Environmental Noise Feasibility Assessment

350 Sparks Street

Ottawa, Ontario

REPORT: GWE15-029 – Environmental Noise

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EXECUTIVE SUMMARY

This document describes an environmental noise feasibility assessment performed for the proposed mixed use Development project by Morguard Developments at 350 Sparks Street in Ottawa, Ontario. The development will consist of a 24-storey residential tower standing mid-block on the north of the site, diagonally opposite a proposed 27-storey hotel tower at the corner of Bay and Queen Streets. Figure 1 illustrates a site plan with surrounding context.

The assessment is based on: (i) theoretical noise prediction methods that conform to the Ministry of the Environment (MOE) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan (OP) roadway classifications; and (iv) architectural drawings received from WZMH Architects.

The results of the current analysis indicate that roadway traffic noise levels will range between 35 and 57 dBA during the daytime period (07:00-23:00) and between 28 and 50 dBA during the nighttime period (23:00-07:00). The highest roadway traffic noise level (i.e. 57 dBA) occurs on the east façades of both the residential and hotel towers (Receptors 22 and 26), which is nearest and most exposed to Lyon Street. Minimum building construction in all areas is required to satisfy the Ontario Building Code (2012). The noise levels predicted due to roadway traffic do not exceed the criteria listed in the ENCG for building components. Therefore, upgraded building components will not be required.

Results of the study also indicate that all units facing east will require forced air heating with provisions for central air conditioning (or similar mechanical systems). In addition to ventilation requirements, Warning Clause (Type C[1]) will also be required to be placed on all Lease, Purchase and Sale Agreements.

[1] City of Ottawa Environmental Noise Control Guidelines, SS Wilson Associates, May 10, 2006

The proposed noise sensitive buildings will be impacted by the existing onsite office tower's rooftop mechanical equipment. To ensure noise levels from the equipment is compliant with the City of Ottawa's Environmental Noise Control Guidelines for stationary sources, it is recommended acoustical louvers and silencers be installed around the equipment as described in Section 5.4. Due to the presence of multiple commercial buildings in the area, a Stationary Noise Warning Clause (Type E[2]) should be placed on all Agreements of Lease, Purchase and Sale.

[2] ibid

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1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by WZMH Architects to undertake an environmental noise feasibility assessment of the proposed Sparks Street Development project by Morguard Developments at 350 Sparks Street in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to an environmental noise feasibility assessment. GWE's scope of work involved assessing exterior and interior noise levels generated by local roadway traffic and stationary sources. The assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa[3] and Ministry of the Environment[4] guidelines. Noise calculations were based on architectural drawings received from WZMH Architects, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this environmental noise feasibility assessment is the planned dual-tower mixed-use redevelopment project located at 350 Sparks Street in Ottawa, Ontario. The study site is located on the west half of the city block bounded by Queen Street to the south, Bay Street to the west, Sparks Street to the north, and Lyon Street North to the east. Local surroundings comprise a moderate-density concentration of low, medium, and high-rise buildings, with a greater density of taller buildings in the downtown Ottawa core to the east. The Ottawa River and Lebreton Flats are at a lower elevation to the west and north of the study site. Upon completion, the development will feature two tall buildings rising from a common multi-level podium. The residential tower on the north side of the site contains 24 storeys, rising to a total height of approximately 78.45 metres above local grade. At the south side of the site, the hotel tower contains 26 storeys and rises to a height of approximately 84 metres above local grade. Above three levels of below-grade parking, the L-shaped podium contains shared hotel and residential uses and integrates with the existing structure on the east portion of the site.

On the 4th Level of the hotel podium, there will be amenity space used as an outdoor living area (OLA). On the 6th Level of the residential podium there is green space that is not accessible by tenants, and therefore not included as an outdoor living area. The major sources of roadway noise are Wellington Street, Lyon

[3] City of Ottawa Environmental Noise Control Guidelines, SS Wilson Associates, May 10, 2006
[4] Ministry of the Environment – Publication NPC-300

Street and Albert Street. The site is surrounded on all sides with mixed-use land, specifically Residential and Mixed-Use Downtown zones. Figure 1 illustrates a complete site plan with surrounding context.

Other surrounding commercial and residential buildings also contribute to environmental noise, known as stationary noise sources, primarily through rooftop mechanical equipment such as cooling towers and rooftop heating, ventilation, and air condition equipment (HVAC).

3. OBJECTIVES

The main goals of this work are to: (i) calculate the future noise levels on the study building produced by local roadway traffic and stationary sources, (ii) ensure that interior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4.2 and 4.4 of this report.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level (2×10^{-5} Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For vehicle traffic, the equivalent sound energy level, L_{EQ}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{EQ} is commonly calculated on the basis of a 16-hour (L_{EQ16}) daytime (07:00-23:00) / 8-hour (L_{EQ8}) nighttime

(23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for residence living rooms (hotel sleeping quarters) and residence sleeping quarters respectively, as listed in Table 1. Based on GWE's experience, more comfortable indoor noise levels should be targeted toward 42 and 37 dBA to control peak noise, and deficiencies in building envelope construction.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD & RAIL)[5]

Type of Space	Time Period	L_{EQ} (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50	45
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40	35

Predicted noise levels at the plane of window (POW) and outdoor living area (OLA) dictate the action required to achieve the recommended sound levels. When noise levels at these areas exceed the criteria outlined in Table 2, specific outdoor, ventilation and Warning Clause requirements may apply. In addition, when noise levels exceed the criteria outlined in Table 3, upgraded building components must be designed.

[5] Adapted from ENCG – Table 1.6

TABLE 2: ROAD & RAIL NOISE COMBINED – OUTDOOR NOISE, VENTILATION AND WARNING CLAUSE REQUIREMENTS[6]

Time Period	L_{EQ} (dBA)	Ventilation Requirements	Outdoor Noise Control Measures	Warning Clause
Outdoor Living Area (OLA)				
Daytime (07:00 – 23:00)	$L_{EQ(16hr)} < 55$	N/A	Not required	Not required
	$55 < L_{EQ(16hr)} \leq 60$	N/A	May not be required but should be considered	Type A†
	$L_{EQ(16hr)} > 60$	N/A	Required to reduce the L_{EQ} to below 60 dBA and as close to 55 dBA where feasible	Type B††
Plane of Window (POW)				
Daytime (07:00 – 23:00)	$L_{EQ(16hr)} < 55$	Not required	N/A	Not required
	$55 < L_{EQ(16hr)} \leq 65$	Forced air heating with provision for central air conditioning	N/A	Type C
	$L_{EQ(16hr)} > 65$	Central air conditioning	N/A	Type D
Nighttime (23:00 – 07:00)	$L_{EQ(8hr)} < 50$	Not required	N/A	Not required
	$50 < L_{EQ(8hr)} \leq 60$	Forced air heating with provision for central air conditioning	N/A	Type C
	$L_{EQ(8hr)} > 60$	Central air conditioning	N/A	Type D

† - Required if resultant L_{EQ} exceeds 55 dBA

†† - Required if resultant L_{EQ} exceeds 55 dBA and if it is administratively, economically and/or technically feasible

TABLE 3: ROAD & RAIL NOISE BUILDING COMPONENT REQUIREMENTS[7]

Source	L_{EQ} (dBA)	Building Component Requirements
Road	$L_{EQ(16hr)} > 65$ (Daytime)	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	$L_{EQ(8hr)} > 60$ (Nighttime)	
Rail	$L_{EQ(16hr)} > 60$ (Daytime)	
	$L_{EQ(8hr)} > 55$(Nighttime)	

[6] Adapted from ENCG – Table 1.10

[7] Adapted from ENCG – Table 1.8

4.2.2 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[8]. Average Annual Daily Traffic (AADT) volumes are then based on data in Table 1.7 of the ENCG for each roadway classification. The Transportation Master Plan – Affordable 2013 Roadway Network provides additional details on future roadway expansions. Table 4 (below) summarizes the AADT values used for each roadway included in this assessment.

TABLE 4: ROADWAY TRAFFIC DATA

Roadway	Roadway Class	Speed Limit (km/h)	Official Plan AADT
Wellington Street	4-UAU	50	**30,000**
Lyon Street	2-UAU	50	**15,000**
Albert Street	4-UAU	50	**15,000**

4.2.3 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the Ministry of the Environment (MOE) computerized noise assessment program, STAMSON 5.04, for road and rail analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway noise calculations were performed by treating each road segment as separate line sources of noise, and by using existing building locations as noise barriers. In addition to the traffic volumes summarized in Table 4, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions
- The day/night split was taken to be 92% / 8% respectively for all streets
- Absorptive and reflective intermediate ground surfaces based on specific source-receiver path ground characteristics
- The study site was treated as having flat topography

[8] City of Ottawa Transportation Master Plan, November 2013

Noise receptors were strategically placed at 30 locations around the study area (see Figures 2-4).

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneered walls can achieve STC 55. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40 depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

According to the ENCG, when daytime noise levels (from road and rail sources) at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[9] considers:

- Window type and total area as a percentage of total room floor area
- Exterior wall type and total area as a percentage of the total room floor area
- Acoustic absorption characteristics of the room
- Outdoor noise source type and approach geometry
- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research[10], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, which was prepared for site plan approval, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels).

[9] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

[10] CMHC, Road & Rail Noise: Effects on Housing

4.4 Stationary Noise

The Ontario Ministry of the Environment has published the D-series guidelines to assist planners and municipalities in the planning process to minimize the impacts industrial facilities and sensitive land uses will have on one another. In the document D-6 "*Compatibility between industrial facilities and sensitive land uses*[11]" general areas of influence and minimum separation distance are recommended to minimize the potential for incompatible land uses creating an adverse effect on sensitive land use. Under the guidelines, industrial facilities are characterized into three categories depending on their size and potential output of noise, odour, dust and / or vibration. Sensitive land use under the guideline can include residential, parks, schools, childcare facilities, senior citizens' residences, hospitals, churches and other places of worship. The development at 350 Sparks Street is outside the separation distances from any surrounding major industrial facilities.

Several commercial buildings are along Queen Street, including retail outlets and restaurants, located at 340 Queen Street. Although they are not industrial facilities under the D-6 guideline, they could be considered a Class I industry, where a recommended minimum separation distance from sensitive land uses is 20 meters and the potential influence zone is 70 meters.

A site visit was conducted on April 15, 2015 to assess the potential noise impacts from surrounding buildings. Findings from this site visit conclude the following:

- The major source of noise in the area was found to be cooling towers on the roof of the adjacent on-site office tower, as well as the roof the apartment building at 151 Bay Street
- No other existing stationary sources were observed to be audible around the building

Based on our site visit and assessment, the only significant existing stationary sources of noise are the cooling towers on the roof of the adjacent on-site office tower, as well as the roof of the apartment building at 151 Bay Street.

[11] ibid

4.4.1 Stationary Noise Criteria

The equivalent sound energy level, L_{EQ}, provides a weighted measure of the time varying noise levels (including quasi-impulsive), which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a selected period of time. For stationary sources, the L_{EQ} is commonly calculated on an hourly interval, while for roadways, the L_{EQ} is calculated on the basis of a 16-hour daytime / 8-hour nighttime split.

Noise criteria taken from the ENCG[12] and NPC-300 apply to outdoor points of reception (POR) on the property; for daytime operations it is considered 30 meters from a dwelling, and for nighttime operations the plane of window (POW). According to this document, the recommended maximum noise levels in an urban environment (Class 1 Area) are the higher of the limits set out in Table 5, or the noise produced by roadway traffic or extraneous stationary sources, whichever is greater[13]. The site is considered to be in a Class 1 area as background noise levels are expected to be dominated by roadway traffic. It should be noted that there is no indoor criteria specified for stationary noise sources, as outdoor noise levels at the plane of window should be below the criteria.

TABLE 5: MOE EXCLUSIONARY SOUND LEVEL LIMITS

Time of Day	Noise Level Limits (dBA)	
	Outdoor Point of Reception	Plane of Window
07:00 – 19:00	50	50
19:00– 23:00	50	50
23:00 – 07:00	N/A	45

4.4.2 Stationary Noise Measurements

Determination of noise impacts from the adjacent on-site office tower were determined through on-site measurements using a Type 1 integrating sound level meter, Brüel & Kjær Type 2250. Site measurements were conducted on April 15, 2015 during the hours of 11:00 to 14:00. Site measurements were conducted on the roof of the on-site existing residential building, as well as the roof of the on-site office tower to determine accurate sound power levels of the rooftop cooling towers. During the measurements the weather conditions were clear with a temperature of 12°C, winds north northwest backing to the

[12] City of Ottawa Environmental Noise Control Guidelines, SS Wilson Associates, May 10, 2006
[13] Ibid See Reference 1, page 28

northwest at 18 to 25 km/h. The relative humidity was 20% and the barometric pressure was around 101.4 kPa.

4.4.3 Stationary Noise Predictions

Using the measurement data obtained on site, and sound data from similar pieces of mechanical equipment, Table 6 describes the sound power data used to model the cooling tower.

TABLE 6: EQUIPMENT SOUND POWER LEVELS (dBA)

Description	Sound Power Levels Octave Band Frequency (Hz)								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Total
Top of Cooling Tower	67	77	84	85	87	82	77	73	91
Sides of Cooling Tower	64	75	82	81	79	74	69	63	87

Noise impacts for the proposed building configuration were conducted by predictions using a three dimensional noise model. Stationary noise source modelling is based on the software program Predictor-Lima developed from the International Standards Organization (ISO) standard 9613 Parts 1 and 2. This computer program is capable of representing three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing. The methodology has been used on numerous assignments, and has been accepted by the Ministry of Environment and Climate Change (MOE) as part of Environmental Compliance Approvals applications. Eight (8) individual noise sensor locations were selected in the *Predictor-Lima* model to measure the noise impact at points of reception (POR) during the daytime (07:00 - 23:00) and nighttime (23:00 – 07:00) periods. POR locations included outdoor points of reception (OPOR) and the plane of windows (POW) of on-site noise sensitive locations. Stationary source locations are illustrated in Figure 5 and Sensor locations are described in Table 7 and illustrated in Figure 6. All units were represented as emitting roofs and façades in the Predictor model. Air temperature, pressure and humidity were assumed at 10°C, 101.3 kPA and 70%, respectively. Ground absorption over the study area was determined based on topographical features (such as water, concrete, grassland, etc.). An absorption value of 0 is representative of hard ground, while a value of 1 represents grass, and similar soft surface conditions. Existing and proposed buildings were added to the model to account for screening and reflection effects from building façades.

TABLE 7: RECEPTOR LOCATIONS – STATIONARY NOISE

Receptor Number	Location	Height Above Grade (m)
R1	POW – Hotel – South Façade	65
R2	POW – Hotel – East Façade	65
R3	POW – Residential building– South Façade	55
R4	POW – Residential building – East Façade	55
R5	OPOR – Hotel Podium	1.5
R6	OPOR – Northwest Amenity	1.5

5. RESULTS AND DISCUSSION

5.1 Roadway Noise Levels

Appendix A contains the complete set of input and output data from all STAMSON 5.04 calculations. The results of the roadway noise calculations are summarized in Table 8 below.

TABLE 8: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Plane of Window Receptor Location	Noise Level (dBA)	
		Day	Night
1	POW – Residential Podium – 3rd Floor – North Façade	54	46
2	POW – Residential Podium – 3rd Floor – East Façade	56	48
3	POW – Hotel Podium – 3rd Floor – East Façade	51	43
4	POW – Hotel Podium – 3rd Floor – South Façade	50	43
5	POW – Hotel Podium – 3rd Floor – West Façade	51	43
6	POW – Residential Podium – 3rd Floor – West Façade	53	45
7	POW – Residential – 6th Floor – North Façade	54	46
8	POW – Residential – 6th Floor – East Façade	55	48
9	POW – Residential – 6th Floor – South Façade	36	29
10	POW – Residential – 6th Floor – West Façade	35	28
11	POW – Hotel – 5th Floor – North Façade	38	30
12	POW – Hotel – 5th Floor – West Façade	52	44
13	POW – Residential – 14th Floor – North Façade	54	46
14	POW – Residential – 14th Floor – East Façade	57	49
15	POW – Residential – 14th Floor – South Façade	49	41
16	POW – Residential – 14th Floor – West Façade	35	28
17	POW – Hotel – 16th Floor – North Façade	45	37
18	POW – Hotel – 16th Floor – East Façade	52	44
19	POW – Hotel – 16th Floor – South Façade	50	43
20	POW – Hotel – 16th Floor – West Façade	52	44
21	POW – Residential – 23rd Floor – North Façade	54	47
22	POW – Residential – 23rd Floor – East Façade	57	50
23	POW – Residential – 23rd Floor – South Façade	49	42
24	POW – Residential – 23rd Floor – West Façade	35	28
25	POW – Hotel – 27th Floor – North Façade	45	37
26	POW – Hotel – 27th Floor – East Façade	54	47
27	POW – Hotel – 27th Floor – South Façade	53	46
28	POW – Hotel – 27th Floor – West Façade	52	44
29	OLA – Hotel Podium – Terrace	40	32
30	OLA – Ground Level – Northwest Amenity	53	45

The results of the current analysis indicate that noise levels will range between 35 and 57 dBA during the daytime period (07:00-23:00) and between 28 and 50 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 57 dBA) occurs on the east façade of the residential building (Receptors R14 and R22), which is nearest and most exposed to Lyon Street.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic do not exceed the criteria listed in the ENCG for building components. Therefore, upgraded building components will not be required.

Results of the study also indicate that all units facing east in the residential building will require forced air heating with provisions for central air conditioning (or similar mechanical systems). In addition to ventilation requirements, Warning Clause (Type C[14]) will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Table 9 below.

TABLE 9: SITE VENTILATION AND WARNING CLAUSE REQUIREMENTS

Building	Location	Ventilation Requirements	Warning Clause
Residential + Podium	North Façade	None	None
	East Façade	Forced Air Heating with Provisions for Central Air Conditioning	Type C
	South Façade	None	None
	West Façade	None	None
Hotel + Podium	North Façade	None	None
	East Façade		
	South Façade		
	West Façade		

[14] City of Ottawa Environmental Noise Control Guidelines, SS Wilson Associates, May 10, 2006

5.3 Stationary Noise Levels

Measurements of the mechanical rooftop equipment on the adjacent office tower roof found the cooling tower louver and fan discharge to have sound powers of approximately 95 and 102 dBA respectively. Measurements were taken during a relatively quiet period; however, there were some influences from extraneous sources such as traffic and nearby construction. Therefore, it was decided to use sound power data from a Baltimore cooling tower with similar size and construction. Overall, predictions using the Baltimore data showed good overall correlation with the onsite measurements. It was observed that the lower frequencies of the on-site measurements were higher than expected, most likely do to the influence from the construction noise.

Background noise levels for the daytime and nighttime periods were calculated to be 46 dBA on the south and east façade of the proposed hotel. This is a result of the rooftop cooling tower on the apartment building at 151 Bay Street. Note that ambient noise levels are the noise produced from sources other than the source under investigation.

Unmitigated noise levels from rooftop equipment on the office tower roof at nearby sensitive receptors were found to be above ENCG criteria, as shown in Table 11. The sound levels listed in Table 11 assume all rooftop equipment is at full operation during the daytime and nighttime periods.

TABLE 11: UNMITIGATED NOISE LEVELS FROM ROOFTOP EQUIPMENT

Receptor Number	Receptor Location	1-HR L_{EQ} (dBA)		ENCG Criteria (dBA)		Meets ENCG
		Day	Night	Day	Night	
R1	POW – Hotel – South Façade	44	44	50	46*	Yes
R2	POW – Hotel – East Façade	55	55	50	46*	No
R3	POW – Residential – South Façade	59	59	50	45	No
R4	POW – Residential – East Façade	59	59	50	45	No
R5	OPOR – Hotel – Podium	43	43	50	45	Yes
R6	OPOR – Northwest Amenity	26	26	50	45	Yes

*- Background noise level

As Table 11 summarizes, noise levels for unmitigated rooftop equipment at some receptors are above ENCG criteria. Noise contours can be seen in Figure 7 for daytime and nighttime conditions. The main contributor of noise at these locations is the on-property office tower cooling tower fans and northern

inlet louvers. Noise levels could readily be mitigated by replacing the existing mechanical louvers with acoustic louvers on the cooling tower inlets, as well as a silencer or acoustic louver for the cooling tower fans on the roof of the enclosure. With mitigation in place, noise levels can be reduced to below the ENCG criteria. Table 12 shows the necessary minimum insertion loss for the cooling towers.

TABLE 12: INSERTION LOSS REQUIREMENTS (dBA)

Source	Description	Frequency (Hz)								
		63	125	250	500	1000	2000	4000	8000	Total
North side Louvers	Insertion loss	10	11	14	19	25	24	21	18	N/A
	Mitigated sound power	54	64	68	62	54	50	48	45	70
South side louvers	Insertion loss	3	5	7	9	10	10	10	12	N/A
	Mitigated sound power	61	70	75	72	69	64	59	51	78
Fan discharge	Insertion loss	0	10	17	17	20	16	11	8	N/A
	Mitigated sound power	67	67	67	68	67	66	66	65	76

The insertion losses for the acoustic louvers shown in Table 12 are model VPL-1 and VAL-1 by Kinetics Noise Control. There are various models and other manufactures available that offer similar or greater insertion loss at the cost of reduced louver open area, and increased pressure drop. Other manufacturers include Vibro-Acoustics, or Price. Mitigated noise levels from rooftop equipment are presented in Table 13, which demonstrate compliance with the ENCG criteria.

TABLE 13: MITIGATED NOISE LEVELS FROM ROOFTOP EQUIPMENT

Receptor Number	Receptor Location	1-HR L_{EQ} (dBA)		ENCG Criteria (dBA)		Meets ENCG
		Day	Night	Day	Night	
R1	POW – Hotel – South Façade	35	35	50	46	Yes
R2	POW – Hotel – East Façade	44	44	50	46	Yes
R3	POW – Residential – South Façade	43	43	50	45	Yes
R4	POW – Residential – East Façade	43	43	50	45	Yes
R5	OPOR – Hotel – Podium	30	30	50	45	Yes
R6	OPOR – Northwest Amenity	15	15	50	45	Yes

Mitigated noise contours can be seen in Figure 8 for daytime and nighttime conditions. Since the noise levels are well below ENCG criteria, future noise sensitive land uses is expected to be compatible with the existing rooftop equipment.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 35 and 57 dBA during the daytime period (07:00-23:00) and between 28 and 50 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 57 dBA) occurs on the east façades of the residential and hotel buildings (Receptors 22 and 26), which are nearest and most exposed to Lyon Street. Minimum building construction in all areas is required to satisfy the Ontario Building Code (2012). The noise levels predicted due to roadway traffic do not exceed the criteria listed in the ENCG for building components. Therefore, upgraded building components will not be required.

Results of the study also indicate that all units facing east on the residential building will require forced air heating with provisions for central air conditioning (or similar mechanical systems). In addition to ventilation requirements, Warning Clause (Type C[15]) will also be required to be placed on all Lease, Purchase and Sale Agreements. However the proponent is planning on providing a heating and cooling system which would allow windows and doors to each dwelling to remain closed, therefore the following modified Warning Clause is suggested:

> *"This dwelling unit has been supplied with a heating and cooling system which will allow, at the discretion of the occupant, windows and exterior doors to remain closed, thereby ensuring that indoor sound levels are within the City of Ottawa's and Ministry of Environment and Climate Change's noise criteria."*

The proposed buildings will be impacted by the existing onsite office tower's rooftop mechanical equipment. To ensure noise levels from the equipment is compliant with the City of Ottawa's Environmental Noise Control Guidelines for stationary sources, it is recommended acoustical louvers and silencers be installed around the equipment as described in Section 5.4. Due to the presence of multiple

[15] City of Ottawa Environmental Noise Control Guidelines, SS Wilson Associates, May 10, 2006

commercial buildings in the area the following Stationary Noise Warning Clause (Type E[16]) should be placed on all Agreements of Lease, Purchase and Sale:

> *"Purchasers are advised that due to the proximity of the adjacent commercial facilities, sound levels from the commercial facilities may at times be audible."*

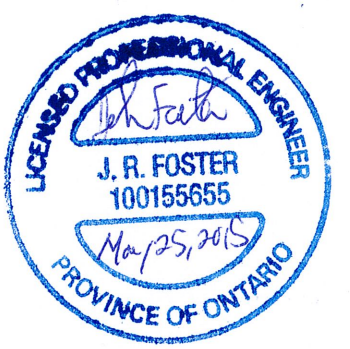
Additionally, the following restrictive covenant shall also be included in all Agreements of Lease, Purchase and Sale:

> *"The Transferee covenants with the Transferor that the above clause, verbatim, shall be included in all subsequent Agreements of Purchase and Sale and deeds conveying the lands described herein, which shall run with the said lands and is for the benefit of the subsequent owners of the said lands and the owner of the adjacent road."*

This concludes our assessment and report. If you have any questions or wish to discuss our findings please advise us. In the interim, we thank you for the opportunity to be of service.

Yours truly,

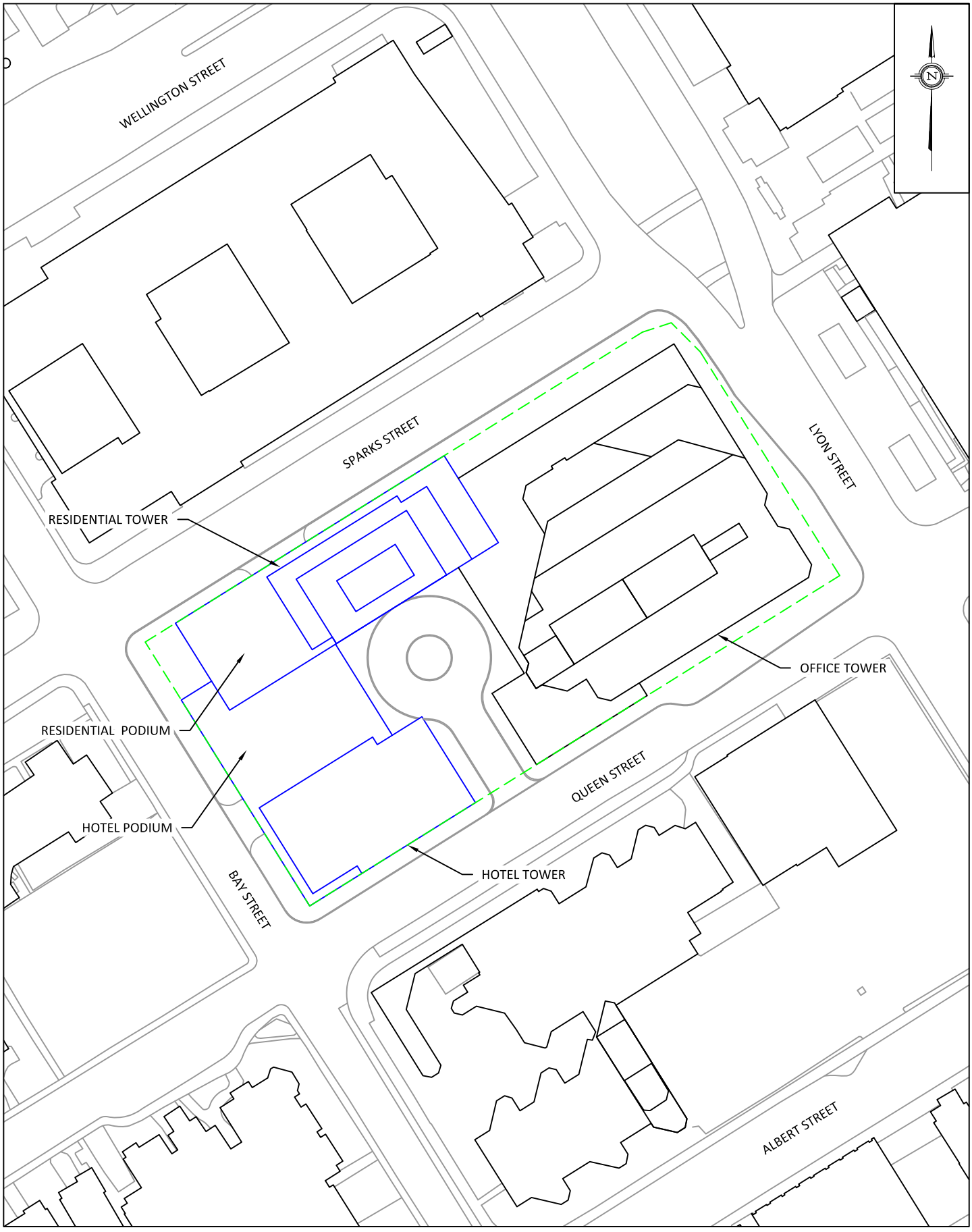
Gradient Wind Engineering Inc.



Michael Lafortune
Environmental Technologist
GWE15-029 - Environmental Noise

Joshua Foster, P.Eng.
Associate

[16] ibid



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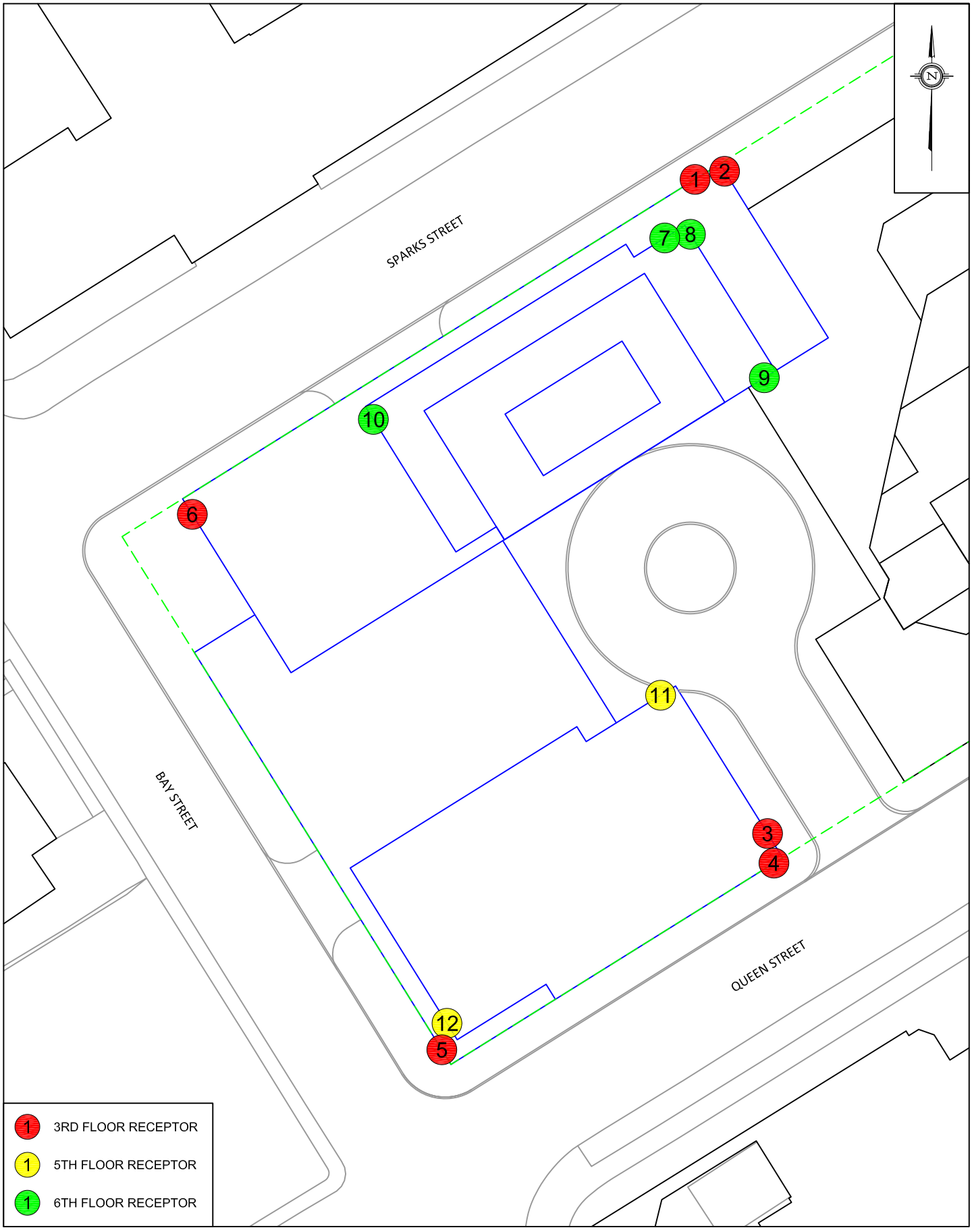
PROJECT	350 SPARKS STREET - ENVIRONMENTAL NOISE FEASIBILITY STUDY
SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE15-029-1
DATE	MAY 19, 2015
DRAWN BY	M.L

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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GRADIENT WIND ENGINEERING INC

PROJECT: 350 SPARKS STREET - ENVIRONMENTAL NOISE FEASIBILITY STUDY		DESCRIPTION: FIGURE 2: 3RD, 5TH AND 6TH FLOOR RECEPTORS
SCALE: 1:500 (APPROX.)	DRAWING NO.: GWE15-029-2	
DATE: MAY 19, 2015	DRAWN BY: M.L	

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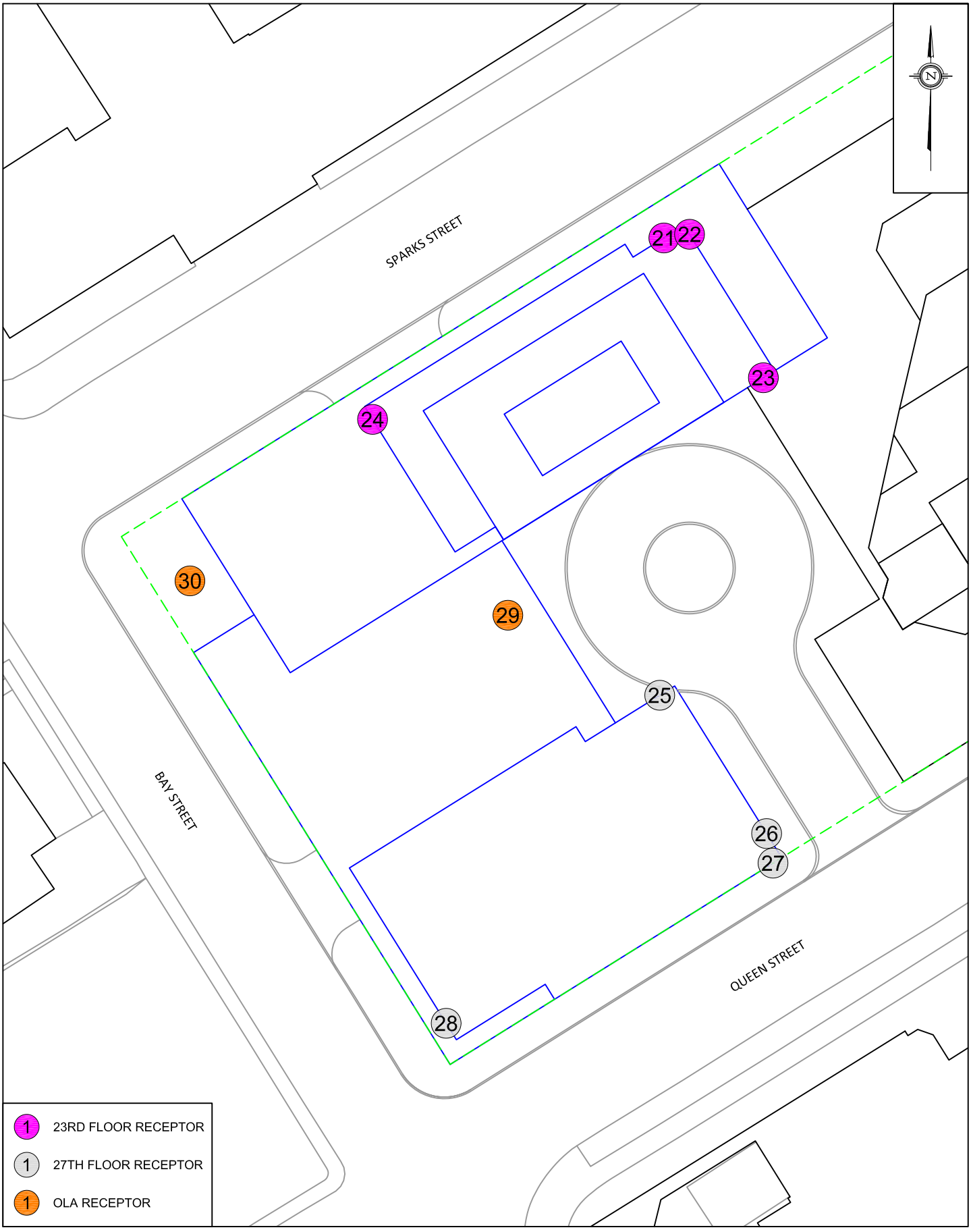
PROJECT: 350 SPARKS STREET - ENVIRONMENTAL NOISE FEASIBILITY STUDY		DESCRIPTION: FIGURE 3: 14TH AND 16TH FLOOR RECEPTORS
SCALE: 1:500 (APPROX.)	DRAWING NO.: GWE15-029-3	
DATE: MAY 19, 2015	DRAWN BY: M.L	



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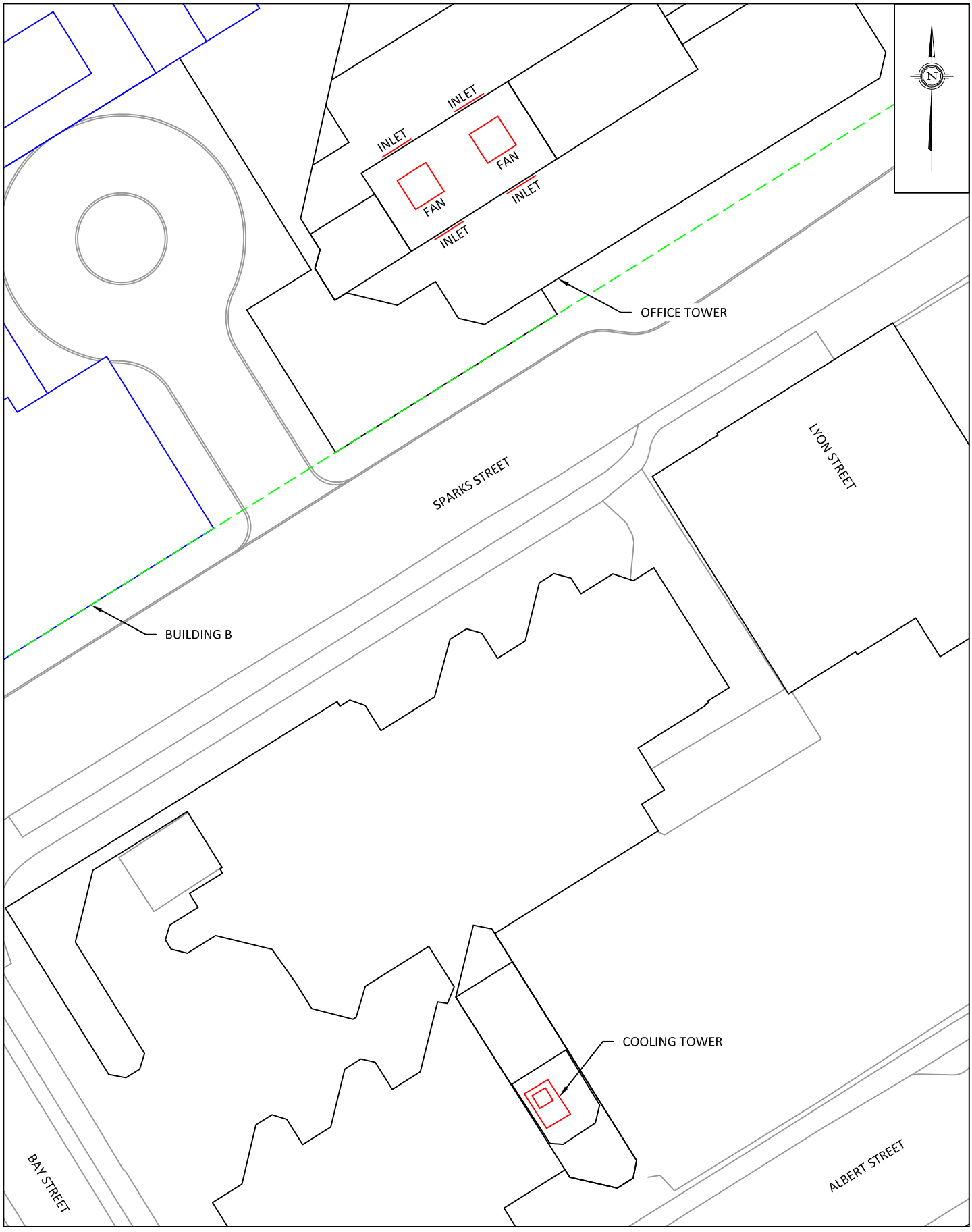
PROJECT	350 SPARKS STREET - ENVIRONMENTAL NOISE FEASIBILITY STUDY
SCALE	1:500 (APPROX.)
DRAWING NO.	GWE15-029-4
DATE	MAY 19, 2015
DRAWN BY	M.L

DESCRIPTION

FIGURE 4:
23RD, 27TH FLOOR RECEPTORS
AND OLA RECEPTORS



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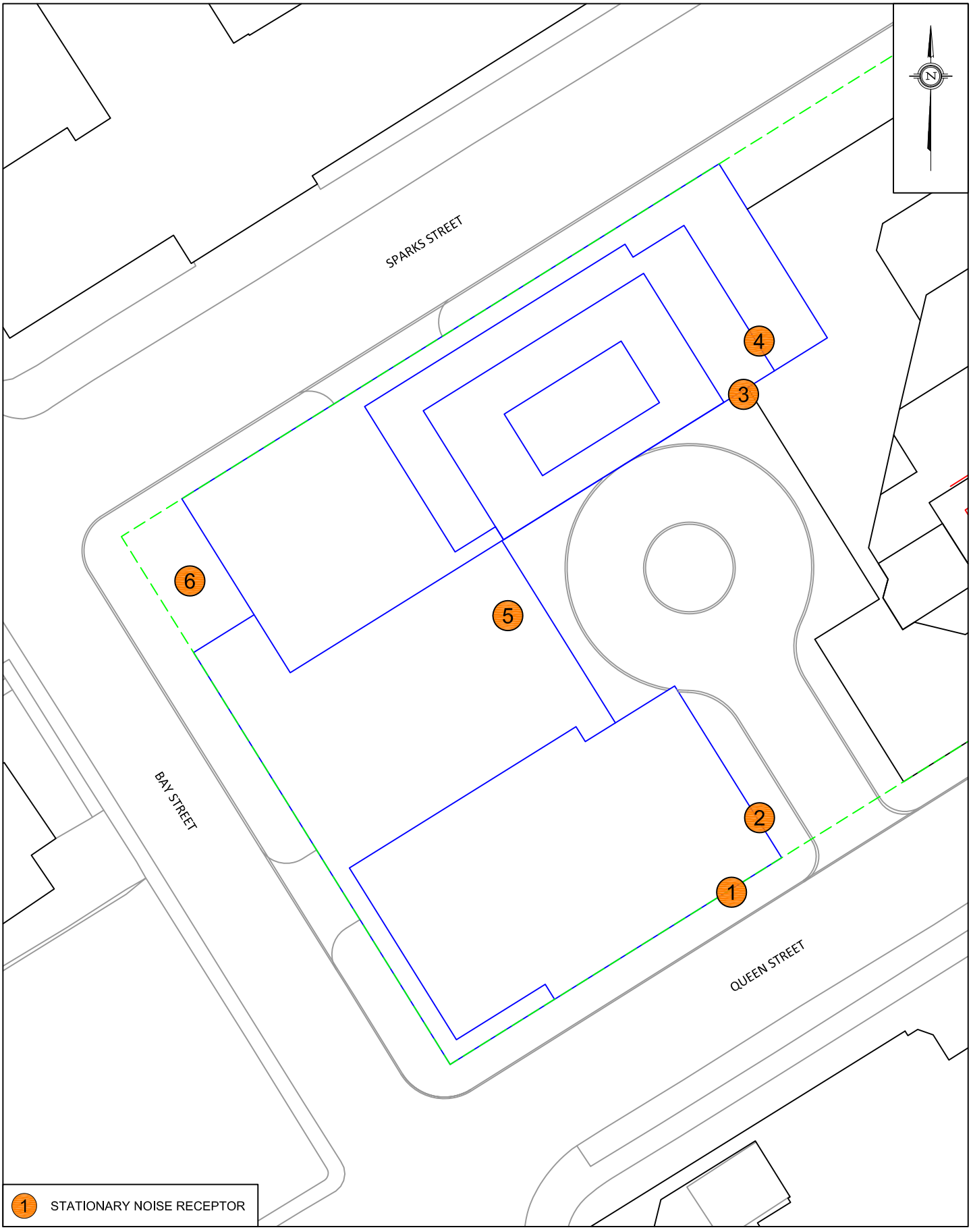
PROJECT: 350 SPARKS STREET - ENVIRONMENTAL NOISE FEASIBILITY STUDY		DESCRIPTION
SCALE: 1:500 (APPROX.)	DRAWING NO.: GWE15-029-5	FIGURE 5: STATIONARY NOISE SOURCE LOCATIONS
DATE: MAY 19, 2015	DRAWN BY: M.L	



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PROJECT	350 SPARKS STREET - ENVIRONMENTAL NOISE FEASIBILITY STUDY
SCALE	1:500 (APPROX.)
DRAWING NO.	GWE15-029-6
DATE	MAY 19, 2015
DRAWN BY	M.L

DESCRIPTION

FIGURE 6:
STATIONARY NOISE RECEPTOR LOCATIONS

FIGURE 7: UNMITIGATED NOISE CONTOURS FOR DAYTIME AND NIGHTTIME CONDITIONS

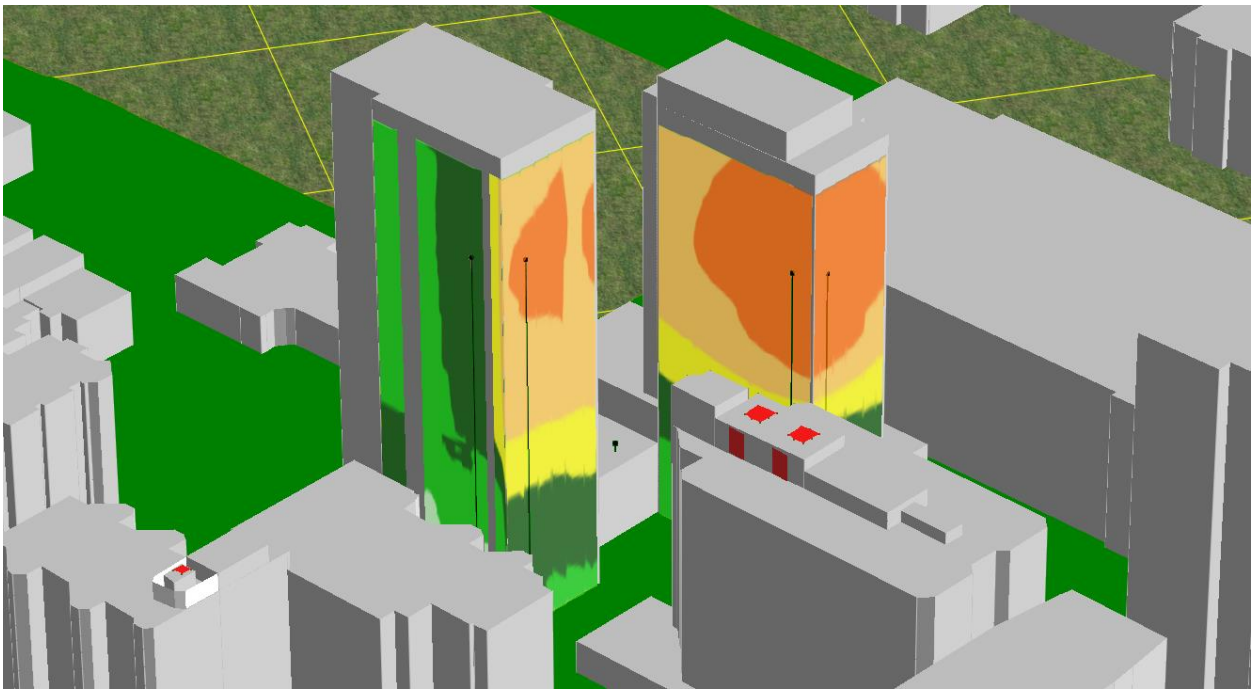
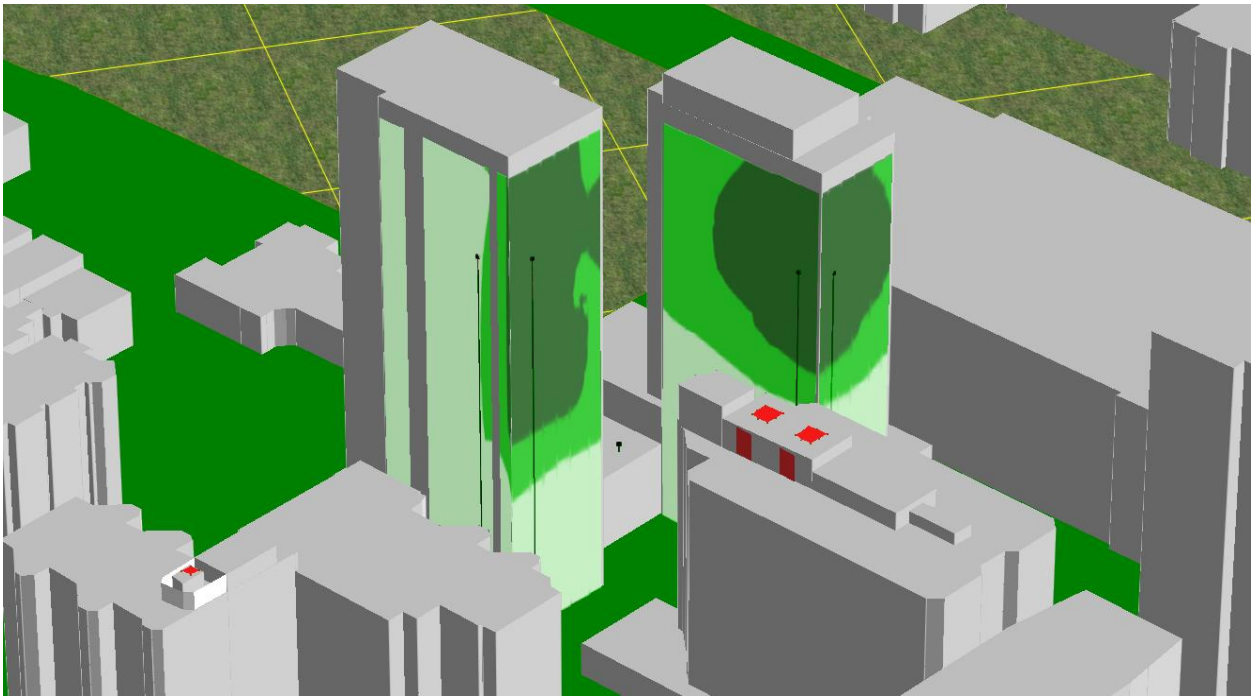


FIGURE 8: MITIGATED NOISE CONTOURS FOR DAYTIME AND NIGHTTIME CONDITIONS



APPENDIX A

STAMSON 5.04 - INPUT AND OUTPUT DATA

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 14:07:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -31.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 86.00 / 86.00 m
Receiver height : 14.90 / 14.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -31.00 deg Angle2 : 31.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 73.00 / 73.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSB (day/night)

Angle1 Angle2 : -53.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -53.00 deg Angle2 : -21.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonNB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNB (day/night)

Angle1 Angle2 : -44.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -44.00 deg Angle2 : -32.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 36.00 / 36.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 14.90 ! 3.52 ! 3.52

ROAD (0.00 + 39.28 + 0.00) = 39.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-31 31 0.00 71.49 0.00 -7.58 -4.63 0.00 0.00 -20.00 39.28

Segment Leq : 39.28 dBA

Results segment # 2: LyonSB (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 ! 11.90 ! 4.96 ! 4.96

ROAD (0.00 + 31.95 + 51.21) = 51.26 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-53 -21 0.00 65.47 0.00 -6.02 -7.50 0.00 0.00 -20.00 31.95

-21 6 0.00 65.47 0.00 -6.02 -8.24 0.00 0.00 0.00 51.21

Segment Leq : 51.26 dBA

Results segment # 3: LyonNB (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 ! 11.90 ! 6.70 ! 6.70

ROAD (0.00 + 26.90 + 50.42) = 50.44 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-44 -32 0.00 65.47 0.00 -6.81 -11.76 0.00 0.00 -20.00 26.90

-32 -5 0.00 65.47 0.00 -6.81 -8.24 0.00 0.00 0.00 50.42

Segment Leq : 50.44 dBA

Total Leq All Segments: 54.03 dBA

Results segment # 1: Wellington (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 ! 14.90 ! 3.52 ! 3.52

ROAD (0.00 + 31.68 + 0.00) = 31.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-31 31 0.00 63.89 0.00 -7.58 -4.63 0.00 0.00 -20.00 31.68

Segment Leq : 31.68 dBA

Results segment # 2: LyonSB (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 ! 11.90 ! 4.96 ! 4.96

ROAD (0.00 + 24.35 + 43.61) = 43.66 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-53 -21 0.00 57.87 0.00 -6.02 -7.50 0.00 0.00 -20.00 24.35

-21 6 0.00 57.87 0.00 -6.02 -8.24 0.00 0.00 0.00 43.61

Segment Leq : 43.66 dBA

Results segment # 3: LyonNB (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 ! 11.90 ! 6.70 ! 6.70

ROAD (0.00 + 19.30 + 42.82) = 42.84 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-44 -32 0.00 57.87 0.00 -6.81 -11.76 0.00 0.00 -20.00 19.30

-32 -5 0.00 57.87 0.00 -6.81 -8.24 0.00 0.00 0.00 42.82

Segment Leq : 42.84 dBA

Total Leq All Segments: 46.43 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.03
(NIGHT): 46.43

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:00:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : 0.00 deg 30.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 87.00 / 87.00 m
Receiver height : 14.90 / 14.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 30.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 74.00 / 74.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -55.00 deg 11.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -55.00 deg Angle2 : -24.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 37.00 / 37.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : 11.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 11.00 deg Angle2 : 17.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 49.00 / 49.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 4: LyonNBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNBL (day/night)

Angle1 Angle2 : -47.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 69.00 / 69.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -47.00 deg Angle2 : -38.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 33.00 / 33.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 5: LyonNBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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 # 5: LyonNBR (day/night)

Angle1 Angle2 : 0.00 deg 4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 69.00 / 69.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 4.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 50.00 / 50.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 6: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 6: LyonL (day/night)

Angle1 Angle2 : 9.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 64.00 / 64.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 9.00 deg Angle2 : 31.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 50.00 / 50.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 7: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 7: LyonR (day/night)

Angle1 Angle2 : 31.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 64.00 / 64.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 31.00 deg Angle2 : 50.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 50.00 / 50.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 14.90 ! 3.50 ! 3.50

ROAD (0.00 + 36.07 + 0.00) = 36.07 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 30 0.00 71.49 0.00 -7.63 -7.78 0.00 0.00 -20.00 36.07

Segment Leq : 36.07 dBA

Results segment # 2: LyonSBL (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 ! 11.90 ! 5.15 ! 5.15

ROAD (0.00 + 32.03 + 52.56) = 52.60 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-55 -24 0.00 65.47 0.00 -5.80 -7.64 0.00 0.00 -20.00 32.03

-24 11 0.00 65.47 0.00 -5.80 -7.11 0.00 0.00 0.00 52.56

Segment Leq : 52.60 dBA

Results segment # 3: LyonSBR (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 ! 11.90 ! 2.96 ! 2.96

ROAD (0.00 + 30.49 + 0.00) = 30.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
11 17 0.00 65.47 0.00 -5.80 -14.77 0.00 0.00 -14.41 30.49

Segment Leq : 30.49 dBA

Results segment # 4: LyonNBL (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 ! 11.90 ! 6.92 ! 6.92

ROAD (0.00 + 25.83 + 52.09) = 52.10 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-47 -38 0.00 65.47 0.00 -6.63 -13.01 0.00 0.00 -20.00 25.83

-38 0 0.00 65.47 0.00 -6.63 -6.75 0.00 0.00 0.00 52.09

Segment Leq : 52.10 dBA

Results segment # 5: LyonNBR (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 ! 11.90 ! 4.36 ! 4.36

ROAD (0.00 + 34.67 + 0.00) = 34.67 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 4 0.00 65.47 0.00 -6.63 -16.53 0.00 0.00 -7.64 34.67

Segment Leq : 34.67 dBA

Results segment # 6: LyonL (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 ! 11.90 ! 3.77 ! 3.77

ROAD (0.00 + 43.04 + 0.00) = 43.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
9 31 0.00 68.48 0.00 -6.30 -9.13 0.00 0.00 -10.01 43.04

Segment Leq : 43.04 dBA

Results segment # 7: LyonR (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 ! 11.90 ! 3.77 ! 3.77

ROAD (0.00 + 32.41 + 0.00) = 32.41 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
31 50 0.00 68.48 0.00 -6.30 -9.77 0.00 0.00 -20.00 32.41

Segment Leq : 32.41 dBA

Total Leq All Segments: 55.73 dBA

Results segment # 1: Wellington (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 ! 14.90 ! 3.50 ! 3.50

ROAD (0.00 + 28.48 + 0.00) = 28.48 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 30 0.00 63.89 0.00 -7.63 -7.78 0.00 0.00 -20.00 28.48

Segment Leq : 28.48 dBA

Results segment # 2: LyonSBL (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 ! 11.90 ! 5.15 ! 5.15

ROAD (0.00 + 24.44 + 44.96) = 45.00 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-55 -24 0.00 57.87 0.00 -5.80 -7.64 0.00 0.00 -20.00 24.44

-24 11 0.00 57.87 0.00 -5.80 -7.11 0.00 0.00 0.00 44.96

Segment Leq : 45.00 dBA

Results segment # 3: LyonSBR (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 ! 11.90 ! 2.96 ! 2.96

ROAD (0.00 + 22.89 + 0.00) = 22.89 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
11 17 0.00 57.87 0.00 -5.80 -14.77 0.00 0.00 -14.41 22.89

Segment Leq : 22.89 dBA

Results segment # 4: LyonNBL (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 ! 11.90 ! 6.92 ! 6.92

ROAD (0.00 + 18.24 + 44.49) = 44.50 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-47 -38 0.00 57.87 0.00 -6.63 -13.01 0.00 0.00 -20.00 18.24

-38 0 0.00 57.87 0.00 -6.63 -6.75 0.00 0.00 0.00 44.49

Segment Leq : 44.50 dBA

Results segment # 5: LyonNBR (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 ! 11.90 ! 4.36 ! 4.36

ROAD (0.00 + 27.07 + 0.00) = 27.07 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 4 0.00 57.87 0.00 -6.63 -16.53 0.00 0.00 -7.64 27.07

Segment Leq : 27.07 dBA

Results segment # 6: LyonL (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 ! 11.90 ! 3.77 ! 3.77

ROAD (0.00 + 35.44 + 0.00) = 35.44 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
9 31 0.00 60.88 0.00 -6.30 -9.13 0.00 0.00 -10.01 35.44

Segment Leq : 35.44 dBA

Results segment # 7: LyonR (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 ! 11.90 ! 3.77 ! 3.77

ROAD (0.00 + 24.82 + 0.00) = 24.82 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
31 50 0.00 60.88 0.00 -6.30 -9.77 0.00 0.00 -20.00 24.82

Segment Leq : 24.82 dBA

Total Leq All Segments: 48.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.73
(NIGHT): 48.13

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:00:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : -19.00 deg 19.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -19.00 deg Angle2 : 0.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 79.00 / 79.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : -24.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 91.00 / 91.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -24.00 deg Angle2 : 0.00 deg
Barrier height : 37.00 m
Barrier receiver distance : 24.00 / 24.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Lyon (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 ! 11.90 ! 3.25 ! 3.25

ROAD (0.00 + 30.70 + 50.70) = 50.74 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-19 0 0.00 68.48 0.00 -8.02 -9.77 0.00 0.00 -20.00 30.70
---
0 19 0.00 68.48 0.00 -8.02 -9.77 0.00 0.00 0.00 50.70

Segment Leq : 50.74 dBA

Results segment # 2: Albert (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 ! 11.90 ! 9.16 ! 9.16

ROAD (0.00 + 31.90 + 0.00) = 31.90 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-24 0 0.00 68.48 0.00 -7.83 -8.75 0.00 0.00 -20.00 31.90

Segment Leq : 31.90 dBA

Total Leq All Segments: 50.80 dBA

Results segment # 1: Lyon (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 ! 11.90 ! 3.25 ! 3.25

ROAD (0.00 + 23.10 + 43.10) = 43.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-19 0 0.00 60.88 0.00 -8.02 -9.77 0.00 0.00 -20.00 23.10
---
0 19 0.00 60.88 0.00 -8.02 -9.77 0.00 0.00 0.00 43.10

Segment Leq : 43.15 dBA

Results segment # 2: Albert (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 ! 11.90 ! 9.16 ! 9.16

ROAD (0.00 + 24.30 + 0.00) = 24.30 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-24 0 0.00 60.88 0.00 -7.83 -8.75 0.00 0.00 -20.00 24.30

Segment Leq : 24.30 dBA

Total Leq All Segments: 43.21 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.80
(NIGHT): 43.21

STAMSON 5.0 NORMAL REPORT Date: 30-04-2015 11:06:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 11.90 / 11.90 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : -28.00 deg 28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -28.00 deg Angle2 : 28.00 deg
Barrier height : 37.00 m
Barrier receiver distance : 49.00 / 49.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Lyon (day)

Source height = 1.50 m

ROAD (0.00 + 50.17 + 0.00) = 50.17 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 17 0.00 68.48 0.00 -8.06 -10.25 0.00 0.00 0.00 50.17

Segment Leq : 50.17 dBA

Results segment # 2: Albert (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 ! 11.90 ! 6.11 ! 6.11

ROAD (0.00 + 35.73 + 0.00) = 35.73 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-28 28 0.00 68.48 0.00 -7.68 -5.07 0.00 0.00 -20.00 35.73

Segment Leq : 35.73 dBA

Total Leq All Segments: 50.32 dBA

Results segment # 1: Lyon (night)

Source height = 1.50 m

ROAD (0.00 + 42.57 + 0.00) = 42.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
    0   17   0.00 60.88   0.00 -8.06 -10.25   0.00   0.00   0.00 42.57

Segment Leq : 42.57 dBA

Results segment # 2: Albert (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 !   11.90 !   6.11 !   6.11

ROAD (0.00 + 28.13 + 0.00) = 28.13 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -28   28   0.00 60.88   0.00 -7.68 -5.07   0.00   0.00 -20.00 28.13

Segment Leq : 28.13 dBA

Total Leq All Segments: 42.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.32
                  (NIGHT): 42.72

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:01:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : 0.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 11.90 / 11.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 19.00 deg Angle2 : 26.00 deg
Barrier height : 30.00 m
Barrier receiver distance : 71.00 / 71.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Albert (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 ! 11.90 ! 3.69 ! 3.69

ROAD (50.93 + 26.60 + 0.00) = 50.95 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 19 0.00 68.48 0.00 -7.78 -9.77 0.00 0.00 0.00 50.93
---
19 26 0.00 68.48 0.00 -7.78 -14.10 0.00 0.00 -20.00 26.60

Segment Leq : 50.95 dBA

Total Leq All Segments: 50.95 dBA

Results segment # 1: Albert (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 ! 11.90 ! 3.69 ! 3.69

ROAD (43.34 + 19.00 + 0.00) = 43.35 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 19 0.00 60.88 0.00 -7.78 -9.77 0.00 0.00 0.00 43.34
---
19 26 0.00 60.88 0.00 -7.78 -14.10 0.00 0.00 -20.00 19.00

Segment Leq : 43.35 dBA

Total Leq All Segments: 43.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.95
(NIGHT): 43.35

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:02:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -28.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 14.90 / 14.90 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -14.00 deg Angle2 : 0.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 24.00 / 24.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 14.90 ! 11.24 ! 11.24

ROAD (52.71 + 32.71 + 0.00) = 52.76 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-28 -14 0.00 71.49 0.00 -7.68 -11.09 0.00 0.00 0.00 52.71

-14 0 0.00 71.49 0.00 -7.68 -11.09 0.00 0.00 -20.00 32.71

Segment Leq : 52.76 dBA

Total Leq All Segments: 52.76 dBA

Results segment # 1: Wellington (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 ! 14.90 ! 11.24 ! 11.24

ROAD (45.12 + 25.12 + 0.00) = 45.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-28 -14 0.00 63.89 0.00 -7.68 -11.09 0.00 0.00 0.00 45.12

-14 0 0.00 63.89 0.00 -7.68 -11.09 0.00 0.00 -20.00 25.12

Segment Leq : 45.16 dBA

Total Leq All Segments: 45.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.76
(NIGHT): 45.16

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:02:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -27.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 89.00 / 89.00 m
Receiver height : 22.70 / 22.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -27.00 deg Angle2 : 27.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 77.00 / 77.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSB (day/night)

Angle1 Angle2 : -49.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -49.00 deg Angle2 : -21.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 46.00 / 46.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonNB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNB (day/night)

Angle1 Angle2 : -40.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.00 / 77.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -40.00 deg Angle2 : -32.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 41.00 / 41.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 22.70 ! 4.35 ! 4.35

ROAD (0.00 + 38.53 + 0.00) = 38.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-27 27 0.00 71.49 0.00 -7.73 -5.23 0.00 0.00 -20.00 38.53

Segment Leq : 38.53 dBA

Results segment # 2: LyonSB (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 ! 19.70 ! 6.82 ! 6.82

ROAD (0.00 + 31.02 + 50.86) = 50.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-49 -21 0.00 65.47 0.00 -6.37 -8.08 0.00 0.00 -20.00 31.02

-21 6 0.00 65.47 0.00 -6.37 -8.24 0.00 0.00 0.00 50.86

Segment Leq : 50.91 dBA

Results segment # 3: LyonNB (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 ! 19.70 ! 10.01 ! 10.01

ROAD (0.00 + 24.84 + 50.13) = 50.14 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-40 -32 0.00 65.47 0.00 -7.10 -13.52 0.00 0.00 -20.00 24.84

-32 -5 0.00 65.47 0.00 -7.10 -8.24 0.00 0.00 0.00 50.13

Segment Leq : 50.14 dBA

Total Leq All Segments: 53.69 dBA

Results segment # 1: Wellington (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 ! 22.70 ! 4.35 ! 4.35

ROAD (0.00 + 30.93 + 0.00) = 30.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-27 27 0.00 63.89 0.00 -7.73 -5.23 0.00 0.00 -20.00 30.93

Segment Leq : 30.93 dBA

Results segment # 2: LyonSB (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 ! 19.70 ! 6.82 ! 6.82

ROAD (0.00 + 23.42 + 43.27) = 43.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-49 -21 0.00 57.87 0.00 -6.37 -8.08 0.00 0.00 -20.00 23.42

-21 6 0.00 57.87 0.00 -6.37 -8.24 0.00 0.00 0.00 43.27

Segment Leq : 43.31 dBA

Results segment # 3: LyonNB (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 ! 19.70 ! 10.01 ! 10.01

ROAD (0.00 + 17.25 + 42.53) = 42.54 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-40 -32 0.00 57.87 0.00 -7.10 -13.52 0.00 0.00 -20.00 17.25

-32 -5 0.00 57.87 0.00 -7.10 -8.24 0.00 0.00 0.00 42.53

Segment Leq : 42.54 dBA

Total Leq All Segments: 46.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.69
(NIGHT): 46.09

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:02:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : 0.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 22.70 / 22.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 25.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 78.00 / 78.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -51.00 deg 7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -51.00 deg Angle2 : -24.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 44.00 / 44.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : 7.00 deg 13.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 7.00 deg Angle2 : 13.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 55.00 / 55.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 4: LyonNBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNBL (day/night)

Angle1 Angle2 : -42.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -35.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 39.00 / 39.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 5: LyonNBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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 # 5: LyonNBR (day/night)

Angle1 Angle2 : -4.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -4.00 deg Angle2 : 0.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 6: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 6: LyonL (day/night)

Angle1 Angle2 : 5.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 5.00 deg Angle2 : 25.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 7: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 7: LyonR (day/night)

Angle1 Angle2 : 25.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 25.00 deg Angle2 : 46.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 22.70 ! 4.32 ! 4.32

ROAD (0.00 + 35.14 + 0.00) = 35.14 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 25 0.00 71.49 0.00 -7.78 -8.57 0.00 0.00 -20.00 35.14

Segment Leq : 35.14 dBA

Results segment # 2: LyonSBL (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 ! 19.70 ! 6.99 ! 6.99

ROAD (0.00 + 31.00 + 51.60) = 51.64 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-51 -24 0.00 65.47 0.00 -6.23 -8.24 0.00 0.00 -20.00 31.00

-24 7 0.00 65.47 0.00 -6.23 -7.64 0.00 0.00 0.00 51.60

Segment Leq : 51.64 dBA

Results segment # 3: LyonSBR (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 ! 19.70 ! 3.81 ! 3.81

ROAD (0.00 + 33.26 + 0.00) = 33.26 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
7 13 0.00 65.47 0.00 -6.23 -14.77 0.00 0.00 -11.21 33.26

Segment Leq : 33.26 dBA

Results segment # 4: LyonNBL (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 ! 19.70 ! 10.11 ! 10.11

ROAD (0.00 + 24.44 + 50.90) = 50.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -35 0.00 65.47 0.00 -6.93 -14.10 0.00 0.00 -20.00 24.44

-35 -4 0.00 65.47 0.00 -6.93 -7.64 0.00 0.00 0.00 50.90

Segment Leq : 50.91 dBA

Results segment # 5: LyonNBR (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 ! 19.70 ! 5.92 ! 5.92

ROAD (0.00 + 42.01 + 0.00) = 42.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-4 0 0.00 65.47 0.00 -6.93 -16.53 0.00 0.00 -4.91 37.10*
-4 0 0.00 65.47 0.00 -6.93 -16.53 0.00 0.00 0.00 42.01
---

* Bright Zone !

Segment Leq : 42.01 dBA

Results segment # 6: LyonL (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 ! 19.70 ! 5.14 ! 5.14

ROAD (0.00 + 46.63 + 0.00) = 46.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
5 25 0.00 68.48 0.00 -6.69 -9.54 0.00 0.00 -5.62 46.63

Segment Leq : 46.63 dBA

Results segment # 7: LyonR (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 ! 19.70 ! 5.14 ! 5.14

ROAD (0.00 + 32.46 + 0.00) = 32.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
25 46 0.00 68.48 0.00 -6.69 -9.33 0.00 0.00 -20.00 32.46

Segment Leq : 32.46 dBA

Total Leq All Segments: 55.29 dBA

Results segment # 1: Wellington (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 ! 22.70 ! 4.32 ! 4.32

ROAD (0.00 + 27.54 + 0.00) = 27.54 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 25 0.00 63.89 0.00 -7.78 -8.57 0.00 0.00 -20.00 27.54

Segment Leq : 27.54 dBA

Results segment # 2: LyonSBL (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 ! 19.70 ! 6.99 ! 6.99

ROAD (0.00 + 23.40 + 44.00) = 44.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-51 -24 0.00 57.87 0.00 -6.23 -8.24 0.00 0.00 -20.00 23.40

-24 7 0.00 57.87 0.00 -6.23 -7.64 0.00 0.00 0.00 44.00

Segment Leq : 44.04 dBA

Results segment # 3: LyonSBR (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 ! 19.70 ! 3.81 ! 3.81

ROAD (0.00 + 25.66 + 0.00) = 25.66 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
7 13 0.00 57.87 0.00 -6.23 -14.77 0.00 0.00 -11.21 25.66

Segment Leq : 25.66 dBA

Results segment # 4: LyonNBL (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 ! 19.70 ! 10.11 ! 10.11

ROAD (0.00 + 16.84 + 43.30) = 43.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -35 0.00 57.87 0.00 -6.93 -14.10 0.00 0.00 -20.00 16.84

-35 -4 0.00 57.87 0.00 -6.93 -7.64 0.00 0.00 0.00 43.30

Segment Leq : 43.31 dBA

Results segment # 5: LyonNBR (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 ! 19.70 ! 5.92 ! 5.92

ROAD (0.00 + 34.41 + 0.00) = 34.41 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-4 0 0.00 57.87 0.00 -6.93 -16.53 0.00 0.00 -4.91 29.50*
-4 0 0.00 57.87 0.00 -6.93 -16.53 0.00 0.00 0.00 34.41
---

* Bright Zone !

Segment Leq : 34.41 dBA

Results segment # 6: LyonL (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 ! 19.70 ! 5.14 ! 5.14

ROAD (0.00 + 39.03 + 0.00) = 39.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
5 25 0.00 60.88 0.00 -6.69 -9.54 0.00 0.00 -5.62 39.03

Segment Leq : 39.03 dBA

Results segment # 7: LyonR (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 ! 19.70 ! 5.14 ! 5.14

ROAD (0.00 + 24.86 + 0.00) = 24.86 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
25 46 0.00 60.88 0.00 -6.69 -9.33 0.00 0.00 -20.00 24.86

Segment Leq : 24.86 dBA

Total Leq All Segments: 47.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.29
(NIGHT): 47.69

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:02:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonL (day/night)

Angle1 Angle2 : 0.00 deg 2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 2.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 57.00 / 57.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonC (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonC (day/night)

Angle1 Angle2 : 2.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 2.00 deg Angle2 : 10.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 48.00 / 48.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonR (day/night)

Angle1 Angle2 : 10.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 19.70 / 19.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 10.00 deg Angle2 : 45.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 57.00 / 57.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LyonL (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 ! 19.70 ! 5.08 ! 5.08

ROAD (0.00 + 23.90 + 0.00) = 23.90 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 2 0.00 68.48 0.00 -6.75 -19.54 0.00 0.00 -18.29 23.90

Segment Leq : 23.90 dBA

Results segment # 2: LyonC (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 ! 19.70 ! 7.39 ! 7.39

ROAD (0.00 + 30.13 + 0.00) = 30.13 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
2 10 0.00 68.48 0.00 -6.75 -13.52 0.00 0.00 -18.07 30.13

Segment Leq : 30.13 dBA

Results segment # 3: LyonR (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 ! 19.70 ! 5.08 ! 5.08

ROAD (0.00 + 34.62 + 0.00) = 34.62 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 45 0.00 68.48 0.00 -6.75 -7.11 0.00 0.00 -20.00 34.62

Segment Leq : 34.62 dBA

Total Leq All Segments: 36.20 dBA

Results segment # 1: LyonL (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 ! 19.70 ! 5.08 ! 5.08

ROAD (0.00 + 16.30 + 0.00) = 16.30 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 2 0.00 60.88 0.00 -6.75 -19.54 0.00 0.00 -18.29 16.30

Segment Leq : 16.30 dBA

Results segment # 2: LyonC (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 ! 19.70 ! 7.39 ! 7.39

ROAD (0.00 + 22.54 + 0.00) = 22.54 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
2 10 0.00 60.88 0.00 -6.75 -13.52 0.00 0.00 -18.07 22.54

Segment Leq : 22.54 dBA

Results segment # 3: LyonR (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 ! 19.70 ! 5.08 ! 5.08

ROAD (0.00 + 27.02 + 0.00) = 27.02 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 45 0.00 60.88 0.00 -6.75 -7.11 0.00 0.00 -20.00 27.02

Segment Leq : 27.02 dBA

Total Leq All Segments: 28.61 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 36.20
(NIGHT): 28.61

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:02:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -26.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 22.70 / 22.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -26.00 deg Angle2 : 0.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 76.00 / 76.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 22.70 ! 4.79 ! 4.79

ROAD (0.00 + 35.31 + 0.00) = 35.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-26 0 0.00 71.49 0.00 -7.78 -8.40 0.00 0.00 -20.00 35.31

Segment Leq : 35.31 dBA

Total Leq All Segments: 35.31 dBA

Results segment # 1: Wellington (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 ! 22.70 ! 4.79 ! 4.79

ROAD (0.00 + 27.71 + 0.00) = 27.71 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-26 0 0.00 63.89 0.00 -7.78 -8.40 0.00 0.00 -20.00 27.71

Segment Leq : 27.71 dBA

Total Leq All Segments: 27.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 35.31
(NIGHT): 27.71

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:02:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -21.00 deg -18.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height : 17.80 / 17.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -21.00 deg Angle2 : -18.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 43.00 / 43.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : -18.00 deg -12.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height : 17.80 / 17.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -18.00 deg Angle2 : -12.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 45.00 / 45.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : -16.00 deg 16.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 17.80 / 17.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -16.00 deg Angle2 : 16.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 81.00 / 81.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LyonSBL (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 ! 17.80 ! 10.26 ! 10.26

ROAD (0.00 + 34.57 + 0.00) = 34.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-21 -18 0.00 65.47 0.00 -7.92 -17.78 0.00 0.00 -5.20 34.57

Segment Leq : 34.57 dBA

Results segment # 2: LyonSBR (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 ! 17.80 ! 9.91 ! 9.91

ROAD (0.00 + 30.42 + 0.00) = 30.42 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-18 -12 0.00 65.47 0.00 -7.92 -14.77 0.00 0.00 -12.36 30.42

Segment Leq : 30.42 dBA

Results segment # 3: Lyon (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 ! 17.80 ! 4.04 ! 4.04

ROAD (0.00 + 32.92 + 0.00) = 32.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 16 0.00 68.48 0.00 -8.06 -7.50 0.00 0.00 -20.00 32.92

Segment Leq : 32.92 dBA

Total Leq All Segments: 37.73 dBA

Results segment # 1: LyonSBL (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 ! 17.80 ! 10.26 ! 10.26

ROAD (0.00 + 26.97 + 0.00) = 26.97 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-21 -18 0.00 57.87 0.00 -7.92 -17.78 0.00 0.00 -5.20 26.97

Segment Leq : 26.97 dBA

Results segment # 2: LyonSBR (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 ! 17.80 ! 9.91 ! 9.91

ROAD (0.00 + 22.82 + 0.00) = 22.82 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-18 -12 0.00 57.87 0.00 -7.92 -14.77 0.00 0.00 -12.36 22.82

Segment Leq : 22.82 dBA

Results segment # 3: Lyon (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 ! 17.80 ! 4.04 ! 4.04

ROAD (0.00 + 25.32 + 0.00) = 25.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 16 0.00 60.88 0.00 -8.06 -7.50 0.00 0.00 -20.00 25.32

Segment Leq : 25.32 dBA

Total Leq All Segments: 30.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 37.73
(NIGHT): 30.13

STAMSON 5.0 NORMAL REPORT Date: 02-04-2015 10:03:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : 0.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 92.00 / 92.00 m
Receiver height : 17.80 / 17.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 20.00 deg Angle2 : 23.00 deg
Barrier height : 30.00 m
Barrier receiver distance : 73.00 / 73.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Albert (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 ! 17.80 ! 4.86 ! 4.86

ROAD (51.06 + 22.82 + 42.82) = 51.67 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 20 0.00 68.48 0.00 -7.88 -9.54 0.00 0.00 0.00 51.06
---
20 23 0.00 68.48 0.00 -7.88 -17.78 0.00 0.00 -20.00 22.82
---
23 26 0.00 68.48 0.00 -7.88 -17.78 0.00 0.00 0.00 42.82

Segment Leq : 51.67 dBA

Total Leq All Segments: 51.67 dBA

Results segment # 1: Albert (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 ! 17.80 ! 4.86 ! 4.86

ROAD (43.46 + 15.22 + 35.22) = 44.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 20 0.00 60.88 0.00 -7.88 -9.54 0.00 0.00 0.00 43.46
---
20 23 0.00 60.88 0.00 -7.88 -17.78 0.00 0.00 -20.00 15.22
---
23 26 0.00 60.88 0.00 -7.88 -17.78 0.00 0.00 0.00 35.22

Segment Leq : 44.08 dBA

Total Leq All Segments: 44.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.67
(NIGHT): 44.08

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:46:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R13.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -27.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 89.00 / 89.00 m
Receiver height : 47.70 / 47.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -27.00 deg Angle2 : 27.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 77.00 / 77.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSB (day/night)

Angle1 Angle2 : -49.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -49.00 deg Angle2 : -21.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 46.00 / 46.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonNB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNB (day/night)

Angle1 Angle2 : -40.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.00 / 77.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -40.00 deg Angle2 : -32.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 41.00 / 41.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 47.70 ! 7.73 ! 7.73

ROAD (0.00 + 38.53 + 0.00) = 38.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-27 27 0.00 71.49 0.00 -7.73 -5.23 0.00 0.00 -20.00 38.53

Segment Leq : 38.53 dBA

Results segment # 2: LyonSB (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 ! 44.70 ! 14.12 ! 14.12

ROAD (0.00 + 31.02 + 50.86) = 50.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-49 -21 0.00 65.47 0.00 -6.37 -8.08 0.00 0.00 -20.00 31.02

-21 6 0.00 65.47 0.00 -6.37 -8.24 0.00 0.00 0.00 50.86

Segment Leq : 50.91 dBA

Results segment # 3: LyonNB (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 ! 44.70 ! 21.69 ! 21.69

ROAD (0.00 + 29.77 + 50.13) = 50.17 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-40 -32 0.00 65.47 0.00 -7.10 -13.52 0.00 0.00 -15.07 29.77

-32 -5 0.00 65.47 0.00 -7.10 -8.24 0.00 0.00 0.00 50.13

Segment Leq : 50.17 dBA

Total Leq All Segments: 53.70 dBA

Results segment # 1: Wellington (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 ! 47.70 ! 7.73 ! 7.73

ROAD (0.00 + 30.93 + 0.00) = 30.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-27 27 0.00 63.89 0.00 -7.73 -5.23 0.00 0.00 -20.00 30.93

Segment Leq : 30.93 dBA

Results segment # 2: LyonSB (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 ! 44.70 ! 14.12 ! 14.12

ROAD (0.00 + 23.42 + 43.27) = 43.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-49 -21 0.00 57.87 0.00 -6.37 -8.08 0.00 0.00 -20.00 23.42

-21 6 0.00 57.87 0.00 -6.37 -8.24 0.00 0.00 0.00 43.27

Segment Leq : 43.31 dBA

Results segment # 3: LyonNB (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 ! 44.70 ! 21.69 ! 21.69

ROAD (0.00 + 22.18 + 42.53) = 42.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-40 -32 0.00 57.87 0.00 -7.10 -13.52 0.00 0.00 -15.07 22.18

-32 -5 0.00 57.87 0.00 -7.10 -8.24 0.00 0.00 0.00 42.53

Segment Leq : 42.57 dBA

Total Leq All Segments: 46.10 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.70
(NIGHT): 46.10

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:49:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R14.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : 0.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 47.70 / 47.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 25.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 78.00 / 78.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -51.00 deg 7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -51.00 deg Angle2 : -24.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 44.00 / 44.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : 7.00 deg 13.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 7.00 deg Angle2 : 13.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 55.00 / 55.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 4: LyonNBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNBL (day/night)

Angle1 Angle2 : -42.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -35.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 39.00 / 39.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 5: LyonNBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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 # 5: LyonNBR (day/night)

Angle1 Angle2 : -4.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -4.00 deg Angle2 : 0.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 6: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 6: LyonL (day/night)

Angle1 Angle2 : 5.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 5.00 deg Angle2 : 25.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 7: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 7: LyonR (day/night)

Angle1 Angle2 : 25.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 25.00 deg Angle2 : 46.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 47.70 ! 7.66 ! 7.66

ROAD (0.00 + 35.14 + 0.00) = 35.14 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 25 0.00 71.49 0.00 -7.78 -8.57 0.00 0.00 -20.00 35.14

Segment Leq : 35.14 dBA

Results segment # 2: LyonSBL (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 ! 44.70 ! 14.53 ! 14.53

ROAD (0.00 + 31.00 + 51.60) = 51.64 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-51 -24 0.00 65.47 0.00 -6.23 -8.24 0.00 0.00 -20.00 31.00

-24 7 0.00 65.47 0.00 -6.23 -7.64 0.00 0.00 0.00 51.60

Segment Leq : 51.64 dBA

Results segment # 3: LyonSBR (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 ! 44.70 ! 6.98 ! 6.98

ROAD (0.00 + 44.47 + 0.00) = 44.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
7 13 0.00 65.47 0.00 -6.23 -14.77 0.00 0.00 0.00 44.47*
7 13 0.00 65.47 0.00 -6.23 -14.77 0.00 0.00 0.00 44.47
---

* Bright Zone !

Segment Leq : 44.47 dBA

Results segment # 4: LyonNBL (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 ! 44.70 ! 21.93 ! 21.93

ROAD (0.00 + 29.78 + 50.90) = 50.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -35 0.00 65.47 0.00 -6.93 -14.10 0.00 0.00 -14.65 29.78

-35 -4 0.00 65.47 0.00 -6.93 -7.64 0.00 0.00 0.00 50.90

Segment Leq : 50.93 dBA

Results segment # 5: LyonNBR (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 ! 44.70 ! 12.00 ! 12.00

ROAD (0.00 + 42.01 + 0.00) = 42.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-4 0 0.00 65.47 0.00 -6.93 -16.53 0.00 0.00 0.00 42.01*
-4 0 0.00 65.47 0.00 -6.93 -16.53 0.00 0.00 0.00 42.01
---

* Bright Zone !

Segment Leq : 42.01 dBA

Results segment # 6: LyonL (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 ! 44.70 ! 10.14 ! 10.14

ROAD (0.00 + 52.25 + 0.00) = 52.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
5 25 0.00 68.48 0.00 -6.69 -9.54 0.00 0.00 0.00 52.25*
5 25 0.00 68.48 0.00 -6.69 -9.54 0.00 0.00 0.00 52.25
---

* Bright Zone !

Segment Leq : 52.25 dBA

Results segment # 7: LyonR (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 ! 44.70 ! 10.14 ! 10.14

ROAD (0.00 + 32.46 + 0.00) = 32.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
25 46 0.00 68.48 0.00 -6.69 -9.33 0.00 0.00 -20.00 32.46

Segment Leq : 32.46 dBA

Total Leq All Segments: 56.87 dBA

Results segment # 1: Wellington (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 ! 47.70 ! 7.66 ! 7.66

ROAD (0.00 + 27.54 + 0.00) = 27.54 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 25 0.00 63.89 0.00 -7.78 -8.57 0.00 0.00 -20.00 27.54

Segment Leq : 27.54 dBA

Results segment # 2: LyonSBL (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 ! 44.70 ! 14.53 ! 14.53

ROAD (0.00 + 23.40 + 44.00) = 44.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-51 -24 0.00 57.87 0.00 -6.23 -8.24 0.00 0.00 -20.00 23.40

-24 7 0.00 57.87 0.00 -6.23 -7.64 0.00 0.00 0.00 44.00

Segment Leq : 44.04 dBA

Results segment # 3: LyonSBR (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 ! 44.70 ! 6.98 ! 6.98

ROAD (0.00 + 36.87 + 0.00) = 36.87 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
7 13 0.00 57.87 0.00 -6.23 -14.77 0.00 0.00 0.00 36.87*
7 13 0.00 57.87 0.00 -6.23 -14.77 0.00 0.00 0.00 36.87
---

* Bright Zone !

Segment Leq : 36.87 dBA

Results segment # 4: LyonNBL (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 ! 44.70 ! 21.93 ! 21.93

ROAD (0.00 + 22.19 + 43.30) = 43.34 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -35 0.00 57.87 0.00 -6.93 -14.10 0.00 0.00 -14.65 22.19

-35 -4 0.00 57.87 0.00 -6.93 -7.64 0.00 0.00 0.00 43.30

Segment Leq : 43.34 dBA

Results segment # 5: LyonNBR (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 ! 44.70 ! 12.00 ! 12.00

ROAD (0.00 + 34.41 + 0.00) = 34.41 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-4 0 0.00 57.87 0.00 -6.93 -16.53 0.00 0.00 0.00 34.41*
-4 0 0.00 57.87 0.00 -6.93 -16.53 0.00 0.00 0.00 34.41
---

* Bright Zone !

Segment Leq : 34.41 dBA

Results segment # 6: LyonL (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 ! 44.70 ! 10.14 ! 10.14

ROAD (0.00 + 44.65 + 0.00) = 44.65 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
5 25 0.00 60.88 0.00 -6.69 -9.54 0.00 0.00 0.00 44.65*
5 25 0.00 60.88 0.00 -6.69 -9.54 0.00 0.00 0.00 44.65
---

* Bright Zone !

Segment Leq : 44.65 dBA

Results segment # 7: LyonR (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 ! 44.70 ! 10.14 ! 10.14

ROAD (0.00 + 24.86 + 0.00) = 24.86 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
25 46 0.00 60.88 0.00 -6.69 -9.33 0.00 0.00 -20.00 24.86

Segment Leq : 24.86 dBA

Total Leq All Segments: 49.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.87
(NIGHT): 49.27

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:52:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R15.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonL (day/night)

Angle1 Angle2 : 0.00 deg 2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 2.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 57.00 / 57.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonC (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonC (day/night)

Angle1 Angle2 : 2.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 2.00 deg Angle2 : 10.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 48.00 / 48.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonR (day/night)

Angle1 Angle2 : 10.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 44.70 / 44.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 10.00 deg Angle2 : 45.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 57.00 / 57.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LyonL (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 ! 44.70 ! 10.01 ! 10.01

ROAD (0.00 + 36.54 + 0.00) = 36.54 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 2 0.00 68.48 0.00 -6.75 -19.54 0.00 0.00 -5.64 36.54

Segment Leq : 36.54 dBA

Results segment # 2: LyonC (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 ! 44.70 ! 15.49 ! 15.49

ROAD (0.00 + 48.21 + 0.00) = 48.21 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
2 10 0.00 68.48 0.00 -6.75 -13.52 0.00 0.00 -0.07 48.13*
2 10 0.00 68.48 0.00 -6.75 -13.52 0.00 0.00 0.00 48.21
---

* Bright Zone !

Segment Leq : 48.21 dBA

Results segment # 3: LyonR (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 ! 44.70 ! 10.01 ! 10.01

ROAD (0.00 + 34.62 + 0.00) = 34.62 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 45 0.00 68.48 0.00 -6.75 -7.11 0.00 0.00 -20.00 34.62

Segment Leq : 34.62 dBA

Total Leq All Segments: 48.67 dBA

Results segment # 1: LyonL (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 ! 44.70 ! 10.01 ! 10.01

ROAD (0.00 + 28.94 + 0.00) = 28.94 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 2 0.00 60.88 0.00 -6.75 -19.54 0.00 0.00 -5.64 28.94

Segment Leq : 28.94 dBA

Results segment # 2: LyonC (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 ! 44.70 ! 15.49 ! 15.49

ROAD (0.00 + 40.61 + 0.00) = 40.61 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
2 10 0.00 60.88 0.00 -6.75 -13.52 0.00 0.00 -0.07 40.54*
2 10 0.00 60.88 0.00 -6.75 -13.52 0.00 0.00 0.00 40.61
---

* Bright Zone !

Segment Leq : 40.61 dBA

Results segment # 3: LyonR (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 ! 44.70 ! 10.01 ! 10.01

ROAD (0.00 + 27.02 + 0.00) = 27.02 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 45 0.00 60.88 0.00 -6.75 -7.11 0.00 0.00 -20.00 27.02

Segment Leq : 27.02 dBA

Total Leq All Segments: 41.07 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.67
(NIGHT): 41.07

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:56:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R16.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -26.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 47.70 / 47.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -26.00 deg Angle2 : 0.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 76.00 / 76.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 47.70 ! 8.68 ! 8.68

ROAD (0.00 + 35.31 + 0.00) = 35.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-26 0 0.00 71.49 0.00 -7.78 -8.40 0.00 0.00 -20.00 35.31

Segment Leq : 35.31 dBA

Total Leq All Segments: 35.31 dBA

Results segment # 1: Wellington (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 ! 47.70 ! 8.68 ! 8.68

ROAD (0.00 + 27.71 + 0.00) = 27.71 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-26 0 0.00 63.89 0.00 -7.78 -8.40 0.00 0.00 -20.00 27.71

Segment Leq : 27.71 dBA

Total Leq All Segments: 27.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 35.31
(NIGHT): 27.71

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:43:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R17.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -21.00 deg -18.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -21.00 deg Angle2 : -18.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 43.00 / 43.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : -18.00 deg -12.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -18.00 deg Angle2 : -12.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 45.00 / 45.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : -16.00 deg 16.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -16.00 deg Angle2 : 16.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 81.00 / 81.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LyonSBL (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 ! 47.00 ! 25.96 ! 25.96

ROAD (0.00 + 39.76 + 0.00) = 39.76 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-21 -18 0.00 65.47 0.00 -7.92 -17.78 0.00 0.00 0.00 39.76*
-21 -18 0.00 65.47 0.00 -7.92 -17.78 0.00 0.00 0.00 39.76
---

* Bright Zone !

Segment Leq : 39.76 dBA

Results segment # 2: LyonSBR (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 ! 47.00 ! 24.98 ! 24.98

ROAD (0.00 + 42.77 + 0.00) = 42.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-18 -12 0.00 65.47 0.00 -7.92 -14.77 0.00 0.00 0.00 42.77*
-18 -12 0.00 65.47 0.00 -7.92 -14.77 0.00 0.00 0.00 42.77
---

* Bright Zone !

Segment Leq : 42.77 dBA

Results segment # 3: Lyon (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 ! 47.00 ! 8.61 ! 8.61

ROAD (0.00 + 32.92 + 0.00) = 32.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 16 0.00 68.48 0.00 -8.06 -7.50 0.00 0.00 -20.00 32.92

Segment Leq : 32.92 dBA

Total Leq All Segments: 44.82 dBA

Results segment # 1: LyonSBL (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 ! 47.00 ! 25.96 ! 25.96

ROAD (0.00 + 32.17 + 0.00) = 32.17 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-21 -18 0.00 57.87 0.00 -7.92 -17.78 0.00 0.00 0.00 32.17*
-21 -18 0.00 57.87 0.00 -7.92 -17.78 0.00 0.00 0.00 32.17
---

* Bright Zone !

Segment Leq : 32.17 dBA

Results segment # 2: LyonSBR (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 ! 47.00 ! 24.98 ! 24.98

ROAD (0.00 + 35.18 + 0.00) = 35.18 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-18 -12 0.00 57.87 0.00 -7.92 -14.77 0.00 0.00 0.00 35.18*
-18 -12 0.00 57.87 0.00 -7.92 -14.77 0.00 0.00 0.00 35.18
---

* Bright Zone !

Segment Leq : 35.18 dBA

Results segment # 3: Lyon (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 ! 47.00 ! 8.61 ! 8.61

ROAD (0.00 + 25.32 + 0.00) = 25.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 16 0.00 60.88 0.00 -8.06 -7.50 0.00 0.00 -20.00 25.32

Segment Leq : 25.32 dBA

Total Leq All Segments: 37.23 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 44.82
(NIGHT): 37.23

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:34:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R18.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : -19.00 deg 19.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -19.00 deg Angle2 : 0.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 79.00 / 79.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : -24.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 91.00 / 91.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -24.00 deg Angle2 : 0.00 deg
Barrier height : 37.00 m
Barrier receiver distance : 24.00 / 24.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Lyon (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 ! 47.00 ! 9.16 ! 9.16

ROAD (0.00 + 30.70 + 50.70) = 50.74 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-19 0 0.00 68.48 0.00 -8.02 -9.77 0.00 0.00 -20.00 30.70
---
0 19 0.00 68.48 0.00 -8.02 -9.77 0.00 0.00 0.00 50.70

Segment Leq : 50.74 dBA

Results segment # 2: Albert (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 ! 47.00 ! 35.00 ! 35.00

ROAD (0.00 + 43.68 + 0.00) = 43.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-24 0 0.00 68.48 0.00 -7.83 -8.75 0.00 0.00 -8.22 43.68

Segment Leq : 43.68 dBA

Total Leq All Segments: 51.52 dBA

Results segment # 1: Lyon (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 ! 47.00 ! 9.16 ! 9.16

ROAD (0.00 + 23.10 + 43.10) = 43.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-19 0 0.00 60.88 0.00 -8.02 -9.77 0.00 0.00 -20.00 23.10
---
0 19 0.00 60.88 0.00 -8.02 -9.77 0.00 0.00 0.00 43.10

Segment Leq : 43.15 dBA

Results segment # 2: Albert (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 ! 47.00 ! 35.00 ! 35.00

ROAD (0.00 + 36.08 + 0.00) = 36.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-24 0 0.00 60.88 0.00 -7.83 -8.75 0.00 0.00 -8.22 36.08

Segment Leq : 36.08 dBA

Total Leq All Segments: 43.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.52
(NIGHT): 43.93

STAMSON 5.0 NORMAL REPORT Date: 30-04-2015 11:07:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r19.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 47.00 / 47.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : -28.00 deg 28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -28.00 deg Angle2 : 28.00 deg
Barrier height : 37.00 m
Barrier receiver distance : 49.00 / 49.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Lyon (day)

Source height = 1.50 m

ROAD (0.00 + 50.17 + 0.00) = 50.17 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 17 0.00 68.48 0.00 -8.06 -10.25 0.00 0.00 0.00 50.17

Segment Leq : 50.17 dBA

Results segment # 2: Albert (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 ! 47.00 ! 21.66 ! 21.66

ROAD (0.00 + 35.73 + 0.00) = 35.73 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-28 28 0.00 68.48 0.00 -7.68 -5.07 0.00 0.00 -20.00 35.73

Segment Leq : 35.73 dBA

Total Leq All Segments: 50.32 dBA

Results segment # 1: Lyon (night)

Source height = 1.50 m

ROAD (0.00 + 42.57 + 0.00) = 42.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 17 0.00 60.88 0.00 -8.06 -10.25 0.00 0.00 0.00 42.57

Segment Leq : 42.57 dBA

Results segment # 2: Albert (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 ! 47.00 ! 21.66 ! 21.66

ROAD (0.00 + 28.13 + 0.00) = 28.13 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-28 28 0.00 60.88 0.00 -7.68 -5.07 0.00 0.00 -20.00 28.13

Segment Leq : 28.13 dBA

Total Leq All Segments: 42.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.32
(NIGHT): 42.72

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:45:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R20.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : 0.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 92.00 / 92.00 m
Receiver height : 47.00 / 47.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 20.00 deg Angle2 : 23.00 deg
Barrier height : 30.00 m
Barrier receiver distance : 73.00 / 73.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Albert (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 ! 47.00 ! 10.89 ! 10.89

ROAD (51.06 + 22.82 + 42.82) = 51.67 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 20 0.00 68.48 0.00 -7.88 -9.54 0.00 0.00 0.00 51.06
---
20 23 0.00 68.48 0.00 -7.88 -17.78 0.00 0.00 -20.00 22.82
---
23 26 0.00 68.48 0.00 -7.88 -17.78 0.00 0.00 0.00 42.82

Segment Leq : 51.67 dBA

Total Leq All Segments: 51.67 dBA

Results segment # 1: Albert (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 ! 47.00 ! 10.89 ! 10.89

ROAD (43.46 + 15.22 + 35.22) = 44.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 20 0.00 60.88 0.00 -7.88 -9.54 0.00 0.00 0.00 43.46
---
20 23 0.00 60.88 0.00 -7.88 -17.78 0.00 0.00 -20.00 15.22
---
23 26 0.00 60.88 0.00 -7.88 -17.78 0.00 0.00 0.00 35.22

Segment Leq : 44.08 dBA

Total Leq All Segments: 44.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.67
(NIGHT): 44.08

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:48:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R21.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -27.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 89.00 / 89.00 m
Receiver height : 74.20 / 74.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -27.00 deg Angle2 : 27.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 77.00 / 77.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSB (day/night)

Angle1 Angle2 : -49.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -49.00 deg Angle2 : -21.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 46.00 / 46.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonNB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNB (day/night)

Angle1 Angle2 : -40.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.00 / 77.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -40.00 deg Angle2 : -32.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 41.00 / 41.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 74.20 ! 11.30 ! 11.30

ROAD (0.00 + 38.53 + 0.00) = 38.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-27 27 0.00 71.49 0.00 -7.73 -5.23 0.00 0.00 -20.00 38.53

Segment Leq : 38.53 dBA

Results segment # 2: LyonSB (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 ! 71.20 ! 21.87 ! 21.87

ROAD (0.00 + 38.11 + 50.86) = 51.09 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-49 -21 0.00 65.47 0.00 -6.37 -8.08 0.00 0.00 -12.91 38.11

-21 6 0.00 65.47 0.00 -6.37 -8.24 0.00 0.00 0.00 50.86

Segment Leq : 51.09 dBA

Results segment # 3: LyonNB (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 ! 71.20 ! 34.08 ! 34.08

ROAD (0.00 + 44.84 + 50.13) = 51.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-40 -32 0.00 65.47 0.00 -7.10 -13.52 0.00 0.00 0.00 44.84*
-40 -32 0.00 65.47 0.00 -7.10 -13.52 0.00 0.00 0.00 44.84

-32 -5 0.00 65.47 0.00 -7.10 -8.24 0.00 0.00 0.00 50.13
---

* Bright Zone !

Segment Leq : 51.25 dBA

Total Leq All Segments: 54.30 dBA

Results segment # 1: Wellington (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 ! 74.20 ! 11.30 ! 11.30

ROAD (0.00 + 30.93 + 0.00) = 30.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-27 27 0.00 63.89 0.00 -7.73 -5.23 0.00 0.00 -20.00 30.93

Segment Leq : 30.93 dBA

Results segment # 2: LyonSB (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 ! 71.20 ! 21.87 ! 21.87

ROAD (0.00 + 30.51 + 43.27) = 43.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-49 -21 0.00 57.87 0.00 -6.37 -8.08 0.00 0.00 -12.91 30.51

-21 6 0.00 57.87 0.00 -6.37 -8.24 0.00 0.00 0.00 43.27

Segment Leq : 43.49 dBA

Results segment # 3: LyonNB (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 ! 71.20 ! 34.08 ! 34.08

ROAD (0.00 + 37.25 + 42.53) = 43.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	-32	0.00	57.87	0.00	-7.10	-13.52	0.00	0.00	0.00	37.25*
-40	-32	0.00	57.87	0.00	-7.10	-13.52	0.00	0.00	0.00	37.25
-32	-5	0.00	57.87	0.00	-7.10	-8.24	0.00	0.00	0.00	42.53

* Bright Zone !

Segment Leq : 43.66 dBA

Total Leq All Segments: 46.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.30
(NIGHT): 46.70

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:55:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R22.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : 0.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 74.20 / 74.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 25.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 78.00 / 78.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -51.00 deg 7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -51.00 deg Angle2 : -24.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 44.00 / 44.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : 7.00 deg 13.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 7.00 deg Angle2 : 13.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 55.00 / 55.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 4: LyonNBL (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNBL (day/night)

Angle1 Angle2 : -42.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -35.00 deg
Barrier height : 28.00 m
Barrier receiver distance : 39.00 / 39.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 5: LyonNBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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 # 5: LyonNBR (day/night)

Angle1 Angle2 : -4.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.00 / 74.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -4.00 deg Angle2 : 0.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 6: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 6: LyonL (day/night)

Angle1 Angle2 : 5.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 5.00 deg Angle2 : 25.00 deg
Barrier height : 5.70 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 7: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 7: LyonR (day/night)

Angle1 Angle2 : 25.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 25.00 deg Angle2 : 46.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 56.00 / 56.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 74.20 ! 11.19 ! 11.19

ROAD (0.00 + 35.14 + 0.00) = 35.14 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 25 0.00 71.49 0.00 -7.78 -8.57 0.00 0.00 -20.00 35.14

Segment Leq : 35.14 dBA

Results segment # 2: LyonSBL (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 ! 71.20 ! 22.52 ! 22.52

ROAD (0.00 + 39.19 + 51.60) = 51.84 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-51 -24 0.00 65.47 0.00 -6.23 -8.24 0.00 0.00 -11.81 39.19

-24 7 0.00 65.47 0.00 -6.23 -7.64 0.00 0.00 0.00 51.60

Segment Leq : 51.84 dBA

Results segment # 3: LyonSBR (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 ! 71.20 ! 10.35 ! 10.35

ROAD (0.00 + 44.47 + 0.00) = 44.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
7 13 0.00 65.47 0.00 -6.23 -14.77 0.00 0.00 0.00 44.47*
7 13 0.00 65.47 0.00 -6.23 -14.77 0.00 0.00 0.00 44.47
---

* Bright Zone !

Segment Leq : 44.47 dBA

Results segment # 4: LyonNBL (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 ! 71.20 ! 34.46 ! 34.46

ROAD (0.00 + 44.44 + 50.90) = 51.78 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -35 0.00 65.47 0.00 -6.93 -14.10 0.00 0.00 0.00 44.44*
-42 -35 0.00 65.47 0.00 -6.93 -14.10 0.00 0.00 0.00 44.44

-35 -4 0.00 65.47 0.00 -6.93 -7.64 0.00 0.00 0.00 50.90
---

* Bright Zone !

Segment Leq : 51.78 dBA

Results segment # 5: LyonNBR (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 ! 71.20 ! 18.45 ! 18.45

ROAD (0.00 + 42.01 + 0.00) = 42.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-4 0 0.00 65.47 0.00 -6.93 -16.53 0.00 0.00 0.00 42.01*
-4 0 0.00 65.47 0.00 -6.93 -16.53 0.00 0.00 0.00 42.01
---

* Bright Zone !

Segment Leq : 42.01 dBA

Results segment # 6: LyonL (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 ! 71.20 ! 15.44 ! 15.44

ROAD (0.00 + 52.25 + 0.00) = 52.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
5 25 0.00 68.48 0.00 -6.69 -9.54 0.00 0.00 0.00 52.25*
5 25 0.00 68.48 0.00 -6.69 -9.54 0.00 0.00 0.00 52.25
---

* Bright Zone !

Segment Leq : 52.25 dBA

Results segment # 7: LyonR (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 ! 71.20 ! 15.44 ! 15.44

ROAD (0.00 + 32.46 + 0.00) = 32.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
25 46 0.00 68.48 0.00 -6.69 -9.33 0.00 0.00 -20.00 32.46

Segment Leq : 32.46 dBA

Total Leq All Segments: 57.16 dBA

Results segment # 1: Wellington (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 ! 74.20 ! 11.19 ! 11.19

ROAD (0.00 + 27.54 + 0.00) = 27.54 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 25 0.00 63.89 0.00 -7.78 -8.57 0.00 0.00 -20.00 27.54

Segment Leq : 27.54 dBA

Results segment # 2: LyonSBL (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 ! 71.20 ! 22.52 ! 22.52

ROAD (0.00 + 31.60 + 44.00) = 44.24 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-51 -24 0.00 57.87 0.00 -6.23 -8.24 0.00 0.00 -11.81 31.60

-24 7 0.00 57.87 0.00 -6.23 -7.64 0.00 0.00 0.00 44.00

Segment Leq : 44.24 dBA

Results segment # 3: LyonSBR (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 ! 71.20 ! 10.35 ! 10.35

ROAD (0.00 + 36.87 + 0.00) = 36.87 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
7 13 0.00 57.87 0.00 -6.23 -14.77 0.00 0.00 0.00 36.87*
7 13 0.00 57.87 0.00 -6.23 -14.77 0.00 0.00 0.00 36.87
---

* Bright Zone !

Segment Leq : 36.87 dBA

Results segment # 4: LyonNBL (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 ! 71.20 ! 34.46 ! 34.46

ROAD (0.00 + 36.84 + 43.30) = 44.19 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -35 0.00 57.87 0.00 -6.93 -14.10 0.00 0.00 0.00 36.84*
-42 -35 0.00 57.87 0.00 -6.93 -14.10 0.00 0.00 0.00 36.84

-35 -4 0.00 57.87 0.00 -6.93 -7.64 0.00 0.00 0.00 43.30
---

* Bright Zone !

Segment Leq : 44.19 dBA

Results segment # 5: LyonNBR (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 ! 71.20 ! 18.45 ! 18.45

ROAD (0.00 + 34.41 + 0.00) = 34.41 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-4 0 0.00 57.87 0.00 -6.93 -16.53 0.00 0.00 0.00 34.41*
-4 0 0.00 57.87 0.00 -6.93 -16.53 0.00 0.00 0.00 34.41
---

* Bright Zone !

Segment Leq : 34.41 dBA

Results segment # 6: LyonL (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 ! 71.20 ! 15.44 ! 15.44

ROAD (0.00 + 44.65 + 0.00) = 44.65 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
5 25 0.00 60.88 0.00 -6.69 -9.54 0.00 0.00 0.00 44.65*
5 25 0.00 60.88 0.00 -6.69 -9.54 0.00 0.00 0.00 44.65
---

* Bright Zone !

Segment Leq : 44.65 dBA

Results segment # 7: LyonR (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 ! 71.20 ! 15.44 ! 15.44

ROAD (0.00 + 24.86 + 0.00) = 24.86 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
25 46 0.00 60.88 0.00 -6.69 -9.33 0.00 0.00 -20.00 24.86

Segment Leq : 24.86 dBA

Total Leq All Segments: 49.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.16
(NIGHT): 49.56

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:56:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R23.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: LyonL (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonL (day/night)

Angle1 Angle2 : 0.00 deg 2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 2.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 57.00 / 57.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonC (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonC (day/night)

Angle1 Angle2 : 2.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 2.00 deg Angle2 : 10.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 48.00 / 48.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonR (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: LyonR (day/night)

Angle1 Angle2 : 10.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 71.20 / 71.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 10.00 deg Angle2 : 45.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 57.00 / 57.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LyonL (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 ! 71.20 ! 15.24 ! 15.24

ROAD (0.00 + 42.19 + 0.00) = 42.19 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 2 0.00 68.48 0.00 -6.75 -19.54 0.00 0.00 0.00 42.19*
0 2 0.00 68.48 0.00 -6.75 -19.54 0.00 0.00 0.00 42.19
---

* Bright Zone !

Segment Leq : 42.19 dBA

Results segment # 2: LyonC (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 ! 71.20 ! 24.08 ! 24.08

ROAD (0.00 + 48.21 + 0.00) = 48.21 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
2 10 0.00 68.48 0.00 -6.75 -13.52 0.00 0.00 0.00 48.21*
2 10 0.00 68.48 0.00 -6.75 -13.52 0.00 0.00 0.00 48.21
---

* Bright Zone !

Segment Leq : 48.21 dBA

Results segment # 3: LyonR (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 ! 71.20 ! 15.24 ! 15.24

ROAD (0.00 + 34.62 + 0.00) = 34.62 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 45 0.00 68.48 0.00 -6.75 -7.11 0.00 0.00 -20.00 34.62

Segment Leq : 34.62 dBA

Total Leq All Segments: 49.33 dBA

Results segment # 1: LyonL (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 ! 71.20 ! 15.24 ! 15.24

ROAD (0.00 + 34.59 + 0.00) = 34.59 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 2 0.00 60.88 0.00 -6.75 -19.54 0.00 0.00 0.00 34.59*
0 2 0.00 60.88 0.00 -6.75 -19.54 0.00 0.00 0.00 34.59
---

* Bright Zone !

Segment Leq : 34.59 dBA

Results segment # 2: LyonC (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 ! 71.20 ! 24.08 ! 24.08

ROAD (0.00 + 40.61 + 0.00) = 40.61 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
2 10 0.00 60.88 0.00 -6.75 -13.52 0.00 0.00 0.00 40.61*
2 10 0.00 60.88 0.00 -6.75 -13.52 0.00 0.00 0.00 40.61
---

* Bright Zone !

Segment Leq : 40.61 dBA

Results segment # 3: LyonR (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 ! 71.20 ! 15.24 ! 15.24

ROAD (0.00 + 27.02 + 0.00) = 27.02 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 45 0.00 60.88 0.00 -6.75 -7.11 0.00 0.00 -20.00 27.02

Segment Leq : 27.02 dBA

Total Leq All Segments: 41.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.33
(NIGHT): 41.73

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:57:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R24.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -26.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 74.20 / 74.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -26.00 deg Angle2 : 0.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 76.00 / 76.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 74.20 ! 12.80 ! 12.80

ROAD (0.00 + 35.31 + 0.00) = 35.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-26 0 0.00 71.49 0.00 -7.78 -8.40 0.00 0.00 -20.00 35.31

Segment Leq : 35.31 dBA

Total Leq All Segments: 35.31 dBA

Results segment # 1: Wellington (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 ! 74.20 ! 12.80 ! 12.80

ROAD (0.00 + 27.71 + 0.00) = 27.71 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-26 0 0.00 63.89 0.00 -7.78 -8.40 0.00 0.00 -20.00 27.71

Segment Leq : 27.71 dBA

Total Leq All Segments: 27.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 35.31
(NIGHT): 27.71

STAMSON 5.0 NORMAL REPORT Date: 30-04-2015 10:58:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R25.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBL (day/night)

Angle1 Angle2 : -21.00 deg -18.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -21.00 deg Angle2 : -18.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 43.00 / 43.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSBR (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSBR (day/night)

Angle1 Angle2 : -18.00 deg -12.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -18.00 deg Angle2 : -12.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 45.00 / 45.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : -16.00 deg 16.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -16.00 deg Angle2 : 16.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 81.00 / 81.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: LyonSBL (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 ! 80.10 ! 43.76 ! 43.76

ROAD (0.00 + 39.76 + 0.00) = 39.76 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-21 -18 0.00 65.47 0.00 -7.92 -17.78 0.00 0.00 0.00 39.76*
-21 -18 0.00 65.47 0.00 -7.92 -17.78 0.00 0.00 0.00 39.76
---

* Bright Zone !

Segment Leq : 39.76 dBA

Results segment # 2: LyonSBR (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 ! 80.10 ! 42.07 ! 42.07

ROAD (0.00 + 42.77 + 0.00) = 42.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-18 -12 0.00 65.47 0.00 -7.92 -14.77 0.00 0.00 0.00 42.77*
-18 -12 0.00 65.47 0.00 -7.92 -14.77 0.00 0.00 0.00 42.77
---

* Bright Zone !

Segment Leq : 42.77 dBA

Results segment # 3: Lyon (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 ! 80.10 ! 13.78 ! 13.78

ROAD (0.00 + 32.92 + 0.00) = 32.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 16 0.00 68.48 0.00 -8.06 -7.50 0.00 0.00 -20.00 32.92

Segment Leq : 32.92 dBA

Total Leq All Segments: 44.82 dBA

Results segment # 1: LyonSBL (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 ! 80.10 ! 43.76 ! 43.76

ROAD (0.00 + 32.17 + 0.00) = 32.17 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-21 -18 0.00 57.87 0.00 -7.92 -17.78 0.00 0.00 0.00 32.17*
-21 -18 0.00 57.87 0.00 -7.92 -17.78 0.00 0.00 0.00 32.17
---

* Bright Zone !

Segment Leq : 32.17 dBA

Results segment # 2: LyonSBR (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 ! 80.10 ! 42.07 ! 42.07

ROAD (0.00 + 35.18 + 0.00) = 35.18 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-18 -12 0.00 57.87 0.00 -7.92 -14.77 0.00 0.00 0.00 35.18*
-18 -12 0.00 57.87 0.00 -7.92 -14.77 0.00 0.00 0.00 35.18
---

* Bright Zone !

Segment Leq : 35.18 dBA

Results segment # 3: Lyon (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 ! 80.10 ! 13.78 ! 13.78

ROAD (0.00 + 25.32 + 0.00) = 25.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 16 0.00 60.88 0.00 -8.06 -7.50 0.00 0.00 -20.00 25.32

Segment Leq : 25.32 dBA

Total Leq All Segments: 37.23 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 44.82
(NIGHT): 37.23

STAMSON 5.0 NORMAL REPORT Date: 30-04-2015 10:55:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R26.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : -19.00 deg 19.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -19.00 deg Angle2 : 0.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 79.00 / 79.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : -24.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 91.00 / 91.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -24.00 deg Angle2 : 0.00 deg
Barrier height : 37.00 m
Barrier receiver distance : 24.00 / 24.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Lyon (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 ! 80.10 ! 14.73 ! 14.73

ROAD (0.00 + 30.70 + 50.70) = 50.74 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-19 0 0.00 68.48 0.00 -8.02 -9.77 0.00 0.00 -20.00 30.70
---
0 19 0.00 68.48 0.00 -8.02 -9.77 0.00 0.00 0.00 50.70

Segment Leq : 50.74 dBA

Results segment # 2: Albert (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 ! 80.10 ! 59.37 ! 59.37

ROAD (0.00 + 51.90 + 0.00) = 51.90 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-24 0 0.00 68.48 0.00 -7.83 -8.75 0.00 0.00 0.00 51.90*
-24 0 0.00 68.48 0.00 -7.83 -8.75 0.00 0.00 0.00 51.90
---

* Bright Zone !

Segment Leq : 51.90 dBA

Total Leq All Segments: 54.37 dBA

Results segment # 1: Lyon (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 ! 80.10 ! 14.73 ! 14.73

ROAD (0.00 + 23.10 + 43.10) = 43.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-19 0 0.00 60.88 0.00 -8.02 -9.77 0.00 0.00 -20.00 23.10
---
0 19 0.00 60.88 0.00 -8.02 -9.77 0.00 0.00 0.00 43.10

Segment Leq : 43.15 dBA
Results segment # 2: Albert (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 ! 80.10 ! 59.37 ! 59.37

ROAD (0.00 + 44.30 + 0.00) = 44.30 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-24 0 0.00 60.88 0.00 -7.83 -8.75 0.00 0.00 0.00 44.30*
-24 0 0.00 60.88 0.00 -7.83 -8.75 0.00 0.00 0.00 44.30
---

* Bright Zone !

Segment Leq : 44.30 dBA

Total Leq All Segments: 46.77 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 54.37
(NIGHT): 46.77

STAMSON 5.0 NORMAL REPORT Date: 30-04-2015 11:06:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r27.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Lyon (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 80.10 / 80.10 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : -28.00 deg 28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -28.00 deg Angle2 : 28.00 deg
Barrier height : 37.00 m
Barrier receiver distance : 49.00 / 49.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Lyon (day)

Source height = 1.50 m

ROAD (0.00 + 50.17 + 0.00) = 50.17 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
    0   17   0.00 68.48   0.00 -8.06 -10.25   0.00   0.00   0.00 50.17

Segment Leq : 50.17 dBA

Results segment # 2: Albert (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 !   80.10 !   36.33 !   36.33

ROAD (0.00 + 50.51 + 0.00) = 50.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -28   28   0.00 68.48   0.00 -7.68 -5.07   0.00   0.00 -5.21 50.51

Segment Leq : 50.51 dBA

Total Leq All Segments: 53.35 dBA

Results segment # 1: Lyon (night)

Source height = 1.50 m

ROAD (0.00 + 42.57 + 0.00) = 42.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
    0   17   0.00 60.88   0.00 -8.06 -10.25   0.00   0.00   0.00 42.57

Segment Leq : 42.57 dBA

Results segment # 2: Albert (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 !   80.10 !   36.33 !   36.33

ROAD (0.00 + 42.92 + 0.00) = 42.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -28   28   0.00 60.88   0.00 -7.68 -5.07   0.00   0.00 -5.21 42.92

Segment Leq : 42.92 dBA

Total Leq All Segments: 45.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.35
                  (NIGHT): 45.76

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 09:45:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R28.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Albert (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Albert (day/night)

Angle1 Angle2 : 0.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 92.00 / 92.00 m
Receiver height : 80.10 / 80.10 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 20.00 deg Angle2 : 23.00 deg
Barrier height : 30.00 m
Barrier receiver distance : 73.00 / 73.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Albert (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 ! 80.10 ! 17.73 ! 17.73

ROAD (51.06 + 22.98 + 42.82) = 51.67 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 20 0.00 68.48 0.00 -7.88 -9.54 0.00 0.00 0.00 51.06
---
20 23 0.00 68.48 0.00 -7.88 -17.78 0.00 0.00 -19.84 22.98
---
23 26 0.00 68.48 0.00 -7.88 -17.78 0.00 0.00 0.00 42.82

Segment Leq : 51.67 dBA

Total Leq All Segments: 51.67 dBA

Results segment # 1: Albert (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 ! 80.10 ! 17.73 ! 17.73

ROAD (43.46 + 15.39 + 35.22) = 44.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 20 0.00 60.88 0.00 -7.88 -9.54 0.00 0.00 0.00 43.46
---
20 23 0.00 60.88 0.00 -7.88 -17.78 0.00 0.00 -19.84 15.39
---
23 26 0.00 60.88 0.00 -7.88 -17.78 0.00 0.00 0.00 35.22

Segment Leq : 44.08 dBA

Total Leq All Segments: 44.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.67
(NIGHT): 44.08

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 11:56:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R29.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -25.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 113.00 / 113.00 m
Receiver height : 17.20 / 17.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -25.00 deg Angle2 : 25.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 100.00 / 100.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: LyonSB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonSB (day/night)

Angle1 Angle2 : -37.00 deg -2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 14.20 / 14.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -37.00 deg Angle2 : -2.00 deg
Barrier height : 19.30 m
Barrier receiver distance : 41.00 / 41.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: LyonNB (day/night)

Car traffic volume : 6072/528 veh/TimePeriod *
Medium truck volume : 483/42 veh/TimePeriod *
Heavy truck volume : 345/30 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 7500
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: LyonNB (day/night)

Angle1 Angle2 : -31.00 deg -14.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 107.00 / 107.00 m
Receiver height : 14.20 / 14.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -31.00 deg Angle2 : -14.00 deg
Barrier height : 19.30 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 4: Lyon1 (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Lyon1 (day/night)

Angle1 Angle2 : -8.00 deg -6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 105.00 / 105.00 m
Receiver height : 14.20 / 14.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -8.00 deg Angle2 : -6.00 deg
Barrier height : 10.70 m
Barrier receiver distance : 91.00 / 91.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 5: Lyon2 (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 5: Lyon2 (day/night)

Angle1 Angle2 : -6.00 deg -1.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 105.00 / 105.00 m
Receiver height : 14.20 / 14.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -6.00 deg Angle2 : -1.00 deg
Barrier height : 13.70 m
Barrier receiver distance : 91.00 / 91.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 6: Lyon3 (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 : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 6: Lyon3 (day/night)

Angle1 Angle2 : -1.00 deg 33.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 105.00 / 105.00 m
Receiver height : 14.20 / 14.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -1.00 deg Angle2 : 33.00 deg
Barrier height : 41.60 m
Barrier receiver distance : 91.00 / 91.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 17.20 ! 3.30 ! 3.30

ROAD (0.00 + 37.16 + 0.00) = 37.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-25 25 0.00 71.49 0.00 -8.77 -5.56 0.00 0.00 -20.00 37.16

Segment Leq : 37.16 dBA

Results segment # 2: LyonSB (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 ! 14.20 ! 8.99 ! 8.99

ROAD (0.00 + 30.12 + 0.00) = 30.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-37 -2 0.00 65.47 0.00 -8.24 -7.11 0.00 0.00 -20.00 30.12

Segment Leq : 30.12 dBA

Results segment # 3: LyonNB (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 ! 14.20 ! 9.45 ! 9.45

ROAD (0.00 + 26.74 + 0.00) = 26.74 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-31 -14 0.00 65.47 0.00 -8.53 -10.25 0.00 0.00 -19.95 26.74

Segment Leq : 26.74 dBA

Results segment # 4: Lyon1 (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 ! 14.20 ! 3.19 ! 3.19

ROAD (0.00 + 20.49 + 0.00) = 20.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-8 -6 0.00 68.48 0.00 -8.45 -19.54 0.00 0.00 -20.00 20.49

Segment Leq : 20.49 dBA

Results segment # 5: Lyon2 (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 ! 14.20 ! 3.19 ! 3.19

ROAD (0.00 + 24.47 + 0.00) = 24.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-6 -1 0.00 68.48 0.00 -8.45 -15.56 0.00 0.00 -20.00 24.47

Segment Leq : 24.47 dBA

Results segment # 6: Lyon3 (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 ! 14.20 ! 3.19 ! 3.19

ROAD (0.00 + 32.79 + 0.00) = 32.79 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-1 33 0.00 68.48 0.00 -8.45 -7.24 0.00 0.00 -20.00 32.79

Segment Leq : 32.79 dBA

Total Leq All Segments: 39.54 dBA

Results segment # 1: Wellington (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 ! 17.20 ! 3.30 ! 3.30

ROAD (0.00 + 29.56 + 0.00) = 29.56 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-25 25 0.00 63.89 0.00 -8.77 -5.56 0.00 0.00 -20.00 29.56

Segment Leq : 29.56 dBA

Results segment # 2: LyonSB (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 ! 14.20 ! 8.99 ! 8.99

ROAD (0.00 + 22.52 + 0.00) = 22.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-37 -2 0.00 57.87 0.00 -8.24 -7.11 0.00 0.00 -20.00 22.52

Segment Leq : 22.52 dBA

Results segment # 3: LyonNB (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 ! 14.20 ! 9.45 ! 9.45

ROAD (0.00 + 19.14 + 0.00) = 19.14 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-31 -14 0.00 57.87 0.00 -8.53 -10.25 0.00 0.00 -19.95 19.14

Segment Leq : 19.14 dBA

Results segment # 4: Lyon1 (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 ! 14.20 ! 3.19 ! 3.19

ROAD (0.00 + 12.89 + 0.00) = 12.89 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-8 -6 0.00 60.88 0.00 -8.45 -19.54 0.00 0.00 -20.00 12.89

Segment Leq : 12.89 dBA

Results segment # 5: Lyon2 (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 ! 14.20 ! 3.19 ! 3.19

ROAD (0.00 + 16.87 + 0.00) = 16.87 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-6 -1 0.00 60.88 0.00 -8.45 -15.56 0.00 0.00 -20.00 16.87

Segment Leq : 16.87 dBA

Results segment # 6: Lyon3 (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 ! 14.20 ! 3.19 ! 3.19

ROAD (0.00 + 25.19 + 0.00) = 25.19 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-1 33 0.00 60.88 0.00 -8.45 -7.24 0.00 0.00 -20.00 25.19

Segment Leq : 25.19 dBA

Total Leq All Segments: 31.94 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 39.54
(NIGHT): 31.94

STAMSON 5.0 NORMAL REPORT Date: 06-04-2015 11:58:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R30.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000
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: Wellington (day/night)

Angle1 Angle2 : -20.00 deg 20.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.00 / 94.00 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -5.00 deg Angle2 : 20.00 deg
Barrier height : 31.00 m
Barrier receiver distance : 78.00 / 78.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Wellington (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 ! 4.50 ! 2.01 ! 2.01

ROAD (52.73 + 34.95 + 0.00) = 52.80 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-20 -5 0.00 71.49 0.00 -7.97 -10.79 0.00 0.00 0.00 52.73

-5 20 0.00 71.49 0.00 -7.97 -8.57 0.00 0.00 -20.00 34.95

Segment Leq : 52.80 dBA

Total Leq All Segments: 52.80 dBA

Results segment # 1: Wellington (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 ! 4.50 ! 2.01 ! 2.01

ROAD (45.13 + 27.35 + 0.00) = 45.20 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-20 -5 0.00 63.89 0.00 -7.97 -10.79 0.00 0.00 0.00 45.13

-5 20 0.00 63.89 0.00 -7.97 -8.57 0.00 0.00 -20.00 27.35

Segment Leq : 45.20 dBA

Total Leq All Segments: 45.20 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.80
(NIGHT): 45.20