REPORT

593 Laurier Ave W

Ottawa, Ontario

Noise Impact Study

SACL #SW19233.A1

December 10, 2019

Submitted to:

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1. Introduction

At the request of Alexander Fleck House Inc., Swallow Acoustic Consultants Ltd. (SACL) presents this Noise Impact Study (NIS) for the proposed 16-storey hi-rise apartment building (Project) to be located at 593 Laurier Avenue West, Ottawa, Ontario. The objective of this study is to determine if the proposed Project can meet the noise guidelines of the City of Ottawa and the Ontario Ministry of the Environment, Conservation and Parks (MECP).

2. Site

A site plan for the Project and an aerial photo of the Project area are provided in Appendix A, Figure 1 and Figure 2. A zoning map of the project area is provided in Appendix A, Figure 3. The Project is located in a residential area (zone R4T, highlighted in Figure 3). Surrounding the Project to the east, north, and west are residential areas. To the south and southeast is a commercial/mixed-use zone (TM). To the north, west, south, and southeast of the Project site are 3-storey, 3-storey, 4-storey, and 11-storey apartment buildings, respectively. To the east of the site is a community garden and park. To the north and west of the site is an elevation change, sloping downwards away from the site, such that the top of the 3-storey apartment building to the north is at approximately the same elevation as the ground level of the Project.

There is an existing 3-storey residential dwelling located on the Project site. As shown in the site plan (Figure 1), a small section on the west side of this building is to be demolished, with the remainder of the building to remain on the site. The proposed 9-storey apartment building will be located on the north and west sides of the existing building. The proposed building will connect directly to the existing building on Levels 1 to 3.

3. Noise Sources

This NIS assesses noise impacts from nearby surface transportation sources on the Project. The surface transportation sources impacting the Project are road traffic on the following roads:

- Laurier Avenue West (east of Bronson Avenue)
- Bronson Avenue (south of Albert Street)
- Slater Street
- Albert Street
- Commissioner Street (between Slater Street and Albert Street)

All of these roads are designated as Urban Arterial roads by Schedule F of the City of Ottawa Official Plan[1].

Based on a site visit conducted by SACL on May 7, 2019, and a review of satellite photos of the area, there are no significant stationary noise sources nearby that may impact the Project.

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4. Noise Assessment Criteria

The City of Ottawa requirements for environmental noise impact studies are outlined in the City's *Environmental Noise Control Guidelines*[2] (ENCG) and are based on the Ontario Ministry of the Environment, Conservation, and Parks (MECP) document *Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning*[3] (NPC-300).

4.1 Surface Transportation Noise Assessment Criteria

Sound level limits outlined in ENCG for road traffic noise impacting on noise-sensitive areas applicable to the Project are summarized in Table 1. Sound level limits are given in A-weighted, equivalent sound levels (L_{eq}, dBA), defined in both ENCG and NPC-300.

Additionally, ENCG and NPC-300 provide requirements for building components, ventilation, and warning clauses to be used in sale and lease agreements. These requirements are based on calculated sound levels at OLAs and the plane-of-window of bedrooms and living/dining rooms. Sound level limits and associated requirements applicable to the Project are summarized in Table 2 and Table 3. Warning clause types are defined in NPC-300.

Table 1: Sound Level Limits for Noise-Sensitive Areas

Type of Space	Time Period	Maximum L_{eq} (dBA)
Outdoor Living Area	Daytime (07:00 to 23:00)	55
Living/dining, den areas of residences, hospitals, schools, etc. (indoor)	Daytime (07:00 to 23:00)	45
	Nighttime (23:00 to 07:00)	45
Sleeping quarters of residences (indoor)	Daytime (07:00 to 23:00)	45
	Nighttime (23:00 to 07:00)	40
General offices, reception areas, retail stores, etc. (indoor)	Daytime (07:00 to 23:00)	50

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Table 2: Building Component and Ventilation Requirements

Time Period	Sound Level, L_{eq} (dBA), at Bedroom or Living/Dining Room Plane-of-Window	Building Component Requirement	Ventilation Requirement
Daytime (07:00 – 23:00)	$55 < L_{eq} \leq 65$	Building components must be compliant with the Ontario Building Code (OBC)	Forced air heating with provision for central air conditioning
	$L_{eq} > 65$	Building components (walls, windows, etc.) should be designed to achieve indoor sound level criteria in Table 1	Central air conditioning
Nighttime (23:00 – 07:00)	$50 < L_{eq} \leq 60$	Building components must be compliant with the Ontario Building Code (OBC)	Forced air heating with provision for central air conditioning
	$L_{eq} > 60$	Building components (walls, windows, etc.) should be designed to achieve indoor sound level criteria in Table 1	Central air conditioning

Table 3: Warning Clause Requirements

Assessment Location	Time Period	Sound Level, L_{eq} (dBA)	Warning Clause Requirement
Bedroom or Living/Dining Room Plane-of-Window	Daytime (07:00 – 23:00)	$55 < L_{eq} \leq 65$	Type C Required
		$L_{eq} > 65$	Type D Required
	Nighttime (23:00 – 07:00)	$50 < L_{eq} \leq 60$	Type C Required
		$L_{eq} > 60$	Type D Required
Outdoor Living Areas	Daytime (07:00 – 23:00)	$55 < L_{eq} \leq 60$	If noise control measures are not provided, Type A is required
		$L_{eq} > 60$	Noise control measures must be provided to reduce levels to 60 dBA or lower; if resultant level is above 55 dBA, Type B is required

5. Sound Level Calculations

5.1 Points of Reception

Six points of reception (PORs) were chosen at the points on the building façade that are most exposed to the transportation noise sources identified in Section 3. The outdoor amenity area on

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the ground level to the northeast is considered an Outdoor Living Areas (OLA), subject to the requirements of Table 1 and Table 3. The amenity terrace on the Level 5 roof and balconies of apartment units are less than 4m in depth, and are therefore not considered an OLA according to NPC-300. Site plans showing the locations of the PORs are provided in Appendix A, Figure 4. The locations of the PORs are summarized in Table 4.

Table 4: Points of Reception and Outdoor Living Areas

Point of Reception (POR)	Level	POR Height (m)	Location	Notes/Comments
POR1	16	46.5	West façade	Representative of highest plane-of-window levels on west façade
POR2	16	46.5	NW façade	Representative of highest plane-of-window levels on NW façade
POR3	16	46.5	North façade	Representative of highest plane-of-window levels on north façade
POR4	16	46.5	NE corner	Representative of highest plane-of-window levels at NE corner
POR5	16	46.5	East façade	Representative of highest plane-of-window levels on east façade
POR6	2	4.5	SE corner	Representative of highest plane-of-window levels at SE corner
OLA1	1	1.5	North outdoor amenity area	Level 1 Outdoor Living Area

5.2 Road Traffic Noise Parameters

The “ultimate” road traffic data for the road traffic noise sources identified in Section 2, including the Annual Average Daily Traffic (AADT), were obtained from the ENCG, based on the road classifications provided in the City of Ottawa Official Plan, and are summarized in Table 5.

Table 5: Traffic Parameters

Road Name	Road Section	Implied Roadway Class	Speed Limit (km/h)	AADT (Vehicles per day)	Day/Night Split (%)	Medium Trucks (%)	Heavy Trucks (%)
Laurier Ave W	East of Bronson	2-Lane Urban Arterial (2-UAU)	50	15,000	92/8	7	5
Slater St	-	2-Lane Urban Arterial (2-UAU)	50	15,000	92/8	7	5

Road Name	Road Section	Implied Roadway Class	Speed Limit (km/h)	AADT (Vehicles per day)	Day/Night Split (%)	Medium Trucks (%)	Heavy Trucks (%)
Albert St	-	2-Lane Urban Arterial (2-UAU)	50	15,000	92/8	7	5
Bronson Ave (south)	South of Slater	4-Lane Urban Arterial – Undivided (4-UAU)	50	30,000	92/8	7	5
Bronson Ave (north)	Between Albert and Slater	2-Lane Urban Arterial (2-UAU)	50	15,000	92/8	7	5
Commissioner St	Between Albert and Slater	2-Lane Urban Arterial (2-UAU)	50	15,000	92/8	7	5

5.3 Calculated Sound Levels

Sound levels were calculated at each POR using software developed by the MECP for the assessment of road and rail noise, STAMSON 5.04. Details of these calculations are provided in Appendix C, and scaled site plans showing distances and angles used in STAMSON are provided in Appendix B. The calculated daytime and nighttime levels are presented in Table 6, along with the building component, ventilation, and warning clause requirements.

Due to the minimum allowable source-to-receiver distance limit in the STAMSON software, the sound level calculation for Bronson Avenue at POR6 was corrected to arrive at the final sound levels presented in Table 6. This STAMSON calculation adjustment is explained in further detail in Appendix C.

Table 6: Calculated Sound Levels at PORs

POR	Daytime L_{eq} (dBA)	Nighttime L_{eq} (dBA)	Building Component Requirement	Ventilation Requirement	Warning Clause Requirement
POR1	64	56	Building components must be compliant with the Ontario Building Code.	Forced air heating with provision for central air conditioning	Type C

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POR	Daytime L_{eq} (dBA)	Nighttime L_{eq} (dBA)	Building Component Requirement	Ventilation Requirement	Warning Clause Requirement
POR2	67	60	Building components must be designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR3	70	62	Building components must be designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR4	73	65	Building components must be designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR5	72	64	Building components must be designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR6	75	67	Building components must be designed to achieve indoor sound level criteria.	Central air conditioning	Type D
OLA1	67	N/A	N/A	N/A	Type B

6. Noise Control Requirements

6.1 Building Component Requirements

Building components for all residential units represented by POR2 to POR6 must be designed to achieve indoor sound level criteria. This represents all units with façades facing either north towards Slater Street or east towards Bronson Avenue. All other units with façades facing only west or south may have building façade components which meet OBC criteria.

Detailed floor plans and glazing schedule have not yet been provided. The sound transmission loss of the glazing and building components required to meet MECP interior sound levels with the above calculated outdoor sound levels were determined based on assumed maximum coverage of the exterior wall area and fixed and operable glazing. Because detailed unit layouts are not yet available, it was assumed that a bedroom is located at each POR location. This is a conservative assumption, since bedrooms have the strictest sound level limits according to the MECP requirements.

The glazing and building façade minimum transmission losses, in terms of Sound Transmission Class (STC), are provided in Table 7.

Table 7: Building Envelope Minimum Requirements

Component	Maximum Component Area Percentage Versus Floor Area of Room	Minimum STC Required
POR2 - Northwest Side Bedrooms		
Exterior Wall	100%	36
Fixed Glazing	80%	34
Operable Glazing	40%	31
POR3 - North Side Bedrooms		
Exterior Wall	100%	38
Fixed Glazing	80%	36
Operable Glazing	40%	33
POR4 - Northeast Corner Bedrooms		
Exterior Wall	150%	44
Fixed Glazing	80%	40
Operable Glazing	40%	37
POR5 - East Side Bedrooms		
Exterior Wall	100%	41
Fixed Glazing	80%	39
Operable Glazing	40%	36
POR6 - Southeast Corner Bedrooms		
Exterior Wall	150%	45
Fixed Glazing	80%	41
Operable Glazing	40%	38

Typical minimum constructions for glazing and exterior wall construction were determined to provide a basis for the final design and are presented below.

Exterior Wall Construction

It is noted in the preliminary drawings that some of the exterior wall construction may consist of spandrel glass; however, the following construction is provided for reference. Any exterior wall constructions with equivalent or greater STC values will be acceptable.

The highest required STC rating for the exterior walls is STC-45, at the southeast corner (POR6). The following is an example of a construction which meets this requirement:

- 12.7 mm gypsum board
- Vapour barrier
- 38 x 89 mm studs
- 50 mm (or thicker) mineral wool or glass fibre batts
- Sheathing
- Rigid insulation (25-50 mm)
- Wood siding or metal siding and fibre backer board

For building façades facing west or south, any construction meeting the requirements of the OBC is expected to achieve the interior sound requirements for the building.

Glazing

The highest required STC rating for the glazing is STC-41, for the southeast corner (POR6) fixed glazing. The following glazing recommendations are expected to meet the required STC ratings. The glazing requirements are presented in the form 6 (13) 6L to denote 6 mm glass (13 mm airspace) 6 mm laminated glass.

- POR2 - Fixed Glazing – 3 (16) 3
- POR2 - Operable Glazing – 3 (16) 3

- POR3 - Fixed Glazing – 3 (25) 3
- POR3 - Operable Glazing – 3 (25) 3

- POR5 - Fixed Glazing – 6 (13) 7L
- POR5 - Operable Glazing – 6 (13) 7L

- POR4/6 - Fixed Glazing – 6 (13) 10L
- POR4/6 - Operable Glazing – 6 (13) 10L

For all glazing on the west and south façades, components meeting minimum OBC requirements will be suitable. The above constructions are provided for reference only – STC requirements should be verified with the glazing manufacturer. Any constructions with equivalent or greater STC values will be acceptable. Differences in window sizes and unit layouts from what is assumed in this report will change these requirements. Specifically, reduced window sizes will reduce the window requirements.

6.2 Ventilation Requirements

For all residential units in the building which have façades facing north or east, central air conditioning is required to be installed. While residential units which face only west or south

require a minimum of forced-air heating with the provision for central air conditioning, it is expected that central air conditioning will be available for all units.

6.3 Outdoor Living Area Mitigation

Since the calculated noise level at OLA1 is over 60 dBA, noise mitigation is required for this OLA. In order to reduce the noise level to 60 dBA, the following minimum noise barrier is required:

- A minimum 2 m high barrier along the east side and the north side of the amenity area (OLA1), approximately 32.8 m in length, shielding the line of sight from OLA1 to Bronson Avenue.

The locations of this barrier is shown in Figure 5. As specified in Figure 3, if the noise level at the OLA is not reduced to 55 dBA, a Type B warning clause is required for all residential units with access to the OLAs. It is not feasible to reduce the noise level at OLA1 to 55 dBA; therefore, a Type B warning clause is required.

According to ENCG requirements, all noise barriers must not contain any holes or gaps, and must have a minimum surface density of 20 kg/m^2. Transparent barriers can be used, as long as they meet the minimum density requirement of 20 kg/m^2. All acoustic barriers must comply with the requirements listed in the ENCG. A verification of wind/snow loads must also be undertaken by a third party professional.

6.4 Warning Clause Requirements

Central air conditioning is required for all residential units with façades facing north or east, and is optional for residential units with façades facing only west or south. The following Type D warning clause should be included in all Agreements of Purchase and Sale, lease and rental agreements for all units which are supplied with central air conditioning:

> "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

If any units with façades facing only west or south are supplied with only the provision for adding central air conditioning, the following Type C warning clause is required for these units in place of a Type D warning clause:

> "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain close, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

As the noise barrier provided for OLA1 does not reduce the noise level to 55 dBA or lower, the following Type B warning clause should be inserted in all Agreements of Purchase and Sale, lease and rental agreements for all units with access to this OLA:

> "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

7. Impact of the Project on Surrounding Area

Mechanical equipment within the Project may be considered as a stationary noise source which may impact nearby noise-sensitive areas. Mechanical equipment selections have not yet been made, precluding a detailed analysis at this time. The final mechanical design will be required to comply with ENCG sound level limits from a stationary source at all nearby noise-sensitive areas.

8. Concluding Comments

The noise impact of the nearby transportation noise sources on the Project is expected to meet the requirements of the City of Ottawa and the MECP, provided the recommended noise mitigation as described in Section 6 is implemented. The proposed Project should therefore be approved from a noise perspective.

---------- End ----------

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References

1. City of Ottawa. *Official Plan, Schedule F – Central Area / Inner City Road Network*, 2013.

2. City of Ottawa. *Environmental Noise Control Guidelines*, January 2016.

3. Ontario Ministry of the Environment and Climate Change. *Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning, Publication NPC-300*, August 2013

4. City of Ottawa. *geoOttawa*, 2019. [Online]. Available: http://maps.ottawa.ca/geoottawa/. [Accessed: 28- May- 2019].

Appendix A: Site Plans

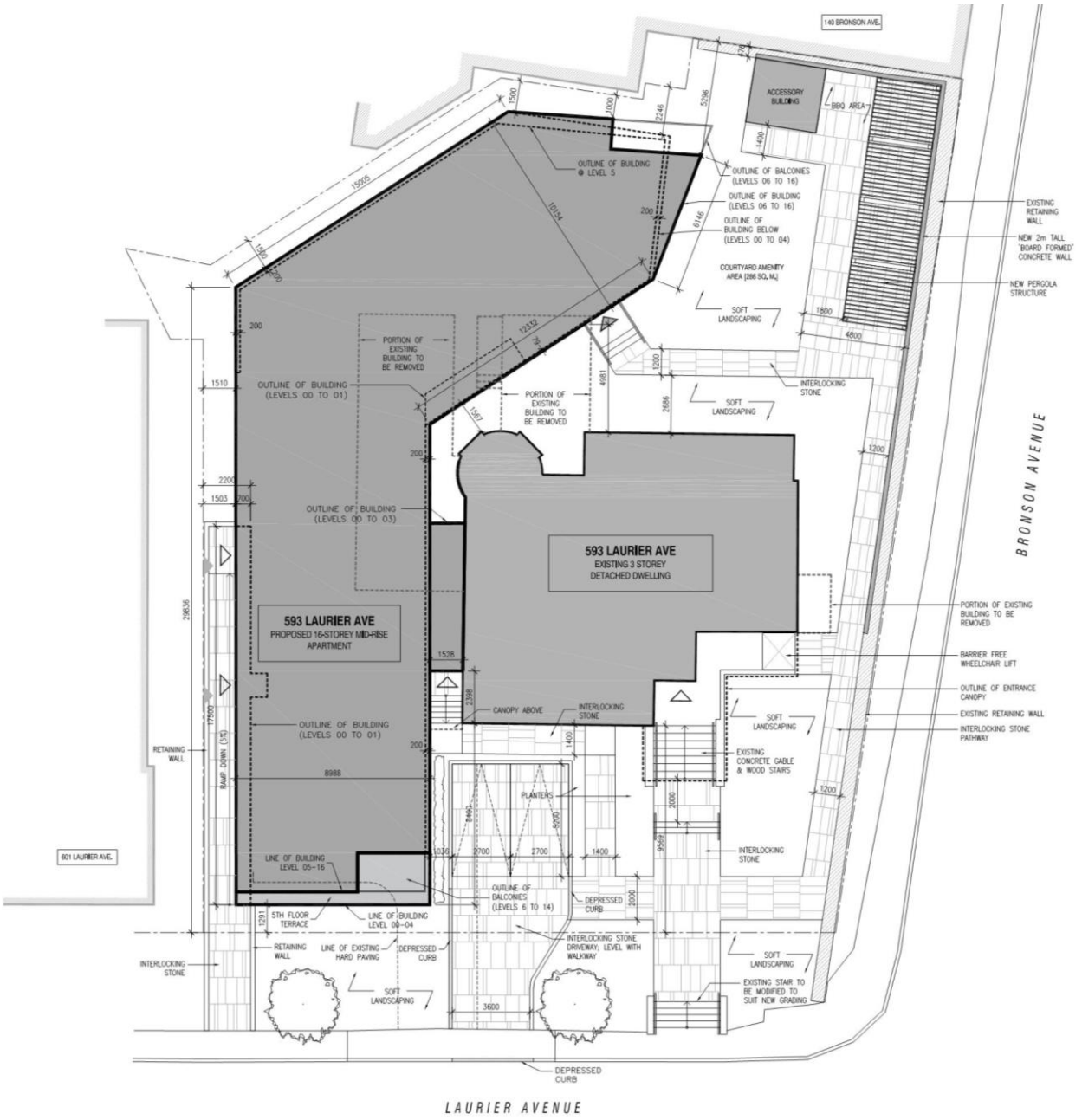

Figure 1: Site plan

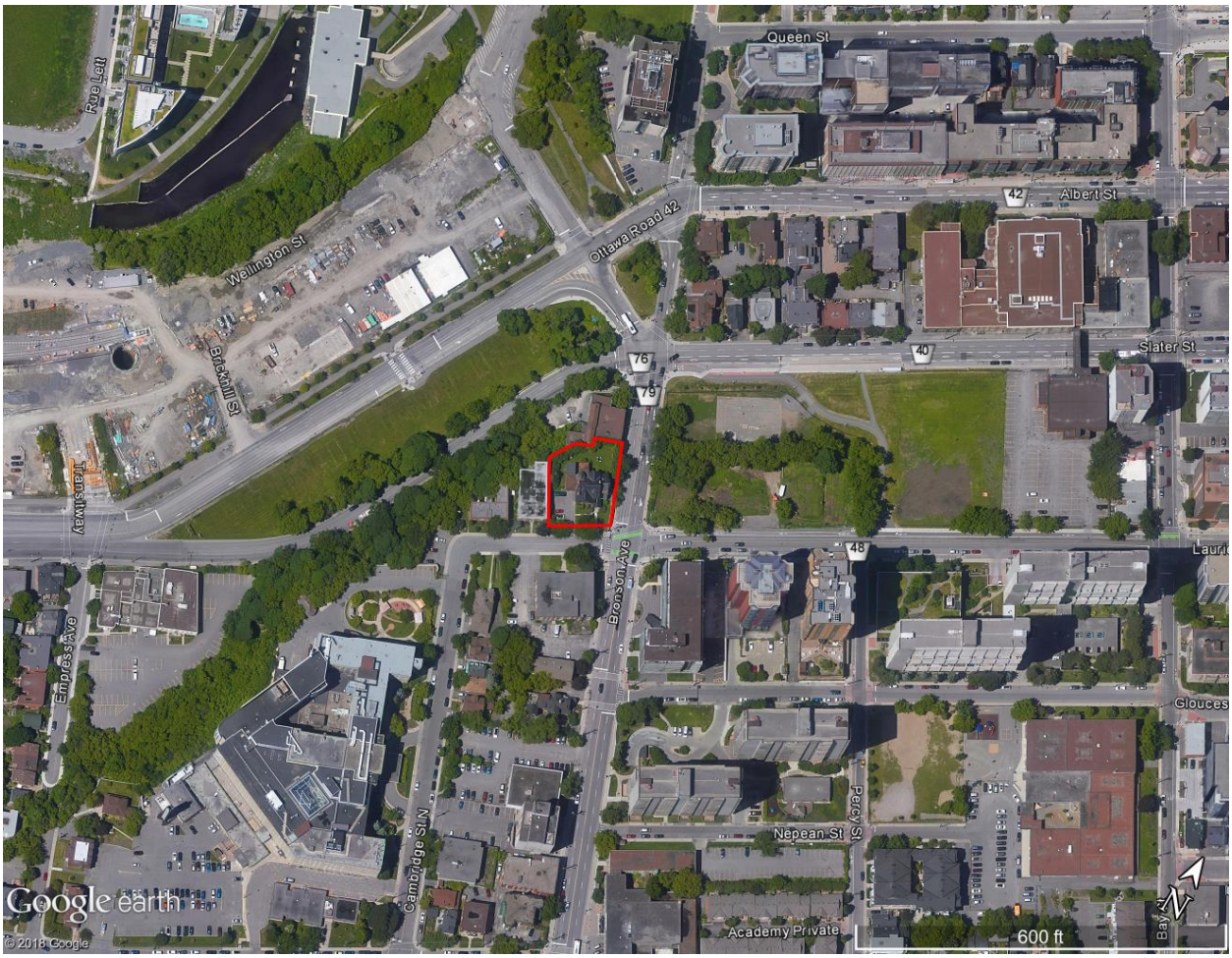

Figure 2: Satellite image of the surrounding area with the approximate property line outlined in red

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Figure 3: Zoning map of the Project area[4]

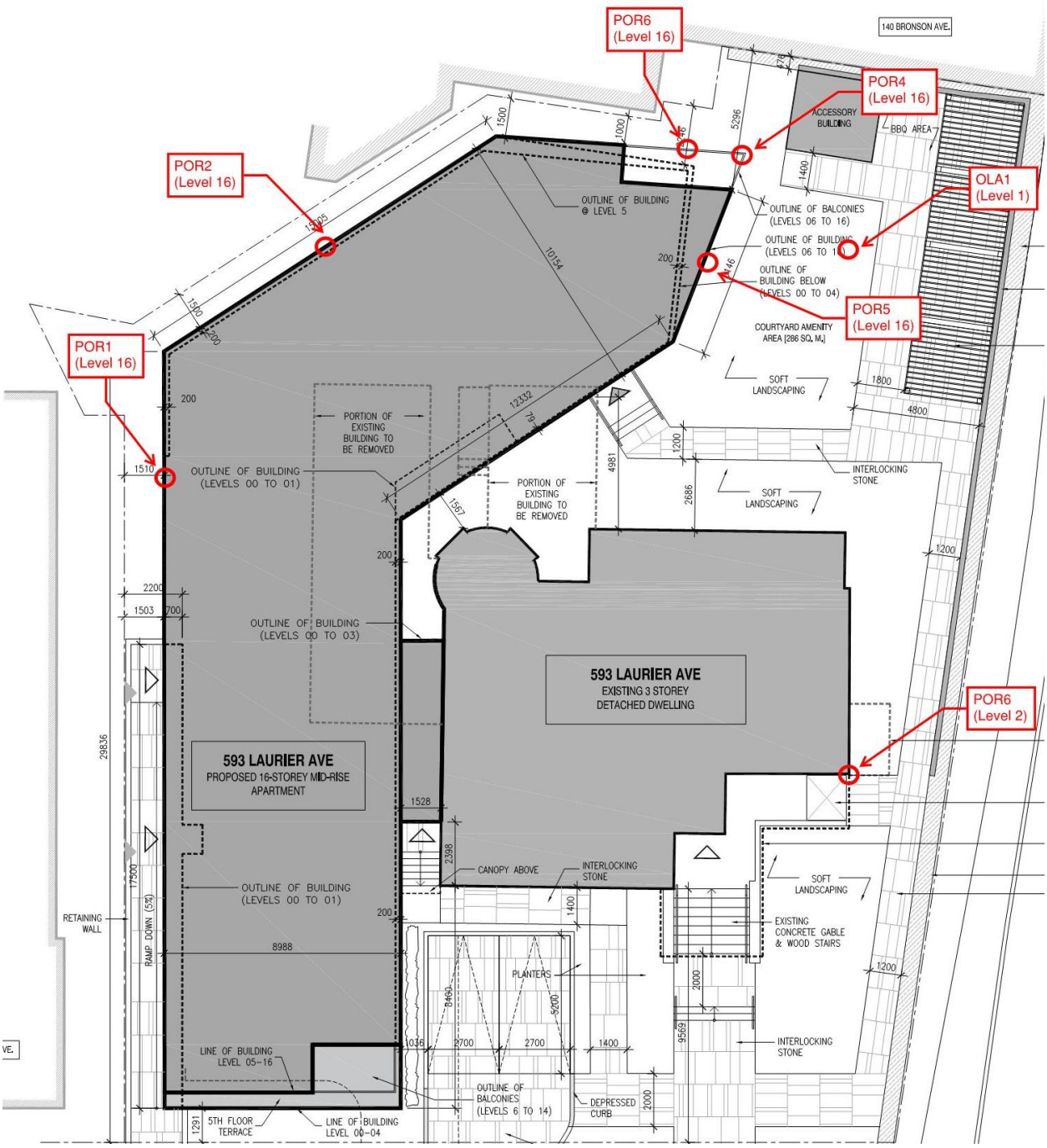

Figure 4: Point of reception (POR) and outdoor living area (OLA) locations

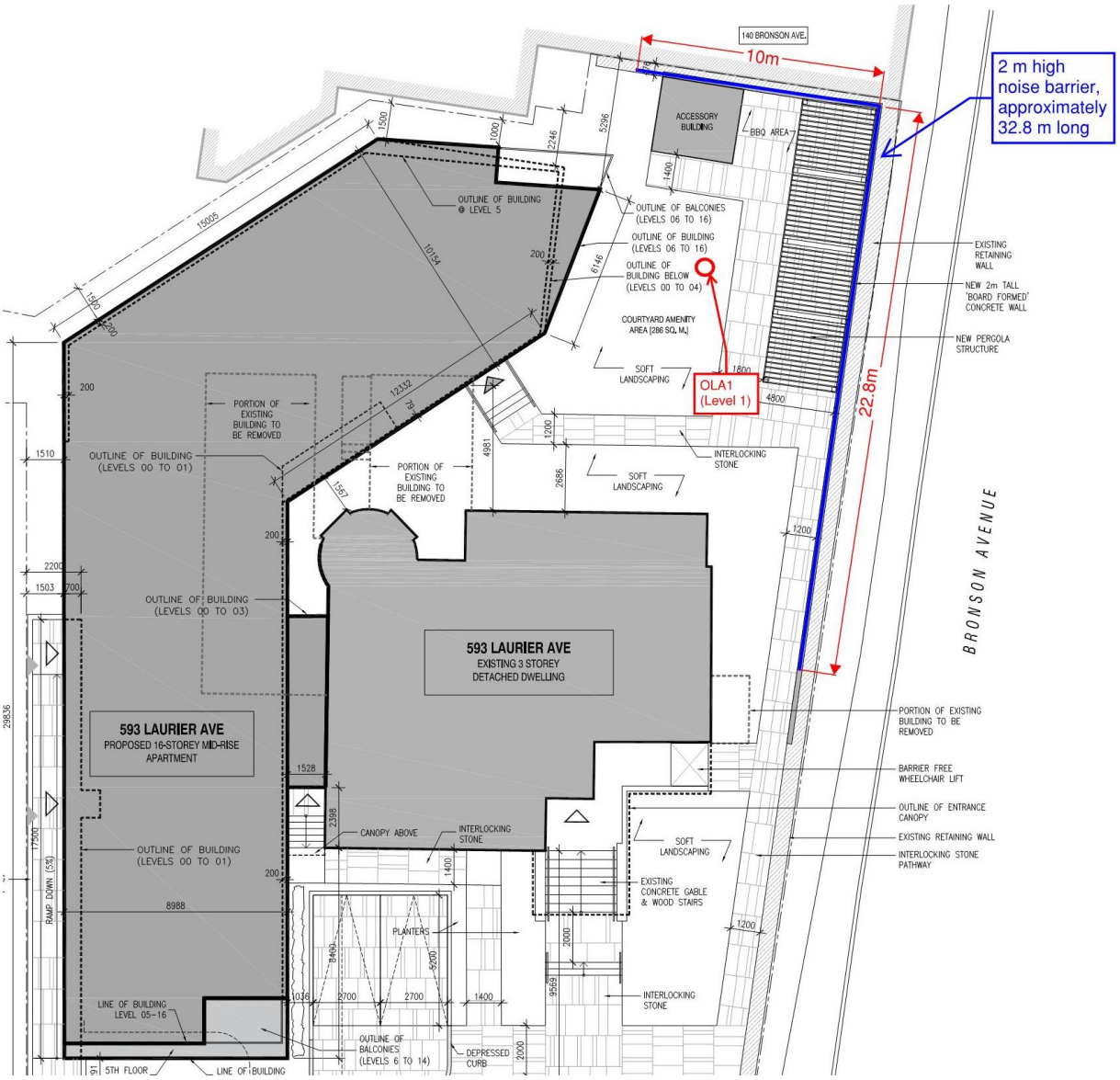

Figure 5: Proposed noise barrier location for OLA1

Appendix B: Distances and Angles Used in STAMSON 5.04

Figure 6: Distances and angles used in STAMSON 5.04 for POR1 (1 of 1)

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Figure 7: Distances and angles used in STAMSON 5.04 for POR2 (1 of 3)

Figure 8: Distances and angles used in STAMSON 5.04 for POR2 (2 of 3)

Figure 9: Distances and angles used in STAMSON 5.04 for POR2 (3 of 3)

Figure 10: Distances and angles used in STAMSON 5.04 for POR3 (1 of 3)

Figure 11: Distances and angles used in STAMSON 5.04 for POR3 (2 of 3)

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Figure 12: Distances and angles used in STAMSON 5.04 for POR3 (3 of 3)

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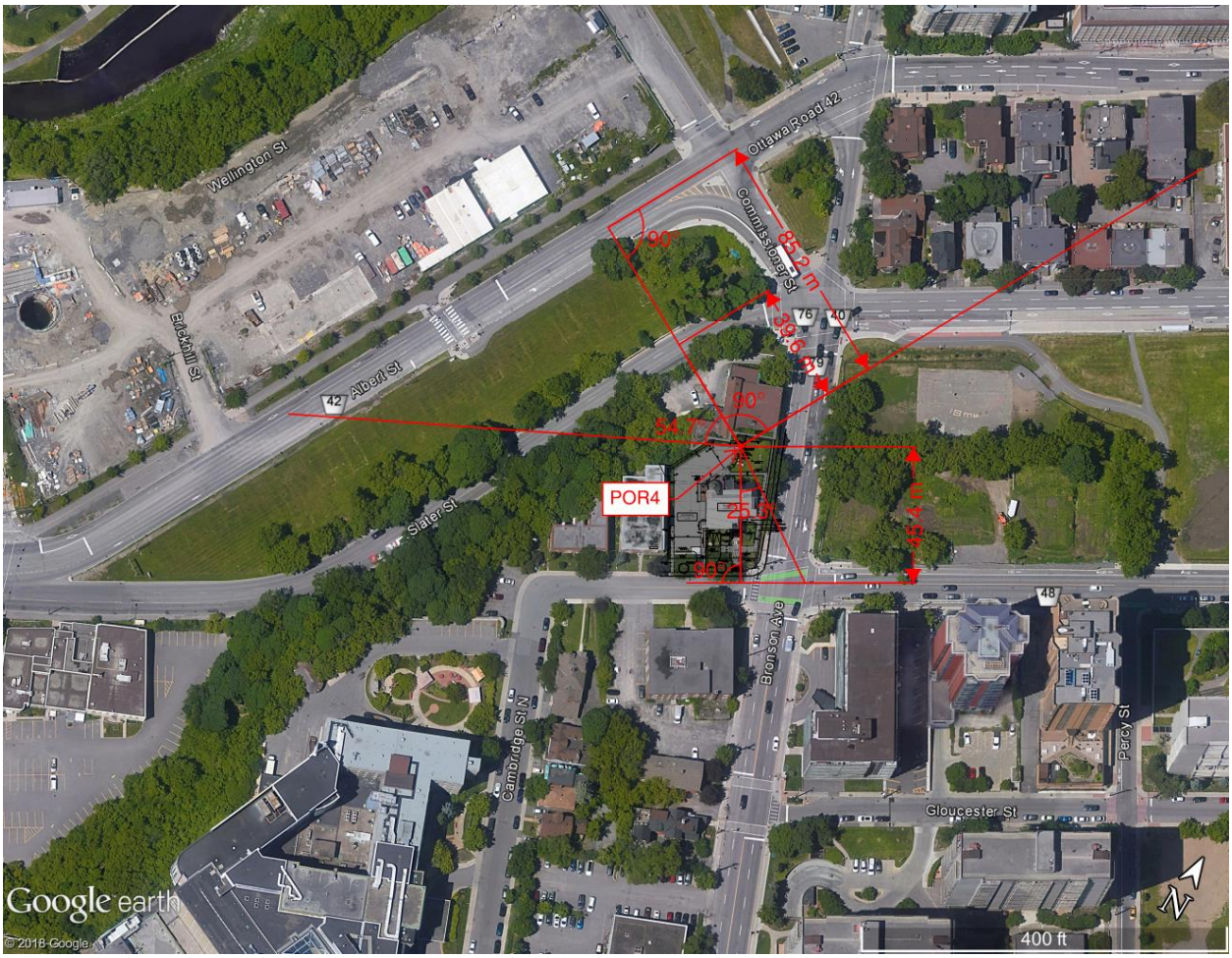

Figure 13: Distances and angles used in STAMSON 5.04 for POR4 (1 of 3)

Figure 14: Distances and angles used in STAMSON 5.04 for POR4 (2 of 3)

Figure 15: Distances and angles used in STAMSON 5.04 for POR4 (3 of 3)

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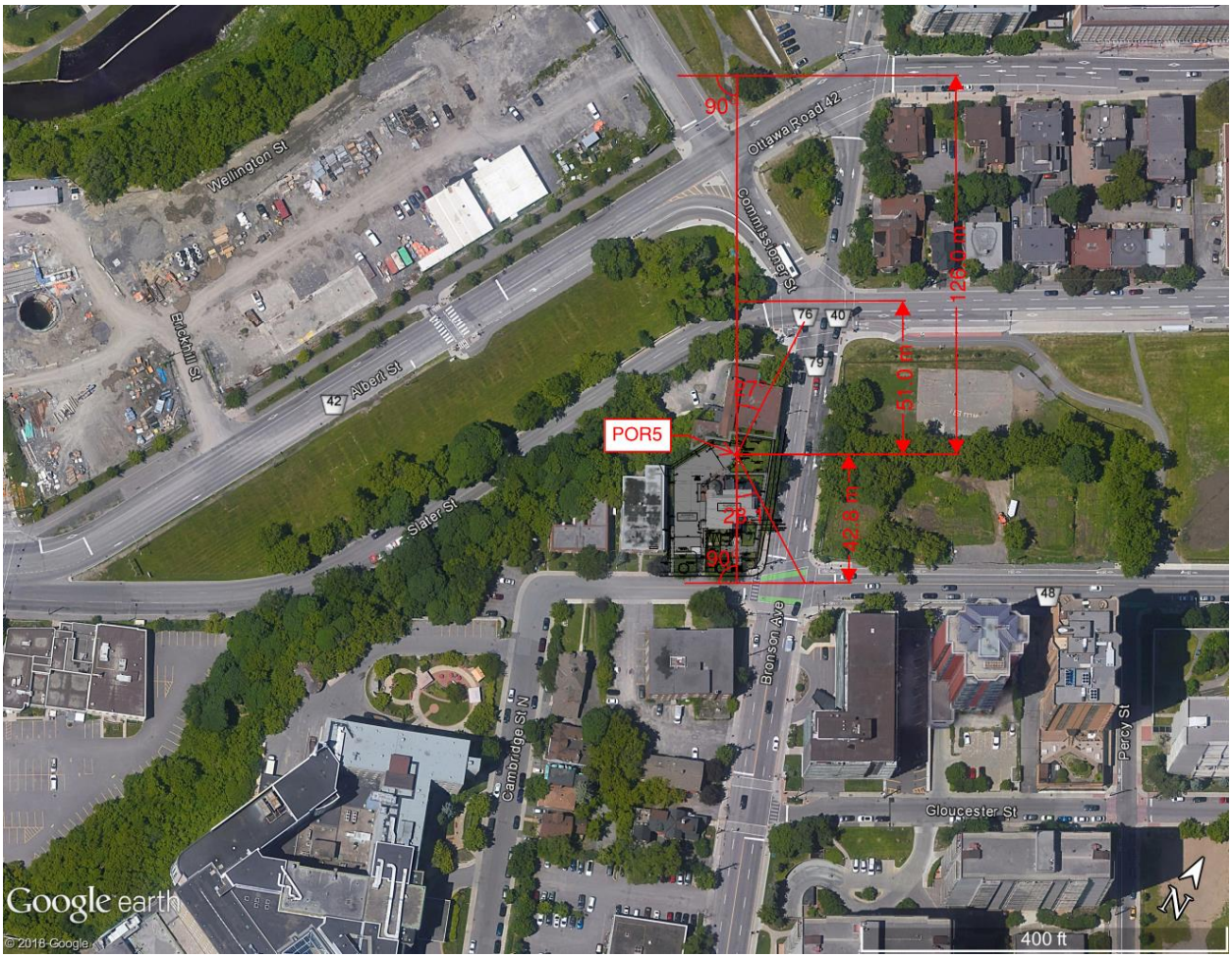

Figure 16: Distances and angles used in STAMSON 5.04 for POR5 (1 of 2)

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Figure 17: Distances and angles used in STAMSON 5.04 for POR5 (2 of 2)

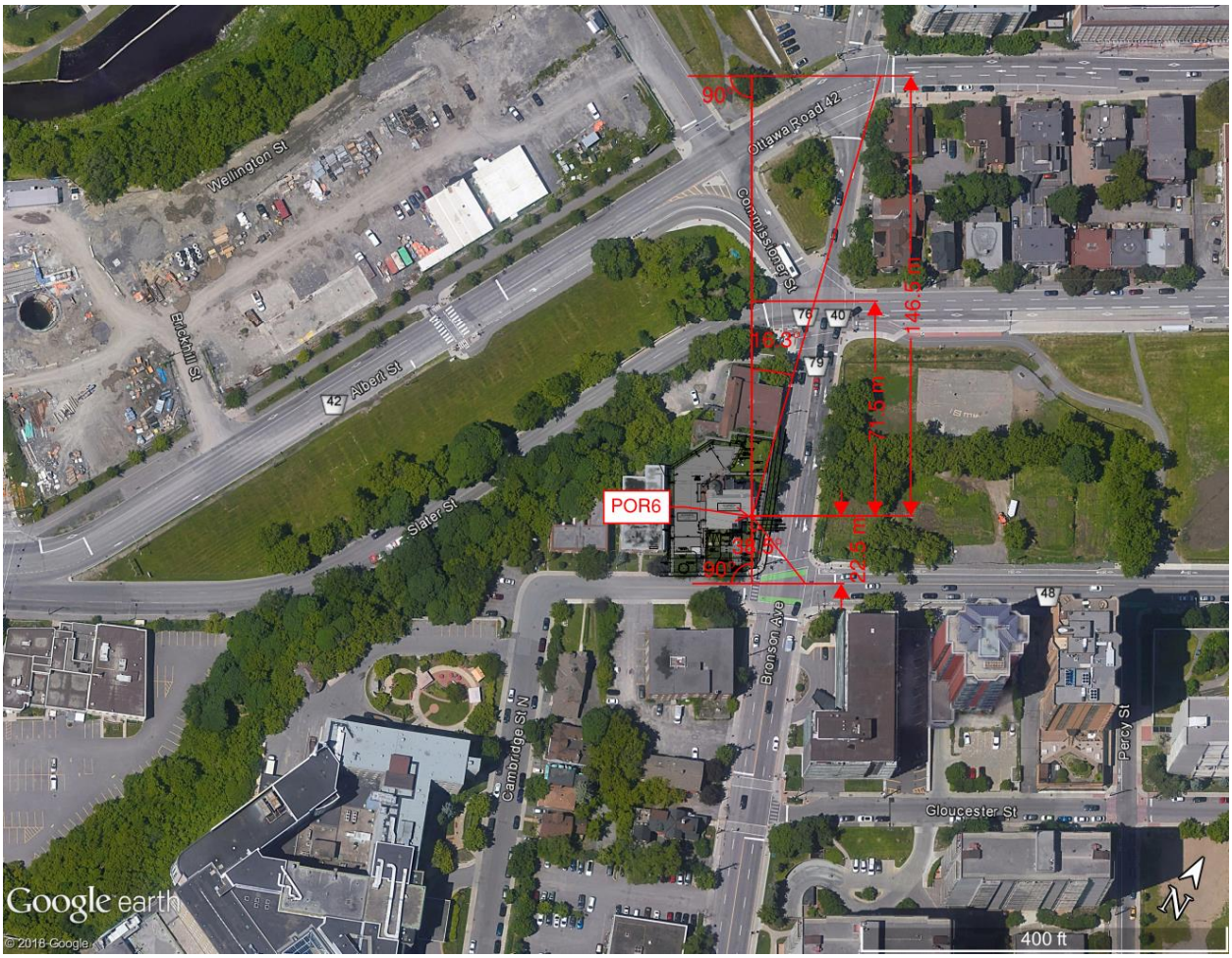

Figure 18: Distances and angles used in STAMSON 5.04 for POR6 (1 of 2)

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Figure 19: Distances and angles used in STAMSON 5.04 for POR6 (2 of 2)

Figure 20: Distances and angles used in STAMSON 5.04 for OLA1 (1 of 3)

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Figure 21: Distances and angles used in STAMSON 5.04 for OLA1 (2 of 3)

Figure 22: Distances and angles used in STAMSON 5.04 for OLA1 (3 of 3)

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Appendix C: STAMSON 5.04 Calculations

The following correction was made to the STAMSON calculations shown below to account for the limitations of the program. These corrections are reflected in the final sound levels shown in Table 6 of this report.

- Because the minimum allowable source-to-receiver distance in STAMSON is 15m, the sound levels from Bronson Avenue at POR6 were calculated using a source-to-receiver distance of 15m, then corrected for the actual distance of less than 15m using the formula below. L_1 is the sound pressure level at a distance d_1, of 15m, and L_2 is the sound pressure level at the actual distance, d_2.

$$L_2 = L_1 + 20\log\left(\frac{d_1}{d_2}\right)$$

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STAMSON 5.0 NORMAL REPORT Date: 23-09-2019 13:40:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por1.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -74.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 39.10 / 39.10 m
Receiver height : 46.50 / 46.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 10.00 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           : -67.00 deg   31.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  84.50 / 84.50  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  16.00 m
Reference angle           :   0.00

🠝
Results segment # 1: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.98 + 0.00) = 61.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -74     31   0.00  68.48   0.00  -4.16  -2.34   0.00   0.00   0.00  61.98
-------------------------------------------------------------------------------

Segment Leq : 61.98 dBA

🠝
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.33 + 0.00) = 58.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -67     31   0.00  68.48   0.00  -7.51  -2.64   0.00   0.00   0.00  58.33
-------------------------------------------------------------------------------

Segment Leq : 58.33 dBA

Total Leq All Segments: 63.54 dBA

🠝
Results segment # 1: Slater (night)
```

Source height = 1.50 m

ROAD (0.00 + 54.38 + 0.00) = 54.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	31	0.00	60.88	0.00	-4.16	-2.34	0.00	0.00	0.00	54.38

Segment Leq : 54.38 dBA

Results segment # 2: Albert (night)

Source height = 1.50 m

ROAD (0.00 + 50.74 + 0.00) = 50.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	31	0.00	60.88	0.00	-7.51	-2.64	0.00	0.00	0.00	50.74

Segment Leq : 50.74 dBA

Total Leq All Segments: 55.94 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.54
(NIGHT): 55.94

STAMSON 5.0 NORMAL REPORT Date: 23-09-2019 13:43:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por2.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -77.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 34.40 / 34.40 m
Receiver height : 46.50 / 46.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 10.00 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           : -69.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  79.80 / 79.80  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  16.00 m
Reference angle           :   0.00

↟
Road data, segment # 3: Bronson S (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       :     8 %
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 # 3: Bronson S (day/night)
-----------------------------------------
Angle1   Angle2           : -58.00 deg   -41.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  36.00 / 36.00  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   8.00 m
Reference angle           :   0.00

↟
```

```
Road data, segment # 4: Bronson N (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: Bronson N (day/night)
-------------------------------------------
Angle1   Angle2           : -73.00 deg   -58.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  36.00 / 36.00  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
Reference angle           :   0.00

↟
Road data, segment # 5: Commissioner (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: Commissioner (day/night)
```

```
-------------------------------------------
Angle1   Angle2           : -52.00 deg   -29.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  59.80 / 59.80  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  11.00 m
Reference angle           :   0.00

🠝
Results segment # 1: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.55 + 0.00) = 64.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -77     90   0.00  68.48   0.00  -3.60  -0.33   0.00   0.00   0.00  64.55
-------------------------------------------------------------------------------

Segment Leq : 64.55 dBA

🠝
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.68 + 0.00) = 60.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -69     90   0.00  68.48   0.00  -7.26  -0.54   0.00   0.00   0.00  60.68
-------------------------------------------------------------------------------

Segment Leq : 60.68 dBA

🠝
Results segment # 3: Bronson S (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.54 + 0.00) = 59.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -58    -41   0.00  73.59   0.00  -3.80 -10.25   0.00   0.00   0.00  59.54
-------------------------------------------------------------------------------
```

Segment Leq : 59.54 dBA

↟
Results segment # 4: Bronson N (day)

Source height = 1.50 m

ROAD (0.00 + 53.89 + 0.00) = 53.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	-58	0.00	68.48	0.00	-3.80	-10.79	0.00	0.00	0.00	53.89

Segment Leq : 53.89 dBA

↟
Results segment # 5: Commissioner (day)

Source height = 1.50 m

ROAD (0.00 + 53.54 + 0.00) = 53.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-52	-29	0.00	68.48	0.00	-6.01	-8.94	0.00	0.00	0.00	53.54

Segment Leq : 53.54 dBA

Total Leq All Segments: 67.32 dBA

↟
Results segment # 1: Slater (night)

Source height = 1.50 m

ROAD (0.00 + 56.95 + 0.00) = 56.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-77	90	0.00	60.88	0.00	-3.60	-0.33	0.00	0.00	0.00	56.95

Segment Leq : 56.95 dBA

↟
Results segment # 2: Albert (night)

Source height = 1.50 m

ROAD (0.00 + 53.09 + 0.00) = 53.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	90	0.00	60.88	0.00	-7.26	-0.54	0.00	0.00	0.00	53.09

Segment Leq : 53.09 dBA

Results segment # 3: Bronson S (night)

Source height = 1.50 m

ROAD (0.00 + 51.94 + 0.00) = 51.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	-41	0.00	65.99	0.00	-3.80	-10.25	0.00	0.00	0.00	51.94

Segment Leq : 51.94 dBA

Results segment # 4: Bronson N (night)

Source height = 1.50 m

ROAD (0.00 + 46.29 + 0.00) = 46.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	-58	0.00	60.88	0.00	-3.80	-10.79	0.00	0.00	0.00	46.29

Segment Leq : 46.29 dBA

Results segment # 5: Commissioner (night)

Source height = 1.50 m

ROAD (0.00 + 45.94 + 0.00) = 45.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-52	-29	0.00	60.88	0.00	-6.01	-8.94	0.00	0.00	0.00	45.94

Segment Leq : 45.94 dBA

Total Leq All Segments: 59.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.32
(NIGHT): 59.72

STAMSON 5.0 NORMAL REPORT Date: 23-09-2019 13:44:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por3.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -55.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 38.70 / 38.70 m
Receiver height : 46.50 / 46.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 10.00 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           : -55.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  84.10 / 84.10  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  16.00 m
Reference angle           :   0.00

🠝
Road data, segment # 3: Bronson S (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       :     8 %
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 # 3: Bronson S (day/night)
-----------------------------------------
Angle1   Angle2           : -66.00 deg   -4.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  22.90 / 22.90  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   6.00 m
Reference angle           :   0.00

🠝
```

```
Road data, segment # 4: Bronson N (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: Bronson N (day/night)
-------------------------------------------
Angle1   Angle2           : -79.00 deg   -66.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  22.90 / 22.90  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
Reference angle           :   0.00

↟
Road data, segment # 5: Commissioner (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: Commissioner (day/night)
```

```
-------------------------------------------
Angle1   Angle2           : -59.00 deg   -38.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  47.50 / 47.50  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  11.00 m
Reference angle           :   0.00
```



```
Results segment # 1: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.42 + 0.00) = 63.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -55     90   0.00  68.48   0.00  -4.12  -0.94   0.00   0.00   0.00  63.42
-------------------------------------------------------------------------------

Segment Leq : 63.42 dBA
```



```
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.05 + 0.00) = 60.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -55     90   0.00  68.48   0.00  -7.49  -0.94   0.00   0.00   0.00  60.05
-------------------------------------------------------------------------------

Segment Leq : 60.05 dBA
```



```
Results segment # 3: Bronson S (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 67.12 + 0.00) = 67.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -66     -4   0.00  73.59   0.00  -1.84  -4.63   0.00   0.00   0.00  67.12
-------------------------------------------------------------------------------
```

Segment Leq : 67.12 dBA

🡅
Results segment # 4: Bronson N (day)

Source height = 1.50 m

ROAD (0.00 + 55.23 + 0.00) = 55.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-66	0.00	68.48	0.00	-1.84	-11.41	0.00	0.00	0.00	55.23

Segment Leq : 55.23 dBA

🡅
Results segment # 5: Commissioner (day)

Source height = 1.50 m

ROAD (0.00 + 54.14 + 0.00) = 54.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	-38	0.00	68.48	0.00	-5.01	-9.33	0.00	0.00	0.00	54.14

Segment Leq : 54.14 dBA

Total Leq All Segments: 69.52 dBA

🡅
Results segment # 1: Slater (night)

Source height = 1.50 m

ROAD (0.00 + 55.83 + 0.00) = 55.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	90	0.00	60.88	0.00	-4.12	-0.94	0.00	0.00	0.00	55.83

Segment Leq : 55.83 dBA

🡅
Results segment # 2: Albert (night)

Source height = 1.50 m

ROAD (0.00 + 52.46 + 0.00) = 52.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	90	0.00	60.88	0.00	-7.49	-0.94	0.00	0.00	0.00	52.46

Segment Leq : 52.46 dBA

Results segment # 3: Bronson S (night)

Source height = 1.50 m

ROAD (0.00 + 59.53 + 0.00) = 59.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	-4	0.00	65.99	0.00	-1.84	-4.63	0.00	0.00	0.00	59.53

Segment Leq : 59.53 dBA

Results segment # 4: Bronson N (night)

Source height = 1.50 m

ROAD (0.00 + 47.63 + 0.00) = 47.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-66	0.00	60.88	0.00	-1.84	-11.41	0.00	0.00	0.00	47.63

Segment Leq : 47.63 dBA

Results segment # 5: Commissioner (night)

Source height = 1.50 m

ROAD (0.00 + 46.55 + 0.00) = 46.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	-38	0.00	60.88	0.00	-5.01	-9.33	0.00	0.00	0.00	46.55

Segment Leq : 46.55 dBA

Total Leq All Segments: 61.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.52
(NIGHT): 61.93

STAMSON 5.0 NORMAL REPORT Date: 23-09-2019 13:52:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por4.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -90.00 deg -25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 45.40 / 45.40 m
Receiver height : 46.50 / 46.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: Slater (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: Slater (day/night)
----------------------------------------
Angle1   Angle2           : -55.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  39.60 / 39.60  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  10.00 m
Reference angle           :   0.00

🠝
Road data, segment # 3: 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 # 3: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -55.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.20 / 85.20  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  16.00 m
Reference angle           :   0.00

🠝
Road data, segment # 4: Bronson S (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       :     8 %
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 # 4: Bronson S (day/night)
-------------------------------------------
Angle1   Angle2           : -68.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.70 / 20.70  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   4.00 m
Reference angle           :   0.00

↟
Road data, segment # 5: Bronson N (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: Bronson N (day/night)
-------------------------------------------
```

```
Angle1   Angle2           : -80.00 deg   -68.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.70 / 20.70  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
Reference angle           :   0.00
```

🡅

```
Road data, segment # 6: Commissioner (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: Commissioner (day/night)
------------------------------------------------
Angle1   Angle2           : -61.00 deg   -40.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.10 / 45.10  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  11.00 m
Reference angle           :   0.00
```

🡅

```
Results segment # 1: Laurier (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.25 + 0.00) = 59.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
```

```
   -90    -25   0.00  68.48   0.00  -4.81  -4.42   0.00   0.00   0.00  59.25
--------------------------------------------------------------------------------

Segment Leq : 59.25 dBA

↟
Results segment # 2: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.32 + 0.00) = 63.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -55     90   0.00  68.48   0.00  -4.22  -0.94   0.00   0.00   0.00  63.32
--------------------------------------------------------------------------------

Segment Leq : 63.32 dBA

↟
Results segment # 3: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -55     90   0.00  68.48   0.00  -7.54  -0.94   0.00   0.00   0.00  60.00
--------------------------------------------------------------------------------

Segment Leq : 60.00 dBA

↟
Results segment # 4: Bronson S (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 71.62 + 0.00) = 71.62 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -68     90   0.00  73.59   0.00  -1.40  -0.57   0.00   0.00   0.00  71.62
--------------------------------------------------------------------------------

Segment Leq : 71.62 dBA

↟
Results segment # 5: Bronson N (day)
------------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 55.32 + 0.00) = 55.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	-68	0.00	68.48	0.00	-1.40	-11.76	0.00	0.00	0.00	55.32

Segment Leq : 55.32 dBA

↟
Results segment # 6: Commissioner (day)

Source height = 1.50 m

ROAD (0.00 + 54.37 + 0.00) = 54.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-61	-40	0.00	68.48	0.00	-4.78	-9.33	0.00	0.00	0.00	54.37

Segment Leq : 54.37 dBA

Total Leq All Segments: 72.82 dBA

↟
Results segment # 1: Laurier (night)

Source height = 1.50 m

ROAD (0.00 + 51.65 + 0.00) = 51.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-25	0.00	60.88	0.00	-4.81	-4.42	0.00	0.00	0.00	51.65

Segment Leq : 51.65 dBA

↟
Results segment # 2: Slater (night)

Source height = 1.50 m

ROAD (0.00 + 55.73 + 0.00) = 55.73 dBA

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

```
   -55     90   0.00  60.88   0.00  -4.22  -0.94   0.00   0.00   0.00  55.73
-------------------------------------------------------------------------------

Segment Leq : 55.73 dBA

↟
Results segment # 3: Albert (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 52.40 + 0.00) = 52.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -55     90   0.00  60.88   0.00  -7.54  -0.94   0.00   0.00   0.00  52.40
-------------------------------------------------------------------------------

Segment Leq : 52.40 dBA

↟
Results segment # 4: Bronson S (night)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.03 + 0.00) = 64.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -68     90   0.00  65.99   0.00  -1.40  -0.57   0.00   0.00   0.00  64.03
-------------------------------------------------------------------------------

Segment Leq : 64.03 dBA

↟
Results segment # 5: Bronson N (night)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 47.72 + 0.00) = 47.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -80    -68   0.00  60.88   0.00  -1.40 -11.76   0.00   0.00   0.00  47.72
-------------------------------------------------------------------------------

Segment Leq : 47.72 dBA

↟
Results segment # 6: Commissioner (night)
-----------------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 46.77 + 0.00) = 46.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-61	-40	0.00	60.88	0.00	-4.78	-9.33	0.00	0.00	0.00	46.77

Segment Leq : 46.77 dBA

Total Leq All Segments: 65.22 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.82
(NIGHT): 65.22

STAMSON 5.0 NORMAL REPORT Date: 23-09-2019 13:55:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por5.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -90.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.80 / 42.80 m
Receiver height : 46.50 / 46.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: Slater (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: Slater (day/night)
----------------------------------------
Angle1   Angle2           :  27.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  51.00 / 51.00  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   8.00 m
Reference angle           :   0.00

🠝
Road data, segment # 3: 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 # 3: Albert (day/night)
----------------------------------------
Angle1   Angle2           :  27.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
Reference angle           :   0.00

🠝
Road data, segment # 4: Bronson S (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       :     8 %
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 # 4: Bronson S (day/night)
-------------------------------------------
Angle1   Angle2           : -68.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  21.50 / 21.50  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   3.00 m
Reference angle           :   0.00

↟
Road data, segment # 5: Bronson N (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: Bronson N (day/night)
-------------------------------------------
```

```
Angle1   Angle2           : -72.00 deg   -68.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.50 / 51.50  m
Receiver height           :  46.50 / 46.50  m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
Reference angle           :   0.00
```

Results segment # 1: Laurier (day)

```
Source height = 1.50 m

ROAD (0.00 + 59.30 + 0.00) = 59.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -28   0.00  68.48   0.00  -4.55  -4.63   0.00   0.00   0.00  59.30
-------------------------------------------------------------------------------

Segment Leq : 59.30 dBA
```

Results segment # 2: Slater (day)

```
Source height = 1.50 m

ROAD (0.00 + 58.61 + 0.00) = 58.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    27     90   0.00  68.48   0.00  -5.31  -4.56   0.00   0.00   0.00  58.61
-------------------------------------------------------------------------------

Segment Leq : 58.61 dBA
```

Results segment # 3: Albert (day)

```
Source height = 1.50 m

ROAD (0.00 + 54.68 + 0.00) = 54.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    27     90   0.00  68.48   0.00  -9.24  -4.56   0.00   0.00   0.00  54.68
-------------------------------------------------------------------------------
```

Segment Leq : 54.68 dBA

↟
Results segment # 4: Bronson S (day)

Source height = 1.50 m

ROAD (0.00 + 71.46 + 0.00) = 71.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-68	90	0.00	73.59	0.00	-1.56	-0.57	0.00	0.00	0.00	71.46

Segment Leq : 71.46 dBA

↟
Results segment # 5: Bronson N (day)

Source height = 1.50 m

ROAD (0.00 + 46.59 + 0.00) = 46.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	-68	0.00	68.48	0.00	-5.36	-16.53	0.00	0.00	0.00	46.59

Segment Leq : 46.59 dBA

Total Leq All Segments: 72.02 dBA

↟
Results segment # 1: Laurier (night)

Source height = 1.50 m

ROAD (0.00 + 51.70 + 0.00) = 51.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	60.88	0.00	-4.55	-4.63	0.00	0.00	0.00	51.70

Segment Leq : 51.70 dBA

↟
Results segment # 2: Slater (night)

Source height = 1.50 m

ROAD (0.00 + 51.01 + 0.00) = 51.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
27	90	0.00	60.88	0.00	-5.31	-4.56	0.00	0.00	0.00	51.01

Segment Leq : 51.01 dBA

Results segment # 3: Albert (night)

Source height = 1.50 m

ROAD (0.00 + 47.08 + 0.00) = 47.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
27	90	0.00	60.88	0.00	-9.24	-4.56	0.00	0.00	0.00	47.08

Segment Leq : 47.08 dBA

Results segment # 4: Bronson S (night)

Source height = 1.50 m

ROAD (0.00 + 63.86 + 0.00) = 63.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-68	90	0.00	65.99	0.00	-1.56	-0.57	0.00	0.00	0.00	63.86

Segment Leq : 63.86 dBA

Results segment # 5: Bronson N (night)

Source height = 1.50 m

ROAD (0.00 + 38.99 + 0.00) = 38.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	-68	0.00	60.88	0.00	-5.36	-16.53	0.00	0.00	0.00	38.99

Segment Leq : 38.99 dBA

Total Leq All Segments: 64.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.02
(NIGHT): 64.42

STAMSON 5.0 NORMAL REPORT Date: 27-05-2019 14:52:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por6.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -90.00 deg -39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.50 / 22.50 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Slater (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: Slater (day/night)
-----------------------------------------
Angle1   Angle2           :  16.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  71.50 / 71.50  m
Receiver height           :   4.50 / 4.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   8.00 m
Reference angle           :   0.00

Road data, segment # 3: 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 # 3: Albert (day/night)
-----------------------------------------
Angle1   Angle2           :  16.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 146.50 / 146.50 m
Receiver height           :   4.50 / 4.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
```

```
Reference angle           :   0.00

↟
Road data, segment # 4: Bronson S (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       :     8 %
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 # 4: Bronson S (day/night)
-----------------------------------------
Angle1   Angle2           : -80.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   2.00 m
Reference angle           :   0.00

↟
Road data, segment # 5: Bronson N (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: Bronson N (day/night)
-------------------------------------------
Angle1   Angle2           : -83.00 deg   -80.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   9.00 m
Reference angle           :   0.00
```



```
Results segment # 1: Laurier (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.24 + 0.00) = 61.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -39   0.00  68.48   0.00  -1.76  -5.48   0.00   0.00   0.00  61.24
-------------------------------------------------------------------------------

Segment Leq : 61.24 dBA
```

```
Results segment # 2: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.56 + 0.00) = 54.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    16     90   0.33  68.48   0.00  -9.02  -4.90   0.00   0.00   0.00  54.56
-------------------------------------------------------------------------------

Segment Leq : 54.56 dBA
```

```
Results segment # 3: Albert (day)
---------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 50.80 + 0.00) = 50.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.30	68.48	0.00	-12.87	-4.81	0.00	0.00	0.00	50.80

Segment Leq : 50.80 dBA

Results segment # 4: Bronson S (day)

Source height = 1.50 m

ROAD (0.00 + 73.34 + 0.00) = 73.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	90	0.00	73.59	0.00	0.00	-0.25	0.00	0.00	0.00	73.34

Segment Leq : 73.34 dBA

Results segment # 5: Bronson N (day)

Source height = 1.50 m

ROAD (0.00 + 50.70 + 0.00) = 50.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	-80	0.00	68.48	0.00	0.00	-17.78	0.00	0.00	0.00	50.70

Segment Leq : 50.70 dBA

Total Leq All Segments: 73.70 dBA

Results segment # 1: Laurier (night)

Source height = 1.50 m

ROAD (0.00 + 53.65 + 0.00) = 53.65 dBA

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

-90	-39	0.00	60.88	0.00	-1.76	-5.48	0.00	0.00	0.00	53.65

Segment Leq : 53.65 dBA

Results segment # 2: Slater (night)

Source height = 1.50 m

ROAD (0.00 + 46.97 + 0.00) = 46.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.33	60.88	0.00	-9.02	-4.90	0.00	0.00	0.00	46.97

Segment Leq : 46.97 dBA

Results segment # 3: Albert (night)

Source height = 1.50 m

ROAD (0.00 + 43.20 + 0.00) = 43.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.30	60.88	0.00	-12.87	-4.81	0.00	0.00	0.00	43.20

Segment Leq : 43.20 dBA

Results segment # 4: Bronson S (night)

Source height = 1.50 m

ROAD (0.00 + 65.74 + 0.00) = 65.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	90	0.00	65.99	0.00	0.00	-0.25	0.00	0.00	0.00	65.74

Segment Leq : 65.74 dBA

Results segment # 5: Bronson N (night)

Source height = 1.50 m

ROAD (0.00 + 43.10 + 0.00) = 43.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	-80	0.00	60.88	0.00	0.00	-17.78	0.00	0.00	0.00	43.10

Segment Leq : 43.10 dBA

Total Leq All Segments: 66.10 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 73.70
(NIGHT): 66.10

STAMSON 5.0 NORMAL REPORT Date: 23-09-2019 14:02:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola1.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -24.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 44.50 / 44.50 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -24.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Elevation : 0.00 m
Barrier receiver distance : 23.00 / 23.00 m
Source elevation : -10.00 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   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  89.90 / 89.90  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -24.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          : -16.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

↟
Road data, segment # 3: Bronson S (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       :     8 %
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 # 3: Bronson S (day/night)
```

```
-----------------------------------------
Angle1   Angle2           : -73.00 deg   80.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.60 / 15.60  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -73.00 deg   Angle2 : 80.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```



```
Road data, segment # 4: Bronson N (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: Bronson N (day/night)
-----------------------------------------
Angle1   Angle2           : -82.00 deg   -73.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.60 / 15.60  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -82.00 deg   Angle2 : -73.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :  -9.00 m
```

```
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

↟

```
Road data, segment # 5: Commissioner (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: Commissioner (day/night)
------------------------------------------------
Angle1   Angle2           : -62.00 deg   -45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -62.00 deg   Angle2 : -45.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          : -11.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

↟

```
Road data, segment # 6: Laurier (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: Laurier (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  44.00 / 44.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Results segment # 1: Slater (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -3.67 !        -3.67

ROAD (0.00 + 45.29 + 0.00) = 45.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -24     90   0.66  68.48   0.00  -7.84  -3.11   0.00   0.00 -12.23  45.29
-------------------------------------------------------------------------------

Segment Leq : 45.29 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 !        1.50 !       -2.59 !        -2.59

ROAD (0.00 + 43.35 + 0.00) = 43.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -24     90   0.66  68.48   0.00 -12.91  -3.11   0.00   0.00  -9.10  43.35
-------------------------------------------------------------------------------

Segment Leq : 43.35 dBA

🠉
Results segment # 3: Bronson S (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -0.42 !        -0.42

ROAD (0.00 + 66.95 + 0.00) = 66.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -73     80   0.00  73.59   0.00  -0.17  -0.71   0.00   0.00  -5.76  66.95
-------------------------------------------------------------------------------

Segment Leq : 66.95 dBA

🠉
Results segment # 4: Bronson N (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -1.96 !        -1.96

ROAD (0.00 + 47.23 + 0.00) = 47.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
```

```
   -82    -73   0.00  68.48   0.00  -0.17 -13.01   0.00   0.00  -8.07  47.23
--------------------------------------------------------------------------------

Segment Leq : 47.23 dBA

🡅
Results segment # 5: Commissioner (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -4.39 !        -4.39

ROAD (0.00 + 39.24 + 0.00) = 39.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -62    -45   0.00  68.48   0.00  -4.57 -10.25   0.00   0.00 -14.41  39.24
--------------------------------------------------------------------------------

Segment Leq : 39.24 dBA

🡅
Results segment # 6: Laurier (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.25 + 0.00) = 56.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -90      0   0.66  68.48   0.00  -7.76  -4.47   0.00   0.00   0.00  56.25
--------------------------------------------------------------------------------

Segment Leq : 56.25 dBA

Total Leq All Segments: 67.40 dBA

🡅
Results segment # 1: Slater (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 !        1.50 !       -3.67 !        -3.67

ROAD (0.00 + 37.70 + 0.00) = 37.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -24     90   0.66  60.88   0.00  -7.84  -3.11   0.00   0.00 -12.23  37.70
-------------------------------------------------------------------------------

Segment Leq : 37.70 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 !        1.50 !       -2.59 !        -2.59

ROAD (0.00 + 35.76 + 0.00) = 35.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -24     90   0.66  60.88   0.00 -12.91  -3.11   0.00   0.00  -9.10  35.76
-------------------------------------------------------------------------------

Segment Leq : 35.76 dBA

🠉
Results segment # 3: Bronson S (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 !        1.50 !       -0.42 !        -0.42

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

```
   -73     80   0.00  65.99   0.00  -0.17  -0.71   0.00   0.00  -5.76  59.36
-------------------------------------------------------------------------------

Segment Leq : 59.36 dBA

↟
Results segment # 4: Bronson N (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 !        1.50 !       -1.96 !        -1.96

ROAD (0.00 + 39.63 + 0.00) = 39.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -82    -73   0.00  60.88   0.00  -0.17 -13.01   0.00   0.00  -8.07  39.63
-------------------------------------------------------------------------------

Segment Leq : 39.63 dBA

↟
Results segment # 5: Commissioner (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 !        1.50 !       -4.39 !        -4.39

ROAD (0.00 + 31.65 + 0.00) = 31.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -62    -45   0.00  60.88   0.00  -4.57 -10.25   0.00   0.00 -14.41  31.65
-------------------------------------------------------------------------------

Segment Leq : 31.65 dBA

↟
Results segment # 6: Laurier (night)
------------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 49.23 + 0.00) = 49.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	60.88	0.00	-7.34	-4.31	0.00	0.00	0.00	49.23

Segment Leq : 49.23 dBA

Total Leq All Segments: 59.85 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.40
(NIGHT): 59.85

STAMSON 5.0 NORMAL REPORT Date: 26-09-2019 12:40:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola1b.te Time Period: Day/Night 16/8 hours
Description:

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

Angle1 Angle2 : -24.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 44.50 / 44.50 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -24.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Elevation : 0.00 m
Barrier receiver distance : 23.00 / 23.00 m
Source elevation : -10.00 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   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  89.90 / 89.90  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -24.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          : -16.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

↟
Road data, segment # 3: Bronson S (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       :     8 %
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 # 3: Bronson S (day/night)
```

```
-----------------------------------------
Angle1   Angle2           : -73.00 deg   80.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.60 / 15.60  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -73.00 deg   Angle2 : 80.00 deg
Barrier height            :   2.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```



```
Road data, segment # 4: Bronson N (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: Bronson N (day/night)
-----------------------------------------
Angle1   Angle2           : -82.00 deg   -73.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.60 / 15.60  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -82.00 deg   Angle2 : -73.00 deg
Barrier height            :   2.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :  -9.00 m
```

```
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

↟

```
Road data, segment # 5: Commissioner (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: Commissioner (day/night)
------------------------------------------------
Angle1   Angle2           : -62.00 deg   -45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -62.00 deg   Angle2 : -45.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          : -11.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

↟

```
Road data, segment # 6: Laurier (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: Laurier (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  44.00 / 44.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

🠝

```
Results segment # 1: Slater (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -3.67 !        -3.67

ROAD (0.00 + 45.29 + 0.00) = 45.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -24     90   0.66  68.48   0.00  -7.84  -3.11   0.00   0.00 -12.23  45.29
-------------------------------------------------------------------------------

Segment Leq : 45.29 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 !        1.50 !       -2.59 !        -2.59

ROAD (0.00 + 43.35 + 0.00) = 43.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -24     90   0.66  68.48   0.00 -12.91  -3.11   0.00   0.00  -9.10  43.35
-------------------------------------------------------------------------------

Segment Leq : 43.35 dBA

🠉
Results segment # 3: Bronson S (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -0.42 !        -0.42

ROAD (0.00 + 58.57 + 0.00) = 58.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -73     80   0.00  73.59   0.00  -0.17  -0.71   0.00   0.00 -14.15  58.57
-------------------------------------------------------------------------------

Segment Leq : 58.57 dBA

🠉
Results segment # 4: Bronson N (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -1.96 !        -1.96

ROAD (0.00 + 42.54 + 0.00) = 42.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -82    -73   0.00  68.48   0.00  -0.17 -13.01   0.00   0.00 -12.76  42.54
-------------------------------------------------------------------------------

Segment Leq : 42.54 dBA

↟
Results segment # 5: Commissioner (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !       -4.39 !        -4.39

ROAD (0.00 + 39.24 + 0.00) = 39.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -62    -45   0.00  68.48   0.00  -4.57 -10.25   0.00   0.00 -14.41  39.24
-------------------------------------------------------------------------------

Segment Leq : 39.24 dBA

↟
Results segment # 6: Laurier (day)
----------------------------------

Source height = 1.50 m

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

ROAD (0.00 + 51.28 + 0.00) = 51.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.54  68.48   0.00  -7.20  -4.26   0.00   0.00  -5.74  51.28
-------------------------------------------------------------------------------
```

Segment Leq : 51.28 dBA

Total Leq All Segments: 59.71 dBA

Results segment # 1: Slater (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-3.67	-3.67

ROAD (0.00 + 37.70 + 0.00) = 37.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	90	0.66	60.88	0.00	-7.84	-3.11	0.00	0.00	-12.23	37.70

Segment Leq : 37.70 dBA

Results segment # 2: Albert (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-2.59	-2.59

ROAD (0.00 + 35.76 + 0.00) = 35.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	90	0.66	60.88	0.00	-12.91	-3.11	0.00	0.00	-9.10	35.76

Segment Leq : 35.76 dBA

Results segment # 3: Bronson S (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-0.42	-0.42

ROAD (0.00 + 50.97 + 0.00) = 50.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	80	0.00	65.99	0.00	-0.17	-0.71	0.00	0.00	-14.15	50.97

Segment Leq : 50.97 dBA

Results segment # 4: Bronson N (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-1.96	-1.96

ROAD (0.00 + 34.94 + 0.00) = 34.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	-73	0.00	60.88	0.00	-0.17	-13.01	0.00	0.00	-12.76	34.94

Segment Leq : 34.94 dBA

Results segment # 5: Commissioner (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

```
       1.50 !        1.50 !       -4.39 !        -4.39

ROAD (0.00 + 31.65 + 0.00) = 31.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -62    -45   0.00  60.88   0.00  -4.57 -10.25   0.00   0.00 -14.41  31.65
-------------------------------------------------------------------------------

Segment Leq : 31.65 dBA

🠉
Results segment # 6: Laurier (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 !        4.09 !         4.09

ROAD (0.00 + 49.23 + 0.00) = 49.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.45  60.88   0.00  -6.78  -4.09   0.00   0.00  -0.21  49.81*
   -90      0   0.57  60.88   0.00  -7.34  -4.31   0.00   0.00   0.00  49.23
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 49.23 dBA

Total Leq All Segments: 53.48 dBA

🠉



TOTAL Leq FROM ALL SOURCES (DAY): 59.71
                           (NIGHT): 53.48
🠉
🠉
```