50.13 + 0.00) = 50.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	47	0.57	63.07	0.00	-8.42	-4.51	0.00	0.00	0.00	50.13

Segment Leq : 50.13 dBA

Results segment # 3: Seg 2NB (night)

Source height = 1.50 m

ROAD (0.00 + 39.91 + 0.00) = 39.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	-64	0.57	63.07	0.00	-10.21	-12.95	0.00	0.00	0.00	39.91

Segment Leq : 39.91 dBA

Results segment # 4: Seg 2SB (night)

Source height = 1.50 m

ROAD (0.00 + 48.35 + 0.00) = 48.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	47	0.57	63.07	0.00	-10.21	-4.51	0.00	0.00	0.00	48.35

Segment Leq : 48.35 dBA

R4.txt

Total Leq All Segments: 52.92 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 59.91
(NIGHT): 52.92

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R5.txt
STAMSON 5.0 NORMAL REPORT Date: 09-05-2018 12:28:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 106.40 / 106.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 1SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R5.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 1SB (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 118.80 / 118.80 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 46.25 + 0.00) = 46.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 17 0.66 70.67 0.00 -14.12 -10.29 0.00 0.00 0.00 46.25

Segment Leq : 46.25 dBA

^
Results segment # 2: Seg 1SB (day)

Source height = 1.50 m

ROAD (0.00 + 45.46 + 0.00) = 45.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 17 0.66 70.67 0.00 -14.92 -10.29 0.00 0.00 0.00 45.46

Segment Leq : 45.46 dBA

Total Leq All Segments: 48.88 dBA

R5.txt

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Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 39.42 + 0.00) = 39.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	17	0.57	63.07	0.00	-13.36	-10.28	0.00	0.00	0.00	39.42

Segment Leq : 39.42 dBA

⬆

Results segment # 2: Seg 1SB (night)

Source height = 1.50 m

ROAD (0.00 + 38.67 + 0.00) = 38.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	17	0.57	63.07	0.00	-14.11	-10.28	0.00	0.00	0.00	38.67

Segment Leq : 38.67 dBA

Total Leq All Segments: 42.07 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 48.88
(NIGHT): 42.07

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R6.txt
STAMSON 5.0 NORMAL REPORT Date: 09-05-2018 12:27:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Seg 1NB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 95.40 / 95.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: Seg 1SB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

R6.txt
24 hr Traffic Volume (AADT or SADT): 17500
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 # 2: Seg 1SB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 107.60 / 107.60 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: Seg 1NB (day)

Source height = 1.50 m

ROAD (0.00 + 51.96 + 0.00) = 51.96 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.66 70.67 0.00 -13.34 -4.47 0.00 -0.90 0.00 51.96

Segment Leq : 51.96 dBA

^
Results segment # 2: Seg 1SB (day)

Source height = 1.50 m

ROAD (0.00 + 51.09 + 0.00) = 51.09 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 0 0.66 70.67 0.00 -14.20 -4.47 0.00 -0.90 0.00 51.09

Segment Leq : 51.09 dBA

Total Leq All Segments: 54.56 dBA

R6.txt

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Results segment # 1: Seg 1NB (night)

Source height = 1.50 m

ROAD (0.00 + 46.14 + 0.00) = 46.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.07	0.00	-12.62	-4.31	0.00	0.00	0.00	46.14

Segment Leq : 46.14 dBA

▲

Results segment # 2: Seg 1SB (night)

Source height = 1.50 m

ROAD (0.00 + 45.32 + 0.00) = 45.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.07	0.00	-13.44	-4.31	0.00	0.00	0.00	45.32

Segment Leq : 45.32 dBA

Total Leq All Segments: 48.76 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 54.56
(NIGHT): 48.76

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