

Geotechnical
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Archaeological Services

Environmental Noise Control Study

Proposed Multi-Storey Building
440-444 Bronson Avenue - Ottawa

Prepared For

TC United

Paterson Group Inc.

Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

Tel: (613) 226-7381

Fax: (613) 226-6344

www.patersongroup.ca

May 2, 2019

Report: PG4304-1 Revision 1

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1.0 Introduction

Paterson Group (Paterson) was commissioned by TC United to conduct an environmental noise control study for the proposed residential buildings to be located at 440-444 Bronson Avenue, 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 a six (6) storey mixed use building with associated parking and landscaped areas. While no outdoor living area was identified on the proposed site plan, the common area located on the west portion of the property has been analyzed as an outdoor living area.

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
☐ Standards taken from Table 2.2a; Sound Level Limit for Outdoor Living Areas - Road and Rail	

Table 2 - Sound Level Limits for Indoor Living Area			
Type of Space	Time Period	Required L_{eq} (dBA)	
		Road	Rail
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
☐ Standards taken from Table 2.2b; Sound Level Limit for Indoor Living Areas - Road and Rail			

It is noted in ENCG, that the limits outlined in Table 2 are for the sound levels on the interior of the glass pane. The ENCG further goes on to state that the limit for the exterior of the pane of glass will be 55 dBA.

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

Table 3 - Warning Clauses for Sound Level Exceedances	
Warning Clause	Description
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."
☐ 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 ENGC, 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
☐ Standards taken from Table 3.2a; Guidelines for Stationary Noise - Steady and Varying Sound		

Due to the location of the subject site, a stationary noise analysis is not required.

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 east by Bronson Avenue, and to the north, west and south by residential buildings.

Based on the City of Ottawa Official Plan, Schedule E, Bronson Avenue is classified as a 4 lane urban arterial undivided (4-UAU). Gladstone Avenue, which is also located within the 100 m radius, is classified as a 2 Lane major collector (2-UMCU). There are no other roadways within the 100 m radius of the subject site that are classified as an arterial, collector or major collector. Highway 417 is located with the 500 m radius of the subject site, and therefore is included in this analysis. Highway 417 consists of 4 lanes in both the eastbound and westbound direction at the point closest to the subject site. For the purposes of this analysis, Highway 417 has been divided into two roadway sections, one for each direction. Noise sources are presented on Paterson Drawing PG4304-1 - 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.

Table 5 - Traffic and Road Parameters						
Road	Implied Roadway	AADT (Veh/day)	Posted Speed (km/h)	Day/Night Split %	Medium Truck %	Heavy Truck %
Bronson Avenue	4-UAU	30,000	50	92/8	7	5
Gladstone Avenue	2-UMCU	12,000	40	92/8	7	5
Highway 417 - Eastbound	Highway	73,332	100	92/8	7	5
Highway 417 - Westbound	Highway	73,332	100	92/8	7	5
☐ Data obtained from the City of Ottawa document ENCG						

Two (2) levels of reception points were selected for this analysis. The following elevations were selected from the heights provided on the building elevation plans for this development.

Table 6 - Elevation of Reception Points			
Floor Number	Elevation at Centre of Window (m)	Floor Use	Daytime/Nighttime Analysis
Ground Floor	1.5	Living and sleeping quarters	daytime/nighttime
Sixth floor	17.4	Living and sleeping quarters	daytime/nighttime

For this analysis, a reception point was taken at the centre of the predetermined floors. Reception points are noted on Drawing PG4304-2 - Receptor Locations in Appendix 1.

All horizontal distances have been measured from the reception point to the edge of the right-of-way. The roadways were analyzed where they intersected the 100 m buffer zone, which is reflected in the local angles, presented in Drawings PG4853-1B to 1E - Site Geometry in Appendix 1.

Table 11 - Summary of Reception Points and Geometry 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 are considered, as stipulated by the ENGC.

The subject site is relatively flat and at grade with the neighbouring roads within the 100 m radius.

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.

Table 7 - Proposed Noise Levels				
Reception Point	Description	Outdoor Area $L_{EQ(16)}$ (dBA)	Daytime at Facade $L_{EQ(16)}$ (dBA)	Nighttime at Facade $L_{eq(8)}$ (dBA)
REC 1-1	Eastern Elevation, 1 st Floor	--	71.34	63.75
REC 1-6	Eastern Elevation, 6 th Floor	--	71.34	63.75
REC 2-1	Southern Elevation, 1 st Floor	--	66.56	58.96
REC 2-6	Southern Elevation, 6 th Floor	--	67.83	58.96
REC 3-0	Rear Grassed Area, North Portion	65.02	--	--
REC 4-0	Rear Grassed Area, South Portion	65.85	--	--
REC 5-1	Northern Elevation, 1 st Floor	--	60.13	52.53
REC 5-6	Northern Elevation, 6 th Floor	--	67.23	59.63
REC 6-1	Western Elevation, 1 st Floor	--	51.47	45.83
REC 6-6	Western Elevation, 6 th Floor	--	52.51	47.24

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

There were no outdoor living areas identified for the proposed development. However, there is a grassed area at the rear of the proposed building that was of sufficient size to be analyzed. It is unknown if this grassed area will be utilized as an outdoor living area.

Two (2) reception points were located within the rear yards. This location was completed as a “free-field” sound level, so it is not affected by the presence of the building under assessment. The results of the STAMSON modeling indicates that the maximum $L_{eq(16)}$ from all sources will be 65.94 dBA, located at the western property edge, in the rear grassed area. This value is above the 55 dBA that was specified in Table 1, and therefore noise attenuation measures are to be provided.

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modelling indicates that the $L_{eq(16)}$ ranges between 56.53 dBA and 71.40 dBA. The ENG C states that the limits for the exterior of the pane of glass is 55 dBA. These results exceeds 55 dBA and therefore warning clauses will be required to be stated on any property titles. The applicable warning clauses are summarized in Table 7.

Table 8 - Summary of Warning Clauses		
Elevation	Applicable Warning Clause	Additional Considerations
Northern Elevation	Warning Clause Type D	All units must be equipped with a central air conditioning system, reducing the need to open windows.
Eastern Elevation	Warning Clause Type D	All units must be equipped with a central air conditioning system, reducing the need to open windows.
Southern Elevation	Warning Clause Type D	All units must be equipped with a central air conditioning system, reducing the need to open windows.
Western Elevation	Warning Clause Type C	All units must be equipped with a provision to install a central air conditioning system.

6.3 Noise Control Measures for Surface Transportation Noise

Outdoor Living Area

As described in subsection 6.1, where the daytime sound levels in outdoor living areas (OLA) exceeds 55 dBA, noise control measures should be implemented.

The following table outlines the MOECC recommended options for sound mitigation and the respected responses.

Table 9 - Outdoor Living Area Noise Mitigation Solutions	
MOECC Recommended Option	Site Specific Response
Distance setback with soft ground.	The proposed development configuration limits the actual maximum setback distance. An additional setback 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 in rear yards.	The proposed buildings are situation in order to shield the rear yards from the noise sources. Additional analysis is provided for this solution.
Shared outdoor amenity areas.	Not required
Earth berms (sound barriers).	Not required
Acoustic Barriers.	Not required

The MOECC also states that warning clauses may be necessary, and it includes reference to specific noise mitigation measures in the development and whether noise is expected to increase in the future. It should be noted that there is a need to maintain the mitigation.

The sound mitigation measure that is to be utilized for this development will be the orientation of the buildings. It is noted that the proposed buildings may have a rear outdoor living space that will be blocked from the noise of Bronson Avenue by the proposed building.

A second analysis was completed using the STAMSON software taking into consideration the proposed building. Based on our analysis, the maximum $L_{eq(16)}$ will be 52.70 dBA, which is below the 55 dBA threshold. This is an acceptable noise mitigation measure, as the outdoor living area would not be constructed until the building has been constructed. No additional noise mitigation measures will be required.

Indoor Living Area

As described in Table 11, where the daytime sound level at the plane of the window exceeds 60 dBA on the northern, southern and eastern elevations, noise control measures should be implemented. The following table outlines the MOECC recommended options for sound mitigation and the respected responses.

Table 10 - Indoor Living Area Noise Mitigation Solutions	
MOECC Recommended Option	Site Specific Response
Distance setback with soft ground.	The proposed development configuration limits the actual maximum setback distance. An additional setback 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	The proposed buildings are situated in order to shield the rear yards from the noise sources. 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 22 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 33 or higher, this would be a sufficient noise attenuation device.**

Detailed shop drawing are not available at the time of issuance of this memo. It is understood through e-mail correspondence that the building materials will consist of the following:

- ☐ double paned windows
- ☐ ground floor will be brick construction
- ☐ upper floors will be cement board cladding
- ☐ construction will be steel stud walls with concrete structure

From a review of these construction materials, it was determined that they are sufficient for the noise attenuation properties to ensure that the indoor living areas will be below 45 dBA.

7.0 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 TC United 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.



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APPENDIX 1

TABLE 11 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG4304-1 - SITE PLAN

DRAWAING PG4304-1B - SITE GEOMETRY (REC 1-1 AND REC 1-6)

DRAWAING PG4304-1C - SITE GEOMETRY (REC 2-1 AND REC 2-6)

DRAWAING PG4304-1D - SITE GEOMETRY (REC 3-0)

DRAWAING PG4304-1E - SITE GEOMETRY (REC 4-0)

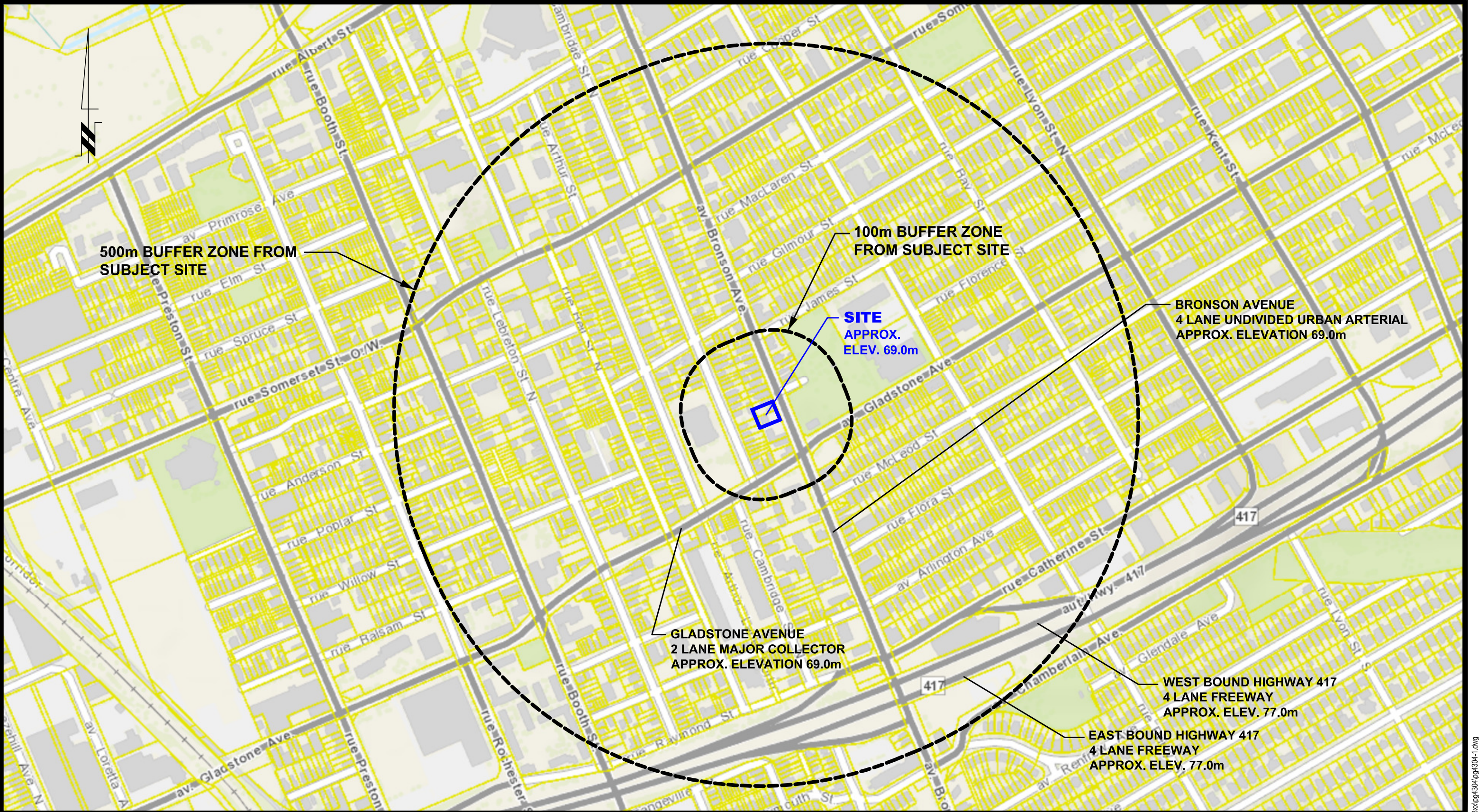
DRAWAING PG4304-1F - SITE GEOMETRY (REC 5-1 AND REC 5-6)

DRAWAING PG4304-1G - SITE GEOMETRY (REC 6-1 AND REC 6-6)

DRAWING PG4304-2 - RECEPTOR LOCATIONS

Table 11a - Summary of Reception Points and Geometry 440-444 Bronson Avenue														
Point of Reception	Location	Leq Day (dBA)	Bronson Avenue						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 1-1	Eastern Elevation, 1st floor	71.34	15	1.5	15.07481343	-85.5, 84.5	n/a	n/a	70	1.5	70.01607	-67, 0	n/a	n/a
REC 1-6	Eastern Elevation, 6th floor	71.34	15	17.4	22.97302766	-85.5, 84.5	n/a	n/a	70	17.4	72.13016	-67, 0	n/a	n/a
REC 2-1	Southern Elevation, 1st floor	66.56	18	1.5	18.06239187	0, 62	n/a	n/a	55	1.5	55.020451	-74, -28	n/a	n/a
						62, 80	4.5	20				-28, 50	4.5	20
REC 2-6	Southern Elevation, 6th Floor	67.83	18	17.4	25.03517525	0, 62	n/a	n/a	55	17.4	57.68674	-74, -28	n/a	n/a
						62, 80	4.5	20				-28, 50	4.5	20
REC 3-0	Rear Common Area, North Portion	65.02	33	1.5	33.03407332	-74, -20	7.5	26	80	1.5	80.014061	-68, -33	n/a	n/a
						-20, 60	n/a	n/a				-33, 38	4.5	27
						60, 74.5	4.5	33						
REC 4-0	Rear Common Area, South Portion	65.85	33	1.5	33.03407332	-75.5, -42	7.5	30	65	1.5	0	-73, -43	n/a	n/a
						-42, 48	n/a	n/a				-43, 43	4.5	20
						48, 73	4.5	33						
REC 5-1	Northern Elevation, 1st Floor	60.13	18	1.5	18.06239187	-81, -15	7.5	11	n/a	n/a	n/a	n/a	n/a	n/a
						-15, 0	n/a	n/a						
REC 5-6	Northern Elevation, 6th Floor	67.23	18	17.4	25.03517525	-81, -15	7.5	11	n/a	n/a	n/a	n/a	n/a	n/a
						-15, 0	n/a	n/a						
REC 6-1	Western Elevation, 1st Floor	51.47	n/a	n/a	n/a	n/a	n/a	n/a	75	1.5	75.014999	0, 40.5	4.5	27
REC 6-6	Western Elevation, 6th Floor	51.47	n/a	n/a	n/a	n/a	n/a	n/a	75	17.4	76.991948	0, 40.5	4.5	27

Table 11b - Summary of Reception Points and Geometry 440-444 Bronson Avenue														
Point of Reception	Location	Leq Day (dBA)	Highway 417 - Westbound						Highway 417 - Eastbound					
			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 1-1	Eastern Elevation, 1st floor	71.34	410	1.5	410.0027439	-39, 0	3	400	440	1.5	440.00256	-33.7, 0	3	430
REC 1-6	Eastern Elevation, 5th floor	71.34	410	17.4	410.3690534	-39, 0	3	400	440	17.4	440.34391	-33.7, 0	3	430
REC 2-1	Southern Elevation, 1st floor	66.56	400	1.5	400.0028125	-40.5, 41	3	390	430	1.5	430.00262	-35, 37.5	3	420
REC 2-6	Southern Elevation, 6th Floor	67.83	400	17.4	400.3782711	-40.5, 41	3	390	430	17.4	430.3519	-35, 37.5	3	420
REC 3-0	Rear Common Area, North Portion	65.02	405	1.5	405.0027778	-40.5, 38.5	3	395	435	1.5	435.00259	-35.5, 35	3	425
REC 4-0	Rear Common Area, South Portion	65.85	420	1.5	420.0026786	-42, 39.5	3	410	450	1.5	450.0025	-36, 34.7	3	440
REC 5-1	Northern Elevation, 1st Floor	60.13	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 5-6	Northern Elevation, 6th Floor	67.23	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 6-1	Western Elevation, 1st Floor	51.47	410	1.5	410.0027439	0, 39	3	400	440	1.5	440.00256	0, 35.5	3	430
REC 6-6	Western Elevation, 6th Floor	51.47	410	17.4	410.3690534	0, 39	3	400	440	17.4	440.34391	0, 35.5	3	430



patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

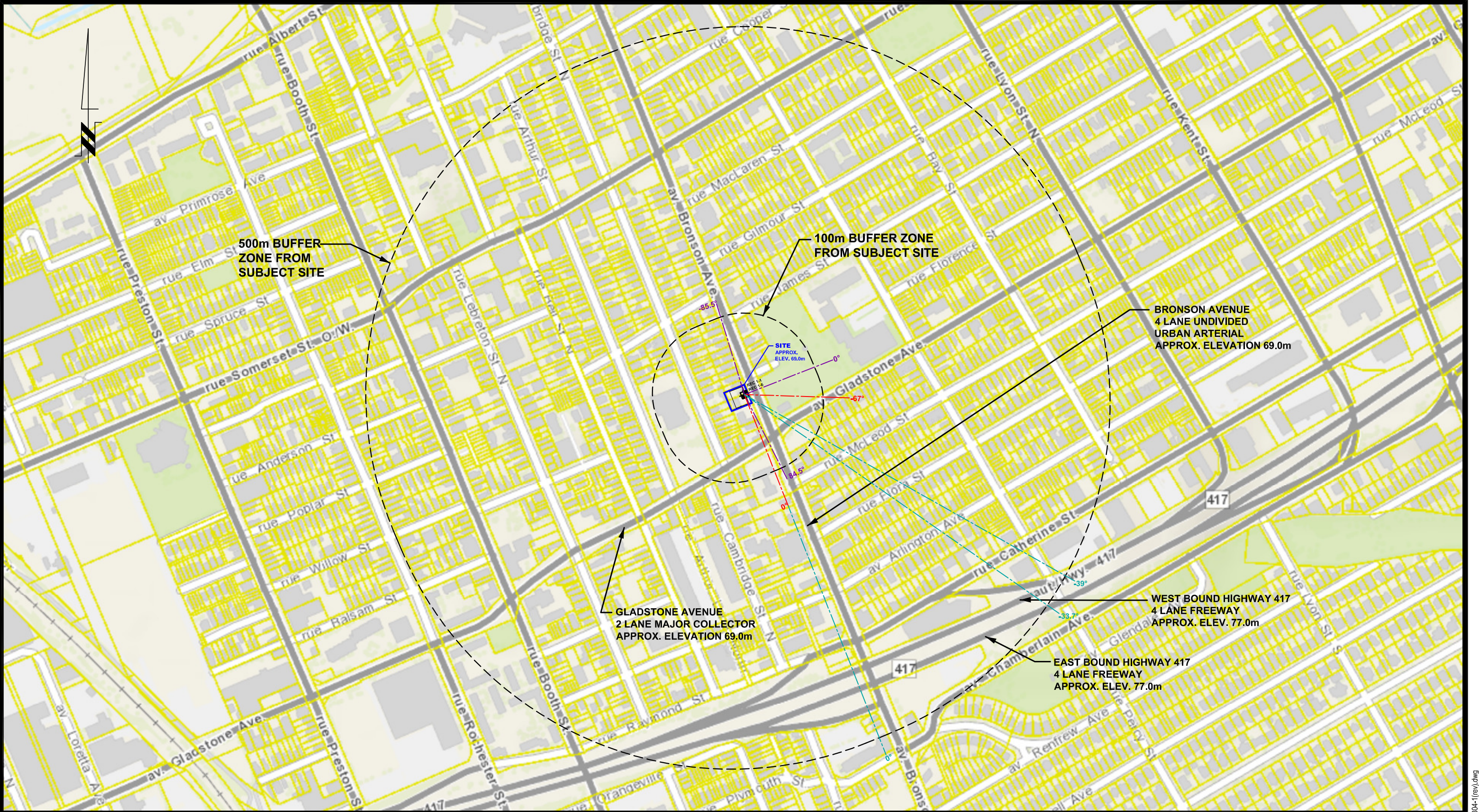
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T.C UNITED
NOISE ATTENUATION STUDY
440 BRONSON AVENUE
ONTARIO

OTTAWA,
Title:

SITE PLAN

Scale:	1:5000	Date:	10/2017
Drawn by:	RCG	Report No.:	PG4304-1
Checked by:	SB	Dwg. No.:	PG4304-1
Approved by:	DJG	Revision No.:	0



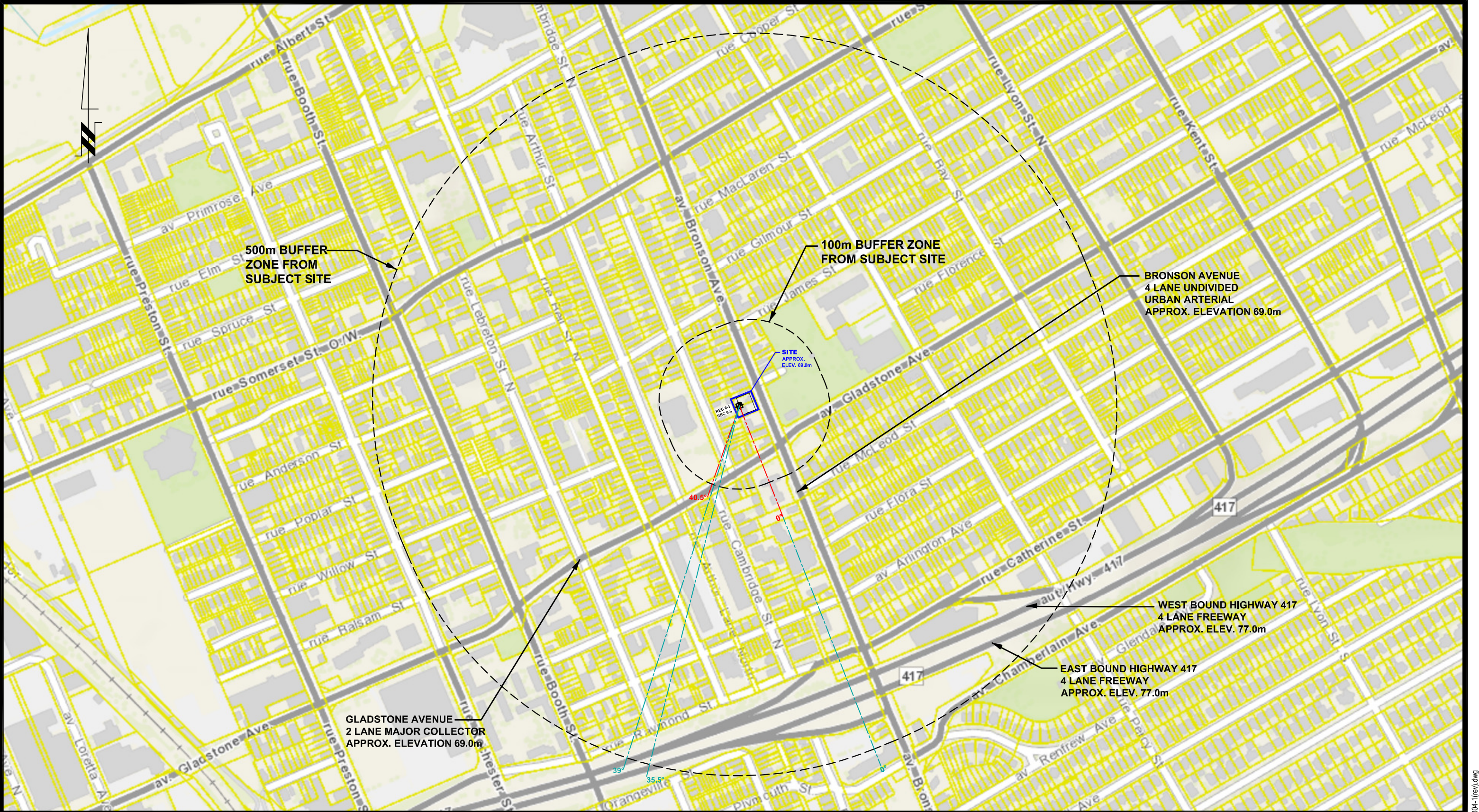
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T.C UNITED	
NOISE ATTENUATION STUDY	
440 BRONSON AVENUE	
OTTAWA,	ONTARIO
Title: SITE GEOMETRY - REC 1-1 , REC 1-6	

Scale:	1:5000	Date:	10/2017
Drawn by:	RCG	Report No.:	PG4304-1
Checked by:	SB	Dwg. No.:	PG4304-1B
Approved by:	DJG	Revision No.:	0



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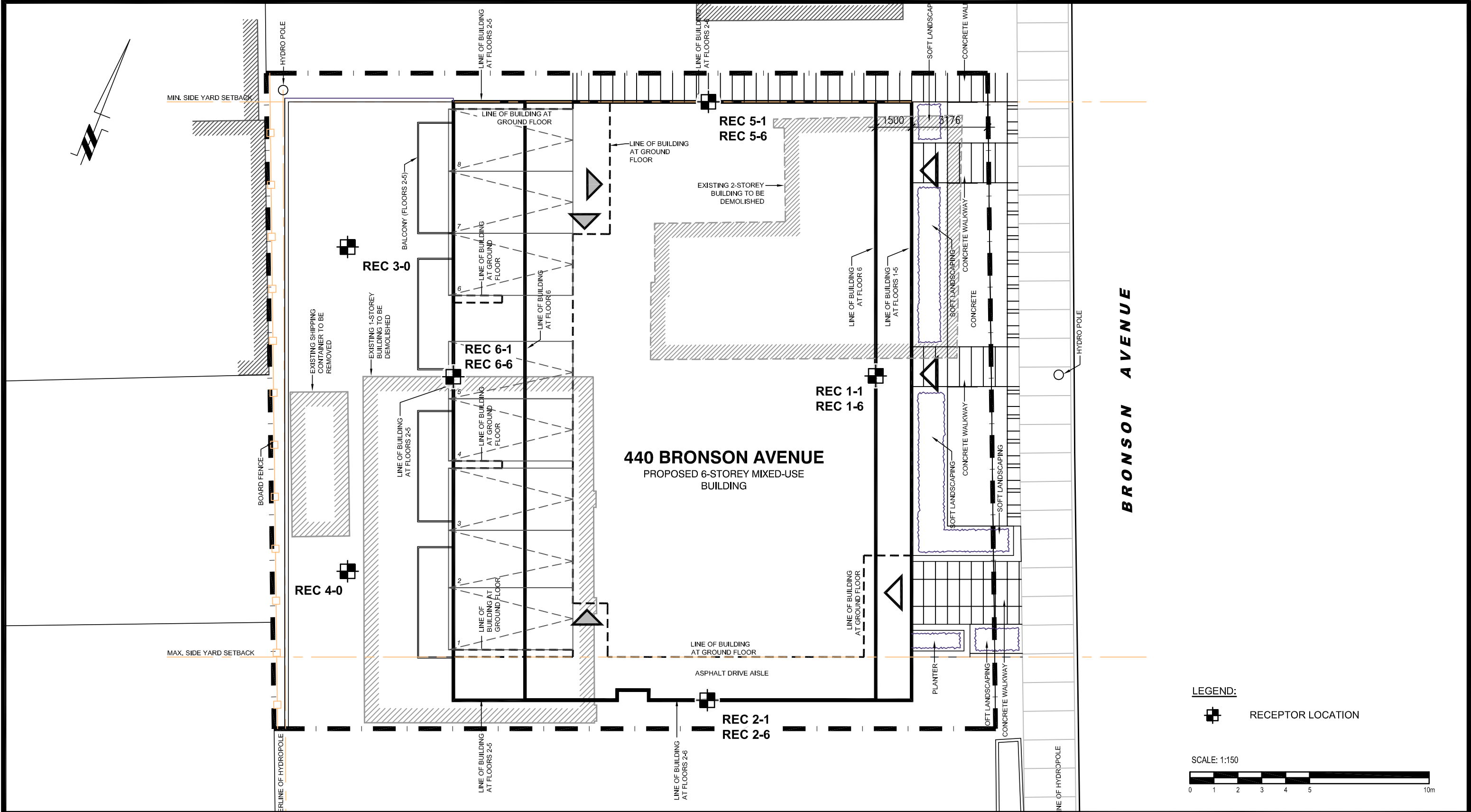
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NOISE ATTENUATION STUDY	
440 BRONSON AVENUE	
OTTAWA,	ONTARIO
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NOISE ATTENUATION STUDY
440 BRONSON AVENUE
ONTARIO

OTTAWA,
Title:

RECEPTOR LOCATION PLAN

Scale:	1:150	Date:	10/2017
Drawn by:	RCG	Report No.:	PG4304-1
Checked by:	SB	Dwg. No.:	PG4304-2
Approved by:	DJG	Revision No.:	0

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APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:41:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC11.te Time Period: Day/Night 16/8 hours
Description: Reception Point 1-1

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -85.00 deg 85.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: 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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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)

 Angle1 Angle2 : -67.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 3 / 3
 House density : 50 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 30.00 / 30.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

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

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 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 417W (day/night)

 Angle1 Angle2 : -39.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 7 / 7
 House density : 60 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 410.00 / 410.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -39.00 deg Angle2 : 0.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 400.00 / 400.00 m

Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 417E (day/night)

Angle1 Angle2 : -34.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 60 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 440.00 / 440.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -34.00 deg Angle2 : 0.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 430.00 / 430.00 m
Source elevation : 77.00 m
Receiver elevation : 67.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

Results segment # 1: Bronson (day)

Source height = 1.50 m

ROAD (0.00 + 71.24 + 0.00) = 71.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	85	0.00	71.49	0.00	0.00	-0.25	0.00	0.00	0.00	71.24

Segment Leq : 71.24 dBA



Results segment # 2: Gladstone (day)

Source height = 1.50 m

ROAD (0.00 + 52.61 + 0.00) = 52.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	0	0.00	65.72	0.00	-3.01	-4.29	0.00	-5.80	0.00	52.61

Segment Leq : 52.61 dBA



Results segment # 3: Hwy 417W (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 !	1.30 !	78.30

ROAD (0.00 + 48.33 + 0.00) = 48.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	0	0.00	81.40	0.00	-14.37	-6.64	0.00	-12.06	0.00	48.33
-39	0	0.00	81.40	0.00	-14.37	-6.64	0.00	0.00	-9.70	50.69

Segment Leq : 48.33 dBA



Results segment # 4: Hwy 417E (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	!	1.27	!	78.27

ROAD (0.00 + 47.45 + 0.00) = 47.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	0	0.00	81.40	0.00	-14.67	-7.24	0.00	-12.03	0.00	47.45
-34	0	0.00	81.40	0.00	-14.67	-7.24	0.00	0.00	-9.88	49.61

Segment Leq : 47.45 dBA

Total Leq All Segments: 71.34 dBA

↑
Results segment # 1: Bronson (night)

Source height = 1.50 m

ROAD (0.00 + 63.65 + 0.00) = 63.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	85	0.00	63.89	0.00	0.00	-0.25	0.00	0.00	0.00	63.65

Segment Leq : 63.65 dBA

↑
Results segment # 2: Gladstone (night)

Source height = 1.50 m

ROAD (0.00 + 45.02 + 0.00) = 45.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	0	0.00	58.12	0.00	-3.01	-4.29	0.00	-5.80	0.00	45.02

Segment Leq : 45.02 dBA

↑
Results segment # 3: Hwy 417W (night)

Source height = 1.49 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.49 !          1.50 !          1.30 !          78.30

```

ROAD (0.00 + 40.73 + 0.00) = 40.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	0	0.00	73.80	0.00	-14.37	-6.64	0.00	-12.06	0.00	40.73
-39	0	0.00	73.80	0.00	-14.37	-6.64	0.00	0.00	-9.70	43.09

Segment Leq : 40.73 dBA

↑

Results segment # 4: Hwy 417E (night)

Source height = 1.49 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.49 !          1.50 !          1.27 !          78.27

```

ROAD (0.00 + 39.85 + 0.00) = 39.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	0	0.00	73.80	0.00	-14.67	-7.24	0.00	-12.03	0.00	39.85
-34	0	0.00	73.80	0.00	-14.67	-7.24	0.00	0.00	-9.88	42.01

Segment Leq : 39.85 dBA

Total Leq All Segments: 63.75 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 71.34
(NIGHT): 63.75

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:43:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC16.te Time Period: Day/Night 16/8 hours
Description: Reception Point 1-6

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -85.00 deg 85.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 17.40 / 17.40 m
Topography : 1 (Flat/gentle slope; no barrier)
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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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)

 Angle1 Angle2 : -67.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 3 / 3
 House density : 50 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 30.00 / 30.00 m
 Receiver height : 17.40 / 17.40 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

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

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 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 417W (day/night)

 Angle1 Angle2 : -39.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 7 / 7
 House density : 60 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 410.00 / 410.00 m
 Receiver height : 17.40 / 17.40 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -39.00 deg Angle2 : 0.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 400.00 / 400.00 m

Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 417E (day/night)

Angle1 Angle2 : -34.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 7 / 7
House density : 60 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 440.00 / 440.00 m
Receiver height : 17.40 / 17.40 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -34.00 deg Angle2 : 0.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 430.00 / 430.00 m
Source elevation : 77.00 m
Receiver elevation : 67.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

Results segment # 1: Bronson (day)

Source height = 1.50 m

ROAD (0.00 + 71.24 + 0.00) = 71.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	85	0.00	71.49	0.00	0.00	-0.25	0.00	0.00	0.00	71.24

Segment Leq : 71.24 dBA



Results segment # 2: Gladstone (day)

Source height = 1.50 m

ROAD (0.00 + 52.61 + 0.00) = 52.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	0	0.00	65.72	0.00	-3.01	-4.29	0.00	-5.80	0.00	52.61

Segment Leq : 52.61 dBA



Results segment # 3: Hwy 417W (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 !	17.40 !	1.69 !	78.69

ROAD (0.00 + 48.33 + 0.00) = 48.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	0	0.00	81.40	0.00	-14.37	-6.64	0.00	-12.06	0.00	48.33
-39	0	0.00	81.40	0.00	-14.37	-6.64	0.00	0.00	-8.23	52.16

Segment Leq : 48.33 dBA



Results segment # 4: Hwy 417E (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	!	17.40	!	1.63	!	78.63

ROAD (0.00 + 47.45 + 0.00) = 47.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	0	0.00	81.40	0.00	-14.67	-7.24	0.00	-12.03	0.00	47.45
-34	0	0.00	81.40	0.00	-14.67	-7.24	0.00	0.00	-8.50	50.98

Segment Leq : 47.45 dBA

Total Leq All Segments: 71.34 dBA

↑

Results segment # 1: Bronson (night)

Source height = 1.50 m

ROAD (0.00 + 63.65 + 0.00) = 63.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	85	0.00	63.89	0.00	0.00	-0.25	0.00	0.00	0.00	63.65

Segment Leq : 63.65 dBA

↑

Results segment # 2: Gladstone (night)

Source height = 1.50 m

ROAD (0.00 + 45.02 + 0.00) = 45.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	0	0.00	58.12	0.00	-3.01	-4.29	0.00	-5.80	0.00	45.02

Segment Leq : 45.02 dBA

↑

Results segment # 3: Hwy 417W (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	17.40	1.69	78.69

ROAD (0.00 + 40.73 + 0.00) = 40.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	0	0.00	73.80	0.00	-14.37	-6.64	0.00	-12.06	0.00	40.73
-39	0	0.00	73.80	0.00	-14.37	-6.64	0.00	0.00	-8.23	44.56

Segment Leq : 40.73 dBA

↑

Results segment # 4: Hwy 417E (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	17.40	1.63	78.63

ROAD (0.00 + 39.85 + 0.00) = 39.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	0	0.00	73.80	0.00	-14.67	-7.24	0.00	-12.03	0.00	39.85
-34	0	0.00	73.80	0.00	-14.67	-7.24	0.00	0.00	-8.50	43.39

Segment Leq : 39.85 dBA

Total Leq All Segments: 63.75 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 71.34
(NIGHT): 63.75

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:45:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bronson Ave (day/night)

Angle1 Angle2 : 0.00 deg 62.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00

Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	7.00
Heavy Truck % of Total Volume	:	5.00
Day (16 hrs) % of Total Volume	:	92.00

Data for Segment # 2: Bronson Ave (day/night)

```

-----
Angle1   Angle2       : 62.00 deg   80.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           0 / 0
Surface         :           2       (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height  :           1.50 / 1.50 m
Topography      :           2       (Flat/gentle slope; with barrier)
Barrier angle1   : 62.00 deg   Angle2 : 80.00 deg
Barrier height   :           4.50 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation :           69.00 m
Receiver elevation :           69.00 m
Barrier elevation :           69.00 m
Reference angle  :           0.00

```



Road data, segment # 3: Gladstone Av (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 : 40 km/h
Road gradient      :           0 %
Road pavement     :           1 (Typical asphalt or concrete)

```

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

24 hr Traffic Volume (AADT or SADT):	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 # 3: Gladstone Av (day/night)

```

-----
Angle1   Angle2       : -74.00 deg   -28.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           0 / 0
Surface         :           2       (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height  :           1.50 / 1.50 m
Topography      :           1       (Flat/gentle slope; no barrier)

```


Reference angle : 0.00

↑

Road data, segment # 4: Gladstone Av (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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 4: Gladstone Av (day/night)

Angle1 Angle2 : -28.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -28.00 deg Angle2 : 50.00 deg
Barrier height : 4.50 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

Road data, segment # 5: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: Hwy 417 West (day/night)

 Angle1 Angle2 : -40.00 deg 41.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 6
 House density : 95 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 400.00 / 400.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -40.00 deg Angle2 : 41.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 390.00 / 390.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Road data, segment # 6: Hwy 417 East (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 6: Hwy 417 East (day/night)

 Angle1 Angle2 : -35.00 deg 38.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 6

House density : 95 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 430.00 / 430.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -35.00 deg Angle2 : 38.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 420.00 / 420.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00



Results segment # 1: Bronson Ave (day)

Source height = 1.50 m

ROAD (0.00 + 66.07 + 0.00) = 66.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	62	0.00	71.49	0.00	-0.79	-4.63	0.00	0.00	0.00	66.07

Segment Leq : 66.07 dBA



Results segment # 2: Bronson Ave (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	!	70.50

ROAD (0.00 + 46.98 + 0.00) = 46.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	80	0.00	71.49	0.00	-0.79	-10.00	0.00	0.00	-13.72	46.98

Segment Leq : 46.98 dBA



Results segment # 3: Gladstone Av (day)

Source height = 1.50 m

ROAD (0.00 + 54.15 + 0.00) = 54.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-28	0.00	65.72	0.00	-5.64	-5.93	0.00	0.00	0.00	54.15

Segment Leq : 54.15 dBA



Results segment # 4: Gladstone Av (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	!	70.50

ROAD (0.00 + 43.67 + 0.00) = 43.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	50	0.00	65.72	0.00	-5.64	-3.63	0.00	0.00	-12.77	43.67

Segment Leq : 43.67 dBA



Results segment # 5: Hwy 417 West (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	!	1.30	!	78.30

ROAD (0.00 + 48.97 + 0.00) = 48.97 dBA

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

-40	41	0.00	81.40	0.00	-14.26	-3.47	0.00	-14.70	0.00	48.97
-40	41	0.00	81.40	0.00	-14.26	-3.47	0.00	0.00	-9.70	53.97

Segment Leq : 48.97 dBA

↑
Results segment # 6: Hwy 417 East (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	!
		1.31	!
			78.31

ROAD (0.00 + 48.32 + 0.00) = 48.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	38	0.00	81.40	0.00	-14.57	-3.92	0.00	-14.59	0.00	48.32
-35	38	0.00	81.40	0.00	-14.57	-3.92	0.00	0.00	-9.69	53.21

Segment Leq : 48.32 dBA

Total Leq All Segments: 66.56 dBA

↑
Results segment # 1: Bronson Ave (night)

Source height = 1.50 m

ROAD (0.00 + 58.47 + 0.00) = 58.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	62	0.00	63.89	0.00	-0.79	-4.63	0.00	0.00	0.00	58.47

Segment Leq : 58.47 dBA

↑
Results segment # 2: Bronson Ave (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	!	70.50

ROAD (0.00 + 39.39 + 0.00) = 39.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	80	0.00	63.89	0.00	-0.79	-10.00	0.00	0.00	-13.72	39.39

Segment Leq : 39.39 dBA



Results segment # 3: Gladstone Av (night)

Source height = 1.50 m

ROAD (0.00 + 46.55 + 0.00) = 46.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-28	0.00	58.12	0.00	-5.64	-5.93	0.00	0.00	0.00	46.55

Segment Leq : 46.55 dBA



Results segment # 4: Gladstone Av (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	!	70.50

ROAD (0.00 + 36.07 + 0.00) = 36.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	50	0.00	58.12	0.00	-5.64	-3.63	0.00	0.00	-12.77	36.07

Segment Leq : 36.07 dBA



Results segment # 5: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49 !	1.50 !	1.30 !	78.30

ROAD (0.00 + 41.37 + 0.00) = 41.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	41	0.00	73.80	0.00	-14.26	-3.47	0.00	-14.70	0.00	41.37
-40	41	0.00	73.80	0.00	-14.26	-3.47	0.00	0.00	-9.70	46.37

Segment Leq : 41.37 dBA



Results segment # 6: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49 !	1.50 !	1.31 !	78.31

ROAD (0.00 + 40.72 + 0.00) = 40.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	38	0.00	73.80	0.00	-14.57	-3.92	0.00	-14.59	0.00	40.72
-35	38	0.00	73.80	0.00	-14.57	-3.92	0.00	0.00	-9.70	45.61

Segment Leq : 40.72 dBA

Total Leq All Segments: 58.96 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 66.56
(NIGHT): 58.96



STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:47:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec26.te Time Period: Day/Night 16/8 hours
Description: Reception Point 2-6

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bronson Ave (day/night)

Angle1 Angle2 : 0.00 deg 62.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height : 17.40 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00

Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	7.00
Heavy Truck % of Total Volume	:	5.00
Day (16 hrs) % of Total Volume	:	92.00

Data for Segment # 2: Bronson Ave (day/night)

```

-----
Angle1   Angle2       : 62.00 deg   80.00 deg
Wood depth      :          0      (No woods.)
No of house rows :          0 / 0
Surface         :          2      (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height  : 17.40 / 1.50 m
Topography      :          2      (Flat/gentle slope; with barrier)
Barrier angle1   : 62.00 deg   Angle2 : 80.00 deg
Barrier height   : 4.50 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle  : 0.00

```



Road data, segment # 3: Gladstone Av (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  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)

```

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

24 hr Traffic Volume (AADT or SADT):	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 # 3: Gladstone Av (day/night)

```

-----
Angle1   Angle2       : -74.00 deg   -28.00 deg
Wood depth      :          0      (No woods.)
No of house rows :          0 / 0
Surface         :          2      (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height  : 17.40 / 1.50 m
Topography      :          1      (Flat/gentle slope; no barrier)

```

Reference angle : 0.00

↑

Road data, segment # 4: Gladstone Av (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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 4: Gladstone Av (day/night)

Angle1 Angle2 : -28.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height : 17.40 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -28.00 deg Angle2 : 50.00 deg
Barrier height : 4.50 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

Road data, segment # 5: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: Hwy 417 West (day/night)

 Angle1 Angle2 : -40.00 deg 41.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 6
 House density : 95 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 400.00 / 400.00 m
 Receiver height : 17.40 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -40.00 deg Angle2 : 41.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 390.00 / 390.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Road data, segment # 6: Hwy 417 East (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 6: Hwy 417 East (day/night)

 Angle1 Angle2 : -35.00 deg 38.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 6

House density : 95 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 430.00 / 430.00 m
 Receiver height : 17.40 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -35.00 deg Angle2 : 38.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 420.00 / 420.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00



Results segment # 1: Bronson Ave (day)

Source height = 1.50 m

ROAD (0.00 + 66.07 + 0.00) = 66.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	62	0.00	71.49	0.00	-0.79	-4.63	0.00	0.00	0.00	66.07

Segment Leq : 66.07 dBA



Results segment # 2: Bronson Ave (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 !	17.40 !	5.03 !	74.03

ROAD (0.00 + 60.70 + 0.00) = 60.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	80	0.00	71.49	0.00	-0.79	-10.00	0.00	0.00	-4.65	56.05*
62	80	0.00	71.49	0.00	-0.79	-10.00	0.00	0.00	0.00	60.70

* Bright Zone !

Segment Leq : 60.70 dBA



Results segment # 3: Gladstone Av (day)

Source height = 1.50 m

ROAD (0.00 + 54.15 + 0.00) = 54.15 dBA

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

-74	-28	0.00	65.72	0.00	-5.64	-5.93	0.00	0.00	0.00	54.15
-----	-----	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 54.15 dBA



Results segment # 4: Gladstone Av (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 !	17.40 !	11.62 !	80.62
--------	---------	---------	-------

ROAD (0.00 + 56.44 + 0.00) = 56.44 dBA

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

-28	50	0.00	65.72	0.00	-5.64	-3.63	0.00	0.00	0.00	56.44*
-----	----	------	-------	------	-------	-------	------	------	------	--------

-28	50	0.00	65.72	0.00	-5.64	-3.63	0.00	0.00	0.00	56.44
-----	----	------	-------	------	-------	-------	------	------	------	-------

* Bright Zone !

Segment Leq : 56.44 dBA



Results segment # 5: Hwy 417 West (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 !          17.40 !          1.69 !          78.69

```

ROAD (0.00 + 48.97 + 0.00) = 48.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	41	0.00	81.40	0.00	-14.26	-3.47	0.00	-14.70	0.00	48.97
-40	41	0.00	81.40	0.00	-14.26	-3.47	0.00	0.00	-8.20	55.47

Segment Leq : 48.97 dBA



Results segment # 6: Hwy 417 East (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 !	17.40 !	1.68 !	78.68

ROAD (0.00 + 48.32 + 0.00) = 48.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	38	0.00	81.40	0.00	-14.57	-3.92	0.00	-14.59	0.00	48.32
-35	38	0.00	81.40	0.00	-14.57	-3.92	0.00	0.00	-8.29	54.62

Segment Leq : 48.32 dBA

Total Leq All Segments: 67.83 dBA



Results segment # 1: Bronson Ave (night)

Source height = 1.50 m

ROAD (0.00 + 58.47 + 0.00) = 58.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	62	0.00	63.89	0.00	-0.79	-4.63	0.00	0.00	0.00	58.47

Segment Leq : 58.47 dBA

Results segment # 2: Bronson Ave (night)

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	!	70.50

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	80	0.00	63.89	0.00	-0.79	-10.00	0.00	0.00	-13.72	39.39

Results segment # 3: Gladstone Av (night)

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-28	0.00	58.12	0.00	-5.64	-5.93	0.00	0.00	0.00	46.55

Results segment # 4: Gladstone Av (night)

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	!	70.50

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

-28	50	0.00	58.12	0.00	-5.64	-3.63	0.00	0.00	-12.77	36.07
-----	----	------	-------	------	-------	-------	------	------	--------	-------

Segment Leq : 36.07 dBA

↑
Results segment # 5: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49	!	1.50	!
		1.30	!
			78.30

ROAD (0.00 + 41.37 + 0.00) = 41.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	41	0.00	73.80	0.00	-14.26	-3.47	0.00	-14.70	0.00	41.37
-40	41	0.00	73.80	0.00	-14.26	-3.47	0.00	0.00	-9.70	46.37

Segment Leq : 41.37 dBA

↑
Results segment # 6: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49	!	1.50	!
		1.31	!
			78.31

ROAD (0.00 + 40.72 + 0.00) = 40.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	38	0.00	73.80	0.00	-14.57	-3.92	0.00	-14.59	0.00	40.72
-35	38	0.00	73.80	0.00	-14.57	-3.92	0.00	0.00	-9.70	45.61

Segment Leq : 40.72 dBA

Total Leq All Segments: 58.96 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 67.83
(NIGHT): 58.96



STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:54:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec30.te Time Period: Day/Night 16/8 hours
Description: Reception Point 3-0

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bronson Ave (day/night)

Angle1 Angle2 : -74.00 deg -20.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : -74.00 deg Angle2 : -20.00 deg
Barrier height : 7.50 m
Barrier receiver distance : 26.00 / 26.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Bronson Ave (day/night)

Angle1 Angle2 : -20.00 deg 60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.00 / 33.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 3: Bronson Ave (day/night)

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Bronson Ave (day/night)

Angle1 Angle2 : 60.00 deg 74.50 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : 60.00 deg Angle2 : 74.50 deg
Barrier height : 4.50 m
Barrier receiver distance : 32.00 / 32.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

Road data, segment # 4: Gladstone Av (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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 4: Gladstone Av (day/night)

Angle1 Angle2 : -69.00 deg -33.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 5: Gladstone Av (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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 5: Gladstone Av (day/night)

 Angle1 Angle2 : -33.00 deg 38.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 80.00 / 80.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -33.00 deg Angle2 : 38.00 deg
 Barrier height : 4.50 m
 Barrier receiver distance : 27.00 / 27.00 m
 Source elevation : 69.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 69.00 m
 Reference angle : 0.00

↑

Road data, segment # 6: Hwy 417 East (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 6: Hwy 417 East (day/night)

 Angle1 Angle2 : -40.00 deg 39.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 405.00 / 405.00 m

Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -40.00 deg Angle2 : 39.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 395.00 / 395.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Road data, segment # 7: Hwy 417 West (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 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 # 7: Hwy 417 West (day/night)

 Angle1 Angle2 : -36.00 deg 35.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 450.00 / 450.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -36.00 deg Angle2 : 35.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 440.00 / 440.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Results segment # 1: Bronson Ave (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	!
			70.50

ROAD (0.00 + 43.47 + 0.00) = 43.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-20	0.00	71.49	0.00	-3.42	-5.23	0.00	0.00	-19.36	43.47

Segment Leq : 43.47 dBA

↑
Results segment # 2: Bronson Ave (day)

Source height = 1.50 m

ROAD (0.00 + 64.54 + 0.00) = 64.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	60	0.00	71.49	0.00	-3.42	-3.52	0.00	0.00	0.00	64.54

Segment Leq : 64.54 dBA

↑
Results segment # 3: Bronson Ave (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	!
			70.50

ROAD (0.00 + 40.14 + 0.00) = 40.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
60	74	0.00	71.49	0.00	-3.42	-10.94	0.00	0.00	-16.99	40.14

Segment Leq : 40.14 dBA

↑
Results segment # 4: Gladstone Av (day)

Source height = 1.50 m

ROAD (0.00 + 51.46 + 0.00) = 51.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	-33	0.00	65.72	0.00	-7.27	-6.99	0.00	0.00	0.00	51.46

Segment Leq : 51.46 dBA

↑
Results segment # 5: Gladstone Av (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 !	70.50

ROAD (0.00 + 42.80 + 0.00) = 42.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-33	38	0.00	65.72	0.00	-7.27	-4.04	0.00	0.00	-11.61	42.80

Segment Leq : 42.80 dBA

↑
Results segment # 6: Hwy 417 East (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 ! 1.30 ! 78.30

ROAD (0.00 + 48.83 + 0.00) = 48.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	39	0.00	81.40	0.00	-14.31	-3.58	0.00	-14.68	0.00	48.83
-40	39	0.00	81.40	0.00	-14.31	-3.58	0.00	0.00	-9.70	53.80

Segment Leq : 48.83 dBA

↑

Results segment # 7: Hwy 417 West (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 !	1.32 !	78.32

ROAD (0.00 + 48.07 + 0.00) = 48.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	35	0.00	81.40	0.00	-14.77	-4.04	0.00	-14.51	0.00	48.07
-36	35	0.00	81.40	0.00	-14.77	-4.04	0.00	0.00	-9.67	52.91

Segment Leq : 48.07 dBA

Total Leq All Segments: 65.02 dBA

↑

Results segment # 1: Bronson Ave (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 !	70.50

ROAD (0.00 + 35.88 + 0.00) = 35.88 dBA

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

-74	-20	0.00	63.89	0.00	-3.42	-5.23	0.00	0.00	-19.36	35.88
-----	-----	------	-------	------	-------	-------	------	------	--------	-------

Segment Leq : 35.88 dBA

```

Results segment # 2: Bronson Ave (night)
-----

```

Source height = 1.50 m

$$\text{ROAD } (0.00 + 56.95 + 0.00) = 56.95 \text{ dBA}$$

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	60	0.00	63.89	0.00	-3.42	-3.52	0.00	0.00	0.00	56.95

Segment Leq : 56.95 dBA

```

Results segment # 3: Bronson Ave (night)
-----

```

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height	(m)	Height	(m)	Height	(m)	Barrier Top (m)
-----	+	-----	+	-----	+	-----
1.50	!	1.50	!	1.50	!	70.50

$$\text{ROAD } (0.00 + 32.54 + 0.00) = 32.54 \text{ dBA}$$

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
60	74	0.00	63.89	0.00	-3.42	-10.94	0.00	0.00	-16.99	32.54

Segment Leq : 32.54 dBA

```

Results segment # 4: Gladstone Av (night)
-----

```

Source height = 1.50 m

$$\text{ROAD } (0.00 + 43.86 + 0.00) = 43.86 \text{ dBA}$$

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

-69 -33 0.00 58.12 0.00 -7.27 -6.99 0.00 0.00 0.00 43.86

Segment Leq : 43.86 dBA

↑
Results segment # 5: Gladstone Av (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	!
			70.50

ROAD (0.00 + 35.20 + 0.00) = 35.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-33	38	0.00	58.12	0.00	-7.27	-4.04	0.00	0.00	-11.61	35.20

Segment Leq : 35.20 dBA

↑
Results segment # 6: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.49	!	1.50	!
		1.30	!
			78.30

ROAD (0.00 + 46.21 + 0.00) = 46.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	39	0.00	73.80	0.00	-14.31	-3.58	0.00	0.00	-9.70	46.21

Segment Leq : 46.21 dBA

↑
Results segment # 7: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	1.50	1.32	78.32

ROAD (0.00 + 45.31 + 0.00) = 45.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	35	0.00	73.80	0.00	-14.77	-4.04	0.00	0.00	-9.68	45.31

Segment Leq : 45.31 dBA

Total Leq All Segments: 57.81 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 65.02
(NIGHT): 57.81

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:55:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec40.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-0

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bronson Ave (day/night)

Angle1 Angle2 : -76.00 deg -42.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : -76.00 deg Angle2 : -42.00 deg
Barrier height : 7.50 m
Barrier receiver distance : 26.00 / 26.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Bronson Ave (day/night)

Angle1 Angle2 : -42.00 deg 48.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.00 / 33.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 3: Bronson Ave (day/night)

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Bronson Ave (day/night)

Angle1 Angle2 : 48.00 deg 73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : 48.00 deg Angle2 : 73.00 deg
 Barrier height : 4.50 m
 Barrier receiver distance : 32.00 / 32.00 m
 Source elevation : 69.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 69.00 m
 Reference angle : 0.00

↑

Road data, segment # 4: Gladstone Av (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 : 40 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 4: Gladstone Av (day/night)

 Angle1 Angle2 : -73.00 deg -43.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 65.00 / 65.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Road data, segment # 5: Gladstone Av (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 : 40 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 5: Gladstone Av (day/night)

 Angle1 Angle2 : -43.00 deg 43.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 65.00 / 65.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -43.00 deg Angle2 : 43.00 deg
 Barrier height : 4.50 m
 Barrier receiver distance : 20.00 / 20.00 m
 Source elevation : 69.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 69.00 m
 Reference angle : 0.00

↑

Road data, segment # 6: Hwy 417 East (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 6: Hwy 417 East (day/night)

 Angle1 Angle2 : -42.00 deg 40.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 420.00 / 420.00 m

Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -42.00 deg Angle2 : 40.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 410.00 / 410.00 m
Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

Road data, segment # 7: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 # 7: Hwy 417 West (day/night)

Angle1 Angle2 : -36.00 deg 35.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 450.00 / 450.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -36.00 deg Angle2 : 35.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 440.00 / 440.00 m
Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

Results segment # 1: Bronson Ave (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	!
			70.50

ROAD (0.00 + 42.06 + 0.00) = 42.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	-42	0.00	71.49	0.00	-3.42	-7.24	0.00	0.00	-18.77	42.06

Segment Leq : 42.06 dBA

↑
Results segment # 2: Bronson Ave (day)

Source height = 1.50 m

ROAD (0.00 + 65.06 + 0.00) = 65.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	48	0.00	71.49	0.00	-3.42	-3.01	0.00	0.00	0.00	65.06

Segment Leq : 65.06 dBA

↑
Results segment # 3: Bronson Ave (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	!
			70.50

ROAD (0.00 + 41.58 + 0.00) = 41.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	73	0.00	71.49	0.00	-3.42	-8.57	0.00	0.00	-17.91	41.58

Segment Leq : 41.58 dBA

↑
Results segment # 4: Gladstone Av (day)

Source height = 1.50 m

ROAD (0.00 + 51.57 + 0.00) = 51.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	-43	0.00	65.72	0.00	-6.37	-7.78	0.00	0.00	0.00	51.57

Segment Leq : 51.57 dBA

↑
Results segment # 5: Gladstone Av (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 !	70.50

ROAD (0.00 + 43.68 + 0.00) = 43.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	43	0.00	65.72	0.00	-6.37	-3.21	0.00	0.00	-12.46	43.68

Segment Leq : 43.68 dBA

↑
Results segment # 6: Hwy 417 East (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 ! 1.30 ! 78.30

ROAD (0.00 + 53.86 + 0.00) = 53.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	40	0.00	81.40	0.00	-14.47	-3.41	0.00	0.00	-9.65	53.86

Segment Leq : 53.86 dBA



Results segment # 7: Hwy 417 West (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 !	1.32 !	78.32

ROAD (0.00 + 52.91 + 0.00) = 52.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	35	0.00	81.40	0.00	-14.77	-4.04	0.00	0.00	-9.67	52.91

Segment Leq : 52.91 dBA

Total Leq All Segments: 65.85 dBA



Results segment # 1: Bronson Ave (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 !	70.50

ROAD (0.00 + 34.46 + 0.00) = 34.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	-42	0.00	63.89	0.00	-3.42	-7.24	0.00	0.00	-18.77	34.46

Segment Leq : 34.46 dBA

↑
Results segment # 2: Bronson Ave (night)

Source height = 1.50 m

ROAD (0.00 + 57.46 + 0.00) = 57.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	48	0.00	63.89	0.00	-3.42	-3.01	0.00	0.00	0.00	57.46

Segment Leq : 57.46 dBA

↑
Results segment # 3: Bronson Ave (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 !	70.50

ROAD (0.00 + 33.98 + 0.00) = 33.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	73	0.00	63.89	0.00	-3.42	-8.57	0.00	0.00	-17.91	33.98

Segment Leq : 33.98 dBA

↑
Results segment # 4: Gladstone Av (night)

Source height = 1.50 m

ROAD (0.00 + 43.97 + 0.00) = 43.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	-43	0.00	58.12	0.00	-6.37	-7.78	0.00	0.00	0.00	43.97

Segment Leq : 43.97 dBA



Results segment # 5: Gladstone Av (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	!
			70.50

ROAD (0.00 + 36.09 + 0.00) = 36.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	43	0.00	58.12	0.00	-6.37	-3.21	0.00	0.00	-12.46	36.09

Segment Leq : 36.09 dBA



Results segment # 6: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49	!	1.50	!
		1.30	!
			78.30

ROAD (0.00 + 46.26 + 0.00) = 46.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	40	0.00	73.80	0.00	-14.47	-3.41	0.00	0.00	-9.65	46.26

Segment Leq : 46.26 dBA



Results segment # 7: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.49	1.50	1.32	78.32

ROAD (0.00 + 45.31 + 0.00) = 45.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	35	0.00	73.80	0.00	-14.77	-4.04	0.00	0.00	-9.68	45.31

Segment Leq : 45.31 dBA

Total Leq All Segments: 58.25 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 65.85
(NIGHT): 58.25

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:58:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec51.te Time Period: Day/Night 16/8 hours
Description: Reception Point 5-1

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -81.00 deg -15.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -81.00 deg Angle2 : -15.00 deg
Barrier height : 7.50 m
Barrier receiver distance : 11.00 / 11.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -15.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Bronson (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 ! 70.50

ROAD (0.00 + 47.03 + 0.00) = 47.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-81	-15	0.00	71.49	0.00	-0.79	-4.36	0.00	0.00	-19.31	47.03

Segment Leq : 47.03 dBA

↑

Results segment # 2: Bronson (day)

Source height = 1.50 m

ROAD (0.00 + 59.91 + 0.00) = 59.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	0	0.00	71.49	0.00	-0.79	-10.79	0.00	0.00	0.00	59.91

Segment Leq : 59.91 dBA

Total Leq All Segments: 60.13 dBA

↑
Results segment # 1: Bronson (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	!
			70.50

ROAD (0.00 + 39.43 + 0.00) = 39.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-81	-15	0.00	63.89	0.00	-0.79	-4.36	0.00	0.00	-19.31	39.43

Segment Leq : 39.43 dBA

↑
Results segment # 2: Bronson (night)

Source height = 1.50 m

ROAD (0.00 + 52.31 + 0.00) = 52.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	0	0.00	63.89	0.00	-0.79	-10.79	0.00	0.00	0.00	52.31

Segment Leq : 52.31 dBA

Total Leq All Segments: 52.53 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 60.13
(NIGHT): 52.53



STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 15:58:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec56.te Time Period: Day/Night 16/8 hours
Description: Reception Point 5-6

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -81.00 deg -15.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height : 17.40 / 17.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -81.00 deg Angle2 : -15.00 deg
Barrier height : 7.50 m
Barrier receiver distance : 11.00 / 11.00 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -15.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.00 / 18.00 m
Receiver height : 17.40 / 17.40 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Bronson (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 ! 17.40 ! 7.68 ! 76.68

ROAD (0.00 + 66.34 + 0.00) = 66.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-81	-15	0.00	71.49	0.00	-0.79	-4.36	0.00	0.00	-4.95	61.40*
-81	-15	0.00	71.49	0.00	-0.79	-4.36	0.00	0.00	0.00	66.34

* Bright Zone !

Segment Leq : 66.34 dBA

↑

Results segment # 2: Bronson (day)

Source height = 1.50 m

ROAD (0.00 + 59.91 + 0.00) = 59.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	0	0.00	71.49	0.00	-0.79	-10.79	0.00	0.00	0.00	59.91

Segment Leq : 59.91 dBA

Total Leq All Segments: 67.23 dBA

↑

Results segment # 1: Bronson (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	17.40	7.68	76.68

ROAD (0.00 + 58.74 + 0.00) = 58.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-81	-15	0.00	63.89	0.00	-0.79	-4.36	0.00	0.00	-4.95	53.80*
-81	-15	0.00	63.89	0.00	-0.79	-4.36	0.00	0.00	0.00	58.74

* Bright Zone !

Segment Leq : 58.74 dBA

↑

Results segment # 2: Bronson (night)

Source height = 1.50 m

ROAD (0.00 + 52.31 + 0.00) = 52.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	0	0.00	63.89	0.00	-0.79	-10.79	0.00	0.00	0.00	52.31

Segment Leq : 52.31 dBA

Total Leq All Segments: 59.63 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 67.23
(NIGHT): 59.63



STAMSON 5.0 NORMAL REPORT Date: 01-05-2019 16:00:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec61.te Time Period: Day/Night 16/8 hours
Description: Reception Point 6-1

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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 : 0.00 deg 41.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 41.00 deg
Barrier height : 27.00 m
Barrier receiver distance : 4.50 / 4.50 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 West (day/night)

Angle1 Angle2 : 0.00 deg 39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 6 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 410.00 / 410.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 39.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 400.00 / 400.00 m
Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 East (day/night)

Angle1 Angle2 : 0.00 deg 36.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 440.00 / 440.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : 0.00 deg Angle2 : 36.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 430.00 / 430.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Results segment # 1: 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 !	70.50

ROAD (0.00 + 32.30 + 0.00) = 32.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	41	0.00	65.72	0.00	-6.99	-6.42	0.00	0.00	-20.00	32.30

Segment Leq : 32.30 dBA

↑

Results segment # 2: Hwy 417 West (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 !	1.30 !	78.30

ROAD (0.00 + 45.73 + 0.00) = 45.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	39	0.00	81.40	0.00	-14.37	-6.64	0.00	-14.66	0.00	45.73
0	39	0.00	81.40	0.00	-14.37	-6.64	0.00	0.00	-9.70	50.69

Segment Leq : 45.73 dBA



Results segment # 3: Hwy 417 East (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 !	1.31 !	78.31

ROAD (0.00 + 50.05 + 0.00) = 50.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	36	0.00	81.40	0.00	-14.67	-6.99	0.00	0.00	-9.68	50.05

Segment Leq : 50.05 dBA

Total Leq All Segments: 51.47 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 !	70.50

ROAD (0.00 + 24.70 + 0.00) = 24.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	41	0.00	58.12	0.00	-6.99	-6.42	0.00	0.00	-20.00	24.70

Segment Leq : 24.70 dBA

↑

Results segment # 2: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	1.50	1.30	78.30

ROAD (0.00 + 43.09 + 0.00) = 43.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	39	0.00	73.80	0.00	-14.37	-6.64	0.00	0.00	-9.70	43.09

Segment Leq : 43.09 dBA

↑

Results segment # 3: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	1.50	1.31	78.31

ROAD (0.00 + 42.45 + 0.00) = 42.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	36	0.00	73.80	0.00	-14.67	-6.99	0.00	0.00	-9.69	42.45

Segment Leq : 42.45 dBA

Total Leq All Segments: 45.83 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 51.47
(NIGHT): 45.83



STAMSON 5.0 NORMAL REPORT Date: 02-05-2019 15:45:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec66.te Time Period: Day/Night 16/8 hours
Description: Reception Point 6-6

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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 : 0.00 deg 41.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height : 17.40 / 17.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 41.00 deg
Barrier height : 27.00 m
Barrier receiver distance : 4.50 / 4.50 m
Source elevation : 69.00 m
Receiver elevation : 69.00 m
Barrier elevation : 69.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 West (day/night)

Angle1 Angle2 : 0.00 deg 39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 6 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 410.00 / 410.00 m
Receiver height : 17.40 / 17.40 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 39.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 400.00 / 400.00 m
Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
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 East (day/night)

Angle1 Angle2 : 0.00 deg 36.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 440.00 / 440.00 m
 Receiver height : 17.40 / 17.40 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : 0.00 deg Angle2 : 36.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 430.00 / 430.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 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 !	17.40 !	16.45 !	85.45

ROAD (0.00 + 32.30 + 0.00) = 32.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	41	0.00	65.72	0.00	-6.99	-6.42	0.00	0.00	-20.00	32.30

Segment Leq : 32.30 dBA

↑

Results segment # 2: Hwy 417 West (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 !	17.40 !	1.69 !	78.69

ROAD (0.00 + 45.73 + 0.00) = 45.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	39	0.00	81.40	0.00	-14.37	-6.64	0.00	-14.66	0.00	45.73
0	39	0.00	81.40	0.00	-14.37	-6.64	0.00	0.00	-8.23	52.16

Segment Leq : 45.73 dBA

↑

Results segment # 3: Hwy 417 East (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 !	17.40 !	1.67 !	78.67

ROAD (0.00 + 51.43 + 0.00) = 51.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	36	0.00	81.40	0.00	-14.67	-6.99	0.00	0.00	-8.31	51.43

Segment Leq : 51.43 dBA

Total Leq All Segments: 52.51 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 !	17.40 !	16.45 !	85.45

ROAD (0.00 + 24.70 + 0.00) = 24.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	41	0.00	58.12	0.00	-6.99	-6.42	0.00	0.00	-20.00	24.70

Segment Leq : 24.70 dBA

↑

Results segment # 2: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	Barrier Top (m)
-----+-----+-----+-----			
1.49 !	17.40 !	1.69 !	78.69

ROAD (0.00 + 44.56 + 0.00) = 44.56 dBA

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

0	39	0.00	73.80	0.00	-14.37	-6.64	0.00	0.00	-8.23	44.56

Segment Leq : 44.56 dBA

↑

Results segment # 3: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	Barrier Top (m)
-----+-----+-----+-----			
1.49 !	17.40 !	1.67 !	78.67

ROAD (0.00 + 43.83 + 0.00) = 43.83 dBA

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

0	36	0.00	73.80	0.00	-14.67	-6.99	0.00	0.00	-8.31	43.83

Segment Leq : 43.83 dBA

Total Leq All Segments: 47.24 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 52.51
(NIGHT): 47.24



STAMSON 5.0 NORMAL REPORT Date: 03-05-2019 09:46:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec30w.te Time Period: Day/Night 16/8 hours
Description: Reception Point 3-0 - with the proposed building

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -74.00 deg -52.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : -74.00 deg Angle2 : -52.00 deg
Barrier height : 7.50 m
Barrier receiver distance : 26.00 / 26.00 m
Source elevation : 96.00 m
Receiver elevation : 96.00 m
Barrier elevation : 96.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 72.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : 72.00 deg Angle2 : 74.00 deg
Barrier height : 4.50 m
Barrier receiver distance : 32.00 / 32.00 m
Source elevation : 96.00 m
Receiver elevation : 96.00 m
Barrier elevation : 96.00 m
Reference angle : 0.00

↑

Road data, segment # 3: 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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 3: Gladstone (day/night)

Angle1 Angle2 : -11.00 deg 39.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 80.00 / 80.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -11.00 deg Angle2 : 39.00 deg
 Barrier height : 4.50 m
 Barrier receiver distance : 27.00 / 27.00 m
 Source elevation : 96.00 m
 Receiver elevation : 96.00 m
 Barrier elevation : 96.00 m
 Reference angle : 0.00

↑

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

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 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 West (day/night)

 Angle1 Angle2 : -11.00 deg 38.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 405.00 / 405.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -11.00 deg Angle2 : 38.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 325.00 / 325.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Road data, segment # 5: Hwy 417 East (day/night)

```
-----
Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00
```

Data for Segment # 5: Hwy 417 East (day/night)

```
-----
Angle1 Angle2 : -11.00 deg 35.00 deg
Wood depth : 0 (No woods.)
No of house rows : 6 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 435.00 / 435.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -11.00 deg Angle2 : 35.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 425.00 / 425.00 m
Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00
```

↑

Results segment # 1: Bronson (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 ! 97.50
```


ROAD (0.00 + 40.36 + 0.00) = 40.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-52	0.00	71.49	0.00	-3.42	-9.13	0.00	0.00	-18.58	40.36

Segment Leq : 40.36 dBA

↑

Results segment # 2: Bronson (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 !	97.50

ROAD (0.00 + 32.60 + 0.00) = 32.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
72	74	0.00	71.49	0.00	-3.42	-19.54	0.00	0.00	-15.93	32.60

Segment Leq : 32.60 dBA

↑

Results segment # 3: 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 !	97.50

ROAD (0.00 + 41.27 + 0.00) = 41.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-11	39	0.00	65.72	0.00	-7.27	-5.56	0.00	0.00	-11.62	41.27

Segment Leq : 41.27 dBA



Results segment # 4: Hwy 417 West (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
-----	+	-----	+	-----	+	-----
1.50	!	1.50	!	-0.08	!	76.92

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
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-11	38	0.00	81.40	0.00	-14.31	-5.65	0.00	-14.68	0.00	46.75
-11	38	0.00	81.40	0.00	-14.31	-5.65	0.00	0.00	-7.88	53.55
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 46.75 dBA



Results segment # 5: Hwy 417 East (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	!	1.31	!	78.31

ROAD (0.00 + 46.28 + 0.00) = 46.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-11	35	0.00	81.40	0.00	-14.62	-5.93	0.00	-14.57	0.00	46.28
-11	35	0.00	81.40	0.00	-14.62	-5.93	0.00	0.00	-9.75	51.10
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 46.28 dBA

Total Leq All Segments: 50.64 dBA



Results segment # 1: Bronson (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	97.50

ROAD (0.00 + 32.76 + 0.00) = 32.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-52	0.00	63.89	0.00	-3.42	-9.13	0.00	0.00	-18.58	32.76

Segment Leq : 32.76 dBA

↑
Results segment # 2: Bronson (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	97.50

ROAD (0.00 + 25.00 + 0.00) = 25.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
72	74	0.00	63.89	0.00	-3.42	-19.54	0.00	0.00	-15.93	25.00

Segment Leq : 25.00 dBA

↑
Results segment # 3: 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 ! 97.50

ROAD (0.00 + 33.67 + 0.00) = 33.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-11	39	0.00	58.12	0.00	-7.27	-5.56	0.00	0.00	-11.62	33.67

Segment Leq : 33.67 dBA

↑
Results segment # 4: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49 !	1.50 !	-0.08 !	76.92

ROAD (0.00 + 45.95 + 0.00) = 45.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-11	38	0.00	73.80	0.00	-14.31	-5.65	0.00	0.00	-7.88	45.95

Segment Leq : 45.95 dBA

↑
Results segment # 5: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49 !	1.50 !	1.31 !	78.31

ROAD (0.00 + 43.50 + 0.00) = 43.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-11	35	0.00	73.80	0.00	-14.62	-5.93	0.00	0.00	-9.75	43.50

Segment Leq : 43.50 dBA

Total Leq All Segments: 48.21 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 50.64
(NIGHT): 48.21



STAMSON 5.0 NORMAL REPORT Date: 03-05-2019 11:00:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec40w.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-0 - with the proposed building

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -78.00 deg -76.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : -78.00 deg Angle2 : -76.00 deg
Barrier height : 7.50 m
Barrier receiver distance : 26.00 / 26.00 m
Source elevation : 96.00 m
Receiver elevation : 96.00 m
Barrier elevation : 96.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 50.00 deg 73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective 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 : 50.00 deg Angle2 : 73.00 deg
Barrier height : 4.50 m
Barrier receiver distance : 32.00 / 32.00 m
Source elevation : 96.00 m
Receiver elevation : 96.00 m
Barrier elevation : 96.00 m
Reference angle : 0.00

↑

Road data, segment # 3: 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 : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 # 3: Gladstone (day/night)

Angle1 Angle2 : -41.00 deg 43.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 65.00 / 65.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -41.00 deg Angle2 : 43.00 deg
 Barrier height : 4.50 m
 Barrier receiver distance : 27.00 / 27.00 m
 Source elevation : 96.00 m
 Receiver elevation : 96.00 m
 Barrier elevation : 96.00 m
 Reference angle : 0.00

↑

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

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 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): 73332
 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 West (day/night)

 Angle1 Angle2 : -41.00 deg 40.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 6 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 420.00 / 420.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -41.00 deg Angle2 : 40.00 deg
 Barrier height : 3.00 m
 Elevation : 8.00 m
 Barrier receiver distance : 410.00 / 410.00 m
 Source elevation : 77.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 77.00 m
 Reference angle : 0.00

↑

Road data, segment # 5: Hwy 417 East (day/night)

```
-----
Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 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): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00
```

Data for Segment # 5: Hwy 417 East (day/night)

```
-----
Angle1 Angle2 : -41.00 deg 35.00 deg
Wood depth : 0 (No woods.)
No of house rows : 6 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 450.00 / 450.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -41.00 deg Angle2 : 35.00 deg
Barrier height : 3.00 m
Elevation : 8.00 m
Barrier receiver distance : 440.00 / 440.00 m
Source elevation : 77.00 m
Receiver elevation : 69.00 m
Barrier elevation : 77.00 m
Reference angle : 0.00
```

↑

Results segment # 1: Bronson (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 ! 97.50
```

ROAD (0.00 + 32.73 + 0.00) = 32.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	-76	0.00	71.49	0.00	-3.42	-19.54	0.00	0.00	-15.79	32.73

Segment Leq : 32.73 dBA

↑

Results segment # 2: Bronson (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	!	97.50

ROAD (0.00 + 41.33 + 0.00) = 41.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
50	73	0.00	71.49	0.00	-3.42	-8.94	0.00	0.00	-17.80	41.33

Segment Leq : 41.33 dBA

↑

Results segment # 3: 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	!	97.50

ROAD (0.00 + 44.07 + 0.00) = 44.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-41	43	0.00	65.72	0.00	-6.37	-3.31	0.00	0.00	-11.97	44.07

Segment Leq : 44.07 dBA



Results segment # 4: Hwy 417 West (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	!	1.30	!	78.30

ROAD (0.00 + 48.83 + 0.00) = 48.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-41	40	0.00	81.40	0.00	-14.47	-3.47	0.00	-14.62	0.00	48.83
-41	40	0.00	81.40	0.00	-14.47	-3.47	0.00	0.00	-9.66	53.80

Segment Leq : 48.83 dBA



Results segment # 5: Hwy 417 East (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	!	1.32	!	78.32

ROAD (0.00 + 48.37 + 0.00) = 48.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-41	35	0.00	81.40	0.00	-14.77	-3.74	0.00	-14.51	0.00	48.37
-41	35	0.00	81.40	0.00	-14.77	-3.74	0.00	0.00	-9.64	53.25

Segment Leq : 48.37 dBA

Total Leq All Segments: 52.70 dBA



Results segment # 1: Bronson (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	97.50

ROAD (0.00 + 25.14 + 0.00) = 25.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	-76	0.00	63.89	0.00	-3.42	-19.54	0.00	0.00	-15.79	25.14

Segment Leq : 25.14 dBA

↑

Results segment # 2: Bronson (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	97.50

ROAD (0.00 + 33.73 + 0.00) = 33.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
50	73	0.00	63.89	0.00	-3.42	-8.94	0.00	0.00	-17.80	33.73

Segment Leq : 33.73 dBA

↑

Results segment # 3: 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 ! 97.50

ROAD (0.00 + 36.47 + 0.00) = 36.47 dBA

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

-41	43	0.00	58.12	0.00	-6.37	-3.31	0.00	0.00	-11.97	36.47
-----	----	------	-------	------	-------	-------	------	------	--------	-------

Segment Leq : 36.47 dBA



Results segment # 4: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49 !	1.50 !	1.30 !	78.30

ROAD (0.00 + 46.20 + 0.00) = 46.20 dBA

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

-41	40	0.00	73.80	0.00	-14.47	-3.47	0.00	0.00	-9.66	46.20
-----	----	------	-------	------	--------	-------	------	------	-------	-------

Segment Leq : 46.20 dBA



Results segment # 5: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49 !	1.50 !	1.32 !	78.32

ROAD (0.00 + 45.65 + 0.00) = 45.65 dBA

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

-41	35	0.00	73.80	0.00	-14.77	-3.74	0.00	0.00	-9.64	45.65
-----	----	------	-------	------	--------	-------	------	------	-------	-------

Segment Leq : 45.65 dBA

Total Leq All Segments: 49.32 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 52.70
(NIGHT): 49.32



APPENDIX 3

PROPOSED CONSTRUCTION MATERIALS (E-MAIL)

INDUSTRY STANDARDS

Stephanie Boisvenue

From: Daniel Boulanger <dan.boulanger@tcunitedgroup.com>
Sent: September 18, 2018 2:15 PM
To: Stephanie Boisvenue
Cc: Karyn Munch; David Gilbert
Subject: Re: 444 Bronson - Revision to Site Plan and Design
Attachments: 444Bronson_Renderings.pdf

Hi Stephanie,

The windows will be double paned.

The ground floor will be brick construction, with cement board cladding on the upper floors (2 though 6). The construction will be steel stud walls with concrete structure.

Let me know if you need anything else.



Daniel Boulanger

Director, Planning & Consulting

D. 613.265.6584

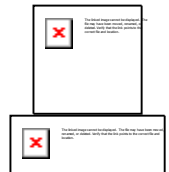
O. 613.680.5582

F. 613.249.3613

800 Industrial Ave, Unit 9, Ottawa, ON K1G 4B8

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Acquisition - Planning & Consulting - Financing - Construction - Property Management



On Sep 18, 2018, at 2:12 PM, Stephanie Boisvenue <SBoisvenue@Patersongroup.ca> wrote:

No problem at all Daniel,

As long as you can confirm that the windows are double paned (which I assume that they will be), then that would be sufficient to complete our review of the windows.

If you could forward the wall construction drawings (or even an e-mail indicating what is proposed on the exterior of the building i.e. brick, vinyl, etc), we will finalize our response to City Comments in regards to the Noise Assessment.

Stephanie

From: Daniel Boulanger <dan.boulanger@tcunitedgroup.com>
Sent: September 18, 2018 2:08 PM
To: Stephanie Boisvenue <SBoisvenue@Patersongroup.ca>
Cc: Karyn Munch <KMunch@Patersongroup.ca>; David Gilbert <DGilbert@Patersongroup.ca>
Subject: Re: 444 Bronson - Revision to Site Plan and Design

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

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

Wall construction details

Wood siding (1)	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
Stucco (2)	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
Brick veneer (3)	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