

November 9, 2018

Amico Properties
2199 Blackacre Drive, Suite 100
Oldcastle, Ontario,
N0R 1L0

**Re: Environmental Noise Addendum
1161-1167 North Shore Blvd East Development, Burlington Ontario
Novus File No. 18-0085**

Novus Environmental Inc. (Novus) was retained by Amico Properties to prepare a Noise Study Addendum to address comments from the City of Burlington following a review of the Official Plan Amendment and Zoning By-law Amendment Application (OPA/ZBA). The comments were provided in response to the Novus Noise Study entitled “Environmental Noise Feasibility Study, Proposed 1161-1167 North Shore Blvd East Development, Burlington, Ontario”, dated September 18, 2018.

This addendum addresses comment number 6 of the City’s response, dated November 1, 2018 which has been included below.

“Please amend the Environmental Noise Feasibility Study to include the required STAMSON calculations. The study must also include possible measures to control the noise in the OLA to 55dBA or less. If not feasible, then include calculations to confirm what levels could be achieved, i.e. 60 dBA would require a 3m noise barrier, 59 a 3.5m, 58 dBA a 4.0m, etc. all the way to 55 dBA.”

The above comment can be broken down into two separate comments. The first part *“Please amend the Environmental Noise Feasibility Study to include the required STAMSON calculations.”*

As per the 2018 Noise Study, noise impacts were predicted using the CadnaA noise modelling software and sound emission rates using the ORNAMENT calculation algorithms. A validation file (daytime sound levels) is included in **Appendix A**. This file includes 3 locations at the proposed property as follows:

1. NR1 is a receptor on the southwest façade of the building, at a height of 7.5 above grade;
2. A 4.5m receptor above grade has been modelled on the southeast façade of the building and labelled NR2; and
3. The final receptor is located in the OLA (labelled OLA) and the results are presented both with and without a barrier.

The first 2 receptors were modelled with all major contributing roadways (**Figure A.1**), but the OLA could not be easily transferred to the STAMSON modelling software (**Figure A.2**) due to the complex angular geometry between the various roadways, mitigation barrier and building screening. As a result, the OLA receptor was modelled with only the North Shore roadway traffic for comparison of model purposes. The results presented in **Figure A.2** are not the final cumulative results, as this result omits other surrounding roadways.

The second part of the comment is *“The study must also include possible measures to control the noise in the OLA to 55dBA or less. If not feasible, then include calculations to confirm what levels could be achieved, i.e. 60 dBA would require a 3m noise barrier, 59 a 3.5m, 58 dBA a 4.0m, etc. all the way to 55 dBA.”*

A barrier height analysis was carried out to check if an edge of OLA theoretical (not a proposed design but used for table generation) feasible barrier height design could reduce the sound levels in the OLA to 55 dBA. It should be noted that the southwestern edge of the barrier, once above 5m tall was extended onto the adjacent rooftop to maintain a blockage to the surrounding roadways. This theoretical barrier is **not** proposed for the construction of the building but has been used for commenting on the City’s request on barrier feasibility only. The following table shows the results and the design of the edge of OLA barrier included as **Figure A.3**.

Table 1: Barrier Height versus Resulting Sound Level

Barrier Height (m)	Resulting Sound Level in OLA (dBA)
1.0	66
1.5	66
2.0	64
2.5	63
3.0	62
3.5	61
4.0	59

5.0	58
6.0	57
7.0	56
8.0	56
9.0	55
10.0	54

Based on the table above, the edge of OLA theoretical barrier would require approximately 4.0m or 9.0m tall barrier above local grade to obtain 60 dBA or 55 dBA, respectively. It may be feasible to achieve 60 dBA, but 55 dBA is not feasible due to the required 9.0m barrier height.

Also proposed in the 2018 Noise Study, was the concept of localized acoustical screens. An example screen design is shown in **Figure A.4**. Using an L-shaped screen with a height of 2.0m tall, the predicted sound level at the receptor location is 54 dBA, which is below the 55 dBA suggested sound level. Depending on the location and geometry of the screen to protect specific areas, the height will need to vary to properly protect the area.

As shown in this Addendum, various sound mitigation measure may be practical to limit the noise within the OLA. I trust the above suits your needs at this time. Should you have any questions or comments, please feel free to contact me.

Sincerely,
Novus Environmental Inc.



Aaron Haniff, P.Eng.
Specialist – Acoustics, Noise and Vibration



This page intentionally left blank
for 2-sided printing purposes

Appendix A

This page intentionally left blank
for 2-sided printing purposes

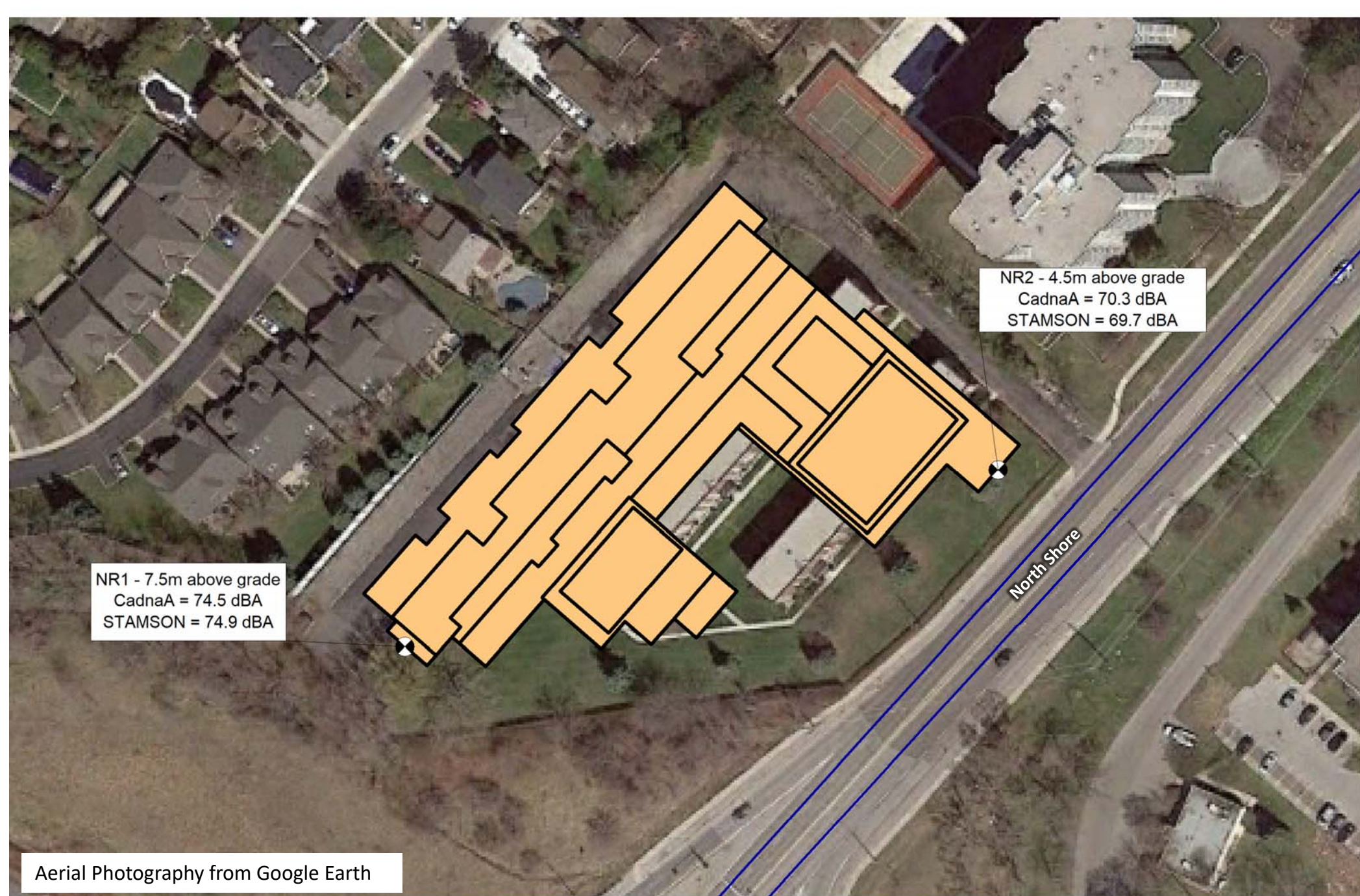


Figure No. **A.1**

Stamson/CandaA Validation Files

1161-1167 North Shore Blvd East Development
Burlington, Ontario



True
North

Scale: 1: 1,000

Date: 18/11/09

File No.: 18-0085

Drawn By: AKH





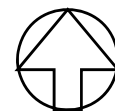
Legend

— Acoustic Barrier

Figure No. **A.2**

Stamson/CandaA Validation Files – Barrier Shown is Not Proposed. For Model Validation only

1161-1167 North Shore Blvd East Development
Burlington, Ontario



True North

Scale: 1: 1,000

Date: 18/11/09

File No.: 18-0085

Drawn By: AKH





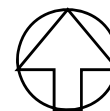
Legend

— Acoustic Barrier

Figure No. **A.3**

Example of Edge of OLA Barrier Used in Feasibility Calculations – For Discussion Purposes

1161-1167 North Shore Blvd East Development
Burlington, Ontario



True
North

Scale: 1: 250

Date: 18/11/09

File No.: 18-0085

Drawn By: AKH





Aerial Photography from Google Earth

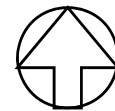
Legend

— Acoustic Barrier

Figure No. **A.4**

Example of Localized Acoustical Screen Used in Feasibility Calculations – For discussion Purposes

1161-1167 North Shore Blvd East Development
Burlington, Ontario



True North

Scale: 1: 250

Date: 18/11/09

File No.: 18-0085

Drawn By: AKH



Filename: NR1_in.txt Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 73084/8120 veh/TimePeriod
Medium truck volume : 2421/269 veh/TimePeriod
Heavy truck volume : 7263/807 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW NB (day/night)

Angle1 Angle2 : -55.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 134.50 / 134.50 m
Receiver height : 7.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 73084/8120 veh/TimePeriod
Medium truck volume : 2421/269 veh/TimePeriod
Heavy truck volume : 7263/807 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: QEW SB (day/night)

Angle1 Angle2 : -55.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 153.70 / 153.70 m
Receiver height : 7.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

NR1_SUM.TXT

↑
Results segment # 1: QEW NB (day)

Source height = 1.72 m

ROAD (0.00 + 72.18 + 0.00) = 72.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	80	0.00	82.96	0.00	-9.53	-1.25	0.00	0.00	0.00	72.18

Segment Leq : 72.18 dBA

↑
Results segment # 2: QEW SB (day)

Source height = 1.72 m

ROAD (0.00 + 71.60 + 0.00) = 71.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	80	0.00	82.96	0.00	-10.11	-1.25	0.00	0.00	0.00	71.60

Segment Leq : 71.60 dBA

Total Leq All Segments: 74.91 dBA

↑
Results segment # 1: QEW NB (night)

Source height = 1.72 m

ROAD (0.00 + 65.65 + 0.00) = 65.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	80	0.00	76.43	0.00	-9.53	-1.25	0.00	0.00	0.00	65.65

Segment Leq : 65.65 dBA

↑
Results segment # 2: QEW SB (night)

NR1_SUM.TXT

Source height = 1.72 m

ROAD (0.00 + 65.07 + 0.00) = 65.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	80	0.00	76.43	0.00	-10.11	-1.25	0.00	0.00	0.00	65.07

Segment Leq : 65.07 dBA

Total Leq All Segments: 68.38 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 74.91

↑

↑

Filename: se.txt Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 12432/1381 veh/TimePeriod
 Medium truck volume : 206/23 veh/TimePeriod
 Heavy truck volume : 180/20 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: NS_EL_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 : 16.40 / 15.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

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

 Car traffic volume : 12141/1349 veh/TimePeriod
 Medium truck volume : 201/22 veh/TimePeriod
 Heavy truck volume : 174/19 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: NS_EL_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 : 24.72 / 15.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

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

Car traffic volume : 3091/8120 veh/TimePeriod
Medium truck volume : 62/269 veh/TimePeriod
Heavy truck volume : 53/807 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: QEW NB (day/night)

Angle1 Angle2 : -50.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 242.70 / 242.70 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 73084/8120 veh/TimePeriod
Medium truck volume : 2421/269 veh/TimePeriod
Heavy truck volume : 7263/807 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: QEW SB (day/night)

Angle1 Angle2 : -50.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 260.90 / 260.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: NS_EL_WB (day)

Source height = 1.09 m

NR2_Sum.TXT

ROAD (0.00 + 65.71 + 0.00) = 65.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.09	0.00	-0.39	0.00	0.00	0.00	0.00	65.71

Segment Leq : 65.71 dBA

↑
Results segment # 2: NS_EL_EB (day)

Source height = 1.09 m

ROAD (0.00 + 63.81 + 0.00) = 63.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.98	0.00	-2.17	0.00	0.00	0.00	0.00	63.81

Segment Leq : 63.81 dBA

↑
Results segment # 3: QEW NB (day)

Source height = 1.13 m

ROAD (0.00 + 41.05 + 0.00) = 41.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	0	0.00	58.70	0.00	-12.09	-5.56	0.00	0.00	0.00	41.05

Segment Leq : 41.05 dBA

↑
Results segment # 4: QEW SB (day)

Source height = 1.72 m

ROAD (0.00 + 64.99 + 0.00) = 64.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	0	0.00	82.96	0.00	-12.40	-5.56	0.00	0.00	0.00	64.99

Segment Leq : 64.99 dBA

Total Leq All Segments: 69.68 dBA

↑
Results segment # 1: NS_EL_WB (night)

Source height = 1.09 m

ROAD (0.00 + 59.56 + 0.00) = 59.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.56	0.00	0.00	0.00	0.00	0.00	0.00	59.56

Segment Leq : 59.56 dBA

↑
Results segment # 2: NS_EL_EB (night)

Source height = 1.08 m

ROAD (0.00 + 59.41 + 0.00) = 59.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.41	0.00	0.00	0.00	0.00	0.00	0.00	59.41

Segment Leq : 59.41 dBA

↑
Results segment # 3: QEW NB (night)

Source height = 1.72 m

ROAD (0.00 + 53.38 + 0.00) = 53.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	0	0.00	71.03	0.00	-12.09	-5.56	0.00	0.00	0.00	53.38

Segment Leq : 53.38 dBA

↑
Results segment # 4: QEW SB (night)

NR2_Sum.TXT

Source height = 1.72 m

ROAD (0.00 + 58.46 + 0.00) = 58.46 dBA

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

-50	0	0.00	76.43	0.00	-12.40	-5.56	0.00	0.00	0.00	58.46
-----	---	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 58.46 dBA

Total Leq All Segments: 64.31 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 69.68

↑

↑

Filename: ola_in.txt Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 12432/1381 veh/TimePeriod
 Medium truck volume : 206/23 veh/TimePeriod
 Heavy truck volume : 180/20 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: NS_EL_WB (day/night)

 Angle1 Angle2 : -30.00 deg 60.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 47.80 / 47.80 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

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

 Car traffic volume : 12141/1349 veh/TimePeriod
 Medium truck volume : 201/22 veh/TimePeriod
 Heavy truck volume : 174/19 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: NS_EL_EB (day/night)

 Angle1 Angle2 : -30.00 deg 60.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 55.30 / 55.30 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

OLA_SUM.TXT

↑
Results segment # 1: NS_EL_WB (day)

Source height = 1.09 m

ROAD (0.00 + 58.05 + 0.00) = 58.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	60	0.00	66.09	0.00	-5.03	-3.01	0.00	0.00	0.00	58.05

Segment Leq : 58.05 dBA

↑
Results segment # 2: NS_EL_EB (day)

Source height = 1.09 m

ROAD (0.00 + 57.30 + 0.00) = 57.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	60	0.00	65.98	0.00	-5.67	-3.01	0.00	0.00	0.00	57.30

Segment Leq : 57.30 dBA

Total Leq All Segments: 60.70 dBA

↑
Results segment # 1: NS_EL_WB (night)

Source height = 1.09 m

ROAD (0.00 + 51.52 + 0.00) = 51.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	60	0.00	59.56	0.00	-5.03	-3.01	0.00	0.00	0.00	51.52

Segment Leq : 51.52 dBA

↑
Results segment # 2: NS_EL_EB (night)

OLA_SUM.TXT

Source height = 1.08 m

ROAD (0.00 + 50.73 + 0.00) = 50.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	60	0.00	59.41	0.00	-5.67	-3.01	0.00	0.00	0.00	50.73

Segment Leq : 50.73 dBA

Total Leq All Segments: 54.15 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 60.70

↑

↑

Filename: OLAM_in.txt Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12432/1391 veh/TimePeriod
Medium truck volume : 206/23 veh/TimePeriod
Heavy truck volume : 180/20 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: NS_EL_WB (day/night)

Angle1 Angle2 : -25.00 deg 60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 47.80 / 47.80 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -25.00 deg Angle2 : 60.00 deg
Barrier height : 2.00 m
Barrier receiver distance : 7.70 / 7.70 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12141/1349 veh/TimePeriod
Medium truck volume : 201/22 veh/TimePeriod
Heavy truck volume : 174/19 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: NS_EL_EB (day/night)

Angle1 Angle2 : -25.00 deg 60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

OLAM_SUM.TXT

Surface : 2 (Reflective ground surface)
 Receiver source distance : 55.30 / 55.30 m
 Receiver height : 1.50 / 4.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -25.00 deg Angle2 : 60.00 deg
 Barrier height : 2.00 m
 Barrier receiver distance : 7.70 / 7.70 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

↑

Results segment # 1: NS_EL_WB (day)

Source height = 1.09 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.09	1.50	1.43	1.43

ROAD (0.00 + 51.76 + 0.00) = 51.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	60	0.00	66.09	0.00	-5.03	-3.26	0.00	0.00	-6.04	51.76

Segment Leq : 51.76 dBA

↑

Results segment # 2: NS_EL_EB (day)

Source height = 1.09 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.09	1.50	1.44	1.44

ROAD (0.00 + 51.06 + 0.00) = 51.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	60	0.00	66.09	0.00	-5.03	-3.26	0.00	0.00	-6.04	51.06

OLAM_SUM.TXT

```
-----
-25    60    0.00  65.98    0.00  -5.67  -3.26    0.00    0.00  -5.99  51.06
-----
```

Segment Leq : 51.06 dBA

Total Leq All Segments: 54.43 dBA

↑
Results segment # 1: NS_EL_WB (night)

Source height = 1.09 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.09 !          4.50 !          3.95 !          3.95
-----
```

ROAD (0.00 + 51.29 + 0.00) = 51.29 dBA

```
-----
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-25    60    0.00  59.58    0.00  -5.03  -3.26    0.00    0.00    0.00  51.29*
-25    60    0.00  59.58    0.00  -5.03  -3.26    0.00    0.00    0.00  51.29
-----
```

* Bright Zone !

Segment Leq : 51.29 dBA

↑
Results segment # 2: NS_EL_EB (night)

Source height = 1.08 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.08 !          4.50 !          4.02 !          4.02
-----
```

ROAD (0.00 + 50.48 + 0.00) = 50.48 dBA

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


OLAM_SUM.TXT

-25	60	0.00	59.41	0.00	-5.67	-3.26	0.00	0.00	0.00	50.48*
-25	60	0.00	59.41	0.00	-5.67	-3.26	0.00	0.00	0.00	50.48

* Bright Zone !

Segment Leq : 50.48 dBA

Total Leq All Segments: 53.91 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 54.43

↑

↑