REPORT

244 Fountain Place

Ottawa, Ontario

Noise Impact Study

SACL #SW18073.A0

February 26, 2018

Submitted to:

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1. Introduction

At the request of TC United Group, Swallow Acoustic Consultants Ltd. (SACL) is pleased to present this Noise Impact Study (NIS) for the proposed 6-storey residential building (the "Project") to be located on currently vacant land at 244 Fountain Place in Ottawa, Ontario. The entire development consists of residential suites, with underground parking located below the building. Adjacencies include residences, as well as Besserer Park to the northwest. The building features a rooftop terrace and there is also a backyard located southwest of the building. This NIS assesses noise impacts from nearby surface transportation sources. Based on observations made at the site, there are no significant stationary noise sources that are likely to exceed the applicable sound level criteria for the Project, and an assessment of stationary noise sources associated with the Project is outside the scope of this report (details in Section 5). This report supercedes a previous version of the report, dated September 12, 2016. Changes have been made following revisions to the project design.

The only surface transportation corridor impacting on the Project is Rideau Street, due to its roadway classification per the City of Ottawa and its proximity to the development. Copies of the proposed site plans are included in Appendix A. The site plan drawings have been marked-up to show the location of worst-case Points of Assessment (POA).

2. Noise Assessment Criteria

The City of Ottawa requirements for environmental noise impact assessments are outlined in the ENCG [1], which in turn reference guideline documents prepared by the Ontario Ministry of the Environment and Climate Change (MOECC). The Project is located in a Class 1 area, which is defined as an area with an acoustical environment typical of a major population centre. The sections below describe the applicable noise assessment criteria for surface transportation noise sources and stationary noise sources.

2.1 Surface Transportation Noise Assessment Criteria

Exclusion limit values outlined in ENCG [1] for surface transportation noise impacting on a noise-sensitive development have been summarized in Table 1 for a residential development. There are no railway corridors within the ENCG's prescribed radius of the proposed development, and therefore only significant road corridors are considered in this report.

Table 1: ENCG Exclusion Limit Values for residential developments Areas (Road Noise)

Type of Point of Assessment	Time Period	Time Period Description	Sound Level Limit L_{EQ} [dBA]
Outdoor Living Area (OLA)	07:00 to 23:00	Daytime	55
Indoor Space (Living Quarters)	07:00 to 23:00	Daytime	45
Indoor Space (Sleeping Quarters)	07:00 to 23:00	Daytime	45
Indoor Space (Sleeping Quarters)	23:00 to 07:00	Night-time	40

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For outdoor living areas (OLA) where it is not technically or economically feasible to achieve the noise level criterion in Table 1, the MOECC and City of Ottawa Guidelines include a conditional tolerance of no more than 5 dB above the noise level criterion.

Furthermore, based on the plane of window calculations for indoor spaces, upgraded building components, ventilation systems and warning clauses may be required. The City of Ottawa requirements, shown in Table 2 and Table 3 below, are based on the requirements found in MOECC document NPC-300 [3].

Table 2: ENCG Building Component Requirements (Road Noise)

Assessment Location	Sound Level (time as noted)	Building Component Requirements
Plane of Living Room Window and/or Bedroom Window	Daytime $L_{EQ-16HR}$ Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
	Daytime $L_{EQ-16HR}$ Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
Plane of Living Room Window and/or Bedroom Window	Night-time L_{EQ-8HR} Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	Night-time L_{EQ-8HR} Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

(Reference: MOECC NPC-300, Section C7.1.3 – Indoor Living Areas: Building Components)

Table 3: ENCG Ventilation and Warning Clause Requirements (Road Noise)

Assessment Location	Sound Level (time as noted)	Ventilation Requirement	Warning Clause Requirement
Plane of Living Room Window and/or Bedroom Window	Daytime $L_{EQ-16HR}$ Less than or equal to 55 dBA	None required	Not required
	Daytime $L_{EQ-16HR}$ Greater than 55 dBA to less than or equal to 65 dBA	Forced air heating with provision for central air conditioning	Required Type C
	Daytime $L_{EQ-16HR}$ Greater than 65 dBA	Central air conditioning	Required Type D
Plane of Living Room Window and/or Bedroom Window	Night-time L_{EQ-8HR} Greater than 50 dBA to less than or equal to 60 dBA	Forced air heating with provision for central air conditioning	Required Type C
	Night-time L_{EQ-8HR} Greater than 60 dBA	Central air conditioning	Required Type D

(Reference: MOECC NPC-300, Section C7.1.2 – Plane of a Window: Ventilation Requirements)

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2.2 Neighbouring Stationary Source Noise Assessment Criteria

Stationary sources of noise include all sources of sound and vibration that exist or operate on a premises, excluding construction noise sources. The noise level criterion for noise from stationary sources in a given time period is the higher value between (1) the time period exclusion limit value prescribed by the MOECC, and (2) the corresponding minimum hourly background/ambient sound level (L_{EQ-1HR}) due to traffic during the time period. Exclusion limit values outlined in the ENCG [1] for new noise-sensitive land uses in proximity to existing stationary noise sources have been summarized in Table 4 for Class 1 areas.

Table 4: ENCG Exclusion Limit Values for Class 1 Areas (New Noise-Sensitive Land Uses in Proximity to Existing Stationary Sources)

Type of Point of Assessment	Time Period	Time Period Description	Exclusion Limit L_{EQ-1HR} [dBA]
Outdoor Living Area (OLA)	07:00 to 23:00	Daytime	50
Plane of Window (Living Quarters)	07:00 to 23:00	Daytime	50
Plane of Window (Sleeping Quarters)	23:00 to 07:00	Night-time	45

3. Surface Transportation Noise

3.1 Surface Transportation Noise - Sources

The only surface transportation corridor impacting on the Project is Rideau Street. This transportation corridor was included due to its roadway classification ("Urban Arterial" per the City of Ottawa Transportation Master Plan (TMP) [2]) and due to its proximity to the Project (within 100 m of the Project's limits). The "ultimate" road and traffic data information, including the Annual Average Daily Traffic (AADT), for Rideau Street was obtained from the ENCG [1] and is summarized in Table 5. Of note, the total AADT for Rideau Street was split evenly between two segments, representing eastbound and westbound traffic respectively. These parameters were used to predict the traffic noise levels using STAMSON Version 5.04, a software developed by the MOECC. Results from STAMSON are available in Appendix B.

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Table 5: ENCG Traffic and Road Parameters for STAMSON Modelling

Road	Implied Roadway Class	Speed Limit [km/h]	Ultimate AADT [Vehicles per day]	Day/Night Split [%]	Medium Trucks [%]	Heavy Trucks [%]
Rideau Street (Eastbound)	4-Lane Urban Arterial-Undivided (Eastbound and Westbound treated as two lanes each)	50	15,000	92/8	7	5
Rideau Street (Westbound)		50	15,000	92/8	7	5

Separation distances were taken from the centre of the road segments.

3.2 Surface Transportation Noise - Points of Assessment

Points of Assessment (POA) were chosen to represent a worst-case scenarios at the Plane of Window (PoW) of bedrooms and living spaces. Table 6 contains a description of the location of each POA, and a site plan is included in Appendix A showing the location of each POA.

Table 6: Locations of Points of Assessment (POA)

Point of Assessment (POA)	Height (ref. Grade) [m]	Storey	Building Facade	Notes/Comments
POA 'A'	1.5	Ground	Northwest	PoW: Bedroom facing Besserer Park.
POA 'B'	1.5	Ground	Northeast	PoW: Amenity space.
POA 'C'	1.5	Ground	Backyard	OLA: Backyard southwest of building.
POA 'D'	4.5	2nd	Northwest	PoW: Living space facing Besserer Park and Rideau St.
POA 'E'	4.5	2nd	Northeast	PoW: Bedroom facing Rideau St.
POA 'F'	4.5	2nd	Northeast	PoW: Living space facing Rideau St.
POA 'G'	16.5	6th	Northwest	PoW: Bedroom facing Besserer Park and Rideau St.
POA 'H'	16.5	6th	Northeast	PoW: Living space facing Rideau St.
POA 'I'	19.5	Rooftop	N/A	OLA: Rooftop amenity area.

Of note, for POA's A, D and G, line-of-sight to the Rideau Street traffic is partially obstructed by a small hill in Besserer Park to the northwest. However, the effect of this hill on the predicted noise levels was found to be negligible, and therefore the terrain was considered flat in our model and calculations; the only exception is for POA 'C', where a 6.0 m retaining wall to its northwest offers considerable acoustic shading from surface transportation noise sources travelling on Rideau Street. Furthermore, residential balconies associated with the project are not expected to be over 4 m in depth, and therefore are not assessed as OLAs as per the ENCG [1].

3.3 Surface Transportation Noise - Calculations

Calculations generated by STAMSON can be found in Appendix B. Table 7 shows the daytime and night-time noise level predictions at each POA, along with a comparison to the daytime and night-time criteria for noise control measures, outlined in Table 3.

Table 7: Daytime and Night-time Calculated Noise Levels - Surface Transportation Noise

Point of Assessment (POA)	Daytime Noise Level Calculation [dBA]	Night-time Noise Level Calculation [dBA]	Criteria for Noise Control Measures (Daytime) [dBA]	Criteria for Noise Control Measures (Night-time) [dBA]	Compliant? (Day/Night)
POA 'A'	61	54	55	50	(No / No)
POA 'B'	68	61	55	50	(No / No)
POA 'C'	47	N/A	55	N/A	(Yes)
POA 'D'	69	61	55	50	(No / No)
POA 'E'	69	61	55	50	(No / No)
POA 'F'	67	60	55	50	(No / No)
POA 'G'	69	61	55	50	(No / No)
POA 'H'	69	61	55	50	(No / No)
POA 'I'	62	54	55	N/A	(No)

4. Noise Control – Surface Transportation Noise

4.1 Indoor Noise Control Measures

4.1.1 Ventilation Requirements

The results of Section 3.3 indicate that the calculated surface transportation noise levels exceed the applicable sound level limits at the plane of bedroom and living room windows for the Project. Therefore, as per Table 3 of this NIAS, central air conditioning must be provided to all units. This will allow windows to remain closed, thus reducing noise transfer through openings for windows which are essential for reducing interior noise levels.

4.1.2 Building Component Requirements

As indicated in Section 3.3, the sound level criteria are exceeded at the northwest and northeast building façades, both with significant exposure to Rideau Street. Therefore, as indicated in Table *2*, the building envelope components (exterior walls and windows) must be designed to achieve the indoor sound level criteria.

The Acoustic Insulation Factor (AIF) method was used to determine the minimum construction

requirements for the exterior façade and associated glazing. Our analysis has found that daytime noise levels drive the building component requirements in all cases, due to higher daytime noise level calculations compared to the night-time calculations. The requirements below are therefore based on meeting 45 dBA indoors for all types of rooms during the daytime, which will also ensure that all night-time noise level requirements are met.

Exterior Façade

The minimum acoustical performance requirement for the exterior façade was determined based on noise level calculations at POA 'G', assuming an associated corner suite bedroom. This represents the worst-case scenario due to the high daytime noise level, relative area of the glazing compared to the floor, and exposure to Rideau Street on two facades. The exterior wall-to-floor area ratio was found to be approximately 100%, with a required AIF of 31. This corresponds to the required exterior wall Sound Transmission Class (STC) of at least STC 38, which can be met by most typical Ontario Building Code (OBC) exterior wall assemblies. For reference, the minimum exterior wall assembly recommended by the National Research Council Canada (NRC) for this AIF scenario is "EW1", described as:

- One layer on 12.7 mm [1/2 in] gypsum board;
- Vapour barrier;
- 38 mm [1.5 in] x 89 mm [3.5 in] studs;
- 50 mm [2 in] (or thicker) mineral wool or glass fibre batts in inner-stud cavities;
- Exterior sheathing;
- Fibre backer board; and,
- Wood or metal siding.

The requirement is recommended for all four building facades.

Glazing

The minimum acoustical performance requirements for the northeast and northwest façade glazing (facing Fountain Place and Besserer Park) were determined based on noise level calculations at POA 'G'. The exterior façade glazing has been assessed in two parts: operable glazing (includes patio doors) and non-operable (or fixed) glazing. For glazing areas which are not part of patio door assemblies, it was assumed that 33% of the area consisted of operable glazing, whereas the remaining 67% of the area consisted of fixed glazing. Using the Architectural Drawings dated 13 February 2018, the glazing-to-floor area ratios were found to be approximately 50% for fixed glazing, and 25% for operable glazing. Given the requirement to meet AIF of 31, minimum STC glazing requirements are included below.

- Northeast and northwest façade operable glazing assemblies must meet STC 31, while the northeast and northwest façade fixed glazing assemblies must meet STC 34. Examples of acceptable window constructions using monolithic (not laminated) glass which will meet both of these conditions are included below.

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- 4mm glass, 13mm air gap, 4mm glass; and,
- 6mm glass, 6mm air gap, 6mm glass.

The southeast and southwest façades are subjected to lower noise levels, resulting in less onerous sound attenuation requirements. Therefore, widows compliant with the OBC will offer adequate noise attenuation for these facades.

The window assemblies noted above include minimum construction that are expected to meet the acoustic requirements. Constructions with thicker glass panes or larger air gaps between panes will generally result in superior sound reduction. STC ratings for the actual glazing constructions used should be confirmed with the manufacturer and checked to ensure they meet the recommendations herein.

4.1.3 Outdoor Living Area Mitigation

The backyard OLA located southwest of the proposed building, represented by POA 'C', complies with the outdoor noise level limit shown in Table 1. However, the rooftop terrace associated with POA 'I' does not meet the outdoor noise level limits shown in Table 1, and therefore some form of noise mitigation is required in order to reduce noise levels at this location.

The noise level prediction at POA 'I' is 62 dBA. A 1.0 m tall noise barrier at the northeast and northwest sides of the rooftop OLA perimeter is shown to reduce the noise levels down to 58 dBA, which is compliant considering the conditional tolerance noted in Section 2.1. In order to reduce the noise level prediction at POA 'I' to 55 dBA, a 2.0 m tall barrier around the rooftop OLA perimeter is required. Figure 4 of Appendix A shows the proposed location of the rooftop barrier. If a 1.0 m tall noise barrier is erected around the northeast and northwest sides of the rooftop OLA perimeter, a warning clause (see Section 4.1.4) should be included in all agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations. If a 2.0 m tall barrier is erected, no warning clause is required.

Of note, per 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. Subject to technical justification, rooftop barriers may meet a minimum surface density of 10 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.

4.1.4 Warning Clause Requirements

The results of Section 3.3 indicate that the predicted surface transportation noise levels exceed the applicable sound level limits at the plane of bedroom and living room windows for the Project. Therefore, per Table 3, a warning clause "Type D" must be included in agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations. MOECC-suggested wording, consistent with the ENCG, for the warning clause is as follows:

> "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."

Furthermore, if a 1m noise barrier is erected at the rooftop amenity area instead of a 2m noise barrier (discussed in detail in Section 4.1.3), the noise level at the rooftop OLA is above the sound level limit in Table 1, but remains within the 5 dBA tolerance due to the inclusion of the proposed noise barriers (see Section 4.1.3). Therefore, in this case, it is required that a warning clause be included in agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations. MOECC-suggested wording for the warning clause is as follows:

> "Purchaser/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."

5. Neighbouring Stationary Source Noise

A site visit was conducted on April 21, 2016, in order to identify potential stationary noise sources that may impact the project. No significant stationary noise sources were identified in the vicinity of the proposed development that are likely to cause noise levels in excess of MOECC and City of Ottawa requirements. A second site visit was conducted on February 23, 2018, confirming that no new stationary noise sources have been added since the first site visit.

The Project will also be considered a Stationary Source for adjacent land uses. Mechanical equipment selections have not yet been made, and therefore, a detailed analysis is not possible at this time. The final design will need to comply with ENCG sound level limits from a Stationary Source at all nearby noise-sensitive land uses.

6. Concluding Comments

With the incorporation of the noise control measures and warning clauses as presented in Section 4 of this report, the impact of transportation noise on the proposed residential development will meet ENCG requirements. There are currently no significant stationary noise sources that impact the Project. The proposed residential development located at 244 Fountain Place should therefore be approved from the noise aspect.

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

References

1. City of Ottawa Environmental Noise Control Guidelines (ENCG), approved by Ottawa City Council in January 2016;
2. City of Ottawa Transportation Master Plan (TMP), published by the City of Ottawa on November 2013;
3. Ministry of the Environment and Climate Change (MOECC) Publication NPC-300: Stationary and Transportation Sources - Approval and Planning, published in October 2013;
4. Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), Technical document published by the MOECC in October 1989;
5. Ministry of the Environment and Climate Change (MOECC) Publication: Manual for Environmental Noise Assessment in Land Use Planning Course, published in November 1999; and,
6. Canada Mortgage and Housing Corporation (CMHC) Publication: Road and Rail Noise - Effects on Housing, published in 1977 and revised in 1981.

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Appendices

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Appendix A: Site Plans

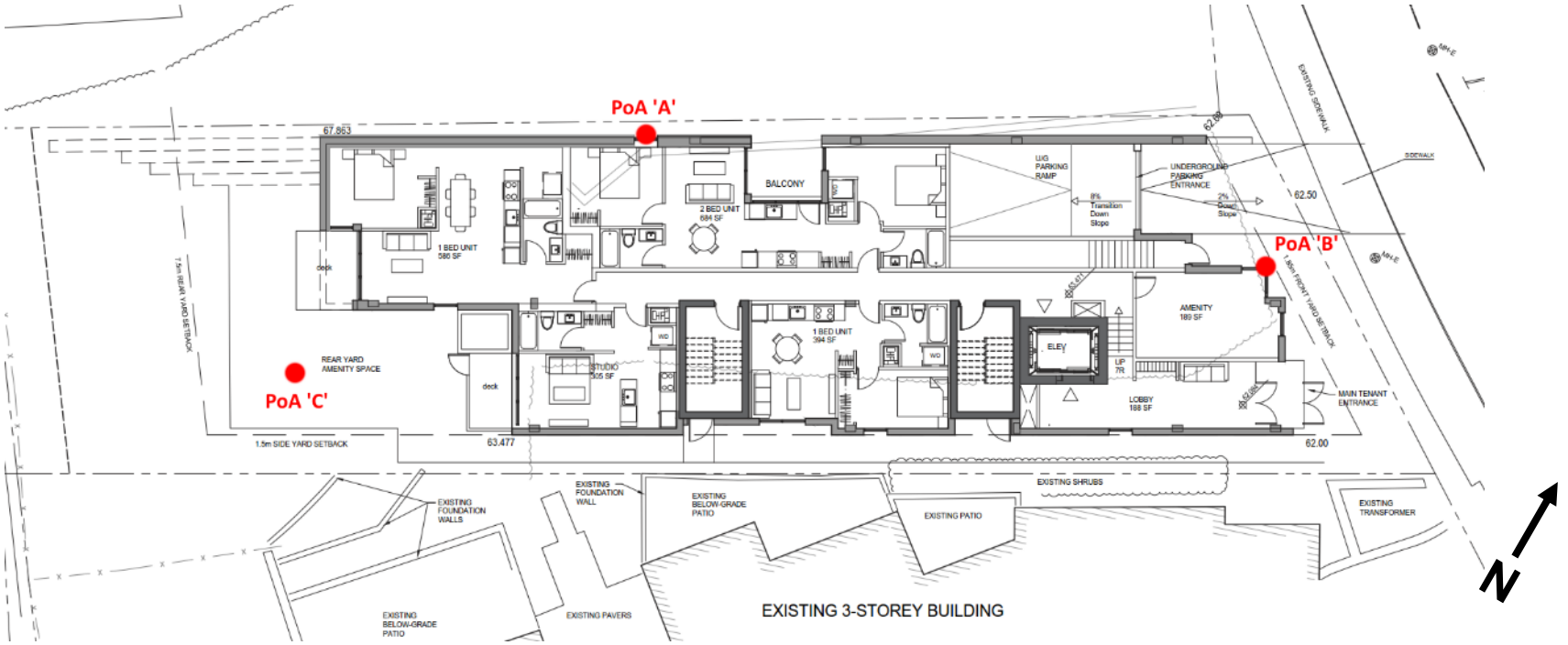

Figure 1: Site plan showing location of Points of Assessment PoA 'A' to 'C' on the ground level.

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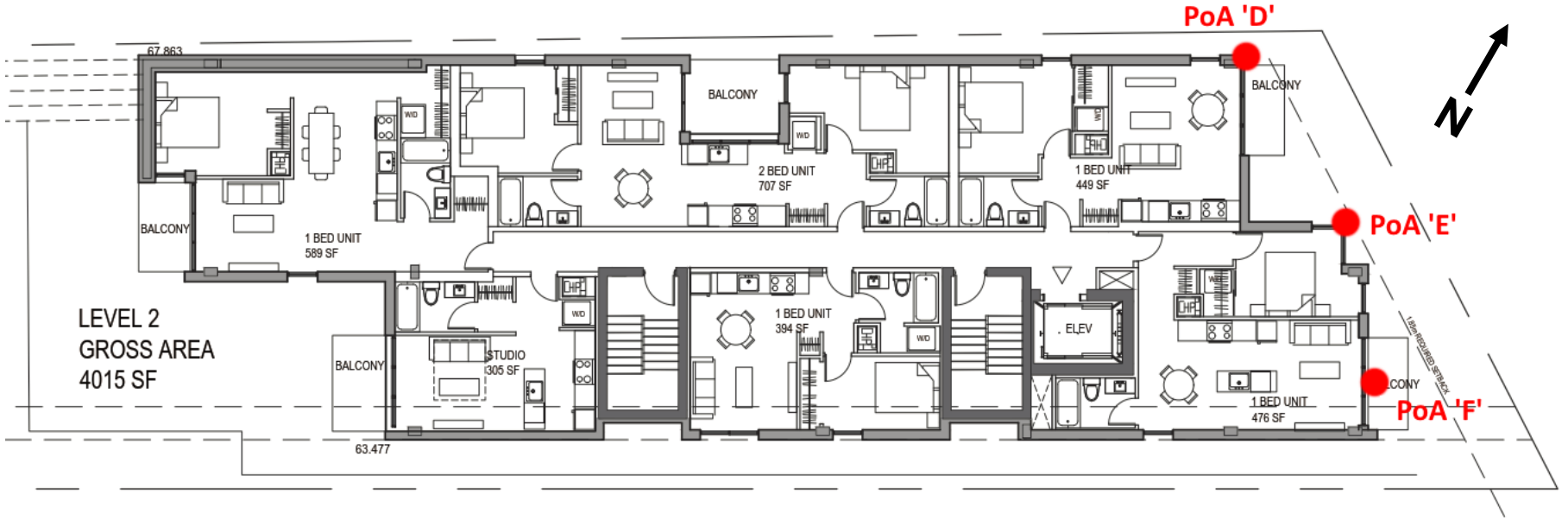

Figure 2: Site plan showing location of Points of Assessment PoA 'D' to 'F' on the second level.

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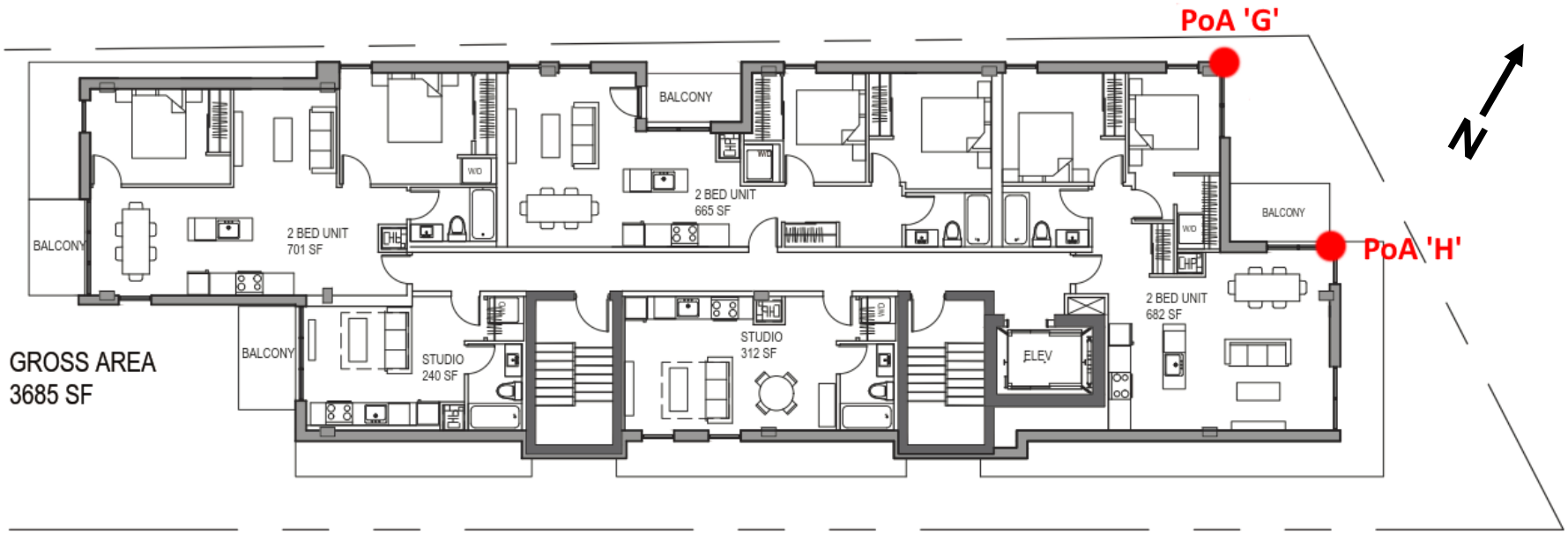

Figure 3: Site plan showing location of Points of Assessment PoA 'G' and 'H' on the sixth level.

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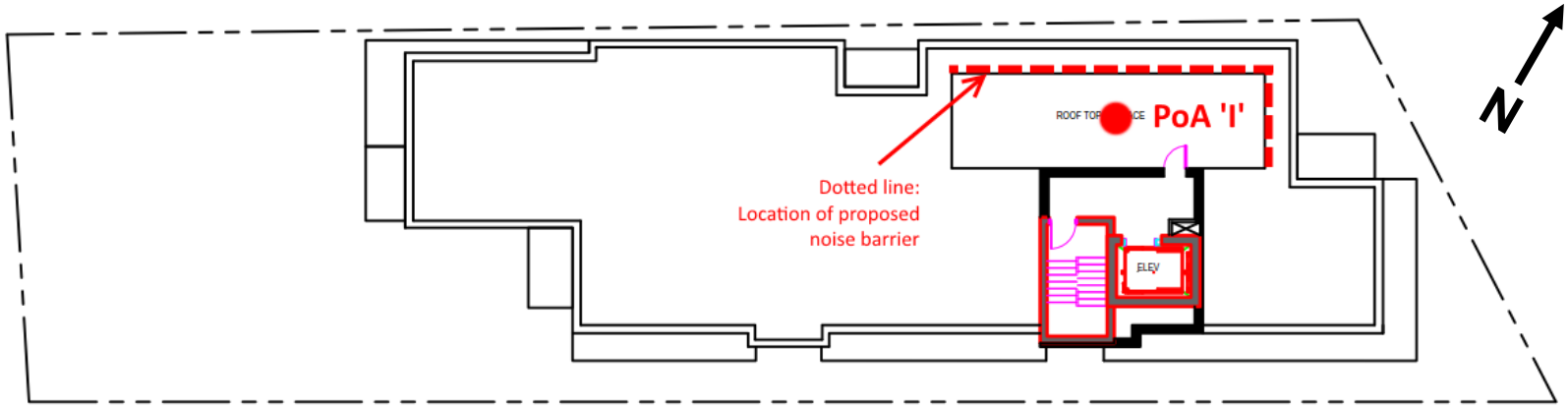

Figure 4: Site plan showing location of Point of Assessment PoA 'I' on the building rooftop.

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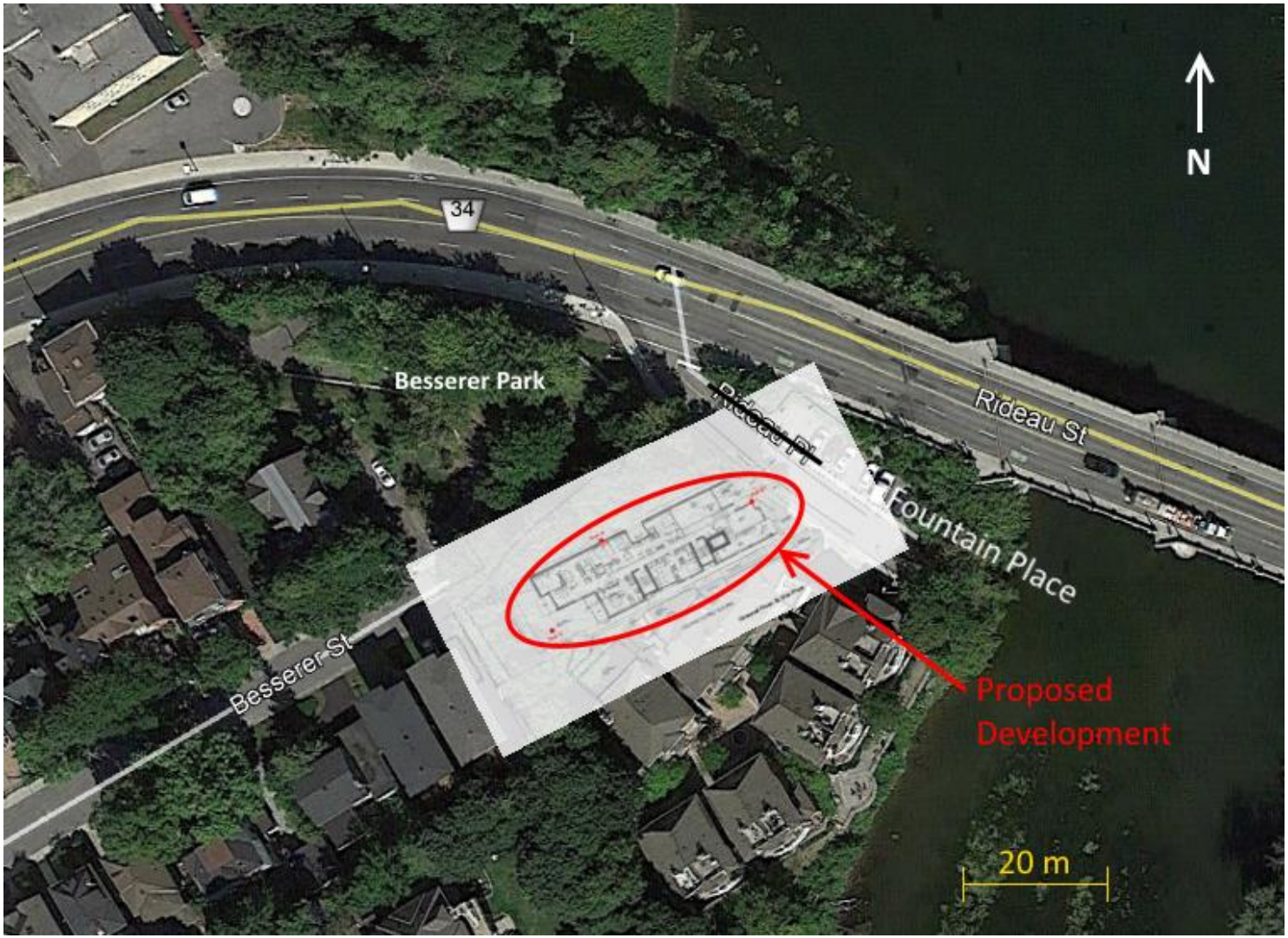

Figure 5: Site plan overlaid onto GoogleEarth, showing the immediate surrounding area.

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Appendix B: Transportation Noise Results from STAMSON

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STAMSON 5.0        SUMMARY REPORT        Date: 15-02-2018 15:42:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poaa.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'A'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   40.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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: RideauSt.WB (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   40.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    58.95 !    58.95
 2.RideauSt.WB      !     1.50 !    57.94 !    57.94
--------------------+----------+----------+----------
                      Total                  61.48 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    51.35 !    51.35
 2.RideauSt.WB      !     1.50 !    50.35 !    50.35
--------------------+----------+----------+----------
                      Total                  53.89 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 61.48
                           (NIGHT): 53.89
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:08:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poab.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'B'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -75.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.50 / 25.50  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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
```


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```
Data for Segment # 2: RideauSt.WB (day/night)
---------------------------------------------
Angle1   Angle2           : -75.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.50 / 31.50  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	65.80	65.80
2.RideauSt.WB	1.50	64.88	64.88
Total			68.37 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	58.20	58.20
2.RideauSt.WB	1.50	57.28	57.28
Total			60.77 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 68.37
                           (NIGHT): 60.77
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 15-02-2018 16:06:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poac.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'C'.


Road data, segment # 1: RideauSt.EB1 (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: RideauSt.EB1 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   -40.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  56.50 / 56.50  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -40.00 deg
Barrier height            :   6.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB1 (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:
```


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```
    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: RideauSt.WB1 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   -40.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  62.50 / 62.50  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -40.00 deg
Barrier height            :   6.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 3: RideauSt.EB2 (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: RideauSt.EB2 (day/night)
-----------------------------------------------
Angle1   Angle2           : -40.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  56.50 / 56.50  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -40.00 deg   Angle2 : 90.00 deg
Barrier height            :  12.00 m
```


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```
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


Road data, segment # 4: RideauSt.WB2 (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: RideauSt.WB2 (day/night)
-----------------------------------------------
Angle1   Angle2           : -40.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  62.50 / 62.50  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -40.00 deg   Angle2 : 90.00 deg
Barrier height            :  12.00 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


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB1     !     1.50 !    39.63 !    39.63
 2.RideauSt.WB1     !     1.50 !    39.09 !    39.09
 3.RideauSt.EB2     !     1.50 !    42.46 !    42.46
 4.RideauSt.WB2     !     1.50 !    42.04 !    42.04
```

	Total		47.07 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB1	1.50	32.03	32.03
2.RideauSt.WB1	1.50	31.49	31.49
3.RideauSt.EB2	1.50	34.87	34.87
4.RideauSt.WB2	1.50	34.44	34.44
Total			39.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 47.07
(NIGHT): 39.47

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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:09:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poad.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'D'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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: RideauSt.WB (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Result summary (day)
--------------------

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB       !     1.50 !    66.26 !    66.26
 2.RideauSt.WB       !     1.50 !    65.33 !    65.33
--------------------+----------+----------+----------
                       Total                  68.83 dBA


Result summary (night)
----------------------

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB       !     1.50 !    58.66 !    58.66
 2.RideauSt.WB       !     1.50 !    57.73 !    57.73
--------------------+----------+----------+----------
                       Total                  61.23 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.83
                           (NIGHT): 61.23
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:10:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poae.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'E'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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: RideauSt.WB (day/night)
-----------------------------------------------
Angle1   Angle2           : -77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	65.94	65.94
2.RideauSt.WB	1.50	65.00	65.00
Total			68.51 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	58.34	58.34
2.RideauSt.WB	1.50	57.41	57.41
Total			60.91 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 68.51
                           (NIGHT): 60.91
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:11:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poaf.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'F'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -50.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  28.00 / 28.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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
```


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```
Data for Segment # 2: RideauSt.WB (day/night)
-----------------------------------------------
Angle1   Angle2           : -50.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  34.00 / 34.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	64.68	64.68
2.RideauSt.WB	1.50	63.83	63.83
Total			67.29 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	57.08	57.08
2.RideauSt.WB	1.50	56.24	56.24
Total			59.69 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 67.29
                           (NIGHT): 59.69
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:13:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poag.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'G'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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: RideauSt.WB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	66.26	66.26
2.RideauSt.WB	1.50	65.33	65.33
Total			68.83 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	58.66	58.66
2.RideauSt.WB	1.50	57.73	57.73
Total			61.23 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 68.83
                           (NIGHT): 61.23
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:13:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poah.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'H'.


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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
```


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```
Data for Segment # 2: RideauSt.WB (day/night)
---------------------------------------------
Angle1   Angle2           : -77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	65.94	65.94
2.RideauSt.WB	1.50	65.00	65.00
Total			68.51 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.RideauSt.EB	1.50	58.34	58.34
2.RideauSt.WB	1.50	57.41	57.41
Total			60.91 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 68.51
                           (NIGHT): 60.91
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:15:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poai.te              Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'I'. (no barr).


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  18.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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:
```


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```
    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: RideauSt.WB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  18.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    58.53 !    58.53
 2.RideauSt.WB      !     1.50 !    58.90 !    58.90
--------------------+----------+----------+----------
                      Total                  61.73 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    50.93 !    50.93
 2.RideauSt.WB      !     1.50 !    51.31 !    51.31
--------------------+----------+----------+----------
                      Total                  54.13 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 61.73
                           (NIGHT): 54.13
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:14:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poai_2.te            Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'I'. (1m barr).


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  19.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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:
```


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```
    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: RideauSt.WB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  19.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    54.90 !    54.90
 2.RideauSt.WB      !     1.50 !    55.24 !    55.24
--------------------+----------+----------+----------
                      Total                  58.08 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    47.31 !    47.31
 2.RideauSt.WB      !     1.50 !    47.64 !    47.64
--------------------+----------+----------+----------
                      Total                  50.49 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 58.08
                           (NIGHT): 50.49
```


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```
STAMSON 5.0        SUMMARY REPORT        Date: 26-02-2018 15:16:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: poai_3.te            Time Period: Day/Night 16/8 hours
Description: Noise level prediction at PoA 'I'. (2m barr).


Road data, segment # 1: RideauSt.EB (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: RideauSt.EB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  20.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: RideauSt.WB (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:
```


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```
    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: RideauSt.WB (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  20.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    52.04 !    52.04
 2.RideauSt.WB      !     1.50 !    52.06 !    52.06
--------------------+----------+----------+----------
                      Total                  55.06 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.RideauSt.EB      !     1.50 !    44.44 !    44.44
 2.RideauSt.WB      !     1.50 !    44.46 !    44.46
--------------------+----------+----------+----------
                      Total                  47.46 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 55.06
                           (NIGHT): 47.46
```


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