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## Environmental Noise Control Study

Proposed Multi-Storey Building  
384 Frank Street - Ottawa

Prepared For

384 Frank Street Ltd.

### Paterson Group Inc.

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March 1, 2018

Report: PG4335-1

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## 1.0 Introduction

Paterson Group (Paterson) was commissioned by 384 Frank Street Ltd. to conduct an environmental noise control study for the proposed residential building to be located at 384 Frank Street, in the City of Ottawa.

The objective of the current study is to:

- ❑ Determine the primary noise sources impacting the site and compare the projected sound levels to guidelines set out by the Ministry of Environment and Climate Change (MOECC) and the City of Ottawa.
- ❑ Review the projected noise levels and offer recommendations regarding warning classes, construction materials or alternative sound barriers.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes acoustical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

This study has been conducted according to City of Ottawa document - Engineering Noise Control Guidelines (ENCG), dated January 2016, and the Ontario Ministry of the Environment Guideline NPC-300.

## 2.0 Background

It is understood that the proposed development will consist of two (2) storey residential building consisting of two units. It is understood that there will be a grassed area to the rear of the dwelling and landscaped and parking areas at the front of the dwelling.

### 3.0 Methodology and Noise Assessment Criteria

The City of Ottawa outlines three (3) sources of environmental noise that must be analyzed separately:

- ☐ Surface Transportation Noise
- ☐ Stationary Noise
  - ☐ new noise-sensitive development applications (noise receptors) in proximity to existing or approved stationary sources of noise, and
  - ☐ new stationary sources of noise (noise generating) in proximity to existing or approved noise-sensitive developments
- ☐ Aircraft noise

#### Surface Transportation Noise

The City of Ottawa's Official Plan, in addition to the ENCG dictate that the influence area must contain any of following conditions to classify as a surface transportation noise source for a subject site:

- ☐ Within 100 m of the right-of-way of an existing or proposed arterial, collector or major collector road; a light rail transit corridor; bus rapid transit, or transit priority corridor
- ☐ Within 250 m of the right-of-way for an existing or proposed highway or secondary rail line
- ☐ Within 300 m from the right of way of a proposed or existing rail corridor or a secondary main railway line
- ☐ Within 500 m of an existing 400 series provincial highway, freeway or principle main railway line.

The NPC-300 outlines the limitations of the stationary and environmental noise levels in relation to the location of the receptors. These can be found in the following tables:

Table 1 - Sound Level Limits for Outdoor Living Areas	
Time Period	Required $L_{eq(16)}$ (dBA)
16-hour, 7:00-23:00	55
<input type="checkbox"/> Standards taken from Table 2.2a; Sound Level Limit for Outdoor Living Areas - Road and Rail	

<b>Table 2 - Sound Level Limits for Indoor Living Area</b>			
<b>Type of Space</b>	<b>Time Period</b>	<b>Required <math>L_{eq}</math> (dBA)</b>	
		<b>Road</b>	<b>Rail</b>
Living/Dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc	7:00-23:00	45	40
Theaters, place of worship, libraries, individual or semi-private offices, conference rooms, reading rooms	23:00-7:00	45	40
Sleeping quarters	7:00-23:00	45	40
	23:00-7:00	40	35
<input type="checkbox"/> Standards taken from Table 2.2b; Sound Level Limit for Indoor Living Areas - Road and Rail			

If the sound level limits are exceeded at the window panes for the indoor living areas, the following Warning Clauses may be referenced:

<b>Table 3 - Warning Clauses for Sound Level Exceedances</b>	
<b>Warning Clause</b>	<b>Description</b>
Warning Clause Type A	"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally 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."
Warning Clause Type B	"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air 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."
Warning Clause Type C	"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."
Warning Clause Type D	"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."
<input type="checkbox"/> Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines - NPC-300	

## Stationary Noise

Stationary noise sources include sources or facilities that are fixed or mobile and can cause a combination of sound and vibration levels emitted beyond the property line. These sources may include commercial air conditioner units, generators and fans. Facilities that may contribute to stationary noise may include car washes, snow disposal sites, transit stations and manufacturing facilities.

The impact of stationary noise sources are directly related to the location of the subject site within the urban environment. The proposed development can be classified as Class 2 by provincial guidelines and outlined in the ENGCG, meaning “a suburban areas of the City outside of the busy core where the urban hum is evident but within the urban boundary.”

Table 4 - Guidelines for Stationary Noise - Class 2		
Time of Day	Outdoor Point of Reception	Pane of Window
7:00-19:00	50	50
19:00-23:00	45	50
23:00-7:00	-	45
<input type="checkbox"/> Standards taken from Table 3.2a; Guidelines for Stationary Noise - Steady and Varying Sound		

## Aircraft/Airport Noise

Aircraft noise is distinct, as it is typically low frequency for longer durations. The sound level may also differ between different types of aircraft. Due to the location of the subject site, an analysis of aircraft/airport noise is not required.

## 4.0 Analysis

The proposed development is bordered to the northwest by Frank Street, and to the northeast, southwest and southeast by residential buildings. Bank Street and Gladstone Avenue are located within the 100 m buffer zone, to the west and south of the subject site. The Provincial Highway 417 was located within the 500 m buffer zone, south of the subject site.

Based on the City of Ottawa Official Plan, Schedule F, Bank Street is classified as a 2 lane urban arterial road (2-UAU), and Gladstone Avenue is classified as a 2 lane major collector (2-UMCU). The remainder of the roads within the 100 m radius include Frank Street, Waverley Street, Florence Street and McLeod Street. However, Schedule F does not classify these roads as either an arterial, collector or major collector road. The provincial Highway 417 is classified as a freeway and both the eastbound and westbound directions are within the 500 m buffer zone. All noise sources are presented on Paterson Drawing PG4335-1 - Site Plan, located in Appendix 1.

There are no stationary noise sources or aircraft noise within the influence area for this subject site.

The noise levels from road traffic are provided by the City of Ottawa, taking into consideration the right-of-way width and the implied roadway class. It is understood that these values represent the maximum allowable capacity of the proposed roadways. The parameters to be used for sound level predictions can be found below.

<b>Table 5 - Traffic and Road Parameters</b>						
<b>Road</b>	<b>Implied Roadway</b>	<b>AADT (Veh/day)</b>	<b>Posted Speed (km/h)</b>	<b>Day/Night Split %</b>	<b>Medium Truck %</b>	<b>Heavy Truck %</b>
Bank Street	2-UAU	15,000	50	92/8	7	5
Gladstone Avenue	2-UMCU	12,000	50	92/8	7	5
Highway 417 - West	Freeway	54,999	100	92/8	7	5
Highway 417 - East	Freeway	54,999	100	92/8	7	5
<input type="checkbox"/> Data obtained from the City of Ottawa document ENCG						

There were several reception points that were considered for a thorough analysis of the proposed residential development. A roof-top patio was identified for the proposed building. This was analyzed as an Outdoor Living Areas (OLA). This point was analyzed utilizing the proposed building as a sound barrier that terminates 1.5 m below the point to be analyzed.

Additional reception points were selected at the bedroom windows at different elevations. For this analysis, a reception point was taken at the centre of the window pane, at the ground level and at the second floor. Reception points are noted on Paterson Drawing PG4335-2 - Receptor Locations, located in Appendix 1.

Table 9 - Summary of Reception Points and Geometry, located in Appendix 1, provides a summary of the points of reception and their geometry with respect to the noise sources. The analysis is completed so that no effects of sound reflection off of the building facade is considered, as stipulated by the ENG C.

The subject site is relatively flat and at grade with the neighbouring roads with the 100 m radius. An elevation difference of approximately 2 m was noted between the Highway 417 and the subject site. However, due to the slight change in elevation over the 300-400 m distance, the elevation change was determined to be relatively insignificant. Therefore, the analysis was performed assuming no change in elevation.

The analysis was completed using STAMSON version 5.04, a computer program which uses the road and rail traffic noise prediction methods using ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) and STEAM (Sound from Trains Environment Analysis Method), publications from the Ontario Ministry of Environment and Energy.

## 5.0 Results

The primary descriptors are the 16-hour daytime and the 8-hour night time equivalent sound levels,  $L_{eq(16)}$  and the  $L_{eq(8)}$  for City roads.

The proposed traffic noise levels were analyzed at all reception points. The results of the STAMSON software can be located in Appendix 2, and the summary of the results can be noted in Table 6.

<b>Table 6 - Proposed Noise Levels</b>				
<b>Reception Point</b>	<b>Description</b>	<b>Outdoor Area <math>L_{EQ(16)}</math> (dBA)</b>	<b>Daytime at Facade <math>L_{EQ(16)}</math> (dBA)</b>	<b>Nighttime at Facade <math>L_{eq(8)}</math> (dBA)</b>
REC 1-5	Western Elevation, 5th Floor	--	64.63	57.79
REC 1-9	Western Elevation, 9th Floor	--	66.60	60.14
REC 2-1	Southern Elevation, 1st Floor	--	48.37	48.08
REC 2-5	Southern Elevation, 5th Floor	--	67.22	60.46
REC 2-9	Southern Elevation, 9th Floor	--	67.84	61.90
REC 3-1	Eastern Elevation, 1st Floor	--	42.53	44.68
REC 3-5	Eastern Elevation, 5th Floor	--	60.20	54.49
REC 3-9	Eastern Elevation, 9th Floor	--	61.41	56.88
REC 4-1	Northern Elevation, 1st Floor	--	40.51	32.91
REC 4-5	Northern Elevation, 5th Floor	--	50.13	42.53
REC 4-9	Northern Elevation, 9th Floor	--	61.11	53.53
REC 5-9	Roof Top Patio	53.01	--	--

## 6.0 Discussion and Recommendations

### 6.1 Outdoor Living Areas

The roof top patio was analyzed as an outdoor living area. This location was completed utilizing the proposed building as a sound barrier that terminates 1.5 m below the reception point. The results of the STAMSON modeling indicates that the maximum  $L_{eq(16)}$  from all sources will be 53.01 dBA. This value is below the 55 dBA that was specified in Table 1, and therefore no additional noise attenuation measures are required.

### 6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modelling indicates that the  $L_{eq(16)}$  ranges between 67.80 dBA and 40.51 dBA. The values of the first floor do not exceed the limit of 55 dBA and therefore will not require any warning clauses. However, the remainder of the floors will require the applicable warning clauses summarized in Table 7.

<b>Table 7 - Summary of Warning Clauses</b>		
<b>Elevation</b>	<b>Applicable Warning Clause</b>	<b>Additional Considerations</b>
Western Elevation Floors 2-9	Warning Clause Type D	All units must be equipped with a central air conditioning system, reducing the need to open windows.
Southern Elevation Floors 2-9	Warning Clause Type D	All units must be equipped with a central air conditioning system, reducing the need to open windows.
Eastern Elevation Floors 2-9	Warning Clause Type C	All units must be equipped with a central air conditioning system, reducing the need to open windows.
Northern Elevation Floors 9	Warning Clause Type C	All units must be equipped with a central air conditioning system, reducing the need to open windows.



## 6.3 Noise Control Measures for Surface Transportation Noise

### Outdoor Living Area

No additional sound mitigation measures are required.

### Indoor Living Area

Where the daytime sound level at the window pane exceeds 55 dBA, noise control measures should be implemented. The following table outlines the MOECC recommended options for sound mitigation and the respected responses.

<b>Table 8 - Indoor Living Area Noise Mitigation Solutions</b>	
<b>MOECC Recommended Option</b>	<b>Site Specific Response</b>
Distance set back with soft ground.	The proposed development configuration limits the actual maximum set back distance. An additional set back is not feasible.
Insertion of noise insensitive land uses between the source and sensitive receptor.	Not applicable to this development.
Orientation of buildings to provide sheltered zones or modified interior spaces (room and corridor arrangement) and amenity areas	There is a possibility that living areas and bedrooms will face the noise source.
Enhanced construction techniques and construction quality (e.g. brick veneers, multi-pane windows).	Construction techniques and building materials are to be analyzed to confirm sufficient soundproofing.
Earth berms (sound barriers).	Not required
Indoor isolation - air conditioning and ventilation, enhanced dampening materials (indoor isolation)	Not required

## Proposed Construction Specifications

It is understood that typical window and wall details are proposed for the residential buildings. The effectiveness of the noise insulation can be expressed as the Acoustical Insulation Factor (AIF), calculated as follows:

$$AIF = L_{eq(16)(Exterior)} - L_{eq(16)(Interior)} + 10 \log_{10}(N) + 2 \text{ dBA}$$

Where:

$L_{eq(16)(Exterior)}$  = Calculated value at the window pane  
 $L_{eq(16)(Interior)}$  = 45 dBA  
N = number of components in the room

No floor plans or detailed design drawings were provided for this portion of the review. A conservative approach is to assume that there are 2 components per room. Therefore, the AIF would need to be at least 17 dBA.

A conversion from AIF to a Standard Transmission Class (STC) rating will require the knowledge of room dimensions in addition to the wall and window dimensions. However, a conservative approach would be to increase the AIF factor by 3. Therefore, provided the building materials of either the windows and/or exterior walls have an STC rating of 31 or higher, this would be a sufficient noise attenuation device.

While no construction drawings were provided to Paterson, a break down of the wall construction was forwarded through e-mail. The e-mail is enclosed in Appendix 3. It is understood that the exterior cladding will consist of either a brick veneer on the lower levels and cement and metal paneling on the upper levels.

Brick veneer has an STC rating of 53 dBA or greater depending on how the wall is designed. Additionally, cement panels and metal cladding is similar to stucco, which has an STC rating of 46 dBA or greater, depending on how the wall is designed. Based on the preliminary data provided, the design of the exterior walls is considered acceptable to reduce the noise to a level of 45 dBA within the residential units.

The window schedule was not provided to Paterson. It is understood that the windows will consist of double/equal panels with low "E" argon. In order to achieve an STC value of 35, the windows consist of double glazing, with a glass thickness of at least 6 mm, with an air space of 13 mm. Provided the proposed windows are double glazed and consist of the aforementioned specifications, the STC value will be greater than 31 required and will be considered acceptable.

## 7.0 Conclusion

The subject site is located at 384 Frank Street. It is understood that the development will consist of single nine-storey building with a roof top patio. The associated analysis identified three noise sources: Bank Street, Gladstone Avenue and Provincial Highway 417.

Several reception points were selected for the analysis, consisting of glass pane reception points on both the first, fifth and ninth floors. A roof top patio was identified as an outdoor living area and is included in the analysis.

All elevations above the first level exceeded the 55 dBA guideline specified by the ENCG. Therefore, a warning clause will be required for these units.

A review of the building materials will be required in order to ensure that the sound dampening will be sufficient to minimize the noise within the individual units. At the time of writing this report, the construction materials were not known. Paterson will require that the construction details be reviewed in order to ensure that proper soundproofing is provided. A STC rating of 31 or higher will be required for the wall and window construction.

## 8.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. Our recommendations should be reviewed when the project drawings and specifications are complete.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than the Casarock Developments Inc or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

### Paterson Group Inc.

Stephanie A. Boisvenue, P.Eng.

David J. Gilbert, P.Eng.



### Report Distribution:

- ☐ 384 Frank Street Limited (3 copies)
- ☐ Paterson Group (1 copy)

# **APPENDIX 1**

## **TABLE 9 - SUMMARY OF RECEPTION POINTS AND GEOMETRY**

### **DRAWING PG4335-1 - SITE PLAN**

#### **DRAWING PG4335-1A - SITE GEOMETRY (REC 1-5, REC 1-9)**

#### **DRAWING PG4335-1B - SITE GEOMETRY (REC 2-1, REC 2-5, REC 2-9)**

#### **DRAWING PG4335-1C - SITE GEOMETRY (REC 3-1, REC 3-5, REC 3-9)**

#### **DRAWING PG4335-1D - SITE GEOMETRY (REC 4-1, REC 4-5, REC 4-9)**

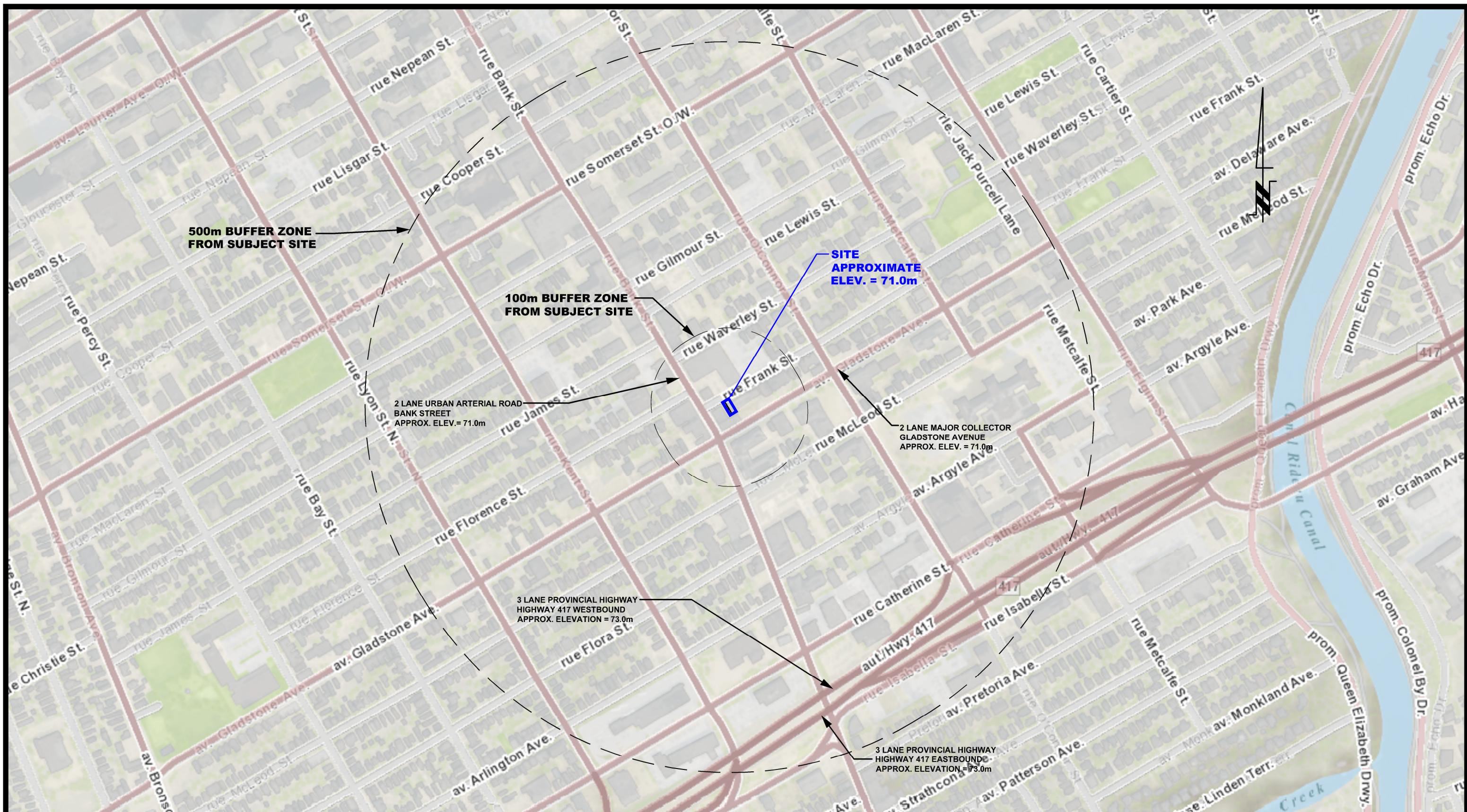
#### **DRAWING PG4335-1E - SITE GEOMETRY (REC 5-9)**

### **DRAWING PG4335-2 - RECEPTOR LOCATIONS**

Table 9a - Summary of Reception Points and Geometry 384 Frank Street														
Point of Reception	Location	Leq Day (dBA)	Bank Street						Gladstone Avenue					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Barrier Height (m)	Distance (m)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Barrier Height (m)	Distance (m)
REC 1-5	Western Elevation, 5th Floor	64.63	25	14.5	28.9	-35, 71	8	4	20	14.5	24.7	0, 68	8	10
REC 1-9	Western Elevation, 9th Floor	66.6	25	26.77	36.6	-35, 71	8	4	20	26.77	33.4	0, 68	8	10
REC 2-1	Southern Elevation, 1st Floor	48.37	33	1.5	33	-58, 0	8	8	15	1.5	15.1	-81.5, -62	n/a	n/a
												-62, 75	8	3
REC 2-5	Southern Elevation, 5th Floor	67.22	33	14.5	36	-58,0	8	8	15	14.5	20.9	-81.5, -62	n/a	n/a
												-62, 75	8	3
REC 2-9	Southern Elevation, 9th Floor	67.84	33	26.77	42.5	-58, 0	8	8	15	26.77	30.7	-81.5, -62	n/a	n/a
												-62, 75	8	3
REC 3-1	Eastern Elevation, 1st Floor	42.53	n/a	n/a	n/a	n/a	n/a	n/a	27	1.5	27	-75, -26.5	8	3
												-26.5, 0	n/a	n/a
REC 3-5	Eastern Elevation, 5th Floor	60.2	n/a	n/a	n/a	n/a	n/a	n/a	27	14.5	30.6	-75, -26.5	8	3
												-26.5, 0	n/a	n/a
REC 3-9	Eastern Elevation, 9th Floor	61.41	n/a	n/a	n/a	n/a	n/a	n/a	27	26.77	38	-75, -26.5	8	3
												-26.5, 0	n/a	n/a
REC 4-1	Northern Elevation, 1st Floor	40.51	30	1.5	30	0, 66	20	8	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-5	Northern Elevation, 5th Floor	50.13	30	14.5	33.3	0, 66	20	8	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-9	Northern Elevation, 9th Floor	61.11	30	26.77	40.2	0, 66	20	8	n/a	n/a	n/a	n/a	n/a	n/a
REC 5-9	Roof Top Patio	53.01	35	30	46.1	-66, 69	28.5	10	25	30	39.1	-74, 76	28.5	10

Table 9b - Summary of Reception Points and Geometry 384 Frank Street														
Point of Reception	Location	Leq Day (dBA)	Highway 417 - Westbound						Highway 417 - Eastbound					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Rows of House	Density (%)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Rows of House	Density (%)
REC 1-5	Western Elevation, 5th Floor	64.63	440	14.5	440.2	0, 32.5	6	90	400	14.5	400.3	0, 37	6	90
REC 1-9	Western Elevation, 9th Floor	66.6	440	26.77	440.8	0, 32.5	6	90	400	26.77	400.9	0, 37	6	90
REC 2-1	Southern Elevation, 1st Floor	48.37	440	1.5	440	-34, 33	6	90	400	1.5	400	-38, 37.5	6	90
REC 2-5	Southern Elevation, 5th Floor	67.22	440	14.5	440.2	-34, 33	6	90	400	14.5	400.3	-38, 37.5	6	90
REC 2-9	Southern Elevation, 9th Floor	67.84	440	26.77	440.8	-34, 33	6	90	400	26.77	400.9	-38, 37.5	6	90
REC 3-1	Eastern Elevation, 1st Floor	42.53	440	1.5	440	-34.5, 0	6	90	400	1.5	400	-37, 0	6	90
REC 3-5	Eastern Elevation, 5th Floor	60.2	440	14.5	440.2	-34.5, 0	6	90	400	14.5	400.3	-37, 0	6	90
REC 3-9	Eastern Elevation, 9th Floor	61.41	440	26.77	440.8	-34.5, 0	6	90	400	26.77	400.9	-37, 0	6	90
REC 4-1	Northern Elevation, 1st Floor	40.51	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-5	Northern Elevation, 5th Floor	50.13	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-9	Northern Elevation, 9th Floor	61.11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 5-9	Roof Top Patio	53.01	440	30	441	-34, 34	6	90	400	30	401.1	-37, 38	6	90





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NO.	REVISIONS	DATE	INITIAL

**384 FRANK STREET LIMITED**  
**NOISE ATTENUATION STUDY**  
**PROPOSED MULTI-STOREY BUILDING - 384 FRANK STREET**

**OTTAWA,**  
Title:

## SITE PLAN

**ONTARIO**

Scale:	1:5000
Drawn by:	RCG
Checked by:	SB
Approved by:	DJG

Date:	01/2018
Report No.:	PG4335-2
Dwg. No.:	<b>PG4335-1</b>
Revision No.:	0









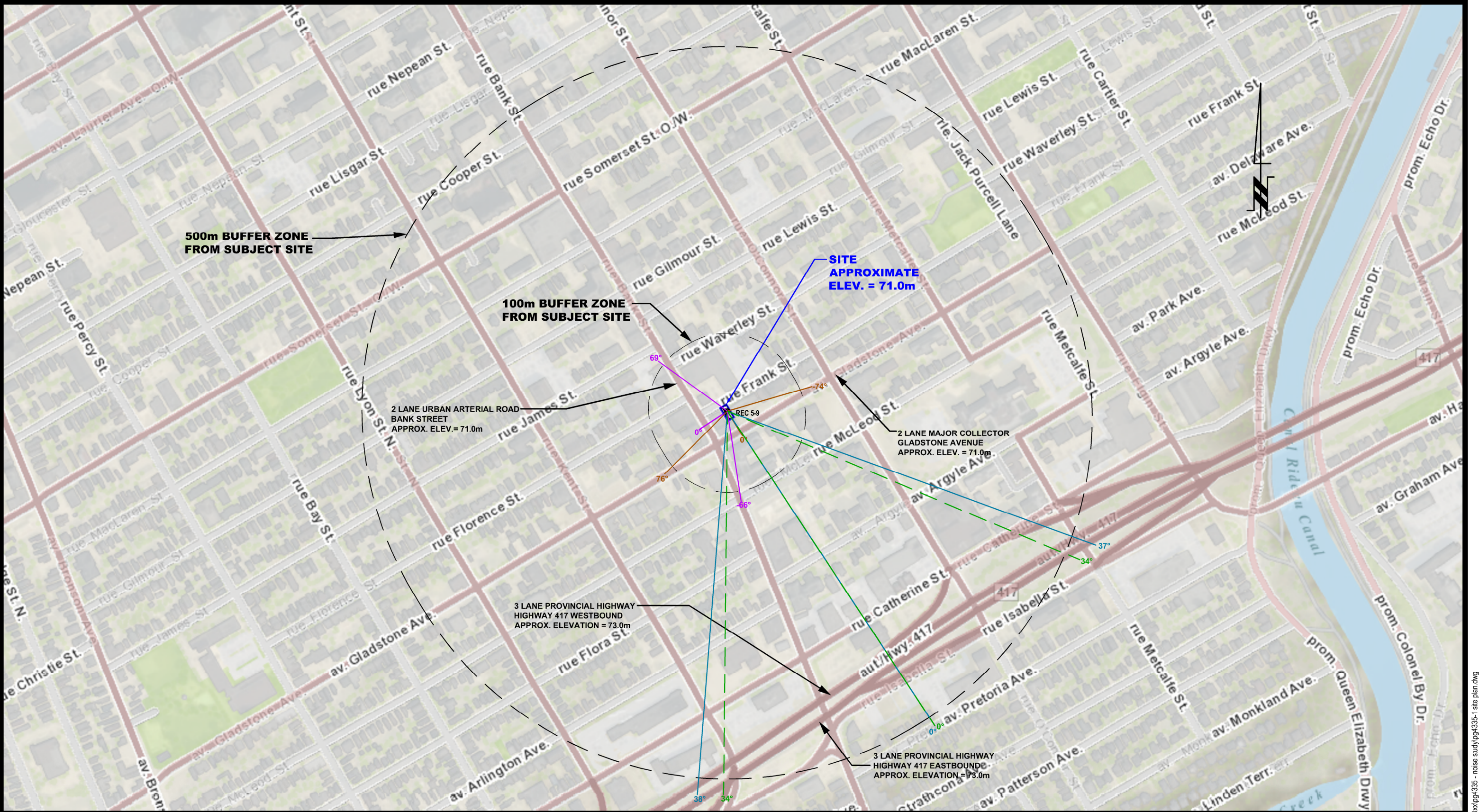












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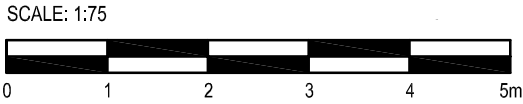
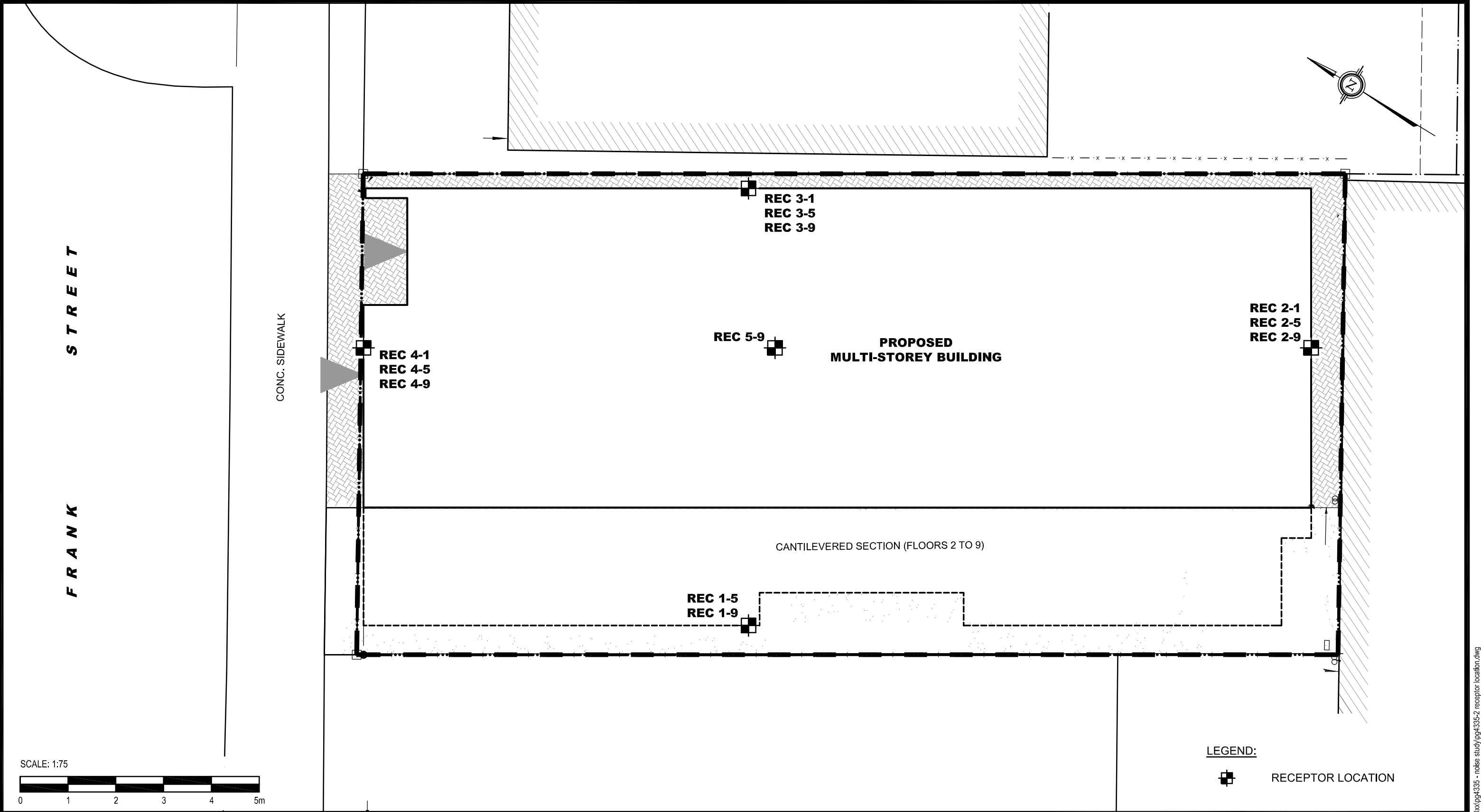
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Tel: (613) 226-7381 Fax: (613) 226-6344

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NO.	REVISIONS	DATE	INITIAL

384 FRANK STREET LIMITED	
NOISE ATTENUATION STUDY	
PROPOSED MULTI-STOREY BUILDING - 384 FRANK STREET	
OTTAWA,	ONTARIO
Title:	
SITE GEOMETRY (REC 5-9)	

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Checked by:	SB	Dwg. No.:	PG4335-1E
Approved by:	DJG	Revision No.:	0





LEGEND:

 RECEPTOR LOCATION

<div><div>patersongroup</div><div>consulting engineers</div><div>154 Colonnade Road South Ottawa, Ontario K2E 7J5 Tel: (613) 226-7381 Fax: (613) 226-6344</div></div>					384 FRANK STREET LTD. NOISE ATTENUATION STUDY PROPOSED MULTI-STOREY BUILDING - 384 FRANK STREET OTTAWA, ONTARIO		Scale:	1:75	Date:	11/2017
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							Checked by:	SB	Dwg. No.:	PG4335-2
							Approved by:	DJG	Revision No.:	
	0				RECEPTOR LOCATION PLAN					
NO.	REVISIONS		DATE	INITIAL						

# **APPENDIX 2**

## **STAMSON RESULTS**

Filename: rec15.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 1-5

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

-----  
 Angle1    Angle2 : -71.00 deg    53.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 25.00 / 25.00 m  
 Receiver height : 14.50 / 14.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -71.00 deg    Angle2 : 53.00 deg  
 Barrier height : 8.00 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: Gladstone (day/night)

-----  
 Car traffic volume : 9715/845 veh/TimePeriod \*  
 Medium truck volume : 773/67 veh/TimePeriod \*  
 Heavy truck volume : 552/48 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): 12000  
 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: Gladstone (day/night)



REC15.TXT

Angle1	Angle2	:	0.00 deg	68.00 deg
Wood depth		:	0	(No woods.)
No of house rows		:	0 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	20.00 / 20.00 m	
Receiver height		:	14.50 / 14.50 m	
Topography		:	2	(Flat/gentle slope; with barrier)
Barrier angle1		:	0.00 deg	Angle2 : 68.00 deg
Barrier height		:	8.00 m	
Barrier receiver distance		:	10.00 / 10.00 m	
Source elevation		:	0.00 m	
Receiver elevation		:	0.00 m	
Barrier elevation		:	0.00 m	
Reference angle		:	0.00	

♀

Road data, segment # 3: Hwy 417 W (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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: Hwy 417 W (day/night)

Angle1	Angle2	:	0.00 deg	32.50 deg
Wood depth		:	0	(No woods.)
No of house rows		:	6 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	440.00 / 440.00 m	
Receiver height		:	14.50 / 14.50 m	
Topography		:	1	(Flat/gentle slope; no barrier)
Reference angle		:	0.00	

♀

Road data, segment # 4: Hwy 417 E (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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

REC15.TXT

Data for Segment # 4: Hwy 417 E (day/night)

```

-----
Angle1   Angle2       :    0.00 deg    37.00 deg
Wood depth :          0      (No woods.)
No of house rows :        6 / 0
Surface :          1      (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height :    14.50 / 14.50 m
Topography :          1      (Flat/gentle slope; no barrier)
Reference angle :     0.00

```

♀  
Results segment # 1: Bank (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----
1.50 !    14.50 !    12.42 !    12.42

```

ROAD (0.00 + 63.76 + 0.00) = 63.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	53	0.00	68.48	0.00	-2.22	-1.62	0.00	0.00	0.00	64.64*
-71	53	0.27	68.48	0.00	-2.82	-1.90	0.00	0.00	0.00	63.76

\* Bright Zone !

Segment Leq : 63.76 dBA

♀  
Results segment # 2: Gladstone (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----
1.50 !    14.50 !     8.00 !     8.00

```

ROAD (0.00 + 57.03 + 0.00) = 57.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	68	0.00	67.51	0.00	-1.25	-4.23	0.00	0.00	-5.00	57.03

Segment Leq : 57.03 dBA

♀  
Results segment # 3: Hwy 417 W (day)

Source height = 1.50 m

## REC15.TXT

ROAD (0.00 + 40.29 + 0.00) = 40.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	32	0.27	80.15	0.00	-18.64	-7.50	0.00	-13.72	0.00	40.29

Segment Leq : 40.29 dBA

♀

Results segment # 4: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 41.25 + 0.00) = 41.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	37	0.27	80.15	0.00	-18.11	-6.96	0.00	-13.83	0.00	41.25

Segment Leq : 41.25 dBA

Total Leq All Segments: 64.63 dBA

♀

Results segment # 1: Bank (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	14.50	12.42	12.42

ROAD (0.00 + 56.17 + 0.00) = 56.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	53	0.00	60.88	0.00	-2.22	-1.62	0.00	0.00	0.00	57.05*
-71	53	0.27	60.88	0.00	-2.82	-1.90	0.00	0.00	0.00	56.17

\* Bright Zone !

Segment Leq : 56.17 dBA

♀

Results segment # 2: Gladstone (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	14.50	8.00	8.00

ROAD (0.00 + 49.43 + 0.00) = 49.43 dBA

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

## REC15.TXT

0	68	0.00	59.91	0.00	-1.25	-4.23	0.00	0.00	-5.00	49.43
---	----	------	-------	------	-------	-------	------	------	-------	-------

Segment Leq : 49.43 dBA

Results segment # 3: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 46.41 + 0.00) = 46.41 dBA										
Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	32	0.27	72.55	0.00	-18.64	-7.50	0.00	0.00	0.00	46.41

Segment Leq : 46.41 dBA

Results segment # 4: Hwy 417 E (night)

Source height = 1.50 m

ROAD (0.00 + 47.48 + 0.00) = 47.48 dBA										
Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	37	0.27	72.55	0.00	-18.11	-6.96	0.00	0.00	0.00	47.48

Segment Leq : 47.48 dBA

Total Leq All Segments: 57.79 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.63  
(NIGHT): 57.79

Filename: rec19.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 1-9

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

-----  
 Angle1    Angle2 : -71.00 deg    53.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 25.00 / 25.00 m  
 Receiver height : 26.77 / 26.77 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -71.00 deg    Angle2 : 53.00 deg  
 Barrier height : 8.00 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: Gladstone (day/night)

-----  
 Car traffic volume : 9715/845 veh/TimePeriod \*  
 Medium truck volume : 773/67 veh/TimePeriod \*  
 Heavy truck volume : 552/48 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): 12000  
 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: Gladstone (day/night)

REC19.TXT

Angle1	Angle2	:	0.00 deg	68.00 deg
Wood depth		:	0	(No woods.)
No of house rows		:	0 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	20.00 / 20.00 m	
Receiver height		:	26.77 / 26.77 m	
Topography		:	2	(Flat/gentle slope; with barrier)
Barrier angle1		:	0.00 deg	Angle2 : 68.00 deg
Barrier height		:	8.00 m	
Barrier receiver distance		:	10.00 / 10.00 m	
Source elevation		:	0.00 m	
Receiver elevation		:	0.00 m	
Barrier elevation		:	0.00 m	
Reference angle		:	0.00	

♀

Road data, segment # 3: Hwy 417 W (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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: Hwy 417 W (day/night)

Angle1	Angle2	:	0.00 deg	32.50 deg
Wood depth		:	0	(No woods.)
No of house rows		:	6 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	440.00 / 440.00 m	
Receiver height		:	26.77 / 26.77 m	
Topography		:	1	(Flat/gentle slope; no barrier)
Reference angle		:	0.00	

♀

Road data, segment # 4: Hwy 417 E (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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

## REC19.TXT

Data for Segment # 4: Hwy 417 E (day/night)

```

-----
Angle1   Angle2       :    0.00 deg    37.00 deg
Wood depth :          0      (No woods.)
No of house rows :        6 / 0
Surface :          1      (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height :    26.77 / 26.77 m
Topography :          1      (Flat/gentle slope; no barrier)
Reference angle :    0.00

```

♀

Results segment # 1: Bank (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.50 !    26.77 !    22.73 !    22.73

```

ROAD (0.00 + 64.64 + 0.00) = 64.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	53	0.00	68.48	0.00	-2.22	-1.62	0.00	0.00	0.00	64.64*
-71	53	0.00	68.48	0.00	-2.22	-1.62	0.00	0.00	0.00	64.64

\* Bright Zone !

Segment Leq : 64.64 dBA

♀

Results segment # 2: Gladstone (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.50 !    26.77 !    14.13 !    14.13

```

ROAD (0.00 + 62.03 + 0.00) = 62.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	68	0.00	67.51	0.00	-1.25	-4.23	0.00	0.00	0.00	62.03*
0	68	0.00	67.51	0.00	-1.25	-4.23	0.00	0.00	0.00	62.03

\* Bright Zone !

Segment Leq : 62.03 dBA

♀

Results segment # 3: Hwy 417 W (day)

REC19.TXT

Source height = 1.50 m

ROAD (0.00 + 44.32 + 0.00) = 44.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	32	0.00	80.15	0.00	-14.67	-7.43	0.00	-13.72	0.00	44.32

Segment Leq : 44.32 dBA

♀

Results segment # 4: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 45.18 + 0.00) = 45.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	37	0.00	80.15	0.00	-14.26	-6.87	0.00	-13.83	0.00	45.18

Segment Leq : 45.18 dBA

Total Leq All Segments: 66.60 dBA

♀

Results segment # 1: Bank (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	26.77	22.73	22.73

ROAD (0.00 + 57.05 + 0.00) = 57.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	53	0.00	60.88	0.00	-2.22	-1.62	0.00	0.00	0.00	57.05*
-71	53	0.00	60.88	0.00	-2.22	-1.62	0.00	0.00	0.00	57.05

\* Bright Zone !

Segment Leq : 57.05 dBA

♀

Results segment # 2: Gladstone (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	26.77	14.13	14.13



REC19.TXT

ROAD (0.00 + 54.43 + 0.00) = 54.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	68	0.00	59.91	0.00	-1.25	-4.23	0.00	0.00	0.00	54.43*
0	68	0.00	59.91	0.00	-1.25	-4.23	0.00	0.00	0.00	54.43

\* Bright Zone !

Segment Leq : 54.43 dBA

♀

Results segment # 3: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 50.44 + 0.00) = 50.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	32	0.00	72.55	0.00	-14.67	-7.43	0.00	0.00	0.00	50.44

Segment Leq : 50.44 dBA

♀

Results segment # 4: Hwy 417 E (night)

Source height = 1.50 m

ROAD (0.00 + 51.42 + 0.00) = 51.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	37	0.00	72.55	0.00	-14.26	-6.87	0.00	0.00	0.00	51.42

Segment Leq : 51.42 dBA

Total Leq All Segments: 60.14 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 66.60  
(NIGHT): 60.14

♀

♀

Filename: rec21.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 2-1

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

-----  
 Angle1 Angle2 : -58.00 deg 0.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 33.00 / 33.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -58.00 deg Angle2 : 0.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 8.00 / 8.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 9715/845 veh/TimePeriod \*  
 Medium truck volume : 773/67 veh/TimePeriod \*  
 Heavy truck volume : 552/48 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): 12000  
 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: Gladstone (day/night)

REC21.TXT

Angle1	Angle2	:	-82.00 deg	75.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	1	(Absorptive ground surface)	
Receiver source distance	:	15.00 / 15.00	m	
Receiver height	:	1.50 / 1.50	m	
Topography	:	2	(Flat/gentle slope; with barrier)	
Barrier angle1	:	-82.00 deg	Angle2 :	75.00 deg
Barrier height	:	8.00	m	
Barrier receiver distance	:	3.00 / 3.00	m	
Source elevation	:	0.00	m	
Receiver elevation	:	0.00	m	
Barrier elevation	:	0.00	m	
Reference angle	:	0.00		

♀

Road data, segment # 3: Hwy 417 W (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100	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):	54999
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: Hwy 417 W (day/night)

Angle1	Angle2	:	-34.00 deg	33.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	6 / 0		
Surface	:	1	(Absorptive ground surface)	
Receiver source distance	:	440.00 / 440.00	m	
Receiver height	:	1.50 / 1.50	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

♀

Road data, segment # 4: Hwy 417 E (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100	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):	54999
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

REC21.TXT

Data for Segment # 4: Hwy 417 E (day/night)

```

-----
Angle1   Angle2       : -38.00 deg   38.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀  
Results segment # 1: Bank (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.50 !      1.50 !      1.50 !      1.50
  
```

```

ROAD (0.00 + 39.37 + 0.00) = 39.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
   -58      0   0.18  68.48   0.00  -4.04  -5.07   0.00   0.00 -20.00  39.37
  
```

Segment Leq : 39.37 dBA

♀  
Results segment # 2: Gladstone (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.50 !      1.50 !      1.50 !      1.50
  
```

```

ROAD (0.00 + 46.71 + 0.00) = 46.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
   -82     75   0.18  67.51   0.00   0.00  -0.91   0.00   0.00 -19.89  46.71
  
```

Segment Leq : 46.71 dBA

♀  
Results segment # 3: Hwy 417 W (day)

Source height = 1.50 m

```

ROAD (0.00 + 37.61 + 0.00) = 37.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
  
```

-34 33 0.66 80.15 0.00 -24.36 -4.46 0.00 -13.72 0.00 37.61

Segment Leq : 37.61 dBA

♀

Results segment # 4: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 38.68 + 0.00) = 38.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	38	0.66	80.15	0.00	-23.67	-3.96	0.00	-13.83	0.00	38.68

Segment Leq : 38.68 dBA

Total Leq All Segments: 48.37 dBA

♀

Results segment # 1: Bank (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 + 31.78 + 0.00) = 31.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	0	0.18	60.88	0.00	-4.04	-5.07	0.00	0.00	-20.00	31.78

Segment Leq : 31.78 dBA

♀

Results segment # 2: Gladstone (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 + 39.12 + 0.00) = 39.12 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	75	0.18	59.91	0.00	0.00	-0.91	0.00	0.00	-19.89	39.12

Segment Leq : 39.12 dBA

♀

Results segment # 3: Hwy 417 W (night)

-----

Source height = 1.50 m

ROAD (0.00 + 43.73 + 0.00) = 43.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	33	0.66	72.55	0.00	-24.36	-4.46	0.00	0.00	0.00	43.73

-----

Segment Leq : 43.73 dBA

♀

Results segment # 4: Hwy 417 E (night)

-----

Source height = 1.50 m

ROAD (0.00 + 44.92 + 0.00) = 44.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	38	0.66	72.55	0.00	-23.67	-3.96	0.00	0.00	0.00	44.92

-----

Segment Leq : 44.92 dBA

Total Leq All Segments: 48.08 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 48.37  
 (NIGHT): 48.08

♀

♀

Filename: rec25.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 2-5

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

-----  
 Angle1    Angle2 : -58.00 deg    0.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 33.00 / 33.00 m  
 Receiver height : 14.50 / 14.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -58.00 deg    Angle2 : 0.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 8.00 / 8.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 9715/845 veh/TimePeriod \*  
 Medium truck volume : 773/67 veh/TimePeriod \*  
 Heavy truck volume : 552/48 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): 12000  
 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: Gladstone (day/night)

REC25.TXT

Angle1	Angle2	:	-82.00 deg	75.00 deg
Wood depth		:	0	(No woods.)
No of house rows		:	0 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	15.00 / 15.00 m	
Receiver height		:	14.50 / 14.50 m	
Topography		:	2	(Flat/gentle slope; with barrier)
Barrier angle1		:	-82.00 deg	Angle2 : 75.00 deg
Barrier height		:	8.00 m	
Barrier receiver distance		:	3.00 / 3.00 m	
Source elevation		:	0.00 m	
Receiver elevation		:	0.00 m	
Barrier elevation		:	0.00 m	
Reference angle		:	0.00	

♀

Road data, segment # 3: Hwy 417 W (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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: Hwy 417 W (day/night)

Angle1	Angle2	:	-34.00 deg	33.00 deg
Wood depth		:	0	(No woods.)
No of house rows		:	6 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	440.00 / 440.00 m	
Receiver height		:	14.50 / 14.50 m	
Topography		:	1	(Flat/gentle slope; no barrier)
Reference angle		:	0.00	

♀

Road data, segment # 4: Hwy 417 E (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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



REC25.TXT

Data for Segment # 4: Hwy 417 E (day/night)

-----  
 Angle1 Angle2 : -38.00 deg 38.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 6 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 400.00 / 400.00 m  
 Receiver height : 14.50 / 14.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

♀  
 Results segment # 1: Bank (day)  
 -----

Source height = 1.50 m

Barrier height for grazing incidence

-----  
 Source ! Receiver ! Barrier ! Elevation of  
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
 -----  
 1.50 ! 14.50 ! 11.35 ! 11.35

ROAD (0.00 + 58.99 + 0.00) = 58.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	0	0.00	68.48	0.00	-3.42	-4.92	0.00	0.00	0.00	60.14*
-58	0	0.27	68.48	0.00	-4.35	-5.14	0.00	0.00	0.00	58.99

-----

\* Bright Zone !

Segment Leq : 58.99 dBA

♀  
 Results segment # 2: Gladstone (day)  
 -----

Source height = 1.50 m

Barrier height for grazing incidence

-----  
 Source ! Receiver ! Barrier ! Elevation of  
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
 -----  
 1.50 ! 14.50 ! 11.90 ! 11.90

ROAD (0.00 + 66.46 + 0.00) = 66.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	75	0.00	67.51	0.00	0.00	-0.59	0.00	0.00	0.00	66.92*
-82	75	0.27	67.51	0.00	0.00	-1.06	0.00	0.00	0.00	66.46

-----

\* Bright Zone !

Segment Leq : 66.46 dBA

♀  
 Results segment # 3: Hwy 417 W (day)  
 -----

REC25.TXT

Source height = 1.50 m

ROAD (0.00 + 43.43 + 0.00) = 43.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	33	0.27	80.15	0.00	-18.64	-4.36	0.00	-13.72	0.00	43.43

Segment Leq : 43.43 dBA

♀

Results segment # 4: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 44.37 + 0.00) = 44.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	38	0.27	80.15	0.00	-18.11	-3.83	0.00	-13.83	0.00	44.37

Segment Leq : 44.37 dBA

Total Leq All Segments: 67.22 dBA

♀

Results segment # 1: Bank (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	14.50	11.35	11.35

ROAD (0.00 + 51.39 + 0.00) = 51.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	0	0.00	60.88	0.00	-3.42	-4.92	0.00	0.00	0.00	52.54*
-58	0	0.27	60.88	0.00	-4.35	-5.14	0.00	0.00	0.00	51.39

\* Bright Zone !

Segment Leq : 51.39 dBA

♀

Results segment # 2: Gladstone (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	14.50	11.90	11.90

REC25.TXT

ROAD (0.00 + 58.86 + 0.00) = 58.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	75	0.00	59.91	0.00	0.00	-0.59	0.00	0.00	0.00	59.32*
-82	75	0.27	59.91	0.00	0.00	-1.06	0.00	0.00	0.00	58.86

\* Bright Zone !

Segment Leq : 58.86 dBA

♀

Results segment # 3: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 49.55 + 0.00) = 49.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	33	0.27	72.55	0.00	-18.64	-4.36	0.00	0.00	0.00	49.55

Segment Leq : 49.55 dBA

♀

Results segment # 4: Hwy 417 E (night)

Source height = 1.50 m

ROAD (0.00 + 50.60 + 0.00) = 50.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	38	0.27	72.55	0.00	-18.11	-3.83	0.00	0.00	0.00	50.60

Segment Leq : 50.60 dBA

Total Leq All Segments: 60.46 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 67.22  
(NIGHT): 60.46

♀

♀

Filename: rec29.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 2-9

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

-----  
 Angle1 Angle2 : -58.00 deg 0.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 33.00 / 33.00 m  
 Receiver height : 26.77 / 26.77 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -58.00 deg Angle2 : 0.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 8.00 / 8.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 9715/845 veh/TimePeriod \*  
 Medium truck volume : 773/67 veh/TimePeriod \*  
 Heavy truck volume : 552/48 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): 12000  
 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: Gladstone (day/night)

REC29.TXT

Angle1	Angle2	:	-82.00 deg	75.00 deg
Wood depth		:	0	(No woods.)
No of house rows		:	0 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	15.00 / 15.00 m	
Receiver height		:	26.77 / 26.77 m	
Topography		:	2	(Flat/gentle slope; with barrier)
Barrier angle1		:	-82.00 deg	Angle2 : 75.00 deg
Barrier height		:	8.00 m	
Barrier receiver distance		:	3.00 / 3.00 m	
Source elevation		:	0.00 m	
Receiver elevation		:	0.00 m	
Barrier elevation		:	0.00 m	
Reference angle		:	0.00	

♀

Road data, segment # 3: Hwy 417 W (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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: Hwy 417 W (day/night)

Angle1	Angle2	:	-34.00 deg	33.00 deg
Wood depth		:	0	(No woods.)
No of house rows		:	6 / 0	
Surface		:	1	(Absorptive ground surface)
Receiver source distance		:	440.00 / 440.00 m	
Receiver height		:	26.77 / 26.77 m	
Topography		:	1	(Flat/gentle slope; no barrier)
Reference angle		:	0.00	

♀

Road data, segment # 4: Hwy 417 E (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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

REC29.TXT

Data for Segment # 4: Hwy 417 E (day/night)

-----  
 Angle1 Angle2 : -38.00 deg 38.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 6 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 400.00 / 400.00 m  
 Receiver height : 26.77 / 26.77 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00  
 -----

♀

Results segment # 1: Bank (day)

Source height = 1.50 m

Barrier height for grazing incidence

-----  
 Source ! Receiver ! Barrier ! Elevation of  
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
 -----  
 1.50 ! 26.77 ! 20.64 ! 20.64  
 -----

ROAD (0.00 + 60.14 + 0.00) = 60.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	0	0.00	68.48	0.00	-3.42	-4.92	0.00	0.00	0.00	60.14*
-58	0	0.00	68.48	0.00	-3.42	-4.92	0.00	0.00	0.00	60.14

-----

\* Bright Zone !

Segment Leq : 60.14 dBA

♀

Results segment # 2: Gladstone (day)

Source height = 1.50 m

Barrier height for grazing incidence

-----  
 Source ! Receiver ! Barrier ! Elevation of  
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
 -----  
 1.50 ! 26.77 ! 21.72 ! 21.72  
 -----

ROAD (0.00 + 66.92 + 0.00) = 66.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	75	0.00	67.51	0.00	0.00	-0.59	0.00	0.00	0.00	66.92*
-82	75	0.00	67.51	0.00	0.00	-0.59	0.00	0.00	0.00	66.92

-----

\* Bright Zone !

Segment Leq : 66.92 dBA

♀

Results segment # 3: Hwy 417 W (day)

REC29.TXT

Source height = 1.50 m

ROAD (0.00 + 47.47 + 0.00) = 47.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	33	0.00	80.15	0.00	-14.67	-4.29	0.00	-13.72	0.00	47.47

Segment Leq : 47.47 dBA

♀

Results segment # 4: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 48.31 + 0.00) = 48.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	38	0.00	80.15	0.00	-14.26	-3.74	0.00	-13.83	0.00	48.31

Segment Leq : 48.31 dBA

Total Leq All Segments: 67.84 dBA

♀

Results segment # 1: Bank (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	26.77	20.64	20.64

ROAD (0.00 + 52.54 + 0.00) = 52.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	0	0.00	60.88	0.00	-3.42	-4.92	0.00	0.00	0.00	52.54*
-58	0	0.00	60.88	0.00	-3.42	-4.92	0.00	0.00	0.00	52.54

\* Bright Zone !

Segment Leq : 52.54 dBA

♀

Results segment # 2: Gladstone (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	26.77	21.72	21.72

REC29.TXT

ROAD (0.00 + 59.32 + 0.00) = 59.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	75	0.00	59.91	0.00	0.00	-0.59	0.00	0.00	0.00	59.32*
-82	75	0.00	59.91	0.00	0.00	-0.59	0.00	0.00	0.00	59.32

\* Bright Zone !

Segment Leq : 59.32 dBA

♀

Results segment # 3: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 53.59 + 0.00) = 53.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	33	0.00	72.55	0.00	-14.67	-4.29	0.00	0.00	0.00	53.59

Segment Leq : 53.59 dBA

♀

Results segment # 4: Hwy 417 E (night)

Source height = 1.50 m

ROAD (0.00 + 54.55 + 0.00) = 54.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	38	0.00	72.55	0.00	-14.26	-3.74	0.00	0.00	0.00	54.55

Segment Leq : 54.55 dBA

Total Leq All Segments: 61.90 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 67.84  
(NIGHT): 61.90

♀

♀



Filename: rec31.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 3-1

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

-----  
 Car traffic volume : 9715/845    veh/TimePeriod    \*  
 Medium truck volume : 773/67    veh/TimePeriod    \*  
 Heavy truck volume : 552/48    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): 12000  
 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: Gladstone (day/night)

-----  
 Angle1    Angle2 : -76.00 deg    0.00 deg  
 Wood depth : 0    (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1    (Absorptive ground surface)  
 Receiver source distance : 27.00 / 27.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -76.00 deg    Angle2 : 0.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

Road data, segment # 2: Hwy 417 W (day/night)

-----  
 Car traffic volume : 44527/3872    veh/TimePeriod    \*  
 Medium truck volume : 3542/308    veh/TimePeriod    \*  
 Heavy truck volume : 2530/220    veh/TimePeriod    \*  
 Posted speed limit : 100 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): 54999  
 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: Hwy 417 W (day/night)

REC31.TXT

```

Angle1  Angle2      : -35.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 440.00 / 440.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Road data, segment # 3: Hwy 417 E (day/night)

```

-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 veh/TimePeriod *
Posted speed limit : 100 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): 54999
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: Hwy 417 E (day/night)

```

-----
Angle1  Angle2      : -37.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Results segment # 1: Gladstone (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 + 40.53 + 0.00) = 40.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	0	0.18	67.51	0.00	-3.01	-4.03	0.00	0.00	-19.94	40.53

Segment Leq : 40.53 dBA

♀

Results segment # 2: Hwy 417 W (day)

REC31.TXT

Source height = 1.50 m

ROAD (0.00 + 34.78 + 0.00) = 34.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.66	80.15	0.00	-24.36	-7.29	0.00	-13.72	0.00	34.78

Segment Leq : 34.78 dBA

♀

Results segment # 3: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 35.57 + 0.00) = 35.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	0	0.66	80.15	0.00	-23.67	-7.07	0.00	-13.83	0.00	35.57

Segment Leq : 35.57 dBA

Total Leq All Segments: 42.53 dBA

♀

Results segment # 1: Gladstone (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 + 32.93 + 0.00) = 32.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	0	0.18	59.91	0.00	-3.01	-4.03	0.00	0.00	-19.94	32.93

Segment Leq : 32.93 dBA

♀

Results segment # 2: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 40.90 + 0.00) = 40.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.66	72.55	0.00	-24.36	-7.29	0.00	0.00	0.00	40.90

Segment Leq : 40.90 dBA

♀

Results segment # 3: Hwy 417 E (night)

Source height = 1.50 m

ROAD (0.00 + 41.80 + 0.00) = 41.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	0	0.66	72.55	0.00	-23.67	-7.07	0.00	0.00	0.00	41.80

Segment Leq : 41.80 dBA

Total Leq All Segments: 44.68 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 42.53  
 (NIGHT): 44.68

♀  
♀

Filename: rec35.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 3-5

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

-----  
 Car traffic volume : 9715/845    veh/TimePeriod    \*  
 Medium truck volume : 773/67    veh/TimePeriod    \*  
 Heavy truck volume : 552/48    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): 12000  
 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: Gladstone (day/night)

-----  
 Angle1    Angle2 : -76.00 deg    0.00 deg  
 Wood depth : 0    (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1    (Absorptive ground surface)  
 Receiver source distance : 27.00 / 27.00 m  
 Receiver height : 14.50 / 14.50 m  
 Topography : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -76.00 deg    Angle2 : 0.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

Road data, segment # 2: Hwy 417 W (day/night)

-----  
 Car traffic volume : 44527/3872    veh/TimePeriod    \*  
 Medium truck volume : 3542/308    veh/TimePeriod    \*  
 Heavy truck volume : 2530/220    veh/TimePeriod    \*  
 Posted speed limit : 100 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): 54999  
 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: Hwy 417 W (day/night)

REC35.TXT

```

Angle1  Angle2      : -35.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 440.00 / 440.00 m
Receiver height  :  14.50 / 14.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Road data, segment # 3: Hwy 417 E (day/night)

```

-----
Car traffic volume : 44527/3872  veh/TimePeriod  *
Medium truck volume : 3542/308   veh/TimePeriod  *
Heavy truck volume  : 2530/220   veh/TimePeriod  *
Posted speed limit  : 100 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): 54999
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: Hwy 417 E (day/night)

```

-----
Angle1  Angle2      : -37.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height  :  14.50 / 14.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Results segment # 1: Gladstone (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	14.50	13.06	13.06

ROAD (0.00 + 60.10 + 0.00) = 60.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	0	0.00	67.51	0.00	-2.55	-3.74	0.00	0.00	0.00	61.21*
-76	0	0.27	67.51	0.00	-3.24	-4.16	0.00	0.00	0.00	60.10

\* Bright Zone !

Segment Leq : 60.10 dBA

♀

## Results segment # 2: Hwy 417 W (day)

Source height = 1.50 m

ROAD (0.00 + 40.61 + 0.00) = 40.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.27	80.15	0.00	-18.64	-7.19	0.00	-13.72	0.00	40.61

Segment Leq : 40.61 dBA

♀

## Results segment # 3: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 41.25 + 0.00) = 41.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	0	0.27	80.15	0.00	-18.11	-6.96	0.00	-13.83	0.00	41.25

Segment Leq : 41.25 dBA

Total Leq All Segments: 60.20 dBA

♀

## Results segment # 1: Gladstone (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	14.50	13.06	13.06

ROAD (0.00 + 52.51 + 0.00) = 52.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	0	0.00	59.91	0.00	-2.55	-3.74	0.00	0.00	0.00	53.61*
-76	0	0.27	59.91	0.00	-3.24	-4.16	0.00	0.00	0.00	52.51

\* Bright Zone !

Segment Leq : 52.51 dBA

♀

## Results segment # 2: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 46.73 + 0.00) = 46.73 dBA

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

REC35.TXT

-35	0	0.27	72.55	0.00	-18.64	-7.19	0.00	0.00	0.00	46.73
-----	---	------	-------	------	--------	-------	------	------	------	-------

---

Segment Leq : 46.73 dBA

♀  
Results segment # 3: Hwy 417 E (night)

---

Source height = 1.50 m

ROAD (0.00 + 47.48 + 0.00) = 47.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	0	0.27	72.55	0.00	-18.11	-6.96	0.00	0.00	0.00	47.48

---

Segment Leq : 47.48 dBA

Total Leq All Segments: 54.49 dBA

♀  
TOTAL Leq FROM ALL SOURCES (DAY): 60.20  
(NIGHT): 54.49

♀  
♀



Filename: rec39.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 3-9

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

-----  
 Car traffic volume : 9715/845    veh/TimePeriod    \*  
 Medium truck volume : 773/67    veh/TimePeriod    \*  
 Heavy truck volume : 552/48    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): 12000  
 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: Gladstone (day/night)

-----  
 Angle1    Angle2 : -76.00 deg    0.00 deg  
 Wood depth : 0    (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1    (Absorptive ground surface)  
 Receiver source distance : 27.00 / 27.00 m  
 Receiver height : 26.77 / 26.77 m  
 Topography : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -76.00 deg    Angle2 : 0.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

Road data, segment # 2: Hwy 417 W (day/night)

-----  
 Car traffic volume : 44527/3872    veh/TimePeriod    \*  
 Medium truck volume : 3542/308    veh/TimePeriod    \*  
 Heavy truck volume : 2530/220    veh/TimePeriod    \*  
 Posted speed limit : 100 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): 54999  
 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: Hwy 417 W (day/night)

REC39.TXT

```

Angle1  Angle2      : -35.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 440.00 / 440.00 m
Receiver height  :  26.77 / 26.77 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Road data, segment # 3: Hwy 417 E (day/night)

```

-----
Car traffic volume : 44527/3872  veh/TimePeriod  *
Medium truck volume :  3542/308  veh/TimePeriod  *
Heavy truck volume  :  2530/220  veh/TimePeriod  *
Posted speed limit  :   100 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):  54999
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: Hwy 417 E (day/night)

```

-----
Angle1  Angle2      : -37.00 deg  0.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      6 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height  :  26.77 / 26.77 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Results segment # 1: Gladstone (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	26.77	23.96	23.96

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	0	0.00	67.51	0.00	-2.55	-3.74	0.00	0.00	0.00	61.21*
-76	0	0.00	67.51	0.00	-2.55	-3.74	0.00	0.00	0.00	61.21

\* Bright Zone !

Segment Leq : 61.21 dBA

♀

## Results segment # 2: Hwy 417 W (day)

Source height = 1.50 m

ROAD (0.00 + 44.65 + 0.00) = 44.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.00	80.15	0.00	-14.67	-7.11	0.00	-13.72	0.00	44.65

Segment Leq : 44.65 dBA

♀

## Results segment # 3: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 45.18 + 0.00) = 45.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	0	0.00	80.15	0.00	-14.26	-6.87	0.00	-13.83	0.00	45.18

Segment Leq : 45.18 dBA

Total Leq All Segments: 61.41 dBA

♀

## Results segment # 1: Gladstone (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	26.77	23.96	23.96

ROAD (0.00 + 53.61 + 0.00) = 53.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	0	0.00	59.91	0.00	-2.55	-3.74	0.00	0.00	0.00	53.61*
-76	0	0.00	59.91	0.00	-2.55	-3.74	0.00	0.00	0.00	53.61

\* Bright Zone !

Segment Leq : 53.61 dBA

♀

## Results segment # 2: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 50.77 + 0.00) = 50.77 dBA

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

REC39.TXT

-35	0	0.00	72.55	0.00	-14.67	-7.11	0.00	0.00	0.00	50.77
-----	---	------	-------	------	--------	-------	------	------	------	-------

---

Segment Leq : 50.77 dBA

♀  
Results segment # 3: Hwy 417 E (night)

---

Source height = 1.50 m

ROAD (0.00 + 51.42 + 0.00) = 51.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	0	0.00	72.55	0.00	-14.26	-6.87	0.00	0.00	0.00	51.42

---

Segment Leq : 51.42 dBA

Total Leq All Segments: 56.88 dBA

♀  
TOTAL Leq FROM ALL SOURCES (DAY): 61.41  
(NIGHT): 56.88

♀  
♀

Filename: rec41.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 4-1

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

-----  
 Angle1    Angle2                      : 0.00 deg    66.00 deg  
 Wood depth                            : 0            (No woods.)  
 No of house rows                      : 0 / 0  
 Surface                                : 1            (Absorptive ground surface)  
 Receiver source distance : 30.00 / 30.00 m  
 Receiver height                        : 1.50 / 1.50 m  
 Topography                            : 2            (Flat/gentle slope; with barrier)  
 Barrier angle1                        : 0.00 deg    Angle2 : 66.00 deg  
 Barrier height                         : 8.00 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation                       : 0.00 m  
 Receiver elevation                     : 0.00 m  
 Barrier elevation                      : 0.00 m  
 Reference angle                        : 0.00

♀

Results segment # 1: Bank (day)

-----  
 Source height = 1.50 m

Barrier height for grazing incidence

-----  

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	1.50	!	1.50	!	1.50

 -----

ROAD (0.00 + 40.51 + 0.00) = 40.51 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.18	68.48	0.00	-3.55	-4.56	0.00	0.00	-19.86	40.51

 -----

Segment Leq : 40.51 dBA

Total Leq All Segments: 40.51 dBA

♀

Results segment # 1: Bank (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 + 32.91 + 0.00) = 32.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.18	60.88	0.00	-3.55	-4.56	0.00	0.00	-19.86	32.91

Segment Leq : 32.91 dBA

Total Leq All Segments: 32.91 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 40.51  
(NIGHT): 32.91

♀

♀

Filename: rec45.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 4-5

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

-----  
 Angle1 Angle2 : 0.00 deg 66.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 30.00 / 30.00 m  
 Receiver height : 14.50 / 14.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : 0.00 deg Angle2 : 66.00 deg  
 Barrier height : 8.00 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

Results segment # 1: Bank (day)

-----  
 Source height = 1.50 m

Barrier height for grazing incidence

-----  

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	14.50	!	5.83	!	5.83

ROAD (0.00 + 50.13 + 0.00) = 50.13 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.00	68.48	0.00	-3.01	-4.36	0.00	0.00	-10.98	50.13

-----  
 Segment Leq : 50.13 dBA

Total Leq All Segments: 50.13 dBA

♀

Results segment # 1: Bank (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	!	14.50	!
		5.83	!
			5.83

ROAD (0.00 + 42.53 + 0.00) = 42.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.00	60.88	0.00	-3.01	-4.36	0.00	0.00	-10.98	42.53

Segment Leq : 42.53 dBA

Total Leq All Segments: 42.53 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 50.13  
(NIGHT): 42.53

♀

♀



Filename: rec49.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 4-9

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

-----  
 Angle1    Angle2                      : 0.00 deg    66.00 deg  
 Wood depth                            : 0            (No woods.)  
 No of house rows                      : 0 / 0  
 Surface                                : 1            (Absorptive ground surface)  
 Receiver source distance : 30.00 / 30.00 m  
 Receiver height                        : 26.77 / 26.77 m  
 Topography                            : 2            (Flat/gentle slope; with barrier)  
 Barrier angle1                        : 0.00 deg    Angle2 : 66.00 deg  
 Barrier height                         : 8.00 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation                       : 0.00 m  
 Receiver elevation                      : 0.00 m  
 Barrier elevation                       : 0.00 m  
 Reference angle                        : 0.00

♀

Results segment # 1: Bank (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	26.77	9.92	9.92

ROAD (0.00 + 61.11 + 0.00) = 61.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.00	68.48	0.00	-3.01	-4.36	0.00	0.00	-0.06	61.05*
0	66	0.00	68.48	0.00	-3.01	-4.36	0.00	0.00	0.00	61.11

\* Bright Zone !

Segment Leq : 61.11 dBA

Total Leq All Segments: 61.11 dBA

♀

Results segment # 1: Bank (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	!	26.77	!
		9.92	!
			9.92

ROAD (0.00 + 53.52 + 0.00) = 53.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.00	60.88	0.00	-3.01	-4.36	0.00	0.00	-0.06	53.46*
0	66	0.00	60.88	0.00	-3.01	-4.36	0.00	0.00	0.00	53.52

\* Bright Zone !

Segment Leq : 53.52 dBA

Total Leq All Segments: 53.52 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 61.11  
(NIGHT): 53.52

♀

♀

Filename: REC59.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 5-9

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

-----  
 Angle1 Angle2 : -66.00 deg 69.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 35.00 / 35.00 m  
 Receiver height : 30.00 / 30.00 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -66.00 deg Angle2 : 69.00 deg  
 Barrier height : 28.50 m  
 Barrier receiver distance : 10.00 / 10.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 9715/845 veh/TimePeriod \*  
 Medium truck volume : 773/67 veh/TimePeriod \*  
 Heavy truck volume : 552/48 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): 12000  
 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: Gladstone (day/night)

REC59.TXT

Angle1	Angle2	:	-74.00 deg	76.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	1	(Absorptive ground surface)	
Receiver source distance	:	15.00 / 15.00	m	
Receiver height	:	30.00 / 30.00	m	
Topography	:	2	(Flat/gentle slope; with barrier)	
Barrier angle1	:	-74.00 deg	Angle2 :	76.00 deg
Barrier height	:	28.50	m	
Barrier receiver distance	:	10.00 / 10.00	m	
Source elevation	:	0.00	m	
Receiver elevation	:	0.00	m	
Barrier elevation	:	0.00	m	
Reference angle	:	0.00		

♀

Road data, segment # 3: Hwy 417 W (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 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):	54999
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: Hwy 417 W (day/night)

Angle1	Angle2	:	-34.00 deg	34.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	6 / 0		
Surface	:	1	(Absorptive ground surface)	
Receiver source distance	:	440.00 / 440.00	m	
Receiver height	:	30.00 / 30.00	m	
Topography	:	4	(Elevated; with barrier)	
Barrier angle1	:	-34.00 deg	Angle2 :	34.00 deg
Barrier height	:	28.50	m	
Elevation	:	0.00	m	
Barrier receiver distance	:	10.00 / 10.00	m	
Source elevation	:	0.00	m	
Receiver elevation	:	0.00	m	
Barrier elevation	:	0.00	m	
Reference angle	:	0.00		

♀

Road data, segment # 4: Hwy 417 E (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	veh/TimePeriod	*
Posted speed limit	:	100 km/h		
Road gradient	:	0 %		
Road pavement	:	1	(Typical asphalt or concrete)	

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

REC59.TXT

24 hr Traffic Volume (AADT or SADT): 54999  
 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: Hwy 417 E (day/night)

-----  
 Angle1 Angle2 : -37.00 deg 38.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 6 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 410.00 / 410.00 m  
 Receiver height : 30.00 / 30.00 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -37.00 deg Angle2 : 38.00 deg  
 Barrier height : 28.50 m  
 Barrier receiver distance : 10.00 / 10.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

Results segment # 1: Bank (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	30.00	21.86	21.86

ROAD (0.00 + 44.82 + 0.00) = 44.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	69	0.00	68.48	0.00	-3.68	-1.25	0.00	0.00	-18.73	44.82

Segment Leq : 44.82 dBA

♀

Results segment # 2: Gladstone (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	30.00	11.00	11.00

ROAD (0.00 + 46.75 + 0.00) = 46.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	76	0.00	67.51	0.00	0.00	-0.79	0.00	0.00	-19.97	46.75

Segment Leq : 46.75 dBA

♀  
Results segment # 3: Hwy 417 W (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	30.00	29.35	29.35

ROAD (0.00 + 47.53 + 0.00) = 47.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	34	0.00	80.15	0.00	-14.67	-4.23	0.00	-13.72	0.00	47.53
-34	34	0.00	80.15	0.00	-14.67	-4.23	0.00	0.00	-2.83	58.41*
-34	34	0.00	80.15	0.00	-14.67	-4.23	0.00	0.00	0.00	61.25

\* Bright Zone !

Segment Leq : 47.53 dBA

♀  
Results segment # 4: Hwy 417 E (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	30.00	29.30	29.30

ROAD (0.00 + 48.17 + 0.00) = 48.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	38	0.00	80.15	0.00	-14.37	-3.80	0.00	-13.80	0.00	48.17
-37	38	0.00	80.15	0.00	-14.37	-3.80	0.00	0.00	-3.13	58.85*
-37	38	0.00	80.15	0.00	-14.37	-3.80	0.00	0.00	0.00	61.98

\* Bright Zone !

Segment Leq : 48.17 dBA

Total Leq All Segments: 53.01 dBA

♀  
Results segment # 1: Bank (night)

Source height = 1.50 m

Barrier height for grazing incidence

## REC59.TXT

Source Height	(m)	! Receiver Height	(m)	! Barrier Height	(m)	! Elevation of Barrier Top	(m)
1.50	!	30.00	!	21.86	!	21.86	

ROAD (0.00 + 37.22 + 0.00) = 37.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	69	0.00	60.88	0.00	-3.68	-1.25	0.00	0.00	-18.73	37.22

Segment Leq : 37.22 dBA

♀

Results segment # 2: Gladstone (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	!	30.00	!	11.00	!	11.00	

ROAD (0.00 + 39.15 + 0.00) = 39.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	76	0.00	59.91	0.00	0.00	-0.79	0.00	0.00	-19.97	39.15

Segment Leq : 39.15 dBA

♀

Results segment # 3: Hwy 417 W (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	!	30.00	!	29.35	!	29.35	

ROAD (0.00 + 53.65 + 0.00) = 53.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	34	0.00	72.55	0.00	-14.67	-4.23	0.00	0.00	-2.83	50.82*
-34	34	0.00	72.55	0.00	-14.67	-4.23	0.00	0.00	0.00	53.65

\* Bright Zone !

Segment Leq : 53.65 dBA

♀

Results segment # 4: Hwy 417 E (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	30.00	29.30	29.30

ROAD (0.00 + 54.38 + 0.00) = 54.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	38	0.00	72.55	0.00	-14.37	-3.80	0.00	0.00	-3.13	51.25*
-37	38	0.00	72.55	0.00	-14.37	-3.80	0.00	0.00	0.00	54.38

\* Bright Zone !

Segment Leq : 54.38 dBA

Total Leq All Segments: 57.15 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 53.01  
(NIGHT): 57.15

♀

♀



# **APPENDIX 3**

**CONSTRUCTION DETAILS (E-MAIL)**

**INDUSTRY STANDARDS**

## Stephanie Boisvenue

---

**From:** Fernando Matos <fmatossoma@gmail.com>  
**Sent:** December-05-17 8:58 PM  
**To:** Stephanie Boisvenue  
**Cc:** Faisal Abou-Seido  
**Subject:** Re: Request for Information - Noise Study at 384 Frank Street  
**Attachments:** 384 FRANK 36x24-ELEV.pdf

Hi Stephanie, see revised elevations and elevation markers.

Most likely construction wall assembly, exterior finish to be brick veneer on the lower floors and cement and metal paneling on upper floors.

TYPICAL EXTERIOR METAL PANEL SIDING @ 1HR NONCOMBUSTIBLE WALLS  
ULC U412 - (SEE ATTACHED DOCUMENT FOR ASSEMBLY DETAILS)  
FRR:CONSTRUCTION:CLADDING  
1 HR.:NONCOMBUSTIBLE:NONCOMBUSTIBLE

- CORRUGATED METAL SIDING or FIBRE CEMENT PANELING or SIDING or EIFS (ALL RATED NON COMBUSTIBLE and INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS)
- 1" METAL Z-GIRTS @ 24" o/c
- 1" RIGID MINERAL WOOL BOARD (R5)
- SBPOF WEATHER BARRIER, ALL JOINTS SEALED W/ TAPE
- 5/8" GLASS MAT GYPSUM BOARD
- 5 1/2" x 1 5/8" METAL STUDS 16 GAUGE AT 16" o/c MAX. c/w BLOCKING AT MID HEIGHT
- SPACING OF STUDS TO LINE UP WITH ROOF TRUSSES ABOVE
- PROVIDE LATERAL BRACING AS PER STRUCTURAL ENGINEER
- 5 1/2" MINERAL WOOD INSULATION (R22)
- 6 MIL POLYETHYLENE VB CONFORM TO CGSB 51.34 TYP
- 2 LAYER OF 5/8" TYPE 'X' GYPSUM BOARD - TAPED AND SANDED
- PAINT FINISH

Thank you

Fernando Matos



SOMA ▪ STUDIO | 2277 PROSPECT AVENUE ▪ OTTAWA  
ONTARIO CANADA ▪ K1H 7G2 ▪ T 613 884 4425

# Wall & Floor Assembly Guide

## Insulation for Sound & Fire Rated Assemblies

### Sound Transmission Loss of Exterior Walls

<i>Exterior finish</i>	<i>Cavity Insulation</i>	<i>Resilient channel</i>	<i>STC</i>
<b>Wood siding (1)</b>	None	No	<b>37</b>
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	No	<b>39</b>
	None	Yes	<b>43</b>
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	Yes	<b>47</b>
<b>Stucco (2)</b>	3-1/2" PINK™ FIBERGLAS® Batt Insulation	No	<b>46</b>
	None	Yes	<b>49</b>
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	Yes	<b>57</b>
<b>Brick veneer (3)</b>	3-1/2" PINK™ FIBERGLAS® Batt Insulation	No	<b>56</b>
	None	Yes	<b>54</b>
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	Yes	<b>58</b>
<b>Concrete block</b>	None	No	<b>45</b>

#### *Wall construction details*

<b>Wood siding (1)</b>	Framing	2"x4" wood studs, (16" o.c.)
	Sheathing	1/2" wood fiberboard insulation nailed to studs
	Siding	5/8"x10" redwood nailed through sheathing into studs
	Interior	1/2" gypsum board screwed to studs or to metal resilient channels which were attached to the studs
<b>Stucco (2)</b>	Framing	2"x4" woods studs, (16" o.c.)
	Sheathing	None
	Stucco	No. 15 felt building and 1" wire mesh nailed to studs. Stucco Applied in 3 coats to 7/8" total thickness. Dry weight of Stucco 7.9 lb/sq ft
	Interior	1/2" gypsum board screwed to studs or resilient channel
<b>Brick veneer (3)</b>	Framing	2"x4" wood studs, (16" o.c.)
	Sheathing	3/4" wood fiberboard insulation
	Brick	standard face brick 3-1/2" wide, spaced 1/2" out from sheathing with metal ties nailed through sheathing into studs. Dry weight of brick and mortar 41 lb/sq ft .
	Interior	1/2" gypsum board screwed to studs or resilient channel

Taken from the U.S. Department of Commerce National Bureau of Standards Building Science Series 77.

\* Information received in imperial units only

# Insulating Glass (Table 2)

Glass Makeup			Frequency in Hertz (Hz)																			STC
			100	125	160	200	250	315	400	500	650	800	1000	1250	1600	2000	2500	3150	4000	5000		
Sound Transmission Loss (dB)																						
Glass Ply	Air Space	Glass Ply																				
1/8" 3 mm	1/4" 6 mm	1/8" 3 mm	26	21	23	23	26	21	19	24	27	30	33	36	40	44	46	39	34	45	28	
1/8" 3 mm	3/8" 9 mm	1/8" 3 mm	26	23	23	20	23	19	23	27	29	32	35	39	44	47	48	41	36	43	31	
1/4" 6 mm	1/2" 13 mm	1/4" 6 mm	27	24	29	22	22	25	30	33	35	38	40	42	42	37	37	43	46	49	35	
1/4" 6 mm	1/2" 13 mm	5/16" 8 mm	28	29	33	29	29	32	36	37	40	43	42	43	42	37	40	44	48	53	40	
1/4" 6 mm	1/2" 13 mm	3/8" 10 mm	28	26	32	29	29	31	35	37	38	39	41	43	41	40	41	44	47	49	39	
5/16" 8 mm	1/2" 13 mm	5/16" 8 mm	26	24	25	31	24	32	32	35	37	39	39	38	36	38	42	44	46	49	37	
1/4" 6 mm	3/4" 19 mm	1/4" 6 mm	27	23	28	21	27	29	34	35	37	41	43	45	44	39	39	46	49	52	38	
1/4" 6 mm	1" 25 mm	1/4" 6 mm	22	19	27	23	31	30	35	35	36	39	41	42	41	36	37	46	51	56	37	

# Laminated Insulating Glass (Table 3)

Glass Makeup					Frequency in Hertz (Hz)																	STC	
					100	125	160	200	250	315	400	500	650	800	1000	1250	1600	2000	2500	3150	4000		5000
Sound Transmission Loss (dB)																							
Glass Ply	Air Space	Glass Ply	PVB*	Glass Ply																			
3/16" 5 mm	3/8" 9 mm	1/8" 3 mm	.030" .76 mm	1/8" 3 mm	27	27	26	24	22	28	32	35	38	38	39	40	42	43	41	45	52	57	37
3/16" 5 mm	1/2" 13 mm	1/8" 3 mm	.030" .76 mm	1/8" 3 mm	26	23	25	23	27	31	34	36	38	39	41	43	45	46	43	49	55	55	39
1/4" 6 mm	1/2" 13 mm	1/8" 3 mm	.030" .76 mm	1/8" 3 mm	28	20	29	24	26	30	34	36	39	42	43	44	44	41	40	47	52	56	39
1/4" 6 mm	1/2" 13 mm	1/4" 6 mm	.030" .76 mm	1/8" 3 mm	28	17	28	29	33	34	38	40	40	41	41	41	41	40	43	49	54	58	40
1/4" 6 mm	1/2" 13 mm	3/16" 5 mm	.060" 1.52 mm	3/16" 5 mm	30	29	31	28	31	34	37	39	41	42	44	46	45	44	47	52	55	60	42
1/4" 6 mm	1/2" 13 mm	1/4" 6 mm	.030" .76 mm	1/4" 6 mm	31	29	32	30	32	35	38	40	40	42	44	46	47	46	47	52	56	61	43
5/16" 8 mm	5/8" 16 mm	3/16" 5 mm	.060" 1.52 mm	3/16" 5 mm	28	28	34	36	33	40	41	42	43	43	42	40	40	43	49	53	57	61	43
1/4" 6 mm	3/4" 19 mm	3/16" 5 mm	.060" 1.52 mm	3/16" 5 mm	28	26	32	30	35	37	40	41	43	44	45	47	47	44	47	53	57	60	44
1/4" 6 mm	3/4" 19 mm	1/4" 6 mm	.060" 1.52 mm	1/4" 6 mm	28	29	36	32	34	39	41	41	41	43	44	45	45	46	47	52	56	61	44
3/8" 10 mm	3/4" 19 mm	1/4" 6 mm	.060" 1.52 mm	1/4" 6 mm	25	31	38	33	37	39	42	43	43	42	40	40	41	56	50	55	58	61	43

Data based on testing 36" x 84" glass in an acoustical wall. Glass size and glazing system will affect STC rating.  
 \*PVB (polyvinyl butyral) interlayer