



Noise Impact Assessment 5294 Hazeldean Road Ottawa, Ontario

Type of Document:
Site Plan Submission

Client:
Hazeldean Crossing Inc.

Project Number:
OTT-00250806-B0

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Date Submitted:
May 2019

Noise Impact Assessment

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Legal Notification

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1 Introduction

Hazeldean Crossing Inc. retained EXP Services Inc. (EXP) to undertake a noise impact assessment study in support of a site plan application for a proposed residential development containing 11 blocks of 76 stacked towns and 10 traditional back to back townhome units, located at 5294 Hazeldean Road in the City of Ottawa. The site is situated at the corner of Hazeldean Road and Victor Street. Since the site is located within 100m of Hazeldean Road, which is as an undivided 4-Lane Urban Arterial (4-UAU) roadway, a noise impact assessment due to traffic is required.

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, Stationary 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 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 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	“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.” <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>
Type B	“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.” <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>
Type C	“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.” <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>
Type D	“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.” <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>
Type E	<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> <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>

3.1 Vehicular Traffic Noise

The site is located within 100 meters from the right-of-way of an existing 4 lane urban arterial roadway (Hazeldean 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: 1) 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 seventeen (17) 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.

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 MECP (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 MECP or City of Ottawa requirements.

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 Second Lind 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	Hazeldean Road
R.O.W. WIDTH (m)	Approx. 32-35 m
Roadway Type	4 Lane Undivided Arterial (4-UAU)
Posted Speed Limit (km/hr)	60 km/hr
Passenger Cars	88%
Medium trucks (%)	7%
Heavy trucks (%)	5%
A.A.D.T. (veh/day) both directions	30,000
Day/night split (%)	92 / 8
Vehicles day/night split (total)	24,288 / 2,112 (26,400)
Medium trucks day/night split (total)	1,932 / 168 (2,100)
Heavy trucks day/night split (total)	1,380 / 120 (1,500)

Based on the proposed site, the ground between the proposed blocks and Hazeldean 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 56.5 – 71.9 dBA during the daytime and between 48.9 – 64.3 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.

Note that unattenuated results are based on an existing 3.0m high existing Durisol noise attenuation barrier located along a portion of the west property line.

Noise levels were only assessed at the building façade, as there were no amenity areas that met the definition of an OLA.

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 10	Façade	71.71	64.11
R2	Block 7	Façade	71.85	64.25
R3	Block 11	Façade	67.80	60.21
R4	Block 12	Façade	68.39	60.79
R5	Block 12	Façade	66.27	58.67
R6	Block 7	Façade	67.81	60.22
R7	Block 6	Façade	65.91	58.31
R8	Block 6	Façade	63.35	57.70
R9	Block 9	Façade	62.52	56.96
R10	Block 4	Façade	57.61	50.02
R11	Block 6	Façade	63.68	57.10
R12	Block 3	Façade	60.19	52.60
R13	Block 1	Façade	58.61	51.01
R14	Block 1	Façade	56.47	48.87
R15	Block 1	Façade	63.65	56.05
R16	Block 1	Façade	65.34	57.74
R17	Block 1	Façade	63.51	55.91

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
R2	N/A	Type D	Type D	Type D	Non-Compliant
R3	N/A	Type D	Type D	Type D	Non-Compliant
R4	N/A	Type D	Type D	Type D	Non-Compliant
R5	N/A	Type D	Type C	Type D	Non-Compliant
R6	N/A	Type D	Type D	Type D	Non-Compliant
R7	N/A	Type D	Type C	Type D	Non-Compliant
R8	N/A	Type C	Type C	Type C	Compliant
R9	N/A	Type C	Type C	Type C	Compliant
R10	N/A	Type C	Type C	Type C	Compliant
R11	N/A	Type C	Type C	Type C	Compliant
R12	N/A	Type C	Type C	Type C	Compliant
R13	N/A	Type C	Type C	Type C	Compliant
R14	N/A	Type C	None	Type C	Compliant
R15	N/A	Type C	Type C	Type C	Compliant
R16	N/A	Type D	Type C	Type D	Non-Compliant
R17	N/A	Type C	Type C	Type C	Compliant
<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>					

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 a 25% window/floor and 80% wall/floor ratio the wall and window component requirements were estimated based on the predicted sound levels at the building facade. 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 above, the minimum AIF for the exterior building components were estimated. The following table summarizes the recommended building component requirements for all residential unattenuated blocks which require their building components to above OBC.

Table 7-2 – AIF & STC Values Required for Building Components

Block Number	Corresp. Receiver Location	¹ Side of Building	Windows		Walls	
			² AIF Required	STC Required	² AIF Required	STC Required
6	R11	North	25	25	25	31
	R7	West	28	28	28	34
7	R2	North	34	34	34	40
	R6	East	25	25	25	33
	R16	West	30	30	30	36
8	R2	North	34	34	34	40
	R16	East	25	25	25	31
	R17	West	25	25	25	33
9	R2	North	34	34	34	40
	R17	East	25	25	25	31
	R17	West	25	25	25	31
10	R2	North	34	34	34	40
	R17	East	25	25	25	31
	R17	West	25	25	25	31
11	R2	North	34	34	34	40
	R17	East	30	30	30	36
	R17	West	25	25	25	31
12	R4	North	30	30	30	36
	R5	East	28	28	28	34
	R5	West	28	28	28	34
Notes: 1) Side of buildings are based on a Construction North as shown in Figure A2 of Appendix A 2) AIF Calculations based on 3 components.						

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 5924 Hazeldean 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 7-2. It is also recommended that a qualified acoustic consultant inspect the building plans to certify that construction will be adequate in this regard.

Block 6-12 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.”

Blocks 1-5 as Identified in Figure A2

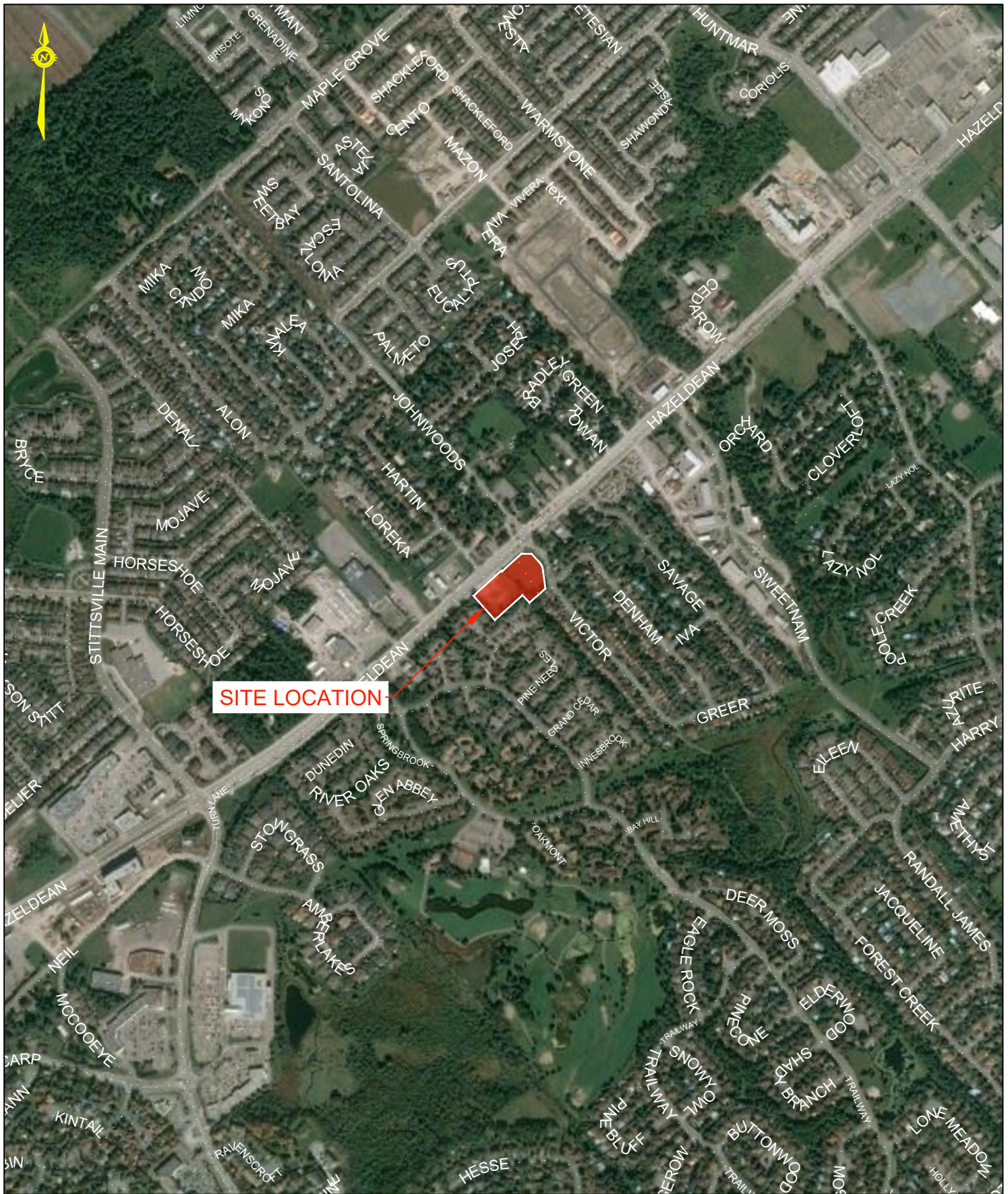
A requirement for Central Air Conditioning Type “C” Warning Clause for the indoor areas is required for these units. The following Notices on Title for these residential lots shall be included in all Agreements of Purchase and Sale in accordance with the terms specified by the Development Agreement:

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.”

Appendix A – Figures

Figure A1 – Site Location Plan

Figure A2 – Source/Receiver Locations for Building Facade



SITE LOCATION

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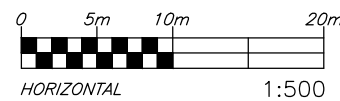
DESIGN	MZG
DRAWN	MZG
DATE	MAY 2019
FILE NO	250806

HAZELDEAN CROSSING
 5924 HAZELDEAN ROAD

SITE LOCATION
 PLAN

SCALE
 1:10000
 SKETCH NO

FIG A1



DESIGN	MZG	5924 HAZELDEAN NOISE STUDY	SCALE	1:500
DRAWN	MZG		FIGURE NO	
DATE	MAY 2019	SOURCE/RECIEVER LOCATIONS	FIG A2	
FILE NO	250806			

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		Angles		Source to Receiver Dist East Bound (m)	Source to Receiver Dist West Bound (m)	Source Ground Elev E/B (m)	Source Ground Elev W/B (m)	Receiver Ground Elev (m)	Source-Receiver Ground, e (m)	Receiver Height (m) (DayTime)	Receiver Height (m) (Night Time)	*Barrier to Receiver Dist (m)	*Barrier Base Elev (m)	*Barrier Height	Combined Equivalent Noise Level Leq (dBa)	
				From	To	From	To												Daytime (7:00-23:00)	Nighttime (23:00-7:00)
R1	Façade	Hazeldean	Block 10	-90			90	15.8	28.1	114.15	114.00	114.35	0.35	6	9.25			3.00	71.71	64.11
R2	Façade		Block 7	-90			90	15.2	27.5	114.69	114.64	115	0.36	6	9.25			3.00	71.85	64.25
R3	Façade		Block 11	0			90	20.1	32.5	113.78	113.68	114.45	0.77	6.2	9.25			3.00	67.80	60.21
R4	Façade		Block 12	-45			90	27.5	40.0	113.68	113.58	114.5	0.92	6.2	9.25			3.00	68.39	60.79
R5	Façade		Block 12	0			90	30.2	42.8	113.44	113.40	114.5	1.10	6	9.25			3.00	66.27	58.67
R6	Façade		Block 7	-90	-22	-22	0	20.2	32.1	114.75	114.64	115.10	0.46	6.2	9.25	7.68	114.91	3.00	67.81	60.22
R7	Façade		Block 6	-90	-8	-8	0	33.4	45.3	114.75	114.64	115.40	0.76	6	9.25	20.9	114.91	3.00	65.91	58.31
R8	Façade		Block 6	-90	-6	-6	0	39.1	51.0	114.75	114.64	115.40	0.76	6	9.25	26.6	114.91	3.00	63.35	57.70
R9	Façade		Block 9	-90	-5	-5	0	47.2	59.0	114.44	114.37	115.50	1.13	6	9.25	34.6	114.91	3.00	62.52	56.96
R10	Façade		Block 4	-48			67	57.5	69.4	114.48	114.27	115.2	0.93	6	9.25			3.00	57.61	50.02
R11	Façade		Block 6	-90	-40	73	90	34.0	42.6	114.70	114.61	115.00	0.39	6.2	9.25	18.2	114.91	3.00	63.68	57.10
R12	Façade		Block 3	-80			88	43.5	55.7	114.18	114.05	114.2	0.15	6.2	9.25			3.00	60.19	52.60
R13	Façade		Block 1	-87			-33	45.2	57.4	114.43	113.64	114.25	0.61	4.35	7.5			3.00	58.61	51.01
R14	Façade		Block 1	-61			30	59.8	71.3	113.76	113.71	114.25	0.54	4.35	7.5			3.00	56.47	48.87
R15	Façade		Block 1	15			90	50.0	58.6	113.44	113.34	114.25	0.91	4.35	7.5			3.00	63.65	56.05
R16	Façade		Block 8	-51			0	20.1	32.5	114.40	114.35	115.01	0.66	6.2	9.25			3.00	65.34	57.74
R17	Façade		Block 9	-34			0	20.5	32.8	114.35	114.16	115.01	0.85	6.2	9.25			3.00	63.51	55.91

*Based on an existing 3m high sound barrier adjacent to the property

AADT = 30,000

Speed limit = 60km/hr

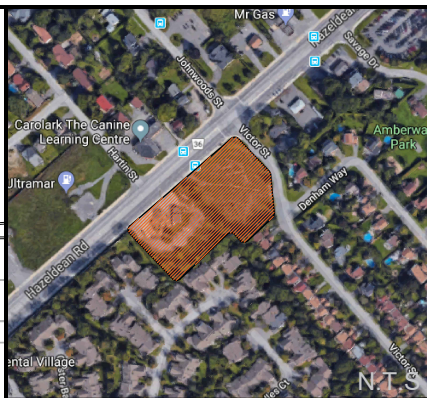
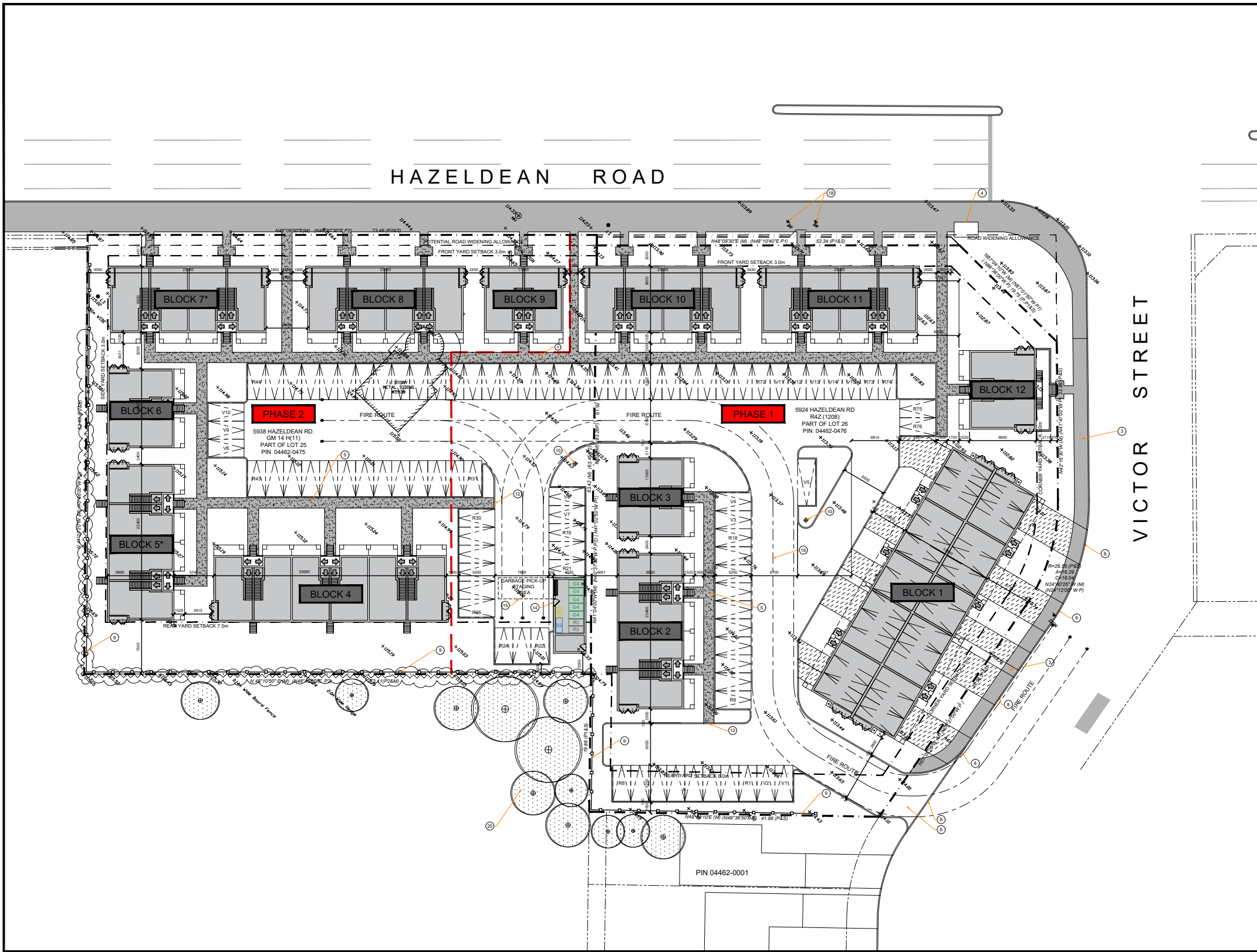
TABLE B2- SUMMARY OF WARNING CLAUSES - SORTED BY RECEIVER LOCATIONS

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 D	Type D	Non-Compliant	Non-Compliant	Non-Compliant
R2	N/A	Type D	Type D	Type D	Non-Compliant	Non-Compliant	Non-Compliant
R3	N/A	Type D	Type D	Type D	Non-Compliant	Non-Compliant	Non-Compliant
R4	N/A	Type D	Type D	Type D	Non-Compliant	Non-Compliant	Non-Compliant
R5	N/A	Type D	Type C	Type D	Non-Compliant	Compliant	Non-Compliant
R6	N/A	Type D	Type D	Type D	Non-Compliant	Non-Compliant	Non-Compliant
R7	N/A	Type D	Type C	Type D	Non-Compliant	Compliant	Non-Compliant
R8	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R9	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R10	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R11	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R12	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R13	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R14	N/A	Type C	None	Type C	Compliant	Compliant	Compliant
R15	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant
R16	N/A	Type D	Type C	Type D	Non-Compliant	Compliant	Non-Compliant
R17	N/A	Type C	Type C	Type C	Compliant	Compliant	Compliant

*Compliant - compliant with Ontario Building Code

*Non-Compliant - not compliant with Ontario Building Code

Appendix C - Architectural Plan



IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

NOTATION SYMBOLS:

- 00 INDICATES DRAWING NOTES, LISTED ON EACH SHEET
- 00 INDICATES ASSEMBLY TYPE, REFER TO TYPICAL ASSEMBLIES SCHEDULE
- 00 INDICATES WINDOW TYPE, REFER TO WINDOW ELEVATIONS AND DETAILS ON A500 SERIES.
- 000 INDICATES DOOR TYPE, REFER TO DOOR SCHEDULE AND DETAILS ON A500 SERIES.
- 00 - DETAIL NUMBER
- 00 - TITLE
- 00 - DETAIL REFERENCE PAGE
- 00 - DETAIL CROSS REFERENCE PAGE

- PROJECT NOTES**
- 1 -
 - 2 -
 - 3 NEW CONCRETE SIDEWALK BUILT TO CITY OF OTTAWA STANDARDS
 - 4 BUS SHELTER RELOCATED 2200mm NE
 - 5 NEW PRIVATELY OWNED SIDEWALK
 - 6 SITE APPROACH (SUBJECT TO APPROVAL OF MINOR VARIANCE)
 - 7 -
 - 8 150mm WIDE MOUNTABLE CURB
 - 9 2.5m. HIGH PRIVACY FENCE
 - 10 NEW FIRE HYDRANT (EXACT LOCATION TO BE CONFIRMED BY CIVIL ENGINEER)
 - 11 -
 - 12 PROVIDE DEPRESSED SIDEWALK
 - 13 ELECTRICAL ROOM CONNECTED TO GARBAGE SHED
 - 14 GARBAGE STORAGE SHED (TO SERVICE 86 UNITS) C/W ROLLING STEEL DOOR, PROVIDE BINS ON CASTERS, MATCH TYPICAL FINISH MATERIALS. PROVIDE ELECTRICAL CONNECTION FOR LIGHTING
 - 15 PROVIDE CONCRETE PAD FOR GARBAGE PICK-UP STAGING AREA
 - 16 PROVIDE PAVED PATHWAY DESIGNED TO SUPPORT FULLY LOADED GARBAGE TRUCK (35,000 lbs.)
 - 17 TRANSFORMER AND SWITCHGEAR, TO BE SPECIFIED BY ELECTRICAL ENGINEER
 - 18 EXISTING BIKE RACK, RELOCATE IF NECESSARY
 - 19 EXISTING LIGHT STANDARD TO BE RELOCATED IF NECESSARY (RELOCATED BY ELECTRICAL ENGINEER)
 - 20 GROUP OF EXISTING TREES TO BE PROTECTED DURING CONSTRUCTION (EXACT LOCATION, SIZE AND NUMBER TO BE DETERMINED BY SURVEYOR)

LEGEND

UNIT ENTRY POINT →

TRAFFIC FLOW →

3 YRD. GARBAGE BIN G3

4 YRD. GARBAGE BIN G4

3 YRD. FIBROUS RECYCLING BIN R3

2 YRD. GLASS AND PLASTIC RECYCLING BIN R2

TYPICAL PARKING SPACE

ORGANICS BIN

EXISTING TREES

FIRE HYDRANT

NEW LIGHT STANDARD

EXISTING LIGHT STANDARD

VISITOR PARKING

RESIDENT PARKING

GEODETIC ELEVATION MARKER

PROPERTY LINE

SETBACK LINE

PHASING LINE

FIRE TRUCK AND GARBAGE PICK UP ROUTE

PROPOSED BUILDING OUTLINE

NEW PRIVACY FENCE

EXISTING BOARD FENCE

NEW PRIVATE DRIVEWAY

NEW PRIVATE SIDEWALKS

NEW PUBLIC SIDEWALKS

FIRE ROUTE

- ADDITIONAL NOTES**
- * BLOCKS 5 AND 7 WILL REQUIRE THE REDUCTION OF UNPROTECTED OPENINGS TO 17.25% (LIMITING DISTANCE 5.5m)
 - ** 6000mm DRIVE AISLES WILL BE SUBJECT TO APPROVAL OF A MINOR VARIANCE ALLOWING DRIVE AISLES NARROWER THAN 6700mm
 - *** BLOCK 1 AND 4 WILL BE SUBJECT TO THE APPROVAL OF A MINOR VARIANCE ALLOWING MORE THAN 8 UNITS PER BLOCK OF TOWNHOUSES

PROJECT DEVELOPER
GNCR DEVELOPMENTS

Konaklar Mh. Akasyali Sk.
No:26 34330
Besiktas Istanbul Turkey

PHONE: +90 212 212 60 60
FAX: +90 212 284 82 77

CIVIL ENGINEER
EXP SERVICES INC.

2650 QUEENSVIEW DRIVE
SUITE 100
OTTAWA, ONTARIO
K2B 8H6

PHONE: 613 688 1899

TRAFFIC ENGINEER
EXP SERVICES INC.

2650 QUEENSVIEW DRIVE
SUITE 100
OTTAWA, ONTARIO
K2B 8H6

PHONE: 613 688 1899

LANDSCAPE ARCHITECT
JAMES B. LENNOX AND ASSOCIATES INC

3332 CARLING AVE.
OTTAWA, ONTARIO, CANADA
K2H 5A8

PHONE: 613 722 5168
FAX: 1 866 343 3942

SURVEYOR
FAIRHALL MOFFATT & WOODLAND LTD.

3332 CARLING AVE.
OTTAWA, ONTARIO, CANADA
K2H 5A8

PHONE: 613 722 5168
FAX: 1 866 343 3942

SITE INFORMATION

ZONING (5924)	R4Z [1208]
MAX BUILDING HEIGHT	14.5 M.
LOT AREA	4931.0 SQ. M.
5924 HAZELDEAN RD	
STITTVILLE, ONTARIO, CANADA	
K2S1B9	
ZONING (5938)	GM14 H[11]
MAX BUILDING HEIGHT	11.0 M.
LOT AREA	4647.0 SQ. M.
5938 HAZELDEAN RD	
STITTVILLE, ONTARIO, CANADA	
K2S1B9	
SITE AREA	
TOTAL SITE AREA	9,578.0 SQ. M.
RESIDENTIAL UNITS	
STACKED TOWNHOUSES:	76
TRADITIONAL TOWNHOUSES:	10
TOTAL UNITS:	86

DEVELOPMENT STATISTICS

SITE SETBACKS (5924)	REQUIRED	PROVIDED
FRONT YARD (HAZELDEAN)	3.0m	3.0m
CORNER SIDE YARD	3.0m	3.0m
(V/COR)		
REAR YARD	6.0m	14.85m*

SITE SETBACKS (5938)	REQUIRED	PROVIDED
FRONT YARD (HAZELDEAN)	3.0m	3.0m
REAR YARD	7.5m	7.5m
INTERIOR SIDE YARD	3.0m	3.0m
(SW ONLY)		

BUILDING STATISTICS	AREA	# OF UNITS	TOTAL UNIT AREA
STACKED TOWN TYPE A (1A)-	1,077 SQFT	22	23,716 SQFT
STACKED TOWN TYPE B (2A)-	968 SQFT	16	15,488 SQFT
STACKED TOWN TYPE C (1B)-	1,278 SQFT	22	28,116 SQFT
STACKED TOWN TYPE D (2B)-	1,168 SQFT	16	18,688 SQFT
TRADITIONAL TOWN TYPE A-	1,524 SQFT	4	6,096 SQFT
TRADITIONAL TOWN TYPE B-	1,506 SQFT	4	6,024 SQFT
TRADITIONAL TOWN TYPE C-	1,154 SQFT	2	2,308 SQFT
TOTAL -		86	100,436 SQFT (9,205.2 SQM)

PARKING	REQUIRED	PROVIDED
STACKED TOWNS		
RESIDENTIAL:	1.2 PER DWELLING	
VISITOR:	0.2 PER DWELLING	
TRADITIONAL TOWNS		
RESIDENTIAL:	1.0 PER DWELLING	
VISITOR:	0.2 PER DWELLING	
PHASING		UNITS
PHASE 1		
STACKED:		32
TRADITIONAL TOWN:		10
PHASE 2		
STACKED:		44
TRADITIONAL TOWN:		0
TOTAL:		86

SITE COVERAGE

SPACE	AREA (sq.m.)
BUILDING FOOTPRINT	2,968.5
PARKING LOT	2,996.2
SIDEWALKS	542.3
DRIVEWAYS	262.5
LOT AREA	
PHASE 1	5,123.9
PHASE 2	4,454.1
TOTAL	9,578.0
LANDSCAPE SPACE	3,350.8
TOTAL LANDSCAPE SPACE (%)	35.0

GENERAL NOTES:

- A REFER TO TYPICAL ASSEMBLIES SHEET FOR WALL, PARTITION, ROOF CEILING & FLOOR TYPES.
- B FOR DOOR TYPES AND HARDWARE REQUIREMENTS REFER TO DOOR SCHEDULE ON A500 SERIES.
- C ALL INTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF STUD
- D ALL EXTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF STUD
- E ALL EXTERIOR WALLS ARE TO BE TYPE 'W1' UNLESS NOTED OTHERWISE
- F ALL INTERIOR PARTITIONS ARE TO BE TYPE 'P1' UNLESS NOTED OTHERWISE
- G ALL REINFORCED CONCRETE SUSPENDED SLABS, COLUMNS & BEAMS HAVE A MIN. FIBR OF 1.5 HRS (AS DETERMINED BY CBC S8-2) UNLESS OTHERWISE STATED.

DRAFT

No. DESCRIPTION DATE

REVISIONS:

ARCHITECT SEAL:

CLIENT:

PROJECT TITLE:

HAZELDEAN CROSSING TOWNS

OTTAWA ONTARIO

SHEET TITLE:

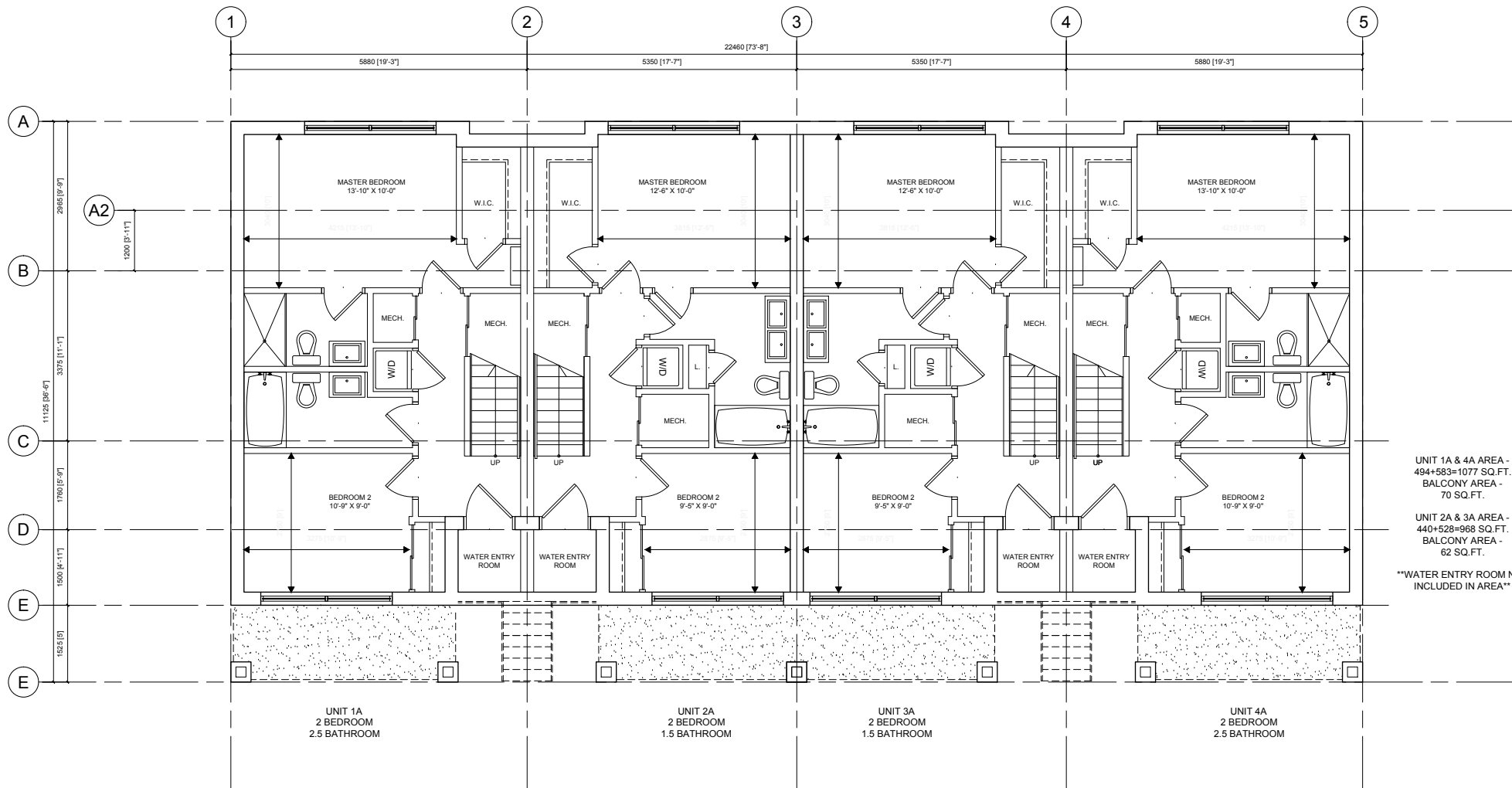
SITE PLAN

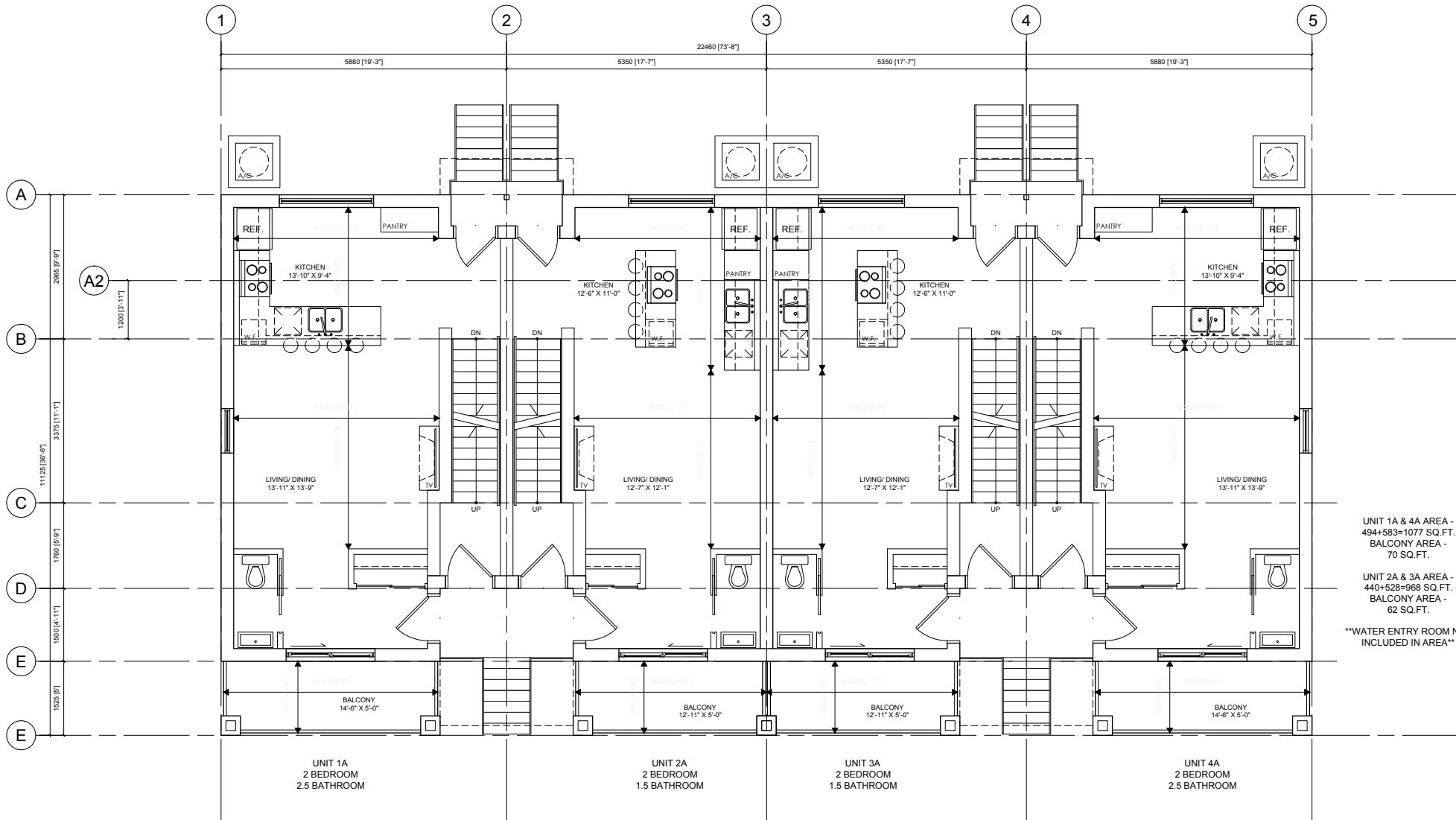
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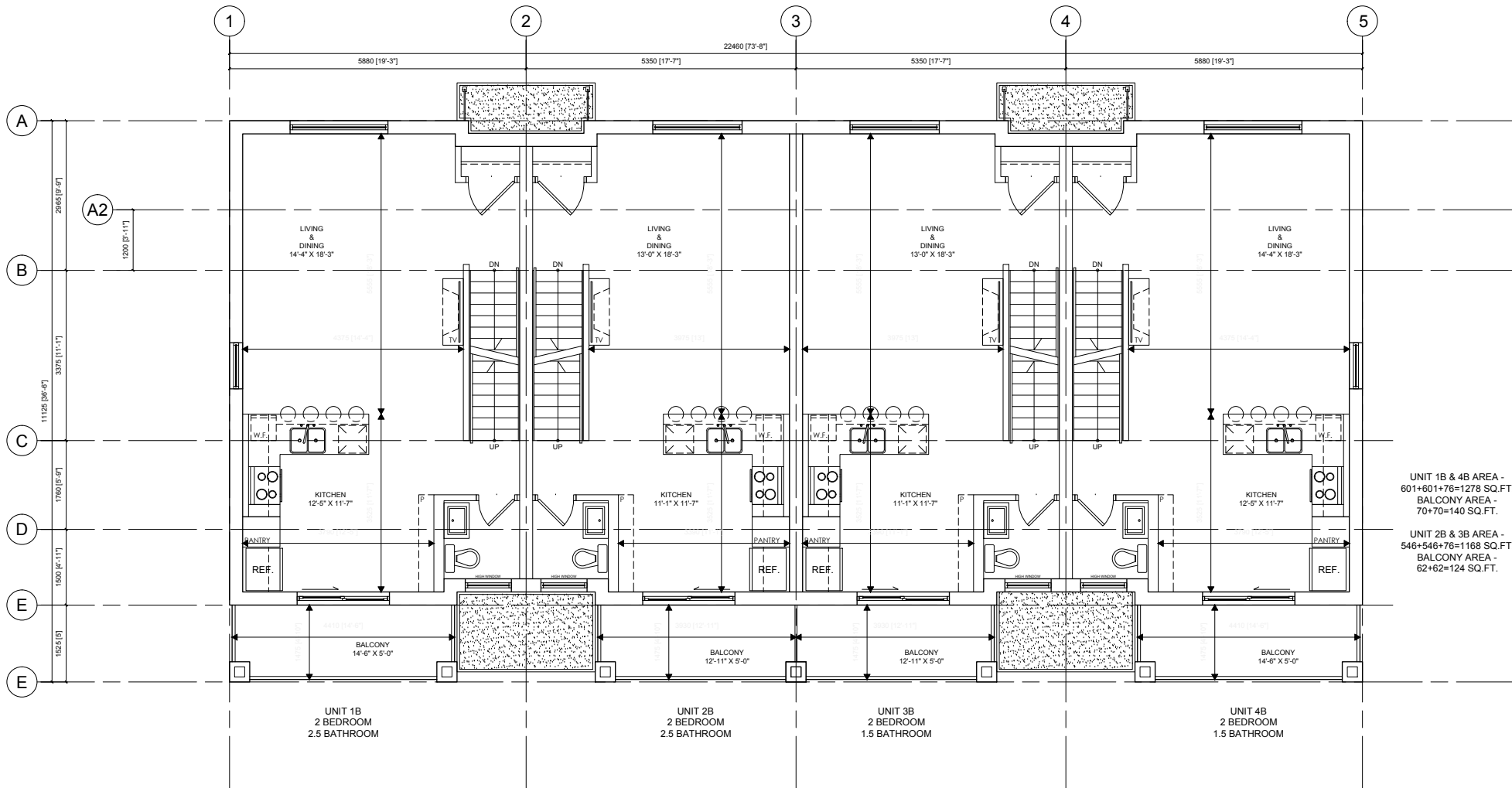
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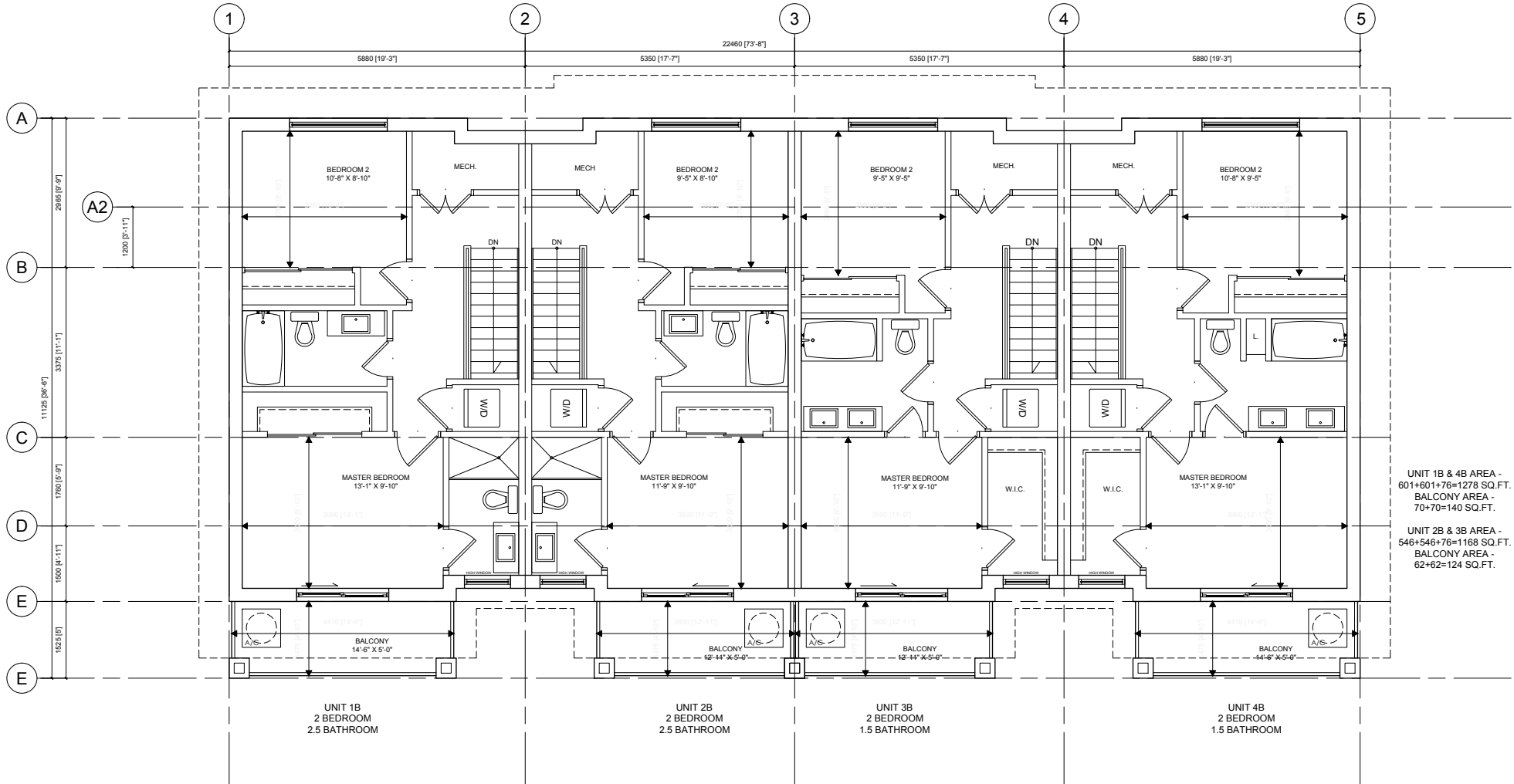
PROJECT No: 1831

SP-0









UNIT 1B & 4B AREA -
601+601+76=1278 SQ.FT.
BALCONY AREA -
70+70=140 SQ.FT.

UNIT 2B & 3B AREA -
546+546+76=1168 SQ.FT.
BALCONY AREA -
62+62=124 SQ.FT.



rla/architecture

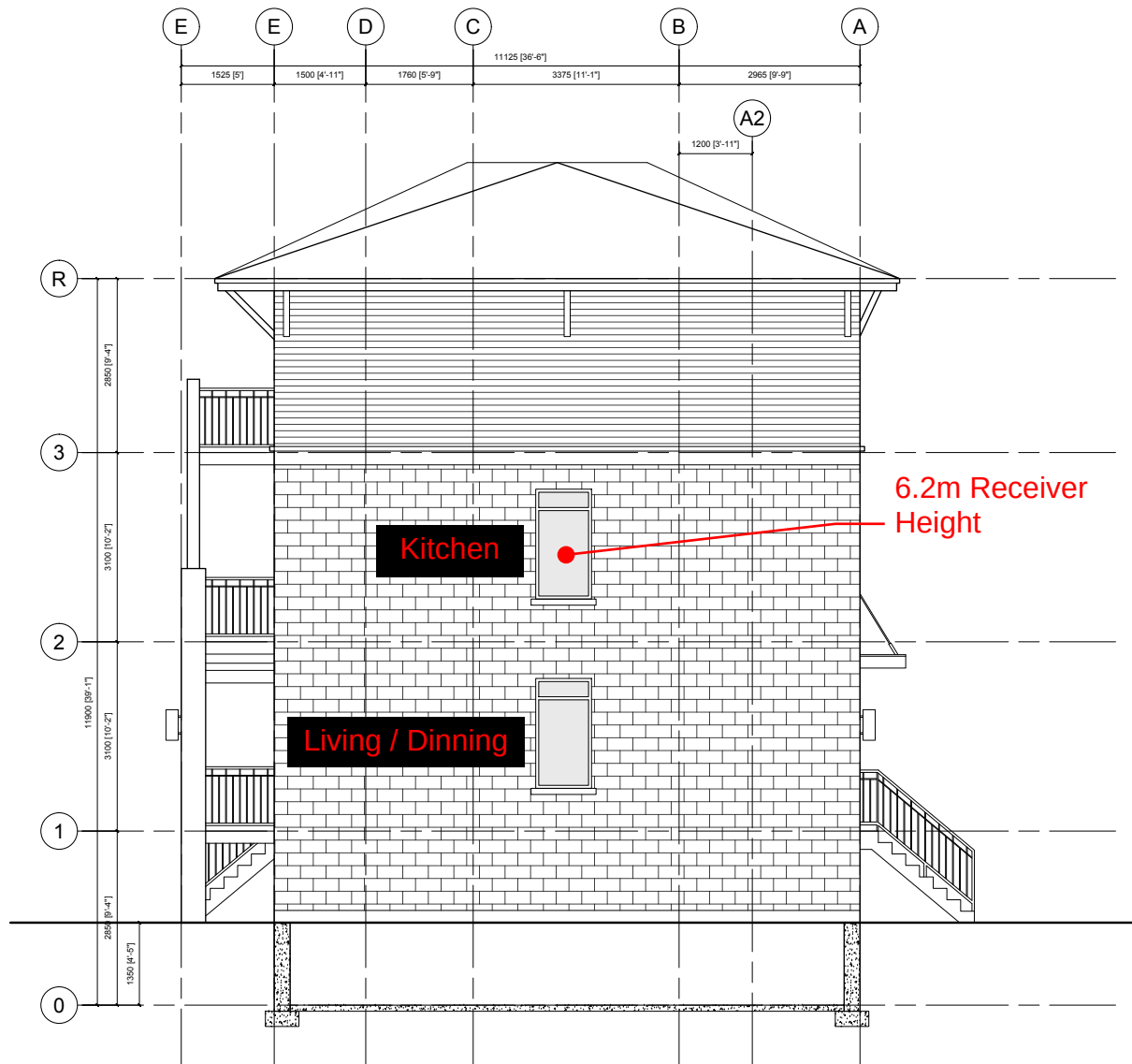
STACKED TOWNS:
FRONT ELEVATION
DATE: 15-02-2019

SCALE: 1:75

5924 HAZELDEAN RD
OTTAWA ONTARIO

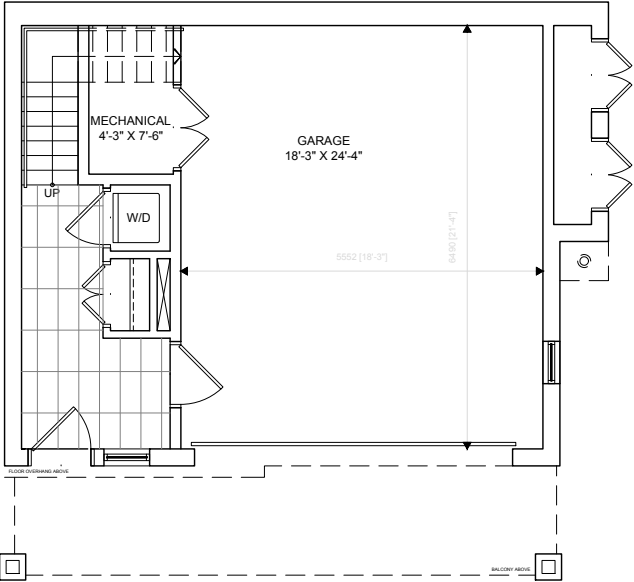
GNCR
HOLDING

05

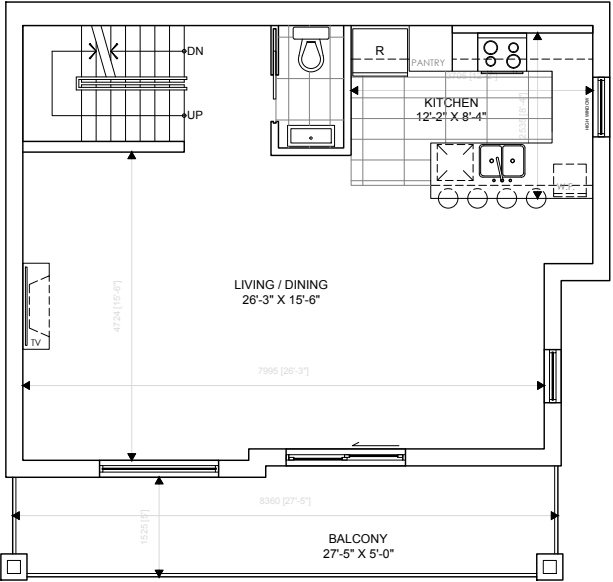




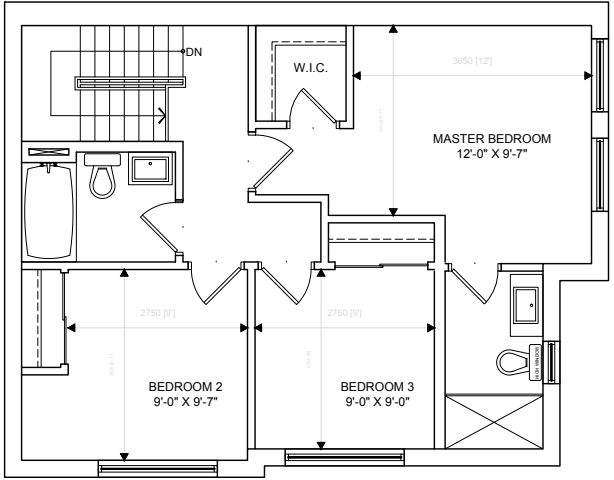
UNIT A
1517 SQ. FT.
3 BEDROOM, 2.5 BATHROOM
DOUBLE CAR GARAGE



GROUND
179 SQ. FT.



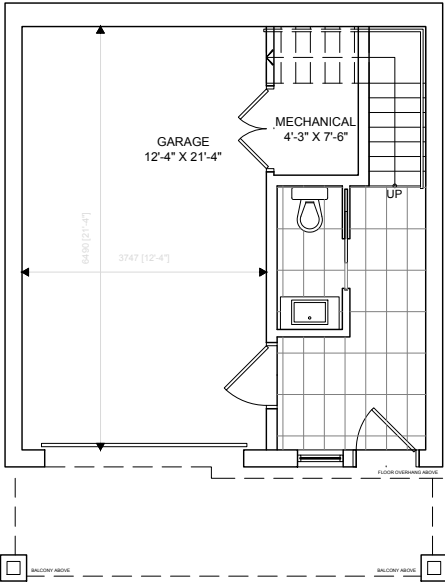
MAIN
669 SQ. FT.



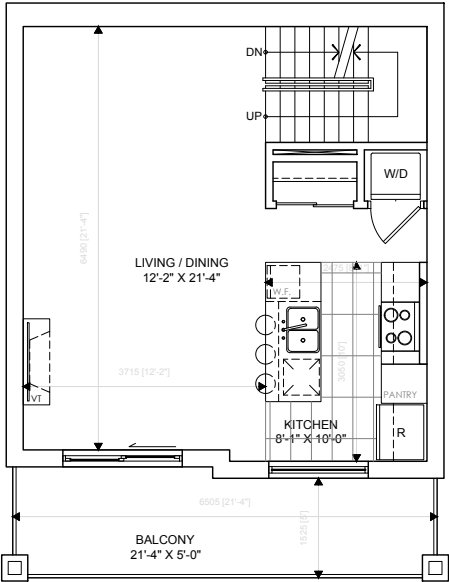
UPPER
669 SQ. FT.

UNIT B

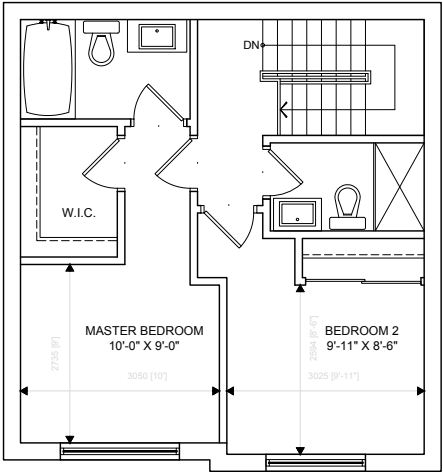
1165 SQ. FT.
2 BEDROOM, 2.5 BATHROOM
SINGLE CAR GARAGE



GROUND
179 SQ. FT.



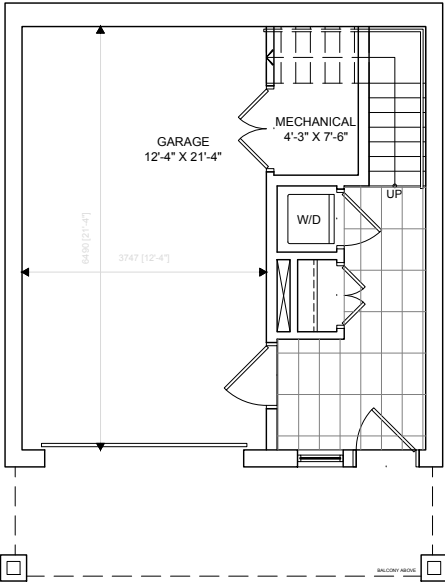
MAIN
493 SQ. FT.



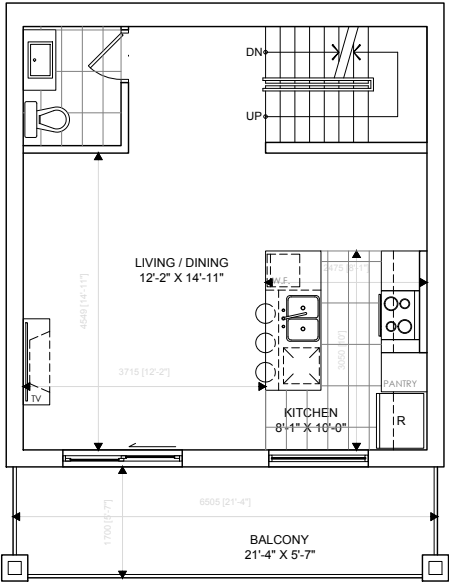
UPPER
493 SQ. FT.

UNIT C

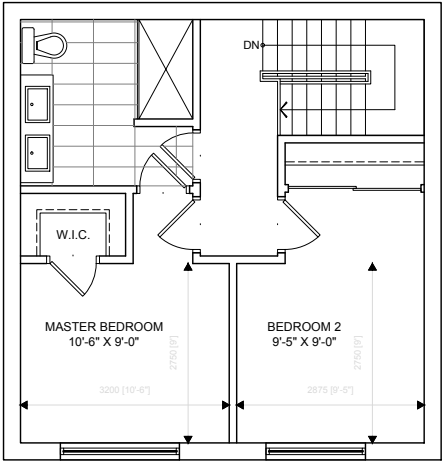
1165 SQ. FT.
2 BEDROOM, 1.5 BATHROOM
SINGLE CAR GARAGE



GROUND
179 SQ. FT.



MAIN
493 SQ. FT.



UPPER
493 SQ. FT.



rla/architecture

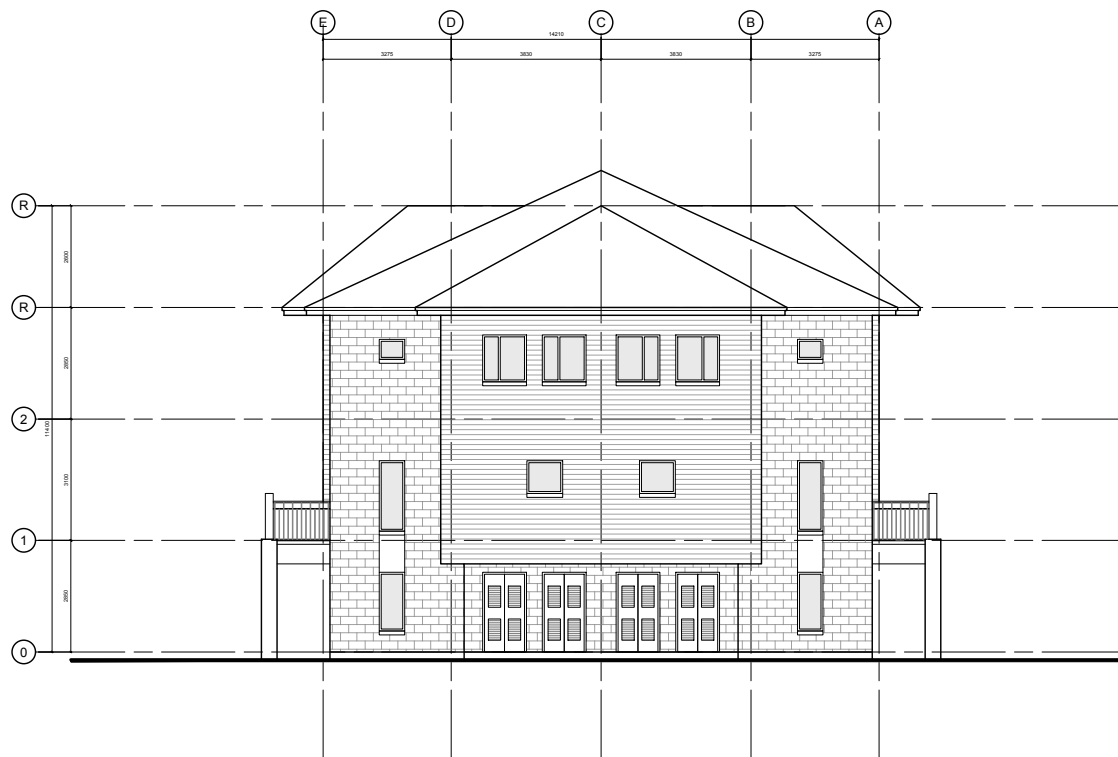
BACK TO BACK:
FRONT/REAR ELEVATION
DATE: 13-02-2019

SCALE: 1:125

5924 HAZELDEAN RD
OTTAWA ONTARIO

GNCR
HOLDING

11









Appendix D – STAMSON Output

R1.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2019 14:41:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (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 : 15.80 / 15.80 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B (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 : 28.10 / 28.10 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 69.77 + 0.00) = 69.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 70.00 0.00 -0.23 0.00 0.00 0.00 0.00 69.77

Segment Leq : 69.77 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 67.27 + 0.00) = 67.27 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 70.00 0.00 -2.73 0.00 0.00 0.00 0.00 67.27

Segment Leq : 67.27 dBA

Total Leq All Segments: 71.71 dBA

R1.txt

▲

Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 62.17 + 0.00) = 62.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.40	0.00	-0.23	0.00	0.00	0.00	0.00	62.17

Segment Leq : 62.17 dBA

▲

Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 59.67 + 0.00) = 59.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.40	0.00	-2.73	0.00	0.00	0.00	0.00	59.67

Segment Leq : 59.67 dBA

Total Leq All Segments: 64.11 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 71.71
(NIGHT): 64.11

▲

▲

R2.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2019 14:44:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (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 : 15.20 / 15.20 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B (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 : 27.50 / 27.50 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 69.94 + 0.00) = 69.94 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 70.00 0.00 -0.06 0.00 0.00 0.00 0.00 69.94

Segment Leq : 69.94 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 67.36 + 0.00) = 67.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 70.00 0.00 -2.63 0.00 0.00 0.00 0.00 67.36

Segment Leq : 67.36 dBA

Total Leq All Segments: 71.85 dBA

R2.txt

⬆

Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 62.34 + 0.00) = 62.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.40	0.00	-0.06	0.00	0.00	0.00	0.00	62.34

Segment Leq : 62.34 dBA

⬆

Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 59.77 + 0.00) = 59.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.40	0.00	-2.63	0.00	0.00	0.00	0.00	59.77

Segment Leq : 59.77 dBA

Total Leq All Segments: 64.25 dBA

⬆

TOTAL Leq FROM ALL SOURCES (DAY): 71.85
(NIGHT): 64.25

⬆

⬆

R3.txt
STAMSON 5.0 NORMAL REPORT Date: 16-05-2019 10:18:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.10 / 20.10 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 32.50 / 32.50 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 65.71 + 0.00) = 65.71 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 90 0.00 70.00 0.00 -1.27 -3.01 0.00 0.00 0.00 65.71

Segment Leq : 65.71 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 63.63 + 0.00) = 63.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 90 0.00 70.00 0.00 -3.36 -3.01 0.00 0.00 0.00 63.63

Segment Leq : 63.63 dBA

Total Leq All Segments: 67.80 dBA

R3.txt

▲

Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 58.12 + 0.00) = 58.12 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	62.40	0.00	-1.27	-3.01	0.00	0.00	0.00	58.12

Segment Leq : 58.12 dBA

▲

Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 56.03 + 0.00) = 56.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	62.40	0.00	-3.36	-3.01	0.00	0.00	0.00	56.03

Segment Leq : 56.03 dBA

Total Leq All Segments: 60.21 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 67.80
(NIGHT): 60.21

▲

▲

R4.txt
STAMSON 5.0 NORMAL REPORT Date: 16-05-2019 10:20:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : -45.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.50 / 27.50 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B (day/night)

Angle1 Angle2 : -45.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 66.11 + 0.00) = 66.11 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-45 90 0.00 70.00 0.00 -2.63 -1.25 0.00 0.00 0.00 66.11

Segment Leq : 66.11 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 64.49 + 0.00) = 64.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-45 90 0.00 70.00 0.00 -4.26 -1.25 0.00 0.00 0.00 64.49

Segment Leq : 64.49 dBA

Total Leq All Segments: 68.39 dBA

R4.txt

▲

Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 58.52 + 0.00) = 58.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	90	0.00	62.40	0.00	-2.63	-1.25	0.00	0.00	0.00	58.52

Segment Leq : 58.52 dBA

▲

Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 56.89 + 0.00) = 56.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	90	0.00	62.40	0.00	-4.26	-1.25	0.00	0.00	0.00	56.89

Segment Leq : 56.89 dBA

Total Leq All Segments: 60.79 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 68.39
(NIGHT): 60.79

▲

▲

R5.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2019 14:48:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 30.20 / 30.20 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.80 / 42.80 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 63.95 + 0.00) = 63.95 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 90 0.00 70.00 0.00 -3.04 -3.01 0.00 0.00 0.00 63.95

Segment Leq : 63.95 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 62.43 + 0.00) = 62.43 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 90 0.00 70.00 0.00 -4.55 -3.01 0.00 0.00 0.00 62.43

Segment Leq : 62.43 dBA

Total Leq All Segments: 66.27 dBA

R5.txt

▲

Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 56.35 + 0.00) = 56.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	62.40	0.00	-3.04	-3.01	0.00	0.00	0.00	56.35

Segment Leq : 56.35 dBA

▲

Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 54.84 + 0.00) = 54.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	62.40	0.00	-4.55	-3.01	0.00	0.00	0.00	54.84

Segment Leq : 54.84 dBA

Total Leq All Segments: 58.67 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 66.27
(NIGHT): 58.67

▲

▲

R6.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2019 15:15:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B wall (day/night)

Angle1 Angle2 : -90.00 deg -22.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height : 6.20 / 9.25 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -22.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 7.68 / 7.68 m
Source elevation : 114.75 m
Receiver elevation : 115.10 m
Barrier elevation : 114.91 m
Reference angle : 0.00

^
Road data, segment # 2: East B open (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *

R6.txt
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): 15000
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: East B open (day/night)

Angle1 Angle2 : -22.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height : 6.20 / 9.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 3: West B wall (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B wall (day/night)

Angle1 Angle2 : -90.00 deg -22.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R6.txt

```

Surface          :      2      (Reflective ground surface)
Receiver source distance : 32.10 / 32.10 m
Receiver height   :    6.20 / 9.25 m
Topography        :      2      (Flat/gentle slope; with barrier)
Barrier angle1    : -90.00 deg   Angle2 : -22.00 deg
Barrier height    :    3.00 m
Barrier receiver distance : 7.68 / 7.68 m
Source elevation  : 114.64 m
Receiver elevation : 115.10 m
Barrier elevation  : 114.91 m
Reference angle   :    0.00

```

⬆
Road data, segment # 4: West B open (day/night)

```

-----
Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B open (day/night)

```

-----
Angle1 Angle2 : -22.00 deg 0.00 deg
Wood depth    : 0 (No woods.)
No of house rows : 0 / 0
Surface       : 2 (Reflective ground surface)
Receiver source distance : 32.10 / 32.10 m
Receiver height : 6.20 / 9.25 m
Topography     : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

⬆
Results segment # 1: East B wall (day)

Source height = 1.50 m

R6.txt

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 6.20 ! 4.47 ! 119.38

```

ROAD (0.00 + 64.48 + 0.00) = 64.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-22	0.00	70.00	0.00	-1.29	-4.23	0.00	0.00	-0.57	63.90*
-90	-22	0.00	70.00	0.00	-1.29	-4.23	0.00	0.00	0.00	64.48

* Bright Zone !

Segment Leq : 64.48 dBA

⬆
Results segment # 2: East B open (day)

Source height = 1.50 m

ROAD (0.00 + 59.58 + 0.00) = 59.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	0	0.00	70.00	0.00	-1.29	-9.13	0.00	0.00	0.00	59.58

Segment Leq : 59.58 dBA

⬆
Results segment # 3: West B wall (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 ! 6.20 ! 5.15 ! 120.06

```

ROAD (0.00 + 62.46 + 0.00) = 62.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-22	0.00	70.00	0.00	-1.29	-4.23	0.00	0.00	0.00	64.48

R6.txt

-90	-22	0.00	70.00	0.00	-3.30	-4.23	0.00	0.00	-0.30	62.16*
-90	-22	0.00	70.00	0.00	-3.30	-4.23	0.00	0.00	0.00	62.46

* Bright Zone !

Segment Leq : 62.46 dBA

▲
Results segment # 4: West B open (day)

Source height = 1.50 m

ROAD (0.00 + 57.56 + 0.00) = 57.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	0	0.00	70.00	0.00	-3.30	-9.13	0.00	0.00	0.00	57.56

Segment Leq : 57.56 dBA

Total Leq All Segments: 67.81 dBA

▲
Results segment # 1: East B wall (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 !	9.25 !	6.36 !	121.27

ROAD (0.00 + 56.88 + 0.00) = 56.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-22	0.00	62.40	0.00	-1.29	-4.23	0.00	0.00	-0.12	56.76*
-90	-22	0.00	62.40	0.00	-1.29	-4.23	0.00	0.00	0.00	56.88

* Bright Zone !

Segment Leq : 56.88 dBA

R6.txt

▲
Results segment # 2: East B open (night)

Source height = 1.50 m

ROAD (0.00 + 51.98 + 0.00) = 51.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	0	0.00	62.40	0.00	-1.29	-9.13	0.00	0.00	0.00	51.98

Segment Leq : 51.98 dBA

▲
Results segment # 3: West B wall (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 !	9.25 !	7.47 !	122.38

ROAD (0.00 + 54.87 + 0.00) = 54.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-22	0.00	62.40	0.00	-3.30	-4.23	0.00	0.00	-0.08	54.79*
-90	-22	0.00	62.40	0.00	-3.30	-4.23	0.00	0.00	0.00	54.87

* Bright Zone !

Segment Leq : 54.87 dBA

▲
Results segment # 4: West B open (night)

Source height = 1.50 m

ROAD (0.00 + 49.97 + 0.00) = 49.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	0	0.00	62.40	0.00	-3.30	-9.13	0.00	0.00	0.00	49.97

R6.txt

Segment Leq : 49.97 dBA

Total Leq All Segments: 60.22 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 67.81
(NIGHT): 60.22



Filename: r7.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B wall (day/night)

Angle1 Angle2 : -90.00 deg -8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.40 / 33.40 m
Receiver height : 6.00 / 9.25 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -8.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 20.90 / 20.90 m
Source elevation : 114.75 m
Receiver elevation : 115.40 m
Barrier elevation : 114.91 m
Reference angle : 0.00

^
Road data, segment # 2: East B open (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *

R7.txt
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): 15000
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: East B open (day/night)

Angle1 Angle2 : -8.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.40 / 33.40 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 3: West B wall (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B wall (day/night)

Angle1 Angle2 : -90.00 deg -8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R7.txt

```

Surface          :      2      (Reflective ground surface)
Receiver source distance : 45.30 / 45.30 m
Receiver height   :    6.00 / 9.25 m
Topography        :      2      (Flat/gentle slope; with barrier)
Barrier angle1    : -90.00 deg   Angle2 : -8.00 deg
Barrier height    :    3.00 m
Barrier receiver distance : 20.90 / 20.90 m
Source elevation  : 114.64 m
Receiver elevation : 115.40 m
Barrier elevation  : 114.91 m
Reference angle   :    0.00

```

▲ Road data, segment # 4: West B open (day/night)

```

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B open (day/night)

```

Angle1 Angle2 : -8.00 deg 0.00 deg
Wood depth   : 0 (No woods.)
No of house rows : 0 / 0
Surface       : 2 (Reflective ground surface)
Receiver source distance : 45.30 / 45.30 m
Receiver height : 6.00 / 9.25 m
Topography     : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

▲ Results segment # 1: East B wall (day)

Source height = 1.50 m

R7.txt

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 6.00 ! 3.26 ! 118.17

```

ROAD (0.00 + 63.11 + 0.00) = 63.11 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90 -8 0.00 70.00 0.00 -3.48 -3.41 0.00 0.00 -4.86 58.25*
-90 -8 0.00 70.00 0.00 -3.48 -3.41 0.00 0.00 0.00 63.11
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

* Bright Zone !

Segment Leq : 63.11 dBA

▲ Results segment # 2: East B open (day)

Source height = 1.50 m

ROAD (0.00 + 53.00 + 0.00) = 53.00 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-8 0 0.00 70.00 0.00 -3.48 -13.52 0.00 0.00 0.00 53.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 53.00 dBA

▲ Results segment # 3: West B wall (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 ! 6.00 ! 4.06 ! 118.97

```

ROAD (0.00 + 61.78 + 0.00) = 61.78 dBA

```

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

```

R7.txt

-90	-8	0.00	70.00	0.00	-4.80	-3.41	0.00	0.00	-3.01	58.77*
-90	-8	0.00	70.00	0.00	-4.80	-3.41	0.00	0.00	0.00	61.78

* Bright Zone !

Segment Leq : 61.78 dBA

Results segment # 4: West B open (day)

Source height = 1.50 m

ROAD (0.00 + 51.67 + 0.00) = 51.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-8	0	0.00	70.00	0.00	-4.80	-13.52	0.00	0.00	0.00	51.67

Segment Leq : 51.67 dBA

Total Leq All Segments: 65.91 dBA

Results segment # 1: East B wall (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	!	9.25	!	4.48	!	119.39

ROAD (0.00 + 55.51 + 0.00) = 55.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-8	0.00	62.40	0.00	-3.48	-3.41	0.00	0.00	-0.78	54.73*
-90	-8	0.00	62.40	0.00	-3.48	-3.41	0.00	0.00	0.00	55.51

* Bright Zone !

Segment Leq : 55.51 dBA

R7.txt

Results segment # 2: East B open (night)

Source height = 1.50 m

ROAD (0.00 + 45.40 + 0.00) = 45.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-8	0	0.00	62.40	0.00	-3.48	-13.52	0.00	0.00	0.00	45.40

Segment Leq : 45.40 dBA

Results segment # 3: West B wall (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	!	9.25	!	5.81	!	120.72

ROAD (0.00 + 54.18 + 0.00) = 54.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-8	0.00	62.40	0.00	-4.80	-3.41	0.00	0.00	-0.28	53.91*
-90	-8	0.00	62.40	0.00	-4.80	-3.41	0.00	0.00	0.00	54.18

* Bright Zone !

Segment Leq : 54.18 dBA

Results segment # 4: West B open (night)

Source height = 1.50 m

ROAD (0.00 + 44.08 + 0.00) = 44.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-8	0	0.00	62.40	0.00	-4.80	-13.52	0.00	0.00	0.00	44.08

R7.txt

Segment Leq : 44.08 dBA

Total Leq All Segments: 58.31 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 65.91
(NIGHT): 58.31



R8.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2019 14:57:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B wall (day/night)

Angle1 Angle2 : -90.00 deg -6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 39.10 / 39.10 m
Receiver height : 6.00 / 9.25 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -6.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 26.60 / 26.60 m
Source elevation : 114.75 m
Receiver elevation : 115.40 m
Barrier elevation : 114.91 m
Reference angle : 0.00

^
Road data, segment # 2: East B open (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *

R8.txt
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): 15000
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: East B open (day/night)

Angle1 Angle2 : -6.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 39.10 / 39.10 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 3: West B wall (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B wall (day/night)

Angle1 Angle2 : -90.00 deg -6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R8.txt

```

Surface           :      2      (Reflective ground surface)
Receiver source distance : 51.00 / 51.00 m
Receiver height    :    6.00 / 9.25 m
Topography        :      2      (Flat/gentle slope; with barrier)
Barrier angle1     : -90.00 deg   Angle2 : -6.00 deg
Barrier height     :    3.00 m
Barrier receiver distance : 26.60 / 26.60 m
Source elevation   : 114.64 m
Receiver elevation  : 115.40 m
Barrier elevation   : 114.91 m
Reference angle    :    0.00

```

▲
Road data, segment # 4: West B open (day/night)

```

-----
Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B open (day/night)

```

-----
Angle1 Angle2 : -6.00 deg 0.00 deg
Wood depth    : 0 (No woods.)
No of house rows : 0 / 0
Surface       : 2 (Reflective ground surface)
Receiver source distance : 51.00 / 51.00 m
Receiver height : 6.00 / 9.25 m
Topography    : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

▲
Results segment # 1: East B wall (day)

Source height = 1.50 m

R8.txt

```

Barrier height for grazing incidence
-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 6.00 ! 2.98 ! 117.89

ROAD (0.00 + 57.52 + 0.00) = 57.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90 -6 0.00 70.00 0.00 -4.16 -3.31 0.00 0.00 -5.00 57.52
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 57.52 dBA

▲
Results segment # 2: East B open (day)

Source height = 1.50 m

```

ROAD (0.00 + 51.06 + 0.00) = 51.06 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-6 0 0.00 70.00 0.00 -4.16 -14.77 0.00 0.00 0.00 51.06
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 51.06 dBA

▲
Results segment # 3: West B wall (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 ! 6.00 ! 3.74 ! 118.65

ROAD (0.00 + 61.37 + 0.00) = 61.37 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90 -6 0.00 70.00 0.00 -5.31 -3.31 0.00 0.00 -4.24 57.13*
-90 -6 0.00 70.00 0.00 -5.31 -3.31 0.00 0.00 0.00 61.37
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

R8.txt

* Bright Zone !

Segment Leq : 61.37 dBA

Results segment # 4: West B open (day)

Source height = 1.50 m

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-6	0	0.00	70.00	0.00	-5.31	-14.77	0.00	0.00	0.00	49.91

Segment Leq : 49.91 dBA

Total Leq All Segments: 63.35 dBA

Results segment # 1: East B wall (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	9.25	4.02	118.93

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-6	0.00	62.40	0.00	-4.16	-3.31	0.00	0.00	-2.47	52.46*
-90	-6	0.00	62.40	0.00	-4.16	-3.31	0.00	0.00	0.00	54.93

* Bright Zone !

Segment Leq : 54.93 dBA

Results segment # 2: East B open (night)

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R8.txt

Source height = 1.50 m

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-6	0	0.00	62.40	0.00	-4.16	-14.77	0.00	0.00	0.00	43.47

Segment Leq : 43.47 dBA

Results segment # 3: West B wall (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	9.25	5.30	120.21

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-6	0.00	62.40	0.00	-5.31	-3.31	0.00	0.00	-0.47	53.31*
-90	-6	0.00	62.40	0.00	-5.31	-3.31	0.00	0.00	0.00	53.77

* Bright Zone !

Segment Leq : 53.77 dBA

Results segment # 4: West B open (night)

Source height = 1.50 m

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-6	0	0.00	62.40	0.00	-5.31	-14.77	0.00	0.00	0.00	42.31

Segment Leq : 42.31 dBA

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R8.txt

Total Leq All Segments: 57.70 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.35
(NIGHT): 57.70



R9.txt
STAMSON 5.0 NORMAL REPORT Date: 15-05-2019 15:07:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B wall (day/night)

Angle1 Angle2 : -90.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.20 / 47.20 m
Receiver height : 6.00 / 9.25 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -5.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 34.60 / 34.60 m
Source elevation : 114.44 m
Receiver elevation : 115.40 m
Barrier elevation : 114.91 m
Reference angle : 0.00

^
Road data, segment # 2: East B open (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *

R9.txt
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): 15000
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: East B open (day/night)

Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.20 / 47.20 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 3: West B wall (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B wall (day/night)

Angle1 Angle2 : -90.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R9.txt

```

Surface          :      2      (Reflective ground surface)
Receiver source distance : 59.00 / 59.00 m
Receiver height   :    6.00 / 9.25 m
Topography        :      2      (Flat/gentle slope; with barrier)
Barrier angle1    : -90.00 deg   Angle2 : -5.00 deg
Barrier height    :    3.00 m
Barrier receiver distance : 34.60 / 34.60 m
Source elevation  : 114.37 m
Receiver elevation : 115.50 m
Barrier elevation  : 114.91 m
Reference angle   :    0.00

```

▲
Road data, segment # 4: West B open (day/night)

```

-----
Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B open (day/night)

```

-----
Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth    : 0 (No woods.)
No of house rows : 0 / 0
Surface        : 2 (Reflective ground surface)
Receiver source distance : 59.00 / 59.00 m
Receiver height : 6.00 / 9.25 m
Topography     : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

▲
Results segment # 1: East B wall (day)

Source height = 1.50 m

R9.txt

```

Barrier height for grazing incidence
-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 6.00 ! 2.48 ! 117.39

ROAD (0.00 + 56.33 + 0.00) = 56.33 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90 -5 0.00 70.00 0.00 -4.98 -3.26 0.00 0.00 -5.43 56.33
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 56.33 dBA

▲
Results segment # 2: East B open (day)

Source height = 1.50 m

```

ROAD (0.00 + 49.45 + 0.00) = 49.45 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-5 0 0.00 70.00 0.00 -4.98 -15.56 0.00 0.00 0.00 49.45
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 49.45 dBA

▲
Results segment # 3: West B wall (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 ! 6.00 ! 3.29 ! 118.20

ROAD (0.00 + 60.79 + 0.00) = 60.79 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90 -5 0.00 70.00 0.00 -5.95 -3.26 0.00 0.00 -4.91 55.88*
-90 -5 0.00 70.00 0.00 -5.95 -3.26 0.00 0.00 0.00 60.79
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

* Bright Zone !

Segment Leq : 60.79 dBA

Results segment # 4: West B open (day)

Source height = 1.50 m

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	0	0.00	70.00	0.00	-5.95	-15.56	0.00	0.00	0.00	48.49

Segment Leq : 48.49 dBA

Total Leq All Segments: 62.52 dBA

Results segment # 1: East B wall (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	9.25	3.35	118.26

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-5	0.00	62.40	0.00	-4.98	-3.26	0.00	0.00	-4.79	49.38*
-90	-5	0.00	62.40	0.00	-4.98	-3.26	0.00	0.00	0.00	54.16

* Bright Zone !

Segment Leq : 54.16 dBA

Results segment # 2: East B open (night)

Source height = 1.50 m

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	0	0.00	62.40	0.00	-4.98	-15.56	0.00	0.00	0.00	41.86

Segment Leq : 41.86 dBA

Results segment # 3: West B wall (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	9.25	4.63	119.54

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-5	0.00	62.40	0.00	-5.95	-3.26	0.00	0.00	-1.17	52.03*
-90	-5	0.00	62.40	0.00	-5.95	-3.26	0.00	0.00	0.00	53.19

* Bright Zone !

Segment Leq : 53.19 dBA

Results segment # 4: West B open (night)

Source height = 1.50 m

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	0	0.00	62.40	0.00	-5.95	-15.56	0.00	0.00	0.00	40.89

Segment Leq : 40.89 dBA

R9.txt

Total Leq All Segments: 56.96 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 62.52
(NIGHT): 56.96



Filename: r10.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : -48.00 deg 67.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 87 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.50 / 57.50 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

▲
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B (day/night)

Angle1 Angle2 : -48.00 deg 67.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 87 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 69.40 / 69.40 m
Receiver height : 6.00 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

▲
Result summary (day)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	! 1.50	! 54.94	! 54.94
2.West B	! 1.50	! 54.23	! 54.23
Total			57.61 dBA

▲
Result summary (night)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	! 1.50	! 47.35	! 47.35
2.West B	! 1.50	! 46.63	! 46.63
Total			50.02 dBA

R10.txt

TOTAL Leq FROM ALL SOURCES (DAY): 57.61
(NIGHT): 50.02



R11.txt
STAMSON 5.0 NORMAL REPORT Date: 16-05-2019 10:23:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B wall (day/night)

Angle1 Angle2 : -90.00 deg -40.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height : 6.20 / 9.25 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -40.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 18.20 / 18.20 m
Source elevation : 114.70 m
Receiver elevation : 114.61 m
Barrier elevation : 114.91 m
Reference angle : 0.00

^
Road data, segment # 2: East B open (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *

R11.txt
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): 15000
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: East B open (day/night)

Angle1 Angle2 : 73.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height : 6.20 / 9.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 3: West B wall (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B wall (day/night)

Angle1 Angle2 : -90.00 deg -40.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

R11.txt

```

Surface          :      2      (Reflective ground surface)
Receiver source distance : 42.60 / 42.60 m
Receiver height   :    6.20 / 9.25 m
Topography        :      2      (Flat/gentle slope; with barrier)
Barrier angle1    : -90.00 deg   Angle2 : -40.00 deg
Barrier height    :    3.00 m
Barrier receiver distance : 7.68 / 7.68 m
Source elevation  : 114.64 m
Receiver elevation : 115.10 m
Barrier elevation  : 114.91 m
Reference angle   :    0.00

```

▲ Road data, segment # 4: West B open (day/night)

```

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: West B open (day/night)

```

Angle1 Angle2 : 73.00 deg 90.00 deg
Wood depth    : 0 (No woods.)
No of house rows : 1 / 0
Surface       : 2 (Reflective ground surface)
Receiver source distance : 42.60 / 42.60 m
Receiver height : 6.20 / 9.25 m
Topography     : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

▲ Results segment # 1: East B wall (day)

Source height = 1.50 m

R11.txt

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 6.20 ! 3.43 ! 118.34

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----
-90 -40 0.00 70.00 0.00 -3.55 -5.56 0.00 0.00 -4.76 56.12*
-90 -40 0.00 70.00 0.00 -3.55 -5.56 0.00 0.00 0.00 60.88
-----

```

* Bright Zone !

Segment Leq : 60.88 dBA

▲ Results segment # 2: East B open (day)

Source height = 1.50 m

```

ROAD (0.00 + 48.62 + 0.00) = 48.62 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----
73 90 0.00 70.00 0.00 -3.55 -10.25 0.00 -7.57 0.00 48.62
-----

```

Segment Leq : 48.62 dBA

▲ Results segment # 3: West B wall (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 ! 6.20 ! 5.46 ! 120.37

```

```

ROAD (0.00 + 59.90 + 0.00) = 59.90 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----

```

R11.txt

-90	-40	0.00	70.00	0.00	-4.53	-5.56	0.00	0.00	-0.34	59.56*
-90	-40	0.00	70.00	0.00	-4.53	-5.56	0.00	0.00	0.00	59.90

* Bright Zone !

Segment Leq : 59.90 dBA

Results segment # 4: West B open (day)

Source height = 1.50 m

ROAD (0.00 + 47.75 + 0.00) = 47.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
73	90	0.00	70.00	0.00	-4.53	-10.25	0.00	-7.46	0.00	47.75

Segment Leq : 47.75 dBA

Total Leq All Segments: 63.68 dBA

Results segment # 1: East B wall (night)

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	!	9.25	!	4.85	!	119.76

ROAD (0.00 + 53.28 + 0.00) = 53.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-40	0.00	62.40	0.00	-3.55	-5.56	0.00	0.00	-0.87	52.41*
-90	-40	0.00	62.40	0.00	-3.55	-5.56	0.00	0.00	0.00	53.28

* Bright Zone !

Segment Leq : 53.28 dBA

R11.txt

Results segment # 2: East B open (night)

Source height = 1.50 m

ROAD (0.00 + 48.60 + 0.00) = 48.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
73	90	0.00	62.40	0.00	-3.55	-10.25	0.00	0.00	0.00	48.60

Segment Leq : 48.60 dBA

Results segment # 3: West B wall (night)

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	!	9.25	!	7.96	!	122.87

ROAD (0.00 + 52.30 + 0.00) = 52.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-40	0.00	62.40	0.00	-4.53	-5.56	0.00	0.00	-0.09	52.21*
-90	-40	0.00	62.40	0.00	-4.53	-5.56	0.00	0.00	0.00	52.30

* Bright Zone !

Segment Leq : 52.30 dBA

Results segment # 4: West B open (night)

Source height = 1.50 m

ROAD (0.00 + 47.62 + 0.00) = 47.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
73	90	0.00	62.40	0.00	-4.53	-10.25	0.00	0.00	0.00	47.62

R11.txt

Segment Leq : 47.62 dBA

Total Leq All Segments: 57.10 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.68
(NIGHT): 57.10



Filename: r12.te Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 12144/1056 veh/TimePeriod *
 Medium truck volume : 966/84 veh/TimePeriod *
 Heavy truck volume : 690/60 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): 15000
 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: East B (day/night)

 Angle1 Angle2 : -80.00 deg 88.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 87 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 43.50 / 43.50 m
 Receiver height : 6.20 / 9.25 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲
 Road data, segment # 2: West B (day/night)

 Car traffic volume : 12144/1056 veh/TimePeriod *
 Medium truck volume : 966/84 veh/TimePeriod *
 Heavy truck volume : 690/60 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): 15000
 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: West B (day/night)

 Angle1 Angle2 : -80.00 deg 88.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 87 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 55.70 / 55.70 m
 Receiver height : 6.20 / 9.25 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲
 Result summary (day)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	! 1.50	! 57.62	! 57.62
2.West B	! 1.50	! 56.70	! 56.70
Total			60.19 dBA

▲
 Result summary (night)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	! 1.50	! 50.03	! 50.03
2.West B	! 1.50	! 49.11	! 49.11
Total			52.60 dBA

R12.txt

TOTAL Leq FROM ALL SOURCES (DAY): 60.19
(NIGHT): 52.60



Filename: r13.te Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 12144/1056 veh/TimePeriod *
 Medium truck volume : 966/84 veh/TimePeriod *
 Heavy truck volume : 690/60 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): 15000
 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: East B (day/night)

 Angle1 Angle2 : -87.00 deg 33.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 87 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 45.20 / 45.20 m
 Receiver height : 4.35 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲
 Road data, segment # 2: West B (day/night)

 Car traffic volume : 12144/1056 veh/TimePeriod *
 Medium truck volume : 966/84 veh/TimePeriod *
 Heavy truck volume : 690/60 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): 15000
 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: West B (day/night)

 Angle1 Angle2 : -87.00 deg 33.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 87 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 57.40 / 57.40 m
 Receiver height : 4.35 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲
 Result summary (day)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	1.50	56.02	56.02
2.West B	1.50	55.13	55.13
Total			58.61 dBA

▲
 Result summary (night)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	1.50	48.42	48.42
2.West B	1.50	47.54	47.54
Total			51.01 dBA

R13.txt

TOTAL Leq FROM ALL SOURCES (DAY): 58.61
(NIGHT): 51.01



Filename: r14.te Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 12144/1056 veh/TimePeriod *
 Medium truck volume : 966/84 veh/TimePeriod *
 Heavy truck volume : 690/60 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): 15000
 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: East B (day/night)

 Angle1 Angle2 : -61.00 deg 30.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 87 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 59.80 / 59.80 m
 Receiver height : 4.35 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲
 Road data, segment # 2: West B (day/night)

 Car traffic volume : 12144/1056 veh/TimePeriod *
 Medium truck volume : 966/84 veh/TimePeriod *
 Heavy truck volume : 690/60 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): 15000
 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: West B (day/night)

 Angle1 Angle2 : -61.00 deg 30.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 87 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 71.30 / 71.30 m
 Receiver height : 4.35 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

▲
 Result summary (day)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	! 1.50	! 53.79	! 53.79
2.West B	! 1.50	! 53.11	! 53.11
Total			56.47 dBA

▲
 Result summary (night)

	! source ! height ! (m)	! Road ! Leq ! (dBA)	! Total ! Leq ! (dBA)
1.East B	! 1.50	! 46.19	! 46.19
2.West B	! 1.50	! 45.51	! 45.51
Total			48.87 dBA

R14.txt

TOTAL Leq FROM ALL SOURCES (DAY): 56.47
(NIGHT): 48.87



R15.txt
STAMSON 5.0 NORMAL REPORT Date: 16-05-2019 10:35:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : 15.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 50.00 / 50.00 m
Receiver height : 4.35 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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:

R15.txt
24 hr Traffic Volume (AADT or SADT): 15000
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: West B (day/night)

Angle1 Angle2 : 15.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 58.60 / 58.60 m
Receiver height : 4.35 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (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

15 90 0.00 70.00 0.00 -5.23 -3.80 0.00 0.00 0.00 60.97

Segment Leq : 60.97 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 60.28 + 0.00) = 60.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

15 90 0.00 70.00 0.00 -5.92 -3.80 0.00 0.00 0.00 60.28

Segment Leq : 60.28 dBA

Total Leq All Segments: 63.65 dBA

R15.txt

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Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 53.37 + 0.00) = 53.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
15	90	0.00	62.40	0.00	-5.23	-3.80	0.00	0.00	0.00	53.37

Segment Leq : 53.37 dBA

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Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 52.68 + 0.00) = 52.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
15	90	0.00	62.40	0.00	-5.92	-3.80	0.00	0.00	0.00	52.68

Segment Leq : 52.68 dBA

Total Leq All Segments: 56.05 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 63.65
(NIGHT): 56.05

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R16.txt
STAMSON 5.0 NORMAL REPORT Date: 16-05-2019 10:45:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r16.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : -51.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.10 / 20.10 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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:

R16.txt
24 hr Traffic Volume (AADT or SADT): 15000
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: West B (day/night)

Angle1 Angle2 : -51.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 32.50 / 32.50 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 63.25 + 0.00) = 63.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-51 0 0.00 70.00 0.00 -1.27 -5.48 0.00 0.00 0.00 63.25

Segment Leq : 63.25 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 61.16 + 0.00) = 61.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-51 0 0.00 70.00 0.00 -3.36 -5.48 0.00 0.00 0.00 61.16

Segment Leq : 61.16 dBA

Total Leq All Segments: 65.34 dBA

R16.txt

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Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 55.65 + 0.00) = 55.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	62.40	0.00	-1.27	-5.48	0.00	0.00	0.00	55.65

Segment Leq : 55.65 dBA

▲

Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 53.56 + 0.00) = 53.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	62.40	0.00	-3.36	-5.48	0.00	0.00	0.00	53.56

Segment Leq : 53.56 dBA

Total Leq All Segments: 57.74 dBA

▲

TOTAL Leq FROM ALL SOURCES (DAY): 65.34
(NIGHT): 57.74

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R17.txt
STAMSON 5.0 NORMAL REPORT Date: 16-05-2019 10:54:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r17.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: East B (day/night)

Angle1 Angle2 : -34.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.50 / 20.50 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Road data, segment # 2: West B (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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:

R17.txt
24 hr Traffic Volume (AADT or SADT): 15000
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: West B (day/night)

Angle1 Angle2 : -34.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 32.80 / 32.80 m
Receiver height : 6.20 / 9.25 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

^
Results segment # 1: East B (day)

Source height = 1.50 m

ROAD (0.00 + 61.40 + 0.00) = 61.40 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-34 0 0.00 70.00 0.00 -1.36 -7.24 0.00 0.00 0.00 61.40

Segment Leq : 61.40 dBA

^
Results segment # 2: West B (day)

Source height = 1.50 m

ROAD (0.00 + 59.36 + 0.00) = 59.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-34 0 0.00 70.00 0.00 -3.40 -7.24 0.00 0.00 0.00 59.36

Segment Leq : 59.36 dBA

Total Leq All Segments: 63.51 dBA

R17.txt

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Results segment # 1: East B (night)

Source height = 1.50 m

ROAD (0.00 + 53.80 + 0.00) = 53.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	0	0.00	62.40	0.00	-1.36	-7.24	0.00	0.00	0.00	53.80

Segment Leq : 53.80 dBA

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Results segment # 2: West B (night)

Source height = 1.50 m

ROAD (0.00 + 51.76 + 0.00) = 51.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	0	0.00	62.40	0.00	-3.40	-7.24	0.00	0.00	0.00	51.76

Segment Leq : 51.76 dBA

Total Leq All Segments: 55.91 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 63.51
(NIGHT): 55.91

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