



Traffic Noise Assessment

**2140 Baseline Road
Ottawa, Ontario**

REPORT: GWE18-047 – Traffic Noise

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EXECUTIVE SUMMARY

This document describes a traffic noise assessment in support of site plan application for a proposed mixed-use development at 2140 Baseline Road in Ottawa, Ontario. The development will contain 11 floors and rise approximately 34 metres above grade. There are no Outdoor Living Areas (OLA) associated with this development. The major sources of traffic noise are due to Baseline Road to the north, Constellation Drive to the east, Gemini Way to the south, and influence from the proposed Bus Rapid Transit (BRT) running along Constellation Drive and west on Baseline Road. Figure 1 illustrates a complete site plan with surrounding context.

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

The results of the current analysis indicate that noise levels will range between 56 and 72 dBA during the daytime period (07:00-23:00) and between 48 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (72 dBA) occurs on the north façade of the development, most exposed to Baseline Road and the BRT. Predicted noise levels due to roadway traffic exceed the criteria listed in Section 4.2 for building components. Therefore, upgraded building components are required where noise levels exceed 65 dBA as shown in Figures 3-4.

In addition to upgraded building components, the development requires central air conditioning with applicable Warning Clauses. If installed, this would allow occupants to keep windows closed to maintain a quiet indoor environment. Additionally, Warning Clauses will be included in all Agreements of Lease, Purchase and Sale as described in Section 6.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by Theberge Homes to undertake a traffic noise assessment in support of site plan application for a proposed mixed-use development at 2140 Baseline Road in Ottawa, Ontario. The development will contain 11 floors and rise approximately 34 metres above grade. This report summarizes the methodology, results, and recommendations related to a traffic noise assessment. GWE's scope of work involved assessing exterior and interior noise levels generated by local roadway traffic. The assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa¹ and Ministry of the Environment and Climate Change (MOECC)² guidelines. Noise calculations were based on architectural drawings received from Fabiani Architect Ltd., with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications, and Bus Rapid Transit (BRT) volumes from previous GWE experience for the Baseline Environmental Assessment project.

2. TERMS OF REFERENCE

The focus of this traffic noise assessment is a proposed mixed-use development at 2140 Baseline Road in Ottawa, Ontario. The development will contain 11 floors and rise approximately 34 metres above grade. The commercial component will be located on the first floor, while residential (student housing) use occupies levels 2-10, and the 11th floor designated for amenity uses. There are no Outdoor Living Areas (OLA) associated with this development. The building planform is L-shaped and oriented along the intersection of Baseline Road and Constellation Drive on the northeast, and Constellation Drive and Gemini Way on the southeast.

The site is surrounded in the immediate vicinity by residential buildings to the north across Baseline Road, commercial use to the east and west, and a park to the south. High-density residential areas are located southwest of the development beyond the medical building west of the development. The major sources of traffic noise are Baseline Road to the north, Constellation Drive to the east, Gemini Way to the south, and influence from the proposed BRT running north along Constellation Drive and then west onto Baseline Road. Figure 1 illustrates a complete site plan with surrounding context.

¹ City of Ottawa Environmental Noise Control Guidelines, January 2016

² Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013
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3. OBJECTIVES

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

4. METHODOLOGY

4.1 Background

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For surface roadway traffic noise, the equivalent sound energy level, L_{eq} , provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 50, 45 and 40 dBA for retail, living rooms and sleeping quarters respectively for roadway as listed in Table 1.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD)³

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

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction⁴. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment⁵. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which normally triggers the need for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, building components will require higher levels of sound attenuation⁶.

4.3 Roadway Noise Assessment

4.3.1 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the MOECC computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

³ Adapted from ENCG 2016 – Tables 2.2b and 2.2c

⁴ Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125

⁵ MOECC, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

⁶ MOECC, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

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- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split was taken to be 92% / 8% respectively for all streets.
- Reflective ground surface between source and receiver.
- Topography assumed to be a flat/gentle slope.
- Receptor height taken to be 1.5 metres at the first floor, and 28.3 metres at the 10th floor based on site plan drawings attached in Appendix A.
- Surrounding buildings ignored as potential noise barriers due to redevelopment potential.
- Proposed building used as a barrier for Receptors 5 and 10, as it acts as a noise screen against Constellation Drive.
- Distance adjustment used for some receivers where source-receiver distances is less than 15 m.
- Noise receptors were strategically placed at 12 locations around the study area (see Figure 2).
- Receptor distances and exposure angles illustrated in Figure 2.
- BRT considered along Constellation Drive to the east, and Baseline Road to the north.

In some cases, source-receiver distances were less than 15 m, which is the minimum distance required for entry in STAMSON. A distance adjustment calculation shown in equation 1 from ORNAMENT was used to calculate the adjustment value, which was added to the calculated noise level from STAMSON⁷. The equation is as follows:

$$\text{Distance Adjustment Value} = 10 (1+\alpha) \log\left(\frac{D_{ref}}{D}\right) \quad (1)$$

Where the parameters are:

- D_{ref} = Distance used in STAMSON, 15 metres
- D = Actual distance of source-receiver
- α = Ground Absorption Factor (Hard Ground = 0, Soft Ground =1)

4.4 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan⁸ which

⁷ ORNAMENT Technical Document, October 1989, Section 4

⁸ City of Ottawa Transportation Master Plan, November 2013

provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. As for the BRT, volumes were based on previous GWE experience for the Baseline Road Environmental Assessment. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway / Transit Class	Speed Limit (km/h)	Traffic Volumes	BRT Volumes
Baseline Road	4-UAD	60	35,000	-
Gemini Way	2-UCU	40	8,000	-
Constellation Drive	2-UCU	50	8,000	-
Bus Rapid Transit	(BRT)	80	-	*347/53

*Daytime and Nighttime volumes based on previous GWE experience for Baseline EA

4.5 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, concrete and masonry walls can achieve STC 50 or more. Curtain wall systems typically provide around STC 35, depending on the glazing elements. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

According to Section 4.2, when daytime noise levels (from road) at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure⁹ considers:

- Window type and total area as a percentage of total room floor area

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

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

Based on published research¹⁰, exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information, available at the time of the study, which was prepared for site plan approval, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels).

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	1.5	POW – 1 st Floor – North Façade	72	64
2	1.5	POW – 1 st Floor – East Façade	*70	*63
3	1.5	POW – 1 st Floor – South Façade	*68	*61
4	1.5	POW – 1 st Floor – Southwest Façade	61	53
5	1.5	POW – 1 st Floor – South Façade	56	49
6	1.5	POW – 1 st Floor – Northwest Façade	69	61
7	28.3	POW – 10 th Floor – North Façade	72	64
8	28.3	POW – 10 th Floor – East Façade	*70	*63

*Distance Adjustment Applied to Receptors as per equation 1

¹⁰ CMHC, Road & Rail Noise: Effects on Housing
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TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC (CONTINUED)

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
9	28.3	POW – 10 th Floor – South Façade	*68	*61
10	28.3	POW – 10 th Floor – Southwest Façade	61	53
11	28.3	POW – 10 th Floor – South Façade	56	49
12	28.3	POW – 10 th Floor – Northwest Façade	69	61

*Distance Adjustment Applied to Receptors as per equation 1

The results of the current analysis indicate that noise levels will range between 56 and 72 dBA during the daytime period (07:00-23:00) and between 48 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (72 dBA) occurs on the north façade of the development, most exposed to Baseline Road and the BRT. Predicted noise levels due to roadway traffic exceed the criteria listed in Section 4.2 for building components. Therefore, upgraded building components are required where noise levels exceed 65 dBA as shown in Figures 3-4. A distance adjustment of 0.3 dBA was applied to Receptors 2 and 8, and 2.20 dBA for Receptors 3 and 9.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.5 the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels). It is recommended detailed STC calculations be performed prior to building permit application for each unit type. The STC requirements for the windows are summarized below for various units within the development (see Figures 3-4):

- **Retail Windows**
 - (i) Retail windows facing North will require a minimum STC of 26
 - (ii) Retail windows facing East will require a minimum STC of 23
 - (iii) All other retail windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Living Room Windows**

- (i) Living room windows facing North will require a minimum STC of 31
- (ii) Living room windows facing West, East, and South will require a minimum STC of 28
- (iii) All other living room windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Bedroom Windows**

- (i) Bedroom windows facing North will require a minimum STC of 36
- (ii) Bedroom windows facing West, East, and South will require a minimum STC of 33
- (iii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Exterior Walls**

- (i) Exterior wall components on the North, East, West, and South façades require a minimum STC of 45 which will be achieved with brick cladding or an acoustical equivalent according to NRC test data¹¹

The STC requirements would apply to windows, doors, spandrel panels and curtain wall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a window / wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. We have specified an example window configuration, however several manufacturers and various combinations of window components, such as those proposed, will offer the necessary sound attenuation rating. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition

¹¹ J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.

to ventilation requirements, Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6 below.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 56 and 72 dBA during the daytime period (07:00-23:00) and between 48 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (72 dBA) occurs on the north façade of the development, most exposed to Baseline Road and the BRT. Predicted noise levels due to roadway traffic exceed the criteria listed in Section 4.2 for building components. Therefore, upgraded building components are required where noise levels exceed 65 dBA as shown in Figures 3-4.

In addition to upgraded building components, ventilation requirements dictate that the development should have central air conditioning. If installed this would allow occupants to keep windows closed to maintain a quiet indoor environment. The following Warning Clause¹² in all Agreements of Lease, Purchase and Sale will be required for these units:

“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 roadway traffic will interfere with some activities as the sound levels exceed the sound level limits of the City and the Ministry of the Environment and Climate Change.

To help address the need for sound attenuation this development has been designed so as to provide an indoor environment that is within provincial guidelines. Measures for sound attenuation include:

- *STC multi-pane glass glazing elements:*
 - *North Façade Retail: STC 26*
 - *East Façade Retail: STC 23*
 - *North Façade Living Room: STC 31*
 - *East, West, and South Façade Living Room: STC 28*
 - *North Façade Bedroom: STC 36*
 - *East, West, and South Façade Bedroom: STC 33*

¹² City of Ottawa, Environmental Noise Control Guidelines, January 2016
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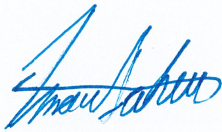
- *STC rated exterior walls*
 - *North, West, East, and south façade: STC 45*

To ensure that provincial sound level limits are not exceeded, this dwelling unit has been designed with central air conditioning. The installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment and Climate Change.”

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

Yours truly,

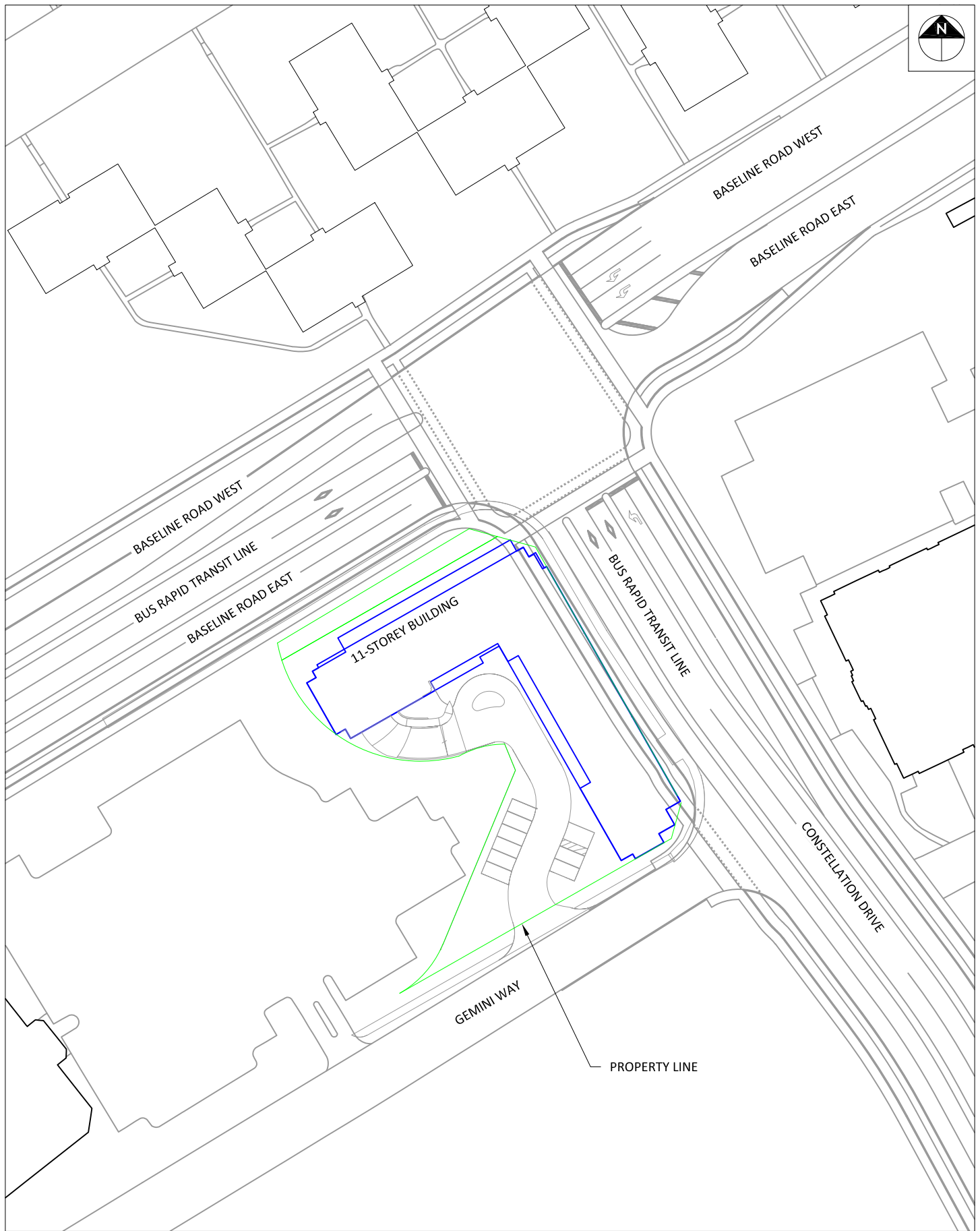
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127 Walgreen Road
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GRADIENT WIND
ENGINEERING INC

PROJECT

2140 BASELINE ROAD - TRAFFIC NOISE ASSESSMENT

SCALE

1:1000 (APPROX)

DRAWING NO.

GWE18-047-1

DATE

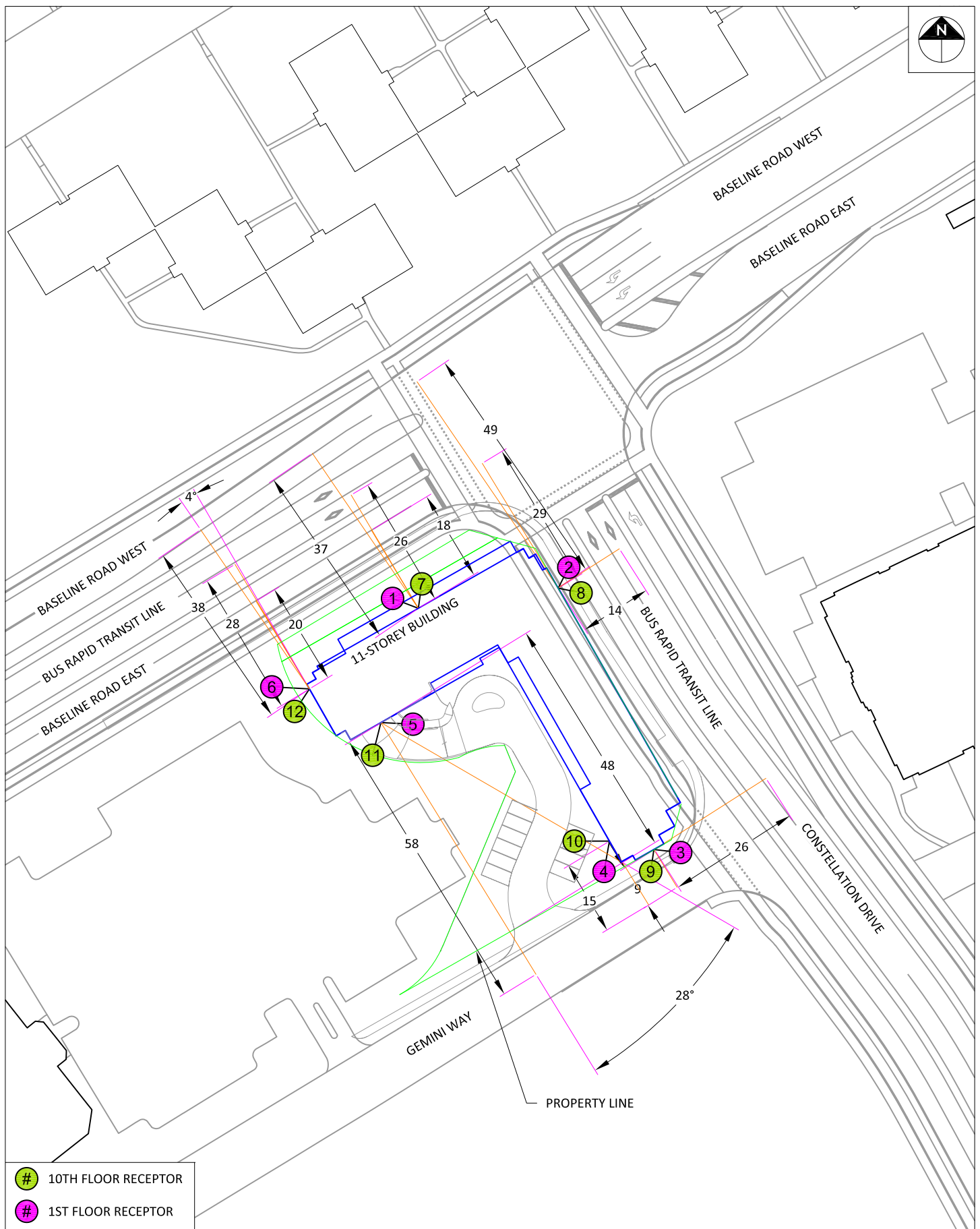
MAY 28, 2018

DRAWN BY

O.D.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



127 Walgreen Road
Ottawa, Ontario
(613) 836 0934

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2140 BASELINE ROAD - TRAFFIC NOISE ASSESSMENT

SCALE

1:1000 (APPROX.)

DRAWING NO.

GWE18-047-2

DATE

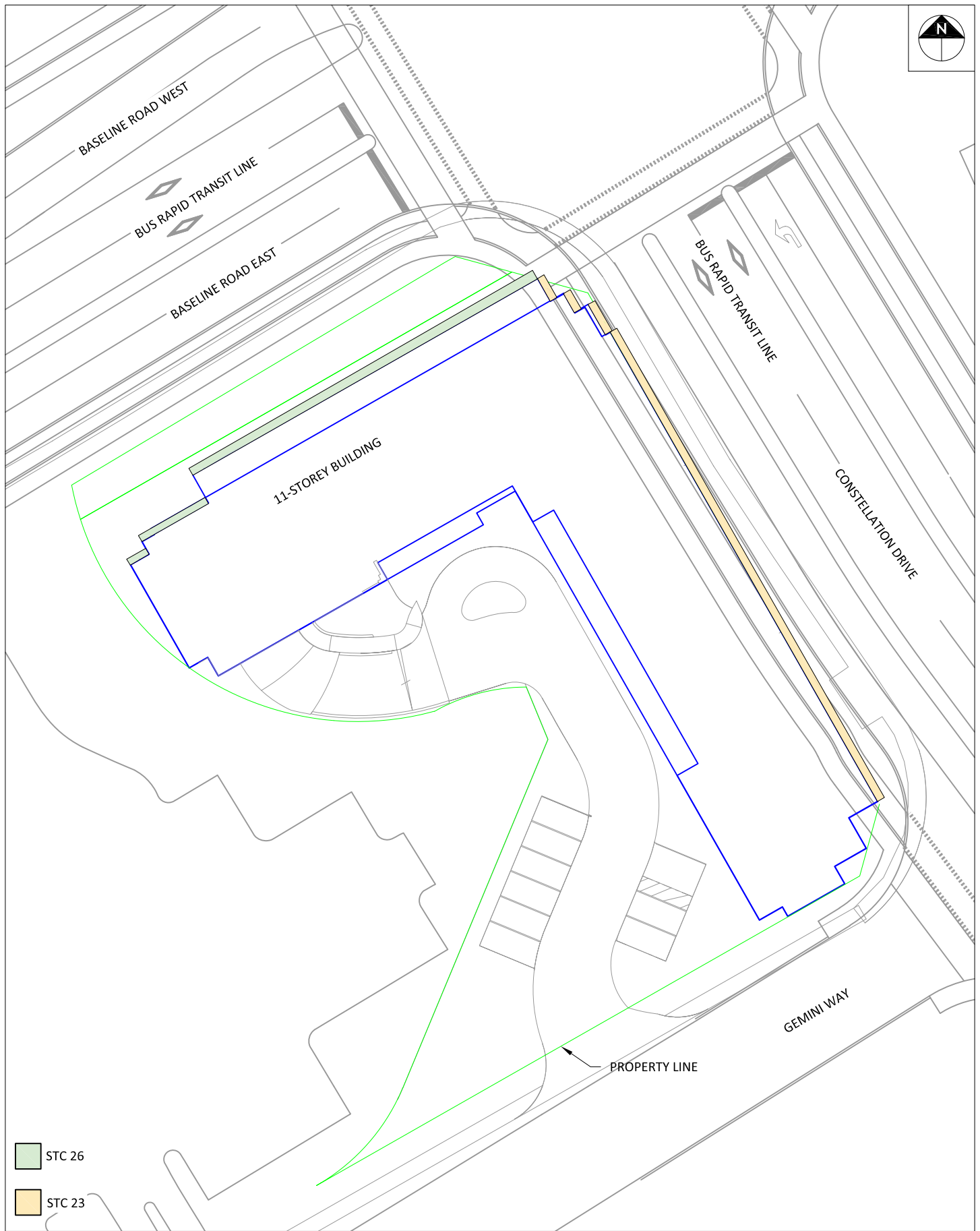
MAY 28, 2018

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DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS, EXPOSURE ANGLES AND
DISTANCES



STC 26

STC 23



127 Walgreen Road
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GRADIENT WIND
ENGINEERING INC

PROJECT

2140 BASELINE ROAD - TRAFFIC NOISE ASSESSMENT

SCALE

1:500 (APPROX.)

DRAWING NO.

GWE18-047-3

DATE

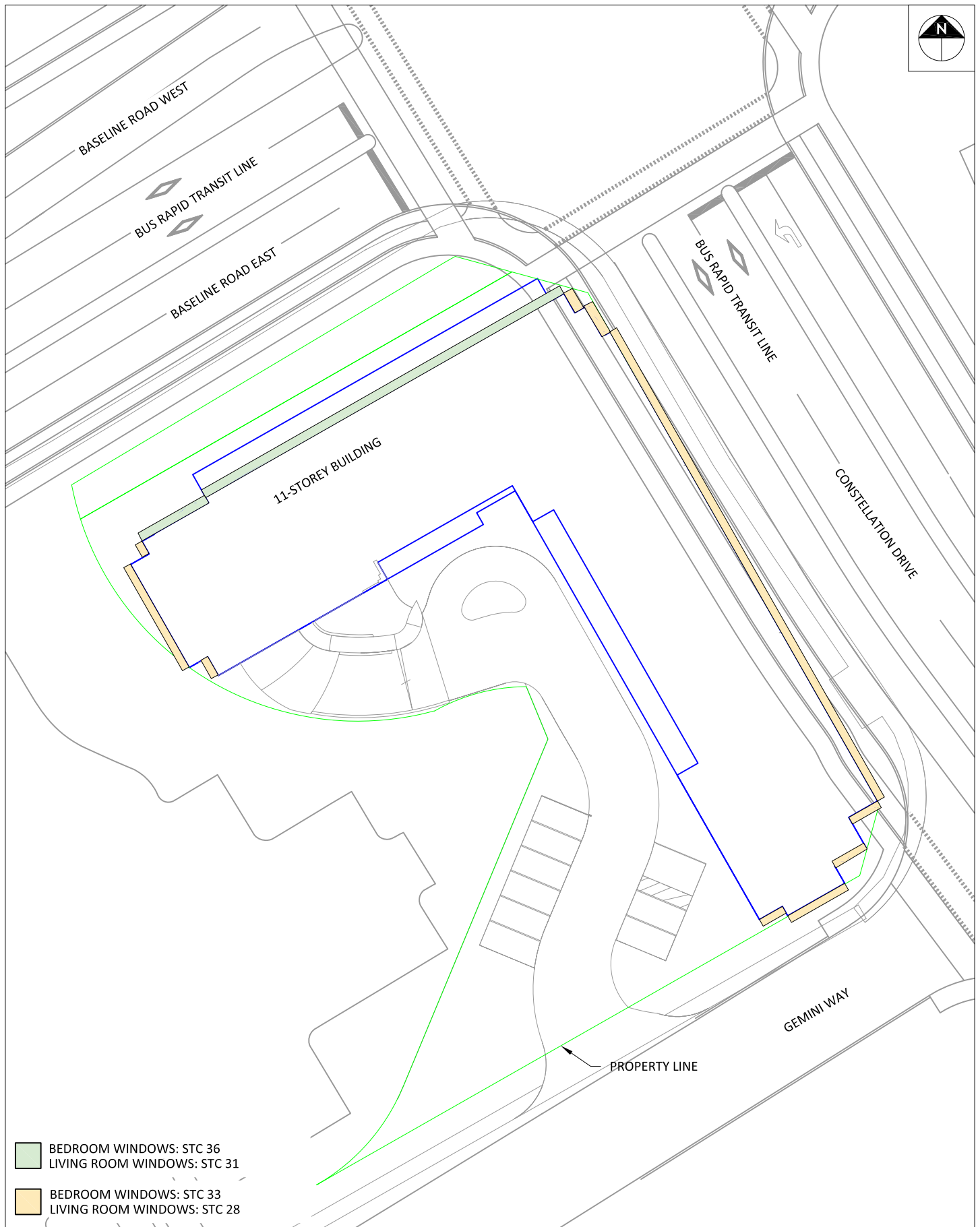
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DESCRIPTION

FIGURE 3:
RETAIL WINDOW STC REQUIREMENTS



127 Walgreen Road
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(613) 836 0934

GRADIENT WIND
ENGINEERING INC

PROJECT

2140 BASELINE ROAD - TRAFFIC NOISE ASSESSMENT

SCALE

1:1000 (APPROX)

DRAWING NO.

GWE18-047-4

DATE

MAY 28, 2018

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DESCRIPTION

FIGURE 4:
BEDROOM/ LIVING ROOM WINDOW STC
REQUIREMENTS

APPENDIX A

STAMSON 5.04 - INPUT AND OUTPUT DATA



STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:01:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Baseline E (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 : 18.00 / 18.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

#

#

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

Car traffic volume	:	14168/1232	veh/TimePeriod	*
Medium truck volume	:	1127/98	veh/TimePeriod	*
Heavy truck volume	:	805/70	veh/TimePeriod	*
Posted speed limit	:	60 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT):	17500
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: Baseline W (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	:	1.50 / 1.50	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

#



Results segment # 1: Baseline E (day)

Source height = 1.50 m

ROAD (0.00 + 69.87 + 0.00) = 69.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.67	0.00	-0.79	0.00	0.00	0.00	0.00	69.87

Segment Leq : 69.87 dBA

Results segment # 2: Baseline W (day)

Source height = 1.50 m

ROAD (0.00 + 66.74 + 0.00) = 66.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.67	0.00	-3.92	0.00	0.00	0.00	0.00	66.74

Segment Leq : 66.74 dBA

Total Leq All Segments: 71.59 dBA

#

#



Results segment # 1: Baseline E (night)

Source height = 1.50 m

ROAD (0.00 + 62.28 + 0.00) = 62.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.07	0.00	-0.79	0.00	0.00	0.00	0.00	62.28

Segment Leq : 62.28 dBA

Results segment # 2: Baseline W (night)

Source height = 1.50 m

ROAD (0.00 + 59.15 + 0.00) = 59.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.07	0.00	-3.92	0.00	0.00	0.00	0.00	59.15

Segment Leq : 59.15 dBA

Total Leq All Segments: 64.00 dBA

#

#

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (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 : 26.00 / 26.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 59.62 + 0.00) = 59.62 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.01	-2.39	0.00	0.00	0.00	0.00	59.62

Segment Leq : 59.62 dBA

Total Leq All Segments: 59.62 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 54.47 + 0.00) = 54.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.86	-2.39	0.00	0.00	0.00	0.00	54.47

Segment Leq : 54.47 dBA

Total Leq All Segments: 54.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.86
(NIGHT): 64.46

#



STAMSON 5.0 NORMAL REPORT Date: 17-04-2018 14:23:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Baseline E (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 29.00 / 29.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

#

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

Car traffic volume	:	14168/1232	veh/TimePeriod	*
Medium truck volume	:	1127/98	veh/TimePeriod	*
Heavy truck volume	:	805/70	veh/TimePeriod	*
Posted speed limit	:	60 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT):	17500
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: Baseline W (day/night)

Angle1	Angle2	:	0.00 deg	90.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	49.00 / 49.00	m	
Receiver height	:	1.50 / 1.50	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

Road data, segment # 3: Const. Drive (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
 Medium truck volume : 515/45 veh/TimePeriod *
 Heavy truck volume : 368/32 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): 8000
 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: Const. Drive (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

#



Results segment # 1: Baseline E (day)

Source height = 1.50 m

ROAD (0.00 + 64.79 + 0.00) = 64.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	70.67	0.00	-2.86	-3.01	0.00	0.00	0.00	64.79

Segment Leq : 64.79 dBA

Results segment # 2: Baseline W (day)

Source height = 1.50 m

ROAD (0.00 + 62.51 + 0.00) = 62.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	70.67	0.00	-5.14	-3.01	0.00	0.00	0.00	62.51

Segment Leq : 62.51 dBA

Results segment # 3: Const. Drive (day)

Source height = 1.50 m

ROAD (0.00 + 65.75 + 0.00) = 65.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.75	0.00	0.00	0.00	0.00	0.00	0.00	65.75

Segment Leq : 65.75 dBA

Total Leq All Segments: 69.32 dBA

#



Results segment # 1: Baseline E (night)

Source height = 1.50 m

ROAD (0.00 + 57.20 + 0.00) = 57.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.07	0.00	-2.86	-3.01	0.00	0.00	0.00	57.20

Segment Leq : 57.20 dBA

Results segment # 2: Baseline W (night)

Source height = 1.50 m

ROAD (0.00 + 54.92 + 0.00) = 54.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.07	0.00	-5.14	-3.01	0.00	0.00	0.00	54.92

Segment Leq : 54.92 dBA

Results segment # 3: Const. Drive (night)

Source height = 1.50 m

ROAD (0.00 + 58.16 + 0.00) = 58.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	58.16	0.00	0.00	0.00	0.00	0.00	0.00	58.16

Segment Leq : 58.16 dBA

Total Leq All Segments: 61.73 dBA

#

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 62.01 + 0.00) = 62.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.01	0.00	0.00	0.00	0.00	0.00	62.01

Segment Leq : 62.01 dBA

Total Leq All Segments: 62.01 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 56.86 + 0.00) = 56.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.86	0.00	0.00	0.00	0.00	0.00	56.86

Segment Leq : 56.86 dBA

Total Leq All Segments: 56.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.06

(NIGHT): 62.96

#

STAMSON 5.0 NORMAL REPORT Date: 17-04-2018 14:23:08
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
-----
Car traffic volume   : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32    veh/TimePeriod  *
Posted speed limit  : 40 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): 8000
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: Gemini Way (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth : 0         (No woods.)
No of house rows : 0 / 0
Surface     : 2         (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 1.50 m
Topography    : 1         (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

Road data, segment # 2: Const. Drive (day/night)

```
-----
Car traffic volume   : 6477/563   veh/TimePeriod  *
Medium truck volume  : 515/45    veh/TimePeriod  *
Heavy truck volume   : 368/32    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): 8000
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: Const. Drive (day/night)

```
-----
Angle1   Angle2      : 0.00 deg  90.00 deg
Wood depth : 0        (No woods.)
No of house rows : 0 / 0
Surface     : 2        (Reflective ground surface)
Receiver source distance : 26.00 / 26.00 m
Receiver height : 1.50 / 1.50 m
Topography    : 1        (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#



Results segment # 1: Gemini Way (day)

Source height = 1.50 m

ROAD (0.00 + 63.96 + 0.00) = 63.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	0.00	0.00	0.00	0.00	0.00	63.96

Segment Leq : 63.96 dBA

Results segment # 2: Const. Drive (day)

Source height = 1.50 m

ROAD (0.00 + 60.35 + 0.00) = 60.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.75	0.00	-2.39	-3.01	0.00	0.00	0.00	60.35

Segment Leq : 60.35 dBA

Total Leq All Segments: 65.53 dBA

#



Results segment # 1: Gemini Way (night)

Source height = 1.50 m

ROAD (0.00 + 56.36 + 0.00) = 56.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	0.00	0.00	0.00	0.00	0.00	56.36

Segment Leq : 56.36 dBA

Results segment # 2: Const. Drive (night)

Source height = 1.50 m

ROAD (0.00 + 52.76 + 0.00) = 52.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	58.16	0.00	-2.39	-3.01	0.00	0.00	0.00	52.76

Segment Leq : 52.76 dBA

Total Leq All Segments: 57.93 dBA

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (day/night)

Angle1	Angle2	:	0.00 deg	90.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	26.00 / 26.00	m	
Receiver height	:	1.50 / 1.50	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#



Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 56.61 + 0.00) = 56.61 dBA

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

0	90	0.00	62.01	-2.39	-3.01	0.00	0.00	0.00	56.61
---	----	------	-------	-------	-------	------	------	------	-------

Segment Leq : 56.61 dBA

Total Leq All Segments: 56.61 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.46 + 0.00) = 51.46 dBA

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

0	90	0.00	56.86	-2.39	-3.01	0.00	0.00	0.00	51.46
---	----	------	-------	-------	-------	------	------	------	-------

Segment Leq : 51.46 dBA

Total Leq All Segments: 51.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.05
(NIGHT): 58.82

#

STAMSON 5.0 NORMAL REPORT Date: 17-04-2018 14:23:14
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
-----
Car traffic volume   : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32    veh/TimePeriod  *
Posted speed limit  : 40 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): 8000
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: Gemini Drive (day/night)

```
-----
Angle1  Angle2      : 0.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 2          (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height     : 1.50 / 1.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
```

#



Results segment # 1: Gemini Drive (day)

Source height = 1.50 m

ROAD (0.00 + 60.95 + 0.00) = 60.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.96	0.00	0.00	-3.01	0.00	0.00	0.00	60.95

Segment Leq : 60.95 dBA

Total Leq All Segments: 60.95 dBA

Results segment # 1: Gemini Drive (night)

Source height = 1.50 m

ROAD (0.00 + 53.35 + 0.00) = 53.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	56.36	0.00	0.00	-3.01	0.00	0.00	0.00	53.35

Segment Leq : 53.35 dBA

Total Leq All Segments: 53.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.95
(NIGHT): 53.35

#

Results segment # 1: Gemini Drive (day)

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	1.50	1.50

ROAD (0.00 + 34.05 + 56.25) = 56.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	63.96	0.00	-5.87	-4.63	0.00	0.00	-19.40	34.05
-28	90	0.00	63.96	0.00	-5.87	-1.83	0.00	0.00	0.00	56.25

Segment Leq : 56.27 dBA

Total Leq All Segments: 56.27 dBA



Results segment # 1: Gemini Drive (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	!
		1.50	!
			1.50

ROAD (0.00 + 26.46 + 48.66) = 48.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	56.36	0.00	-5.87	-4.63	0.00	0.00	-19.40	26.46
-28	90	0.00	56.36	0.00	-5.87	-1.83	0.00	0.00	0.00	48.66

Segment Leq : 48.68 dBA

Total Leq All Segments: 48.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.27
(NIGHT): 48.68

#

STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:13:59
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

 Car traffic volume : 14168/1232 veh/TimePeriod *
 Medium truck volume : 1127/98 veh/TimePeriod *
 Heavy truck volume : 805/70 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
 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: Baseline E (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 20.00 / 20.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

#

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

Car traffic volume	:	14168/1232	veh/TimePeriod	*
Medium truck volume	:	1127/98	veh/TimePeriod	*
Heavy truck volume	:	805/70	veh/TimePeriod	*
Posted speed limit	:	60 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT):	17500
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: Baseline W (day/night)

Angle1	Angle2	:	-90.00 deg	4.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	38.00 / 38.00	m	
Receiver height	:	1.50 / 1.50	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

#



Results segment # 1: Baseline E (day)

Source height = 1.50 m

ROAD (0.00 + 66.41 + 0.00) = 66.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	70.67	0.00	-1.25	-3.01	0.00	0.00	0.00	66.41

Segment Leq : 66.41 dBA

Results segment # 2: Baseline W (day)

Source height = 1.50 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	4	0.00	70.67	0.00	-4.04	-2.82	0.00	0.00	0.00	63.81

Segment Leq : 63.81 dBA

Total Leq All Segments: 68.31 dBA

#

#



Results segment # 1: Baseline E (night)

Source height = 1.50 m

ROAD (0.00 + 58.81 + 0.00) = 58.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	63.07	0.00	-1.25	-3.01	0.00	0.00	0.00	58.81

Segment Leq : 58.81 dBA

Results segment # 2: Baseline W (night)

Source height = 1.50 m

ROAD (0.00 + 56.21 + 0.00) = 56.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	4	0.00	63.07	0.00	-4.04	-2.82	0.00	0.00	0.00	56.21

Segment Leq : 56.21 dBA

Total Leq All Segments: 60.71 dBA

#

#

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (day/night)

Angle1 Angle2 : -90.00 deg 0.00 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 : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 56.29 + 0.00) = 56.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	62.01	-2.71	-3.01	0.00	0.00	0.00	56.29

Segment Leq : 56.29 dBA

Total Leq All Segments: 56.29 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.14 + 0.00) = 51.14 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	56.86	-2.71	-3.01	0.00	0.00	0.00	51.14

Segment Leq : 51.14 dBA

Total Leq All Segments: 51.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.58
(NIGHT): 61.17

#



STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:04:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Baseline E (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 : 18.00 / 18.00 m
Receiver height : 28.30 / 28.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

#

#

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

Car traffic volume	:	14168/1232	veh/TimePeriod	*
Medium truck volume	:	1127/98	veh/TimePeriod	*
Heavy truck volume	:	805/70	veh/TimePeriod	*
Posted speed limit	:	60 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT):	17500
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: Baseline W (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	:	28.30 / 28.30	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

#



Results segment # 1: Baseline E (day)

Source height = 1.50 m

ROAD (0.00 + 69.87 + 0.00) = 69.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.67	0.00	-0.79	0.00	0.00	0.00	0.00	69.87

Segment Leq : 69.87 dBA

Results segment # 2: Baseline W (day)

Source height = 1.50 m

ROAD (0.00 + 66.74 + 0.00) = 66.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.67	0.00	-3.92	0.00	0.00	0.00	0.00	66.74

Segment Leq : 66.74 dBA

Total Leq All Segments: 71.59 dBA

#

#



Results segment # 1: Baseline E (night)

Source height = 1.50 m

ROAD (0.00 + 62.28 + 0.00) = 62.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.07	0.00	-0.79	0.00	0.00	0.00	0.00	62.28

Segment Leq : 62.28 dBA

Results segment # 2: Baseline W (night)

Source height = 1.50 m

ROAD (0.00 + 59.15 + 0.00) = 59.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.07	0.00	-3.92	0.00	0.00	0.00	0.00	59.15

Segment Leq : 59.15 dBA

Total Leq All Segments: 64.00 dBA

#

#

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (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 : 26.00 / 26.00 m
Receiver height : 28.30 / 28.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 59.62 + 0.00) = 59.62 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.01	-2.39	0.00	0.00	0.00	0.00	59.62

Segment Leq : 59.62 dBA

Total Leq All Segments: 59.62 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 54.47 + 0.00) = 54.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.86	-2.39	0.00	0.00	0.00	0.00	54.47

Segment Leq : 54.47 dBA

Total Leq All Segments: 54.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.86
(NIGHT): 64.46

#

STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:04:56
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
-----
Car traffic volume   : 14168/1232   veh/TimePeriod   *
Medium truck volume : 1127/98      veh/TimePeriod   *
Heavy truck volume  : 805/70       veh/TimePeriod   *
Posted speed limit  : 60 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 17500
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: Baseline E (day/night)

```
-----
Angle1   Angle2       : 0.00 deg   90.00 deg
Wood depth : 0         (No woods.)
No of house rows : 0 / 0
Surface     : 2         (Reflective ground surface)
Receiver source distance : 29.00 / 29.00 m
Receiver height : 28.30 / 28.30 m
Topography    : 1         (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

#

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

Car traffic volume	:	14168/1232	veh/TimePeriod	*
Medium truck volume	:	1127/98	veh/TimePeriod	*
Heavy truck volume	:	805/70	veh/TimePeriod	*
Posted speed limit	:	60 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT):	17500
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: Baseline W (day/night)

Angle1	Angle2	:	0.00 deg	90.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	49.00 / 49.00	m	
Receiver height	:	28.30 / 28.30	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

#

Road data, segment # 3: Const. Drive (day/night)

```
-----
Car traffic volume   : 6477/563   veh/TimePeriod  *
Medium truck volume  : 515/45    veh/TimePeriod  *
Heavy truck volume   : 368/32    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): 8000
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: Const. Drive (day/night)

```
-----
Angle1  Angle2      : -90.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 2          (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height      : 28.30 / 28.30 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle      : 0.00
```

#

#



Results segment # 1: Baseline E (day)

Source height = 1.50 m

ROAD (0.00 + 64.79 + 0.00) = 64.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	70.67	0.00	-2.86	-3.01	0.00	0.00	0.00	64.79

Segment Leq : 64.79 dBA

Results segment # 2: Baseline W (day)

Source height = 1.50 m

ROAD (0.00 + 62.51 + 0.00) = 62.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	70.67	0.00	-5.14	-3.01	0.00	0.00	0.00	62.51

Segment Leq : 62.51 dBA

#

#



Results segment # 3: Const. Drive (day)

Source height = 1.50 m

ROAD (0.00 + 65.75 + 0.00) = 65.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.75	0.00	0.00	0.00	0.00	0.00	0.00	65.75

Segment Leq : 65.75 dBA

Total Leq All Segments: 69.32 dBA

Results segment # 1: Baseline E (night)

Source height = 1.50 m

ROAD (0.00 + 57.20 + 0.00) = 57.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.07	0.00	-2.86	-3.01	0.00	0.00	0.00	57.20

Segment Leq : 57.20 dBA

#

#



Results segment # 2: Baseline W (night)

Source height = 1.50 m

ROAD (0.00 + 54.92 + 0.00) = 54.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.07	0.00	-5.14	-3.01	0.00	0.00	0.00	54.92

Segment Leq : 54.92 dBA

Results segment # 3: Const. Drive (night)

Source height = 1.50 m

ROAD (0.00 + 58.16 + 0.00) = 58.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	58.16	0.00	0.00	0.00	0.00	0.00	0.00	58.16

Segment Leq : 58.16 dBA

Total Leq All Segments: 61.73 dBA

#

#

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 28.30 / 28.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 62.01 + 0.00) = 62.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.01	0.00	0.00	0.00	0.00	0.00	62.01

Segment Leq : 62.01 dBA

Total Leq All Segments: 62.01 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 56.86 + 0.00) = 56.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.86	0.00	0.00	0.00	0.00	0.00	56.86

Segment Leq : 56.86 dBA

Total Leq All Segments: 56.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.06
(NIGHT): 62.96

#

STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:05:49
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

 Car traffic volume : 6477/563 veh/TimePeriod *
 Medium truck volume : 515/45 veh/TimePeriod *
 Heavy truck volume : 368/32 veh/TimePeriod *
 Posted speed limit : 40 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): 8000
 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: Gemini Way (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 28.30 / 28.30 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

#

#

Road data, segment # 2: Const. Drive (day/night)

```
-----
Car traffic volume   : 6477/563   veh/TimePeriod  *
Medium truck volume  : 515/45    veh/TimePeriod  *
Heavy truck volume   : 368/32    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): 8000
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: Const. Drive (day/night)

```
-----
Angle1 Angle2       : 0.00 deg 90.00 deg
Wood depth           : 0 (No woods.)
No of house rows     : 0 / 0
Surface              : 2 (Reflective ground surface)
Receiver source distance : 26.00 / 26.00 m
Receiver height      : 28.30 / 28.30 m
Topography           : 1 (Flat/gentle slope; no barrier)
Reference angle      : 0.00
```

Results segment # 1: Gemini Way (day)

Source height = 1.50 m

ROAD (0.00 + 63.96 + 0.00) = 63.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	0.00	0.00	0.00	0.00	0.00	63.96

Segment Leq : 63.96 dBA

#



Results segment # 2: Const. Drive (day)

Source height = 1.50 m

ROAD (0.00 + 60.35 + 0.00) = 60.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.75	0.00	-2.39	-3.01	0.00	0.00	0.00	60.35

Segment Leq : 60.35 dBA

Total Leq All Segments: 65.53 dBA

Results segment # 1: Gemini Way (night)

Source height = 1.50 m

ROAD (0.00 + 56.36 + 0.00) = 56.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	0.00	0.00	0.00	0.00	0.00	56.36

Segment Leq : 56.36 dBA

#

#



Results segment # 2: Const. Drive (night)

Source height = 1.50 m

ROAD (0.00 + 52.76 + 0.00) = 52.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	58.16	0.00	-2.39	-3.01	0.00	0.00	0.00	52.76

Segment Leq : 52.76 dBA

Total Leq All Segments: 57.93 dBA

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod

Speed : 80 km/h

Data for Segment # 1: OC Transpo (day/night)

Angle1	Angle2	:	0.00 deg	90.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	26.00 / 26.00	m	
Receiver height	:	28.30 / 28.30	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

#



Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 56.61 + 0.00) = 56.61 dBA

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

0	90	0.00	62.01	-2.39	-3.01	0.00	0.00	0.00	56.61
---	----	------	-------	-------	-------	------	------	------	-------

Segment Leq : 56.61 dBA

Total Leq All Segments: 56.61 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.46 + 0.00) = 51.46 dBA

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

0	90	0.00	56.86	-2.39	-3.01	0.00	0.00	0.00	51.46
---	----	------	-------	-------	-------	------	------	------	-------

Segment Leq : 51.46 dBA

Total Leq All Segments: 51.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.05
(NIGHT): 58.82

#

STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:06:48
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
-----
Car traffic volume   : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32    veh/TimePeriod  *
Posted speed limit  : 40 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): 8000
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: Gemini Drive (day/night)

```
-----
Angle1  Angle2      : 0.00 deg  90.00 deg
Wood depth      : 0          (No woods.)
No of house rows : 0 / 0
Surface         : 2          (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height  : 28.30 / 28.30 m
Topography       : 1          (Flat/gentle slope; no barrier)
Reference angle   : 0.00
```

#

#



Results segment # 1: Gemini Drive (day)

Source height = 1.50 m

ROAD (0.00 + 60.95 + 0.00) = 60.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.96	0.00	0.00	-3.01	0.00	0.00	0.00	60.95

Segment Leq : 60.95 dBA

Total Leq All Segments: 60.95 dBA

Results segment # 1: Gemini Drive (night)

Source height = 1.50 m

ROAD (0.00 + 53.35 + 0.00) = 53.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	56.36	0.00	0.00	-3.01	0.00	0.00	0.00	53.35

Segment Leq : 53.35 dBA

Total Leq All Segments: 53.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.95
(NIGHT): 53.35

#

Results segment # 1: Gemini Drive (day)

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	28.30	6.12	6.12

ROAD (0.00 + 34.53 + 56.25) = 56.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	63.96	0.00	-5.87	-4.63	0.00	0.00	-18.93	34.53
-28	90	0.00	63.96	0.00	-5.87	-1.83	0.00	0.00	0.00	56.25

Segment Leq : 56.28 dBA

Total Leq All Segments: 56.28 dBA

#



Results segment # 1: Gemini Drive (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	28.30	6.12	6.12

ROAD (0.00 + 26.93 + 48.66) = 48.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	56.36	0.00	-5.87	-4.63	0.00	0.00	-18.93	26.93
-28	90	0.00	56.36	0.00	-5.87	-1.83	0.00	0.00	0.00	48.66

Segment Leq : 48.68 dBA

Total Leq All Segments: 48.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.28
(NIGHT): 48.68

#



STAMSON 5.0 NORMAL REPORT Date: 25-05-2018 13:08:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Baseline E (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 28.30 / 28.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

#

#

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

Car traffic volume	:	14168/1232	veh/TimePeriod	*
Medium truck volume	:	1127/98	veh/TimePeriod	*
Heavy truck volume	:	805/70	veh/TimePeriod	*
Posted speed limit	:	60 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

24 hr Traffic Volume (AADT or SADT):	17500
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: Baseline W (day/night)

Angle1	Angle2	:	-90.00 deg	4.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	38.00 / 38.00	m	
Receiver height	:	28.30 / 28.30	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

#

#



Results segment # 1: Baseline E (day)

Source height = 1.50 m

ROAD (0.00 + 66.41 + 0.00) = 66.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	70.67	0.00	-1.25	-3.01	0.00	0.00	0.00	66.41

Segment Leq : 66.41 dBA

Results segment # 2: Baseline W (day)

Source height = 1.50 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	4	0.00	70.67	0.00	-4.04	-2.82	0.00	0.00	0.00	63.81

Segment Leq : 63.81 dBA

Total Leq All Segments: 68.31 dBA

#

#



Results segment # 1: Baseline E (night)

Source height = 1.50 m

ROAD (0.00 + 58.81 + 0.00) = 58.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	63.07	0.00	-1.25	-3.01	0.00	0.00	0.00	58.81

Segment Leq : 58.81 dBA

Results segment # 2: Baseline W (night)

Source height = 1.50 m

ROAD (0.00 + 56.21 + 0.00) = 56.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	4	0.00	63.07	0.00	-4.04	-2.82	0.00	0.00	0.00	56.21

Segment Leq : 56.21 dBA

Total Leq All Segments: 60.71 dBA

#

#

RT/Custom data, segment # 1: OC Transpo (day/night)

1 - Bus:

Traffic volume : 347/53 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: OC Transpo (day/night)

Angle1 Angle2 : -90.00 deg 0.00 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 : 28.30 / 28.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OC Transpo (day)

Source height = 0.50 m

RT/Custom (0.00 + 56.29 + 0.00) = 56.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	62.01	-2.71	-3.01	0.00	0.00	0.00	56.29

Segment Leq : 56.29 dBA

Total Leq All Segments: 56.29 dBA

Results segment # 1: OC Transpo (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.14 + 0.00) = 51.14 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	56.86	-2.71	-3.01	0.00	0.00	0.00	51.14

Segment Leq : 51.14 dBA

Total Leq All Segments: 51.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.58
(NIGHT): 61.17



1 NORTH ELEVATION @ BASELINE RD
1 : 200

EXTERIOR ELEVATION LEGEND

- 100 ALUMINUM PANEL (COLOUR: RED/ORANGE & WOOD GRAIN TEXTURE)
- 101 ALUMINUM PANEL (COLOUR: DARK GREY)
- 102 ALUMINUM PANEL (COLOUR: LIGHT GREY)
- 110 MANGANESE IRONSPOT BRICK (COLOUR: DARK GREY, MATCH EIFS)
- 115 PREFAB. PANELIZED EXTERIOR INSULATED FINISH SYSTEM (EIFS)(COLOUR: DARK GREY)
- 116 PREFAB. PANELIZED EXTERIOR INSULATED FINISH SYSTEM (EIFS)(COLOUR: GREY)
- 120 ALUMINUM WINDOW (COLOUR: CLEAR ANODIZED)
- 121 ALUMINUM WINDOW WALL (COLOUR: CLEAR ANODIZED)
- 122 ALUMINUM WINDOW WALL (COLOUR: LIGHT GREY)
- 123 ALUMINUM WINDOW WALL (COLOUR: DARK GREY)
- 125 GLAZING - VISION GLASS (COLOUR: CLEAR)

GLAZING AREAS

CATEGORY	AREAS (m²)				TOTAL
	N	E	W	S	
WINDOW	163.8	257.4	320.6	196.6	938.4
WINDOW WALL - CLEAR GLAZING	363	488.8	369.4	465.3	1686.5
WINDOW WALL - SPANDREL	287.7	424.3	273	228.5	1213.5
STOREFRONT	107.6	153	136.3	100.2	497.1
TOTAL	922.1	1323.5	1099.3	990.6	4335.5



2 EAST ELEVATION @ CONSTELLATION DR
1 : 200

NOT ISSUED FOR
CONSTRUCTION

DRAFT

1 ML SITE PLAN APPROVAL 25MAY18

No. BY DESCRIPTION DDDMMYY

Revision / Issue Schedule

DO NOT SCALE DRAWINGS. USE ONLY DRAWINGS MARKED "ISSUED FOR CONSTRUCTION". VERIFY CONFIGURATIONS & DIMENSIONS ON SITE BEFORE BEGINNING WORK. NOTIFY ARCHITECT IMMEDIATELY OF ANY ERRORS, OMISSIONS OR DISCREPANCIES.

DEVELOPMENT CONSULTANT:
1282 CORNWALL RD.
OAKVILLE, ONTARIO L6J 7W4
API
ARCHITECTURE & PLANNING INITIATIVES

ARCHITECT:
1282 CORNWALL RD.
OAKVILLE, ONTARIO L6J 7W4
FABIANI
ARCHITECT LTD.

CLIENT:
Baseline Constellation Partnership Inc.
Theberge Homes
904 Lady Ellen Place
Ottawa, ON K1Z 5L5
Mastercraft Starwood
115 Champagne Avenue South
Ottawa, Ontario K1S 5V5 Canada
THEBERGE HOMES
MASTERCRAFT STARWOOD
BUILDERS SINCE 1984

N
PROFESSIONAL CERTIFICATION

PROJECT
OTTAWA STUDENT RESIDENCE

2140 Baseline Rd, Nepean
(Ottawa) ON, K2G 6E2

DRAWING TITLE
EXTERIOR ELEVATIONS

BY MLZK | FF CHECK ISSUED FOR
PROJECT NO. 18-012 SHEET NO. 1
SCALE: As Indicated
ISSUE DATE: 25MAY18
A301
1 SHEET REVISION

PLOT DATE: 2018-05-23 12:08:01 PM

DRAWING LOCATION: C:\Users\staramovic\Desktop\18-012 OttawaSR\18 ML 180322.rvt