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Environmental Noise Control Study

Proposed Residential Apartment Building
54 - 60 Bayswater Avenue, Ottawa

Prepared For

Centennial Properties

.

March 10, 2021

Report: PG5647-1

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Centennial Properties to conduct an environmental noise control study for the proposed residential apartment building to be located at 54 - 60 Bayswater 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 project will consist of a 6 storey residential apartment building with 1 level of underground parking. Associated at-grade walkways, parking areas and landscaped areas are also anticipated. A rooftop patio is further anticipated at the building.

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 the 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 subject site is not in proximity to existing or approved stationary sources of noise. Therefore, a stationary noise analysis will not be required.

Aircraft/Airport Noise

The subject site is not located within the Airport Vicinity Development Zone. Therefore this project will not require an aircraft/airport noise analysis. No warning clauses regarding aircraft or airport noise will be required.

4.0 Analysis

Surface Transportation Noise

The subject building is bordered to the north by commercial buildings and parking areas followed by Somerset Street West, to the east by Bayswater Avenue followed by residential dwellings, parking areas, a walkway and an institutional building, to the west by a walkway followed by residential dwellings and Spadina Avenue, and to the south by residential dwellings and landscaped areas. Somerset Street West, Bayswater Avenue and Spadina Avenue are identified within the 100 m radius of proposed development.

Based on the City of Ottawa Official Plan, Schedule F, Somerset Street West is considered a 2 lane urban arterial road (2-UAU). Bayswater Avenue is considered a 2 lane urban collector road (2-UCU). Other roads within the 100 m radius of the development that are not classified as either arterial, collector or major collector roads and therefore are not included in this study. Highway 417 is identified as being beyond the 500 m radius from the proposed building. Therefore, Highway 417 is not included in this surface transportation noise analysis.

The Trillium Rail Line is identified within 300 m of the proposed development. It is understood that the Trillium Rail Line is used by O-Train Rail. Based on a phone discussion with OC Transpo personnel, the method to approximate the volume of trains along the rail line is based on the operation hours of 6 am to 12 am and the train service frequency of 10 to 15 minutes. It was further confirmed by OC Transpo personnel that, after Trillium Rail Line extension construction, the O-Trains in Trillium Rail Line will be electrical operated. Each O-Train consists of an electric locomotive pulling 1 car.

All noise sources are presented in Drawing PG5647-3 - Site Geometry located in Appendix 1.

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 4 - Traffic and Road Parameters						
Road	**Implied Roadway**	**AADT (Veh/day)**	**Posted Speed (km/h)**	**Day/Night Split %**	**Medium Truck %**	**Heavy Truck %**
Somerset Street West	2-UAU	15,000	50	92/8	7	5
Bayswater Avenue	2-UCU	8,000	40	92/8	7	5
❑ Data obtained from the City of Ottawa document ENCG or calculated from OC Transpo online schedules						

Table 5 - Rail Parameters				
Rail Line	**Engine Type**	**Maximum Speed (km/hr)**	**Number of Trips/day**	**Length of Train**
O-Train Rail	Electric	80	190	2

Three (3) levels of reception points were selected for this analysis. The following elevations were selected from the heights provided on the survey plan for the subject building.

Table 6 - Elevation of Reception Points			
Floor Number	**Elevation at Centre of Window (m)**	**Floor Use**	**Daytime/Nighttime Analysis**
Ground Floor	1.5	Living Area/Bedroom	daytime/nighttime
Sixth Floor	16.5	Living Area/Bedroom	daytime/nighttime
Rooftop	19.5	--	Outdoor Living Area

For this analysis, a reception point was taken at the centre of each floor, at the ground floor and sixth floor. An outdoor living area - rooftop patio is anticipated at the proposed building. A reception point in the centre of rooftop, 19.5 m high, was selected for the analysis of this area. Reception points are detailed on Drawing PG5647-2 - Receptor Locations presented in Appendix 1.

All horizontal distances have been measured from the reception point to the edge of the right-of-way. The rail line was analyzed where it intersected the 300 m buffer zone, and the roadways were analyzed where they intersected the 100 m buffer zone, which is reflected in the local angles described in Paterson Drawings PG5647-3A to 3E - Site Geometry in Appendix 1.

Table 8 - Summary of Reception Points and Geometry, located in Appendix 1, provides a summary of the points of reception and their geometry with respect to the noise sources. The analysis is completed so that no effects of sound reflection off of the building facade are considered, as stipulated by the ENCG.

The subject site is gently sloping downward to the north and is at-grade with the neighbouring roads within a 100 m radius. It should be noted that the rail line is located within a trench that is approximately 6 m lower than the neighbouring properties and roads which are located west of the rail line. For the purposes of this report, the vertical wall at the edge of the rail line is considered to act as a barrier.

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

Surface Transportation

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 7.

Table 7 - Proposed Noise Levels

Reception Point	Description	OLA (dBA)	Daytime at Facade $L_{EQ(16)}$ (dBA)	Nighttime at Facade $L_{eq(8)}$ (dBA)
REC 1-1	Eastern Elevation, 1st Floor	--	56.85	49.25
REC 1-6	Eastern Elevation, 6th Floor	--	59.44	51.84
REC 2-1	Southern Elevation, 1st Floor	--	51.32	43.72
REC 2-6	Southern Elevation, 6th Floor	--	54.07	46.47
REC 3-1	Western Elevation, 1st Floor	--	43.76	36.16
REC 3-6	Western Elevation, 6th Floor	--	47.45	39.86
REC 4-1	Northern Elevation, 1st Floor	--	52.63	45.01
REC 4-6	Northern Elevation, 6th Floor	--	55.78	48.16
REC 5	Rooftop Patio	56.39	--	--

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

A roof top patio is anticipated in the centre of the proposed building. One (1) receptor point was selected for the analysis at outdoor living area (REC 5). It is assumed that the roof top patio will only be utilized as an outdoor living area provided that the proposed building is constructed resulting in the wall of the structure being utilized as a barrier. The proposed $L_{eq(16)}$ at the roof top patio will be 56.39 dBA, which marginally exceeds the 55 dBA threshold value specified by the MOECC and the City of Ottawa. This exceedance is considered acceptable provided that a Warning Clause Type A is provided on all deeds of sale.

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modeling indicates that the daytime $L_{eq(16)}$ ranges between 43.76 dBA and 59.44 dBA. The ENCG states that the limits for the exterior of the pane of glass is 55 dBA. This value was exceeded at eastern and northern elevations. Therefore, units on the eastern and northern elevations should be designed with the provision for a central air conditioning unit. Additionally, warning clause Type C, as outlined in Table 3, is also recommended for all units on the eastern and northern elevations. It is also noted that the modeling indicates that the $L_{eq(16)}$ is below 65 dBA, and therefore standard building materials are acceptable to provide adequate soundproofing.

7.0 Summary of Findings

The subject site is located at 54 - 60 Bayswater, in the City of Ottawa. It is understood that the proposed development will consist of a 6 storey residential apartment building. The associated analysis identified three surface transportation noise sources: Somerset Street West, Bayswater Avenue, and the Trillium Corridor O-Train Rail Line.

Several reception points were selected for the analysis, consisting of pane of glass reception points on both the first and top level. The northern and eastern elevations of the proposed building exceeded the 55 dBA guideline specified by the ENCG. Therefore, a warning clause Type C will be required for this dwelling in addition to the installation of a central air conditioning unit.

A review of the outdoor living area (rooftop patio) was completed as well. It is assumed that the roof top patio will only be utilized as an outdoor living area, provided that the proposed building is constructed. The anticipated noise levels at the outdoor living area would be a marginal exceedance of the 55 dBA threshold, and is considered acceptable provided that the warning clause Type A is included on all deeds of sale.

The following warning clause is to be included on all Offers of Purchase and Sale and/or lease agreements:

> "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."
>
> "Purchasers/tenants are advised that sound levels due to increasing road 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."

8.0 Statement of Limitations

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

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Centennial Properties 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.

Scott S. Dennis, P.Eng.

Report Distribution:

- ❑ Centennial Properties (3 copies)
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APPENDIX 1

TABLE 8 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG5647-2 - RECEPTOR LOCATION PLAN

DRAWING PG5647-3 - SITE GEOMETRY

DRAWING PG5647-3A - SITE GEOMETRY (REC 1-1 and REC 1-6)

DRAWING PG5647-3B - SITE GEOMETRY (REC 2-1 and REC 2-6)

DRAWING PG5647-3C - SITE GEOMETRY (REC 3-1 and REC 3-6)

DRAWING PG5647-3D - SITE GEOMETRY (REC 4-1 and REC 4-6)

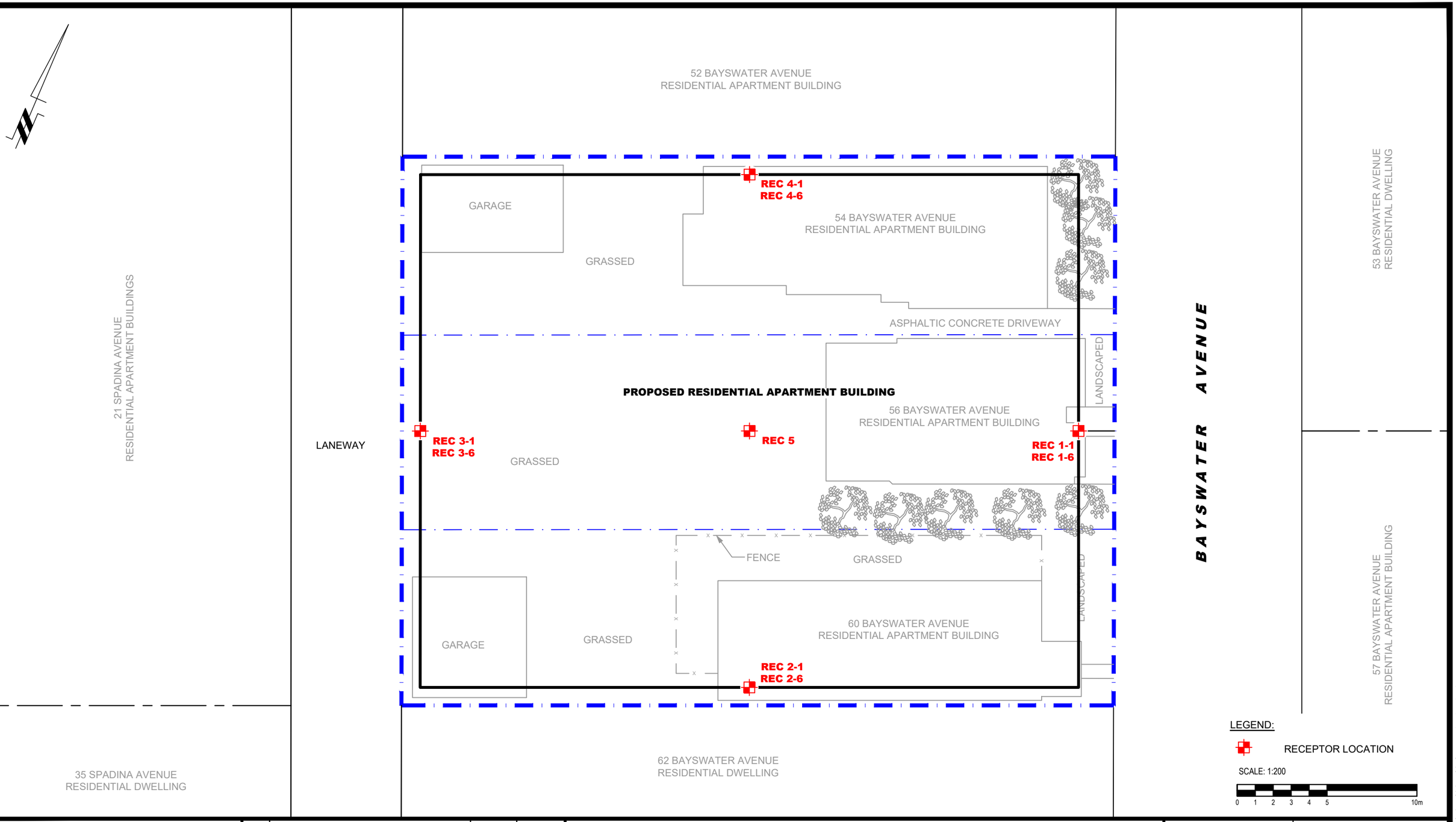
DRAWING PG5647-3E - SITE GEOMETRY (REC 5)

Table 8 - Summary of Reception Points and Geometry
54 - 60 Bayswater Avenue

Point of Reception	Location	Leq Day (dBA)	Somerset Street West						Bayswater Avenue					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Eastern Elevation, 1st Floor	56.85	95	1.5	95.01	0, 30	n/a	n/a	35	1.5	35.03	-82, 86	n/a	n/a
REC 1-6	Eastern Elevation, 6th Floor	59.44	95	16.5	96.42	0, 30	n/a	n/a	35	16.5	38.7	-82, 86	n/a	n/a
REC 2-1	Southern Elevation, 1st Floor	51.32	n/a	n/a	n/a	n/a	n/a	n/a	45	1.5	45.02	0, 75	n/a	n/a
REC 2-6	Southern Elevation, 6th Floor	54.07	n/a	n/a	n/a	n/a	n/a	n/a	45	16.5	47.9	0, 75	n/a	n/a
REC 3-1	Western Elevation, 1st Floor	43.76	95	1.5	95.01	-30, 0	2	40	n/a	n/a	n/a	n/a	n/a	n/a
REC 3-6	Western Elevation, 6th Floor	47.45	95	16.5	96.42	-30, 0	2	40	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-1	Northern Elevation, 1st Floor	52.63	90	1.5	90.01	-42, 44	2	40	45	1.5	45.02	-75, 0	1	20
REC 4-6	Northern Elevation, 6th Floor	55.78	90	16.5	91.5	-42, 44	2	40	45	16.5	47.9	-75, 0	1	20
REC 5	Rooftop Patio	56.39	95	19.5	97.0	-36, 37	2	40	45	19.5	49.04	-82, 77	n/a	n/a

Table 8 - Summary of Reception Points and Geometry
54 - 60 Bayswater Avenue

Point of Reception	Location	Leq Day (dBA)	Trillium Rail Line					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Eastern Elevation, 1st Floor	56.85	245	1.5	245	-74, 28	3	60
REC 1-6	Eastern Elevation, 6th Floor	59.44	245	16.5	245.55	-74, 28	3	60
REC 2-1	Southern Elevation, 1st Floor	51.32	285	1.5	285	0, 25	4	80
REC 2-6	Southern Elevation, 6th Floor	54.07	285	16.5	285.5	0, 25	4	80
REC 3-1	Western Elevation, 1st Floor	43.76	n/a	n/a	n/a	n/a	n/a	n/a
REC 3-6	Western Elevation, 6th Floor	47.45	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-1	Northern Elevation, 1st Floor	52.63	225	1.5	225	-70, 0	3	60
REC 4-6	Northern Elevation, 6th Floor	55.78	225	16.5	225.6	-70, 0	3	60
REC 5	Rooftop Patio	56.39	250	19.5	250.8	-74, 27	3	60



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NO.	REVISIONS	DATE	INITIAL

CENTENNIAL PROPERTIES

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL APARTMENT BUILDING
54, 56 AND 60 BAYSWATER AVENUE

OTTAWA, ONTARIO

Title:

RECEPTOR LOCATION PLAN

Scale: 1:200	Date: 02/2021
Drawn by: YA	Report No.: PG5647-1
Checked by: SB	Dwg. No.: PG5647-2
Approved by: DJG	Revision No.:

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NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL APARTMENT BUILDING
54, 56 AND 60 BAYSWATER AVENUE

OTTAWA, ONTARIO

Title:

SITE GEOMETRY

Scale: 1:3000	Date: 02/2021
Drawn by: YA	Report No.: PG5647-1
Checked by: SB	Dwg. No.: PG5647-3
Approved by: DJG	Revision No.:

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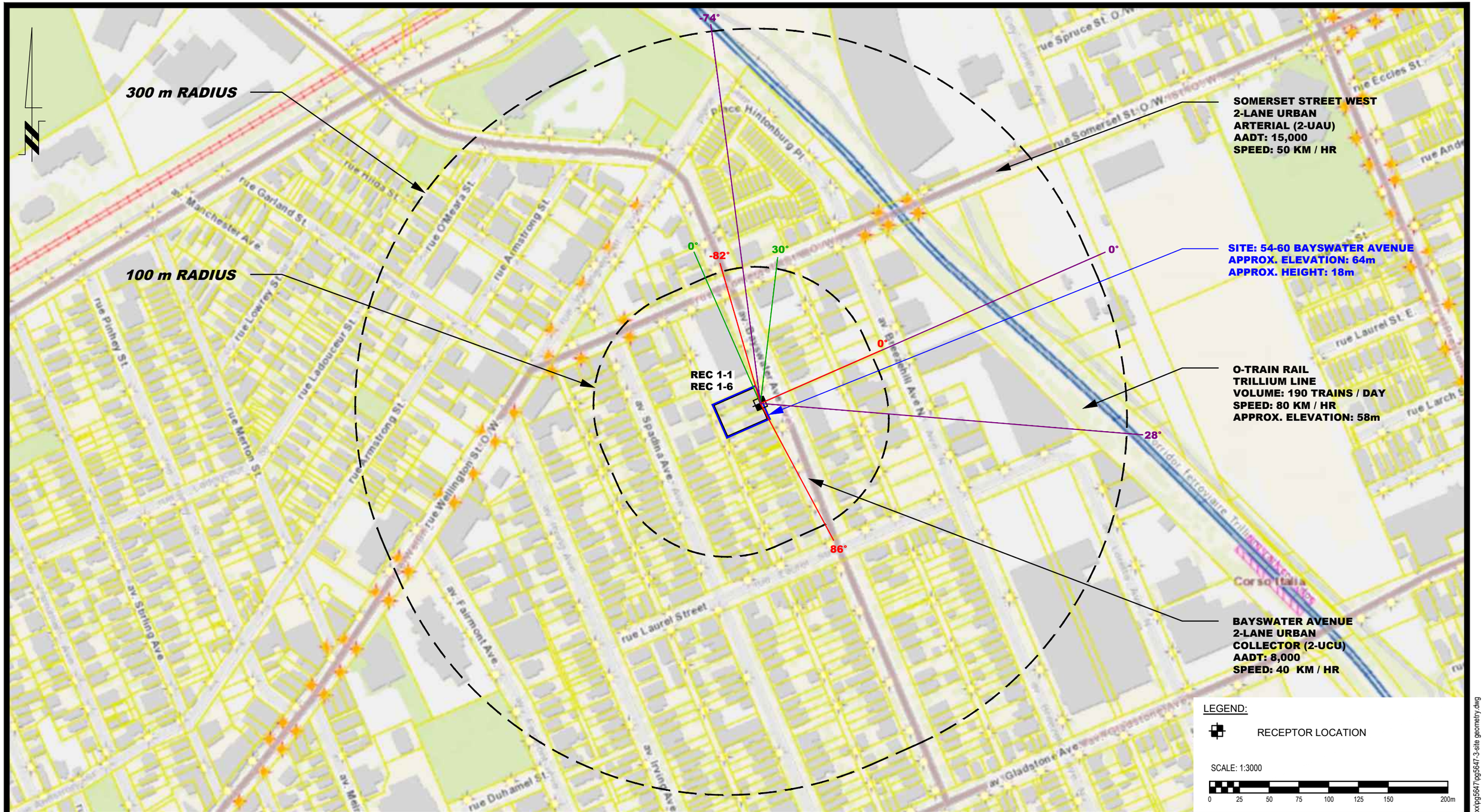

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PROPOSED RESIDENTIAL APARTMENT BUILDING
54, 56 AND 60 BAYSWATER AVENUE

OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 1-1 AND REC 1-6

Scale: 1:3000	Date: 02/2021
Drawn by: YA	Report No.: PG5647-1
Checked by: SB	Dwg. No.: PG5647-3A
Approved by: DJG	Revision No.:

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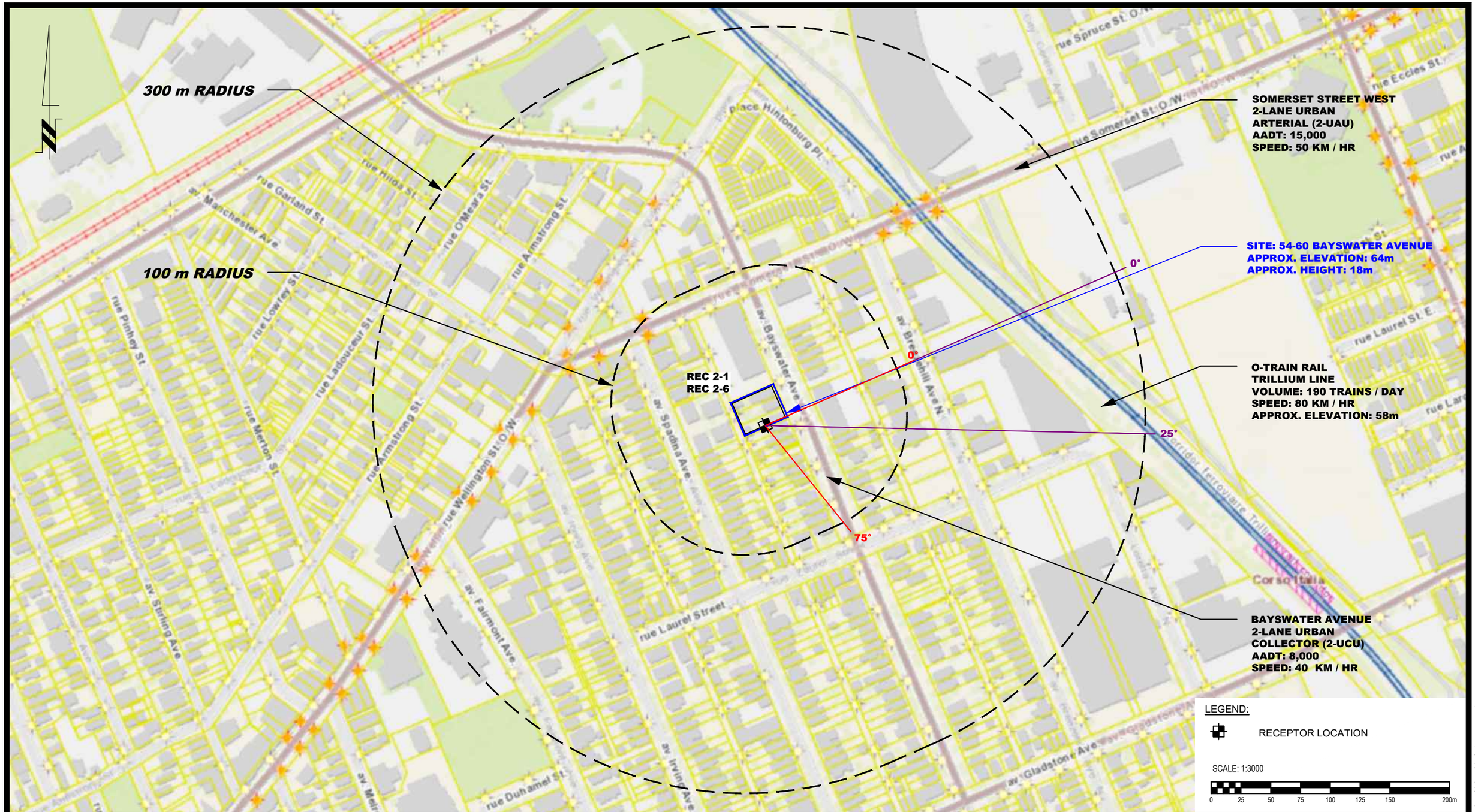

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PROPOSED RESIDENTIAL APARTMENT BUILDING
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OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 2-1 AND REC 2-6

Scale: 1:3000	Date: 02/2021
Drawn by: YA	Report No.: PG5647-1
Checked by: SB	Dwg. No.: PG5647-3B
Approved by: DJG	Revision No.:

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NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL APARTMENT BUILDING
54, 56 AND 60 BAYSWATER AVENUE

OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 3-1 AND REC 3-6

Scale: 1:3000	Date: 02/2021
Drawn by: YA	Report No.: PG5647-1
Checked by: SB	Dwg. No.: PG5647-3C
Approved by: DJG	Revision No.:

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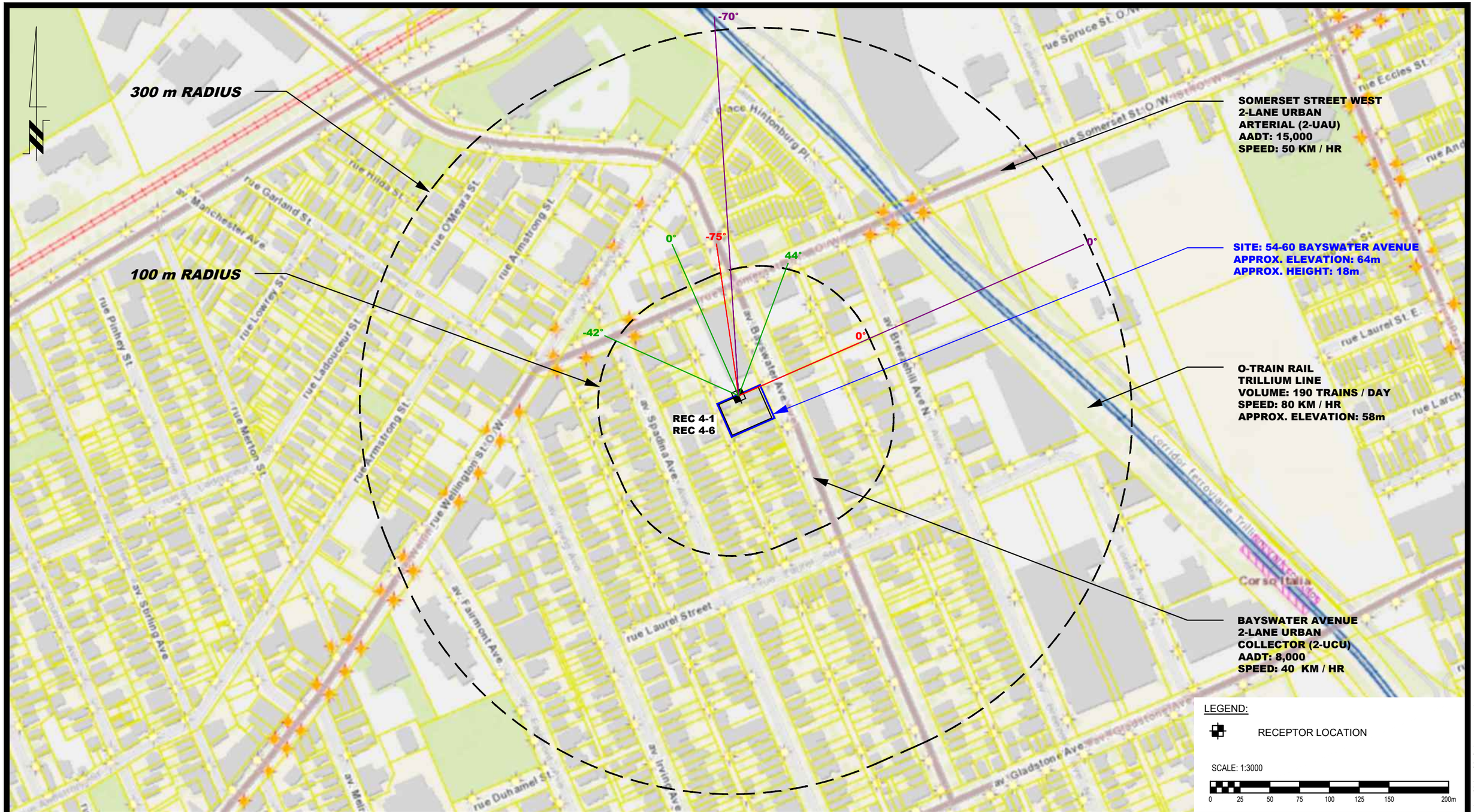

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54, 56 AND 60 BAYSWATER AVENUE

OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 4-1 AND REC 4-6

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Approved by: DJG	Revision No.:

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PROPOSED RESIDENTIAL APARTMENT BUILDING
54, 56 AND 60 BAYSWATER AVENUE

OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 5

Scale: 1:3000	Date: 02/2021
Drawn by: YA	Report No.: PG5647-1
Checked by: SB	Dwg. No.: PG5647-3E
Approved by: DJG	Revision No.:

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APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:32:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec11.te Time Period: Day/Night 16/8 hours
Description: Reception Point 1-1

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

```
Angle1   Angle2           : -74.00 deg   28.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      3 / 3
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 245.00 / 245.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -74.00 deg   Angle2 : 28.00 deg
Barrier height            :   6.00 m
Barrier receiver distance : 240.00 / 240.00 m
Source elevation          :  58.00 m
Receiver elevation        :  64.00 m
Barrier elevation         :  58.00 m
Reference angle           :   0.00
```

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	4.07	62.07
0.50	1.50	0.64	58.64

LOCOMOTIVE (0.00 + 30.81 + 0.00) = 30.81 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	28	0.58	60.53	-19.23	-3.07	0.00	-6.20	0.00	32.04
-74	28	0.22	60.53	-14.86	-2.71	0.00	0.00	-12.14	30.81

```
-------------------------------------------------------------------------

WHEEL (0.00 + 22.24 + 0.00) = 22.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -74     28   0.66  60.54 -20.14  -3.13   0.00  -6.20   0.00  31.07
   -74     28   0.33  60.54 -16.13  -2.82   0.00   0.00 -19.34  22.24
-------------------------------------------------------------------------

Segment Leq : 31.38 dBA

Total Leq All Segments: 31.38 dBA

↟
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        4.07 !        62.07
       0.50 !        1.50 !        0.64 !        58.64

LOCOMOTIVE (0.00 + 11.03 + 0.00) = 11.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -74     28   0.58  40.75 -19.23  -3.07   0.00  -6.20   0.00  12.26
   -74     28   0.22  40.75 -14.86  -2.71   0.00   0.00 -12.14  11.03
-------------------------------------------------------------------------

WHEEL (0.00 + 2.46 + 0.00) = 2.46 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -74     28   0.66  40.76 -20.14  -3.13   0.00  -6.20   0.00  11.29
   -74     28   0.33  40.76 -16.13  -2.82   0.00   0.00 -19.34   2.46
-------------------------------------------------------------------------

Segment Leq : 11.60 dBA

Total Leq All Segments: 11.60 dBA

↟
Road data, segment # 1: SomersetSt W (day/night)
------------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: SomersetSt W (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  95.00 / 95.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Angle1   Angle2           : -82.00 deg   86.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :   1.50 / 1.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: SomersetSt W (day)

Source height = 1.50 m

ROAD (0.00 + 47.26 + 0.00) = 47.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	30	0.66	68.48	0.00	-13.31	-7.91	0.00	0.00	0.00	47.26

Segment Leq : 47.26 dBA

↟
Results segment # 2: BayswaterAve (day)

Source height = 1.50 m

ROAD (0.00 + 56.33 + 0.00) = 56.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	86	0.66	63.96	0.00	-6.11	-1.52	0.00	0.00	0.00	56.33

Segment Leq : 56.33 dBA

Total Leq All Segments: 56.84 dBA

↟
Results segment # 1: SomersetSt W (night)

Source height = 1.50 m

ROAD (0.00 + 39.66 + 0.00) = 39.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	30	0.66	60.88	0.00	-13.31	-7.91	0.00	0.00	0.00	39.66

Segment Leq : 39.66 dBA

↟
Results segment # 2: BayswaterAve (night)

Source height = 1.50 m

ROAD (0.00 + 48.74 + 0.00) = 48.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	86	0.66	56.36	0.00	-6.11	-1.52	0.00	0.00	0.00	48.74

Segment Leq : 48.74 dBA

Total Leq All Segments: 49.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.85
(NIGHT): 49.25

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:35:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec16.te Time Period: Day/Night 16/8 hours
Description: Reception Point 1-6

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

Angle1 Angle2	-74.00 deg	28.00 deg
Wood depth	0	(No woods.)
No of house rows	3 / 3	
House density	60 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	245.00 / 245.00 m	
Receiver height	16.50 / 16.50 m	
Topography	2	(Flat/gentle slope; with barrier)

No Whistle

Barrier angle1	-74.00 deg	Angle2 : 28.00 deg
Barrier height	6.00 m	
Barrier receiver distance	240.00 / 240.00 m	
Source elevation	58.00 m	
Receiver elevation	64.00 m	
Barrier elevation	58.00 m	
Reference angle	0.00	

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	16.50	4.38	62.38
0.50	16.50	0.95	58.95

LOCOMOTIVE (0.00 + 35.09 + 0.00) = 35.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	28	0.14	60.53	-13.77	-2.62	0.00	-6.20	0.00	37.94
-74	28	0.00	60.53	-12.13	-2.47	0.00	0.00	-10.83	35.09

```
-------------------------------------------------------------------------

WHEEL (0.00 + 26.90 + 0.00) = 26.90 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -74     28   0.24  60.54 -15.04  -2.73   0.00  -6.20   0.00  36.57
   -74     28   0.00  60.54 -12.13  -2.47   0.00   0.00 -19.04  26.90
-------------------------------------------------------------------------

Segment Leq : 35.70 dBA

Total Leq All Segments: 35.70 dBA

🠉
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       16.50 !        4.38 !        62.38
       0.50 !       16.50 !        0.95 !        58.95

LOCOMOTIVE (0.00 + 15.32 + 0.00) = 15.32 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -74     28   0.14  40.75 -13.77  -2.62   0.00  -6.20   0.00  18.17
   -74     28   0.00  40.75 -12.13  -2.47   0.00   0.00 -10.83  15.32
-------------------------------------------------------------------------

WHEEL (0.00 + 7.13 + 0.00) = 7.13 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -74     28   0.24  40.76 -15.04  -2.73   0.00  -6.20   0.00  16.79
   -74     28   0.00  40.76 -12.13  -2.47   0.00   0.00 -19.04   7.13
-------------------------------------------------------------------------

Segment Leq : 15.93 dBA

Total Leq All Segments: 15.93 dBA

🠉
Road data, segment # 1: SomersetSt W (day/night)
------------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: SomersetSt W (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  95.00 / 95.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Angle1   Angle2           : -82.00 deg   86.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  16.50 / 16.50  m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: SomersetSt W (day)

Source height = 1.50 m

ROAD (0.00 + 50.95 + 0.00) = 50.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	30	0.21	68.48	0.00	-9.70	-7.82	0.00	0.00	0.00	50.95

Segment Leq : 50.95 dBA

↟
Results segment # 2: BayswaterAve (day)

Source height = 1.50 m

ROAD (0.00 + 58.76 + 0.00) = 58.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	86	0.21	63.96	0.00	-4.45	-0.74	0.00	0.00	0.00	58.76

Segment Leq : 58.76 dBA

Total Leq All Segments: 59.43 dBA

↟
Results segment # 1: SomersetSt W (night)

Source height = 1.50 m

ROAD (0.00 + 43.36 + 0.00) = 43.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	30	0.21	60.88	0.00	-9.70	-7.82	0.00	0.00	0.00	43.36

Segment Leq : 43.36 dBA

↟
Results segment # 2: BayswaterAve (night)

Source height = 1.50 m

ROAD (0.00 + 51.17 + 0.00) = 51.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	86	0.21	56.36	0.00	-4.45	-0.74	0.00	0.00	0.00	51.17

Segment Leq : 51.17 dBA

Total Leq All Segments: 51.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.44
(NIGHT): 51.84

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:36:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

Angle1 Angle2	0.00 deg	25.00 deg
Wood depth	0	(No woods.)
No of house rows	4 / 4	
House density	80 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	285.00 / 285.00 m	
Receiver height	1.50 / 1.50 m	
Topography	2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	0.00 deg	Angle2 : 25.00 deg
Barrier height	6.00 m	
Barrier receiver distance	280.00 / 280.00 m	
Source elevation	58.00 m	
Receiver elevation	64.00 m	
Barrier elevation	58.00 m	
Reference angle	0.00	

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	4.06	62.06
0.50	1.50	0.62	58.62

LOCOMOTIVE (0.00 + 21.90 + 0.00) = 21.90 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	25	0.58	60.53	-20.27	-8.65	0.00	-9.71	0.00	21.90
0	25	0.22	60.53	-15.66	-8.60	0.00	0.00	-13.25	23.01

```
-------------------------------------------------------------------------

WHEEL (0.00 + 14.91 + 0.00) = 14.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     25   0.66  60.54 -21.23  -8.67   0.00  -9.71   0.00  20.94
     0     25   0.33  60.54 -17.01  -8.62   0.00   0.00 -20.00  14.91
-------------------------------------------------------------------------

Segment Leq : 22.69 dBA

Total Leq All Segments: 22.69 dBA

🠉
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        4.06 !        62.06
       0.50 !        1.50 !        0.62 !        58.62

LOCOMOTIVE (0.00 + 2.12 + 0.00) = 2.12 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     25   0.58  40.75 -20.27  -8.65   0.00  -9.71   0.00   2.12
     0     25   0.22  40.75 -15.66  -8.60   0.00   0.00 -13.25   3.23
-------------------------------------------------------------------------

WHEEL (0.00 + -4.87 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     25   0.66  40.76 -21.23  -8.67   0.00  -9.71   0.00   1.16
     0     25   0.33  40.76 -17.01  -8.62   0.00   0.00 -20.00  -4.87
-------------------------------------------------------------------------

Segment Leq : 2.12 dBA

Total Leq All Segments: 2.12 dBA

🠉
Road data, segment # 1: Bayswater (day/night)
---------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Bayswater (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   75.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

🠉
Results segment # 1: Bayswater (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.31 + 0.00) = 51.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     75   0.66  63.96   0.00  -7.92  -4.73   0.00   0.00   0.00  51.31
-------------------------------------------------------------------------------

Segment Leq : 51.31 dBA

Total Leq All Segments: 51.31 dBA

🠉
Results segment # 1: Bayswater (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 43.72 + 0.00) = 43.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     75   0.66  56.36   0.00  -7.92  -4.73   0.00   0.00   0.00  43.72
-------------------------------------------------------------------------------
```

Segment Leq : 43.72 dBA

Total Leq All Segments: 43.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.32
(NIGHT): 43.72

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:38:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

Angle1 Angle2	0.00 deg	25.00 deg
Wood depth	0	(No woods.)
No of house rows	4 / 4	
House density	80 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	285.00 / 285.00 m	
Receiver height	16.50 / 16.50 m	
Topography	2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	0.00 deg	Angle2 : 25.00 deg
Barrier height	6.00 m	
Barrier receiver distance	280.00 / 280.00 m	
Source elevation	58.00 m	
Receiver elevation	64.00 m	
Barrier elevation	58.00 m	
Reference angle	0.00	

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	16.50	4.32	62.32
0.50	16.50	0.89	58.89

LOCOMOTIVE (0.00 + 27.13 + 0.00) = 27.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	25	0.14	60.53	-14.51	-8.59	0.00	-9.71	0.00	27.71
0	25	0.00	60.53	-12.79	-8.57	0.00	0.00	-12.03	27.13

```
-------------------------------------------------------------------------

WHEEL (0.00 + 19.18 + 0.00) = 19.18 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     25   0.24  60.54 -15.86  -8.61   0.00  -9.71   0.00  26.37
     0     25   0.00  60.54 -12.79  -8.57   0.00   0.00 -20.00  19.18
-------------------------------------------------------------------------

Segment Leq : 27.78 dBA

Total Leq All Segments: 27.78 dBA

🠉
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       16.50 !        4.32 !        62.32
       0.50 !       16.50 !        0.89 !        58.89

LOCOMOTIVE (0.00 + 7.35 + 0.00) = 7.35 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     25   0.14  40.75 -14.51  -8.59   0.00  -9.71   0.00   7.94
     0     25   0.00  40.75 -12.79  -8.57   0.00   0.00 -12.03   7.35
-------------------------------------------------------------------------

WHEEL (0.00 + -0.60 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     25   0.24  40.76 -15.86  -8.61   0.00  -9.71   0.00   6.59
     0     25   0.00  40.76 -12.79  -8.57   0.00   0.00 -20.00  -0.60
-------------------------------------------------------------------------

Segment Leq : 7.35 dBA

Total Leq All Segments: 7.35 dBA

🠉
Road data, segment # 1: Bayswater (day/night)
---------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Bayswater (day/night)
-------------------------------------------
Angle1   Angle2           :   0.00 deg   75.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

🠉
Results segment # 1: Bayswater (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.06 + 0.00) = 54.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     75   0.21  63.96   0.00  -5.77  -4.12   0.00   0.00   0.00  54.06
-------------------------------------------------------------------------------

Segment Leq : 54.06 dBA

Total Leq All Segments: 54.06 dBA

🠉
Results segment # 1: Bayswater (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 46.47 + 0.00) = 46.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     75   0.21  56.36   0.00  -5.77  -4.12   0.00   0.00   0.00  46.47
-------------------------------------------------------------------------------
```

Segment Leq : 46.47 dBA

Total Leq All Segments: 46.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.07
(NIGHT): 46.47

STAMSON 5.0 NORMAL REPORT Date: 08-02-2021 17:07:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: SomersetSt W (day/night)

Angle1 Angle2 : -30.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Results segment # 1: SomersetSt W (day)

Source height = 1.50 m

ROAD (0.00 + 43.76 + 0.00) = 43.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	0	0.66	68.48	0.00	-13.31	-7.91	0.00	-3.50	0.00	43.76

Segment Leq : 43.76 dBA

Total Leq All Segments: 43.76 dBA

↟
Results segment # 1: SomersetSt W (night)

Source height = 1.50 m

ROAD (0.00 + 36.16 + 0.00) = 36.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	0	0.66	60.88	0.00	-13.31	-7.91	0.00	-3.50	0.00	36.16

Segment Leq : 36.16 dBA

Total Leq All Segments: 36.16 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 43.76
(NIGHT): 36.16
↟
↟

STAMSON 5.0 NORMAL REPORT Date: 08-02-2021 17:08:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec36.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 3-6

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: SomersetSt W (day/night)

Angle1 Angle2 : -30.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: SomersetSt W (day)

Source height = 1.50 m

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
-30	0	0.21	68.48	0.00	-9.70	-7.82	0.00	-3.50	0.00	47.45

Segment Leq : 47.45 dBA

Total Leq All Segments: 47.45 dBA

↟
Results segment # 1: SomersetSt W (night)

Source height = 1.50 m

ROAD (0.00 + 39.86 + 0.00) = 39.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	0	0.21	60.88	0.00	-9.70	-7.82	0.00	-3.50	0.00	39.86

Segment Leq : 39.86 dBA

Total Leq All Segments: 39.86 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 47.45
(NIGHT): 39.86
↟
↟

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:41:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

Angle1 Angle2	-70.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	3 / 3	
House density	60 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	225.00 / 225.00 m	
Receiver height	1.50 / 1.50 m	
Topography	2	(Flat/gentle slope; with barrier)

No Whistle

Barrier angle1	-70.00 deg	Angle2 : 0.00 deg
Barrier height	6.00 m	
Barrier receiver distance	220.00 / 220.00 m	
Source elevation	58.00 m	
Receiver elevation	64.00 m	
Barrier elevation	58.00 m	
Reference angle	0.00	

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	4.08	62.08
0.50	1.50	0.66	58.66

LOCOMOTIVE (0.00 + 29.73 + 0.00) = 29.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	0	0.58	60.53	-18.64	-4.81	0.00	-6.22	0.00	30.85
-70	0	0.22	60.53	-14.41	-4.39	0.00	0.00	-12.00	29.73

```
-------------------------------------------------------------------------

WHEEL (0.00 + 21.03 + 0.00) = 21.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70      0   0.66  60.54 -19.52  -4.89   0.00  -6.22   0.00  29.90
   -70      0   0.33  60.54 -15.64  -4.52   0.00   0.00 -19.35  21.03
-------------------------------------------------------------------------

Segment Leq : 30.28 dBA

Total Leq All Segments: 30.28 dBA

🠉
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        4.08 !        62.08
       0.50 !        1.50 !        0.66 !        58.66

LOCOMOTIVE (0.00 + 9.95 + 0.00) = 9.95 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70      0   0.58  40.75 -18.64  -4.81   0.00  -6.22   0.00  11.08
   -70      0   0.22  40.75 -14.41  -4.39   0.00   0.00 -12.00   9.95
-------------------------------------------------------------------------

WHEEL (0.00 + 1.25 + 0.00) = 1.25 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70      0   0.66  40.76 -19.52  -4.89   0.00  -6.22   0.00  10.12
   -70      0   0.33  40.76 -15.64  -4.52   0.00   0.00 -19.35   1.25
-------------------------------------------------------------------------

Segment Leq : 10.50 dBA

Total Leq All Segments: 10.50 dBA

🠉
Road data, segment # 1: SomersetSt W (day/night)
------------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: SomersetSt W (day/night)
-----------------------------------------------
Angle1   Angle2           : -42.00 deg   44.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     40 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  90.00 / 90.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Angle1   Angle2           : -75.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     20 %
Surface                   :      1       (Absorptive ground surface)
```

```
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Results segment # 1: SomersetSt W (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 48.58 + 0.00) = 48.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -42     44   0.66  68.48   0.00 -12.92  -3.49   0.00  -3.50   0.00  48.58
-------------------------------------------------------------------------------

Segment Leq : 48.58 dBA
```

↟

```
Results segment # 2: BayswaterAve (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.41 + 0.00) = 50.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -75      0   0.66  63.96   0.00  -7.92  -4.73   0.00  -0.90   0.00  50.41
-------------------------------------------------------------------------------

Segment Leq : 50.41 dBA

Total Leq All Segments: 52.60 dBA
```

↟

```
Results segment # 1: SomersetSt W (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 40.98 + 0.00) = 40.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -42     44   0.66  60.88   0.00 -12.92  -3.49   0.00  -3.50   0.00  40.98
-------------------------------------------------------------------------------

Segment Leq : 40.98 dBA
```

↟

Results segment # 2: BayswaterAve (night)

Source height = 1.50 m

ROAD (0.00 + 42.82 + 0.00) = 42.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	0	0.66	56.36	0.00	-7.92	-4.73	0.00	-0.90	0.00	42.82

Segment Leq : 42.82 dBA

Total Leq All Segments: 45.01 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.63
(NIGHT): 45.01

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:42:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec46.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-6

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

Angle1 Angle2	-70.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	3 / 3	
House density	60 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	225.00 / 225.00 m	
Receiver height	16.50 / 16.50 m	
Topography	2	(Flat/gentle slope; with barrier)

No Whistle

Barrier angle1	-70.00 deg	Angle2 : 0.00 deg
Barrier height	6.00 m	
Barrier receiver distance	220.00 / 220.00 m	
Source elevation	58.00 m	
Receiver elevation	64.00 m	
Barrier elevation	58.00 m	
Reference angle	0.00	

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	16.50	4.41	62.41
0.50	16.50	0.99	58.99

LOCOMOTIVE (0.00 + 34.09 + 0.00) = 34.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	0	0.14	60.53	-13.35	-4.28	0.00	-6.22	0.00	36.68
-70	0	0.00	60.53	-11.76	-4.10	0.00	0.00	-10.57	34.09

```
-------------------------------------------------------------------------

WHEEL (0.00 + 25.73 + 0.00) = 25.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70      0   0.24  60.54 -14.58  -4.41   0.00  -6.22   0.00  35.32
   -70      0   0.00  60.54 -11.76  -4.10   0.00   0.00 -18.94  25.73
-------------------------------------------------------------------------

Segment Leq : 34.68 dBA

Total Leq All Segments: 34.68 dBA

🠉
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       16.50 !        4.41 !        62.41
       0.50 !       16.50 !        0.99 !        58.99

LOCOMOTIVE (0.00 + 14.31 + 0.00) = 14.31 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70      0   0.14  40.75 -13.35  -4.28   0.00  -6.22   0.00  16.90
   -70      0   0.00  40.75 -11.76  -4.10   0.00   0.00 -10.57  14.31
-------------------------------------------------------------------------

WHEEL (0.00 + 5.95 + 0.00) = 5.95 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70      0   0.24  40.76 -14.58  -4.41   0.00  -6.22   0.00  15.54
   -70      0   0.00  40.76 -11.76  -4.10   0.00   0.00 -18.94   5.95
-------------------------------------------------------------------------

Segment Leq : 14.90 dBA

Total Leq All Segments: 14.90 dBA

🠉
Road data, segment # 1: SomersetSt W (day/night)
------------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: SomersetSt W (day/night)
-----------------------------------------------
Angle1   Angle2           : -42.00 deg   44.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     40 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  90.00 / 90.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Angle1   Angle2           : -75.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     20 %
Surface                   :      1       (Absorptive ground surface)
```

```
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Results segment # 1: SomersetSt W (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 52.27 + 0.00) = 52.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -42     44   0.21  68.48   0.00  -9.42  -3.30   0.00  -3.50   0.00  52.27
-------------------------------------------------------------------------------

Segment Leq : 52.27 dBA
```

↟

```
Results segment # 2: BayswaterAve (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.16 + 0.00) = 53.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -75      0   0.21  63.96   0.00  -5.77  -4.12   0.00  -0.90   0.00  53.16
-------------------------------------------------------------------------------

Segment Leq : 53.16 dBA

Total Leq All Segments: 55.75 dBA
```

↟

```
Results segment # 1: SomersetSt W (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 44.67 + 0.00) = 44.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -42     44   0.21  60.88   0.00  -9.42  -3.30   0.00  -3.50   0.00  44.67
-------------------------------------------------------------------------------

Segment Leq : 44.67 dBA
```

↟

Results segment # 2: BayswaterAve (night)

Source height = 1.50 m

ROAD (0.00 + 45.57 + 0.00) = 45.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	0	0.21	56.36	0.00	-5.77	-4.12	0.00	-0.90	0.00	45.57

Segment Leq : 45.57 dBA

Total Leq All Segments: 48.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.78
(NIGHT): 48.16

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 13:47:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec5.te Time Period: Day/Night 16/8 hours
Description: Reception Point 5

Rail data, segment # 1: O-Train Rail (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. O-Train	190.0/1.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: O-Train Rail (day/night)

Angle1 Angle2	-74.00 deg	27.00 deg
Wood depth	0	(No woods.)
No of house rows	3 / 3	
House density	60 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	250.00 / 250.00 m	
Receiver height	19.50 / 19.50 m	
Topography	2	(Flat/gentle slope; with barrier)

No Whistle

Barrier angle1	-74.00 deg	Angle2 : 27.00 deg
Barrier height	6.00 m	
Barrier receiver distance	245.00 / 245.00 m	
Source elevation	58.00 m	
Receiver elevation	64.00 m	
Barrier elevation	58.00 m	
Reference angle	0.00	

Results segment # 1: O-Train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	19.50	4.43	62.43
0.50	19.50	1.00	59.00

LOCOMOTIVE (0.00 + 35.21 + 0.00) = 35.21 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	27	0.05	60.53	-12.77	-2.56	0.00	-6.19	0.00	39.01
-74	27	0.00	60.53	-12.22	-2.51	0.00	0.00	-10.59	35.21

```
-------------------------------------------------------------------

WHEEL (0.00 + 26.84 + 0.00) = 26.84 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -74     27   0.15  60.54 -14.05  -2.68   0.00  -6.19   0.00  37.62
   -74     27   0.00  60.54 -12.22  -2.51   0.00   0.00 -18.96  26.84
-------------------------------------------------------------------

Segment Leq : 35.80 dBA

Total Leq All Segments: 35.80 dBA

🠉
Results segment # 1: O-Train Rail (night)
-----------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       19.50 !        4.43 !        62.43
       0.50 !       19.50 !        1.00 !        59.00

LOCOMOTIVE (0.00 + 15.43 + 0.00) = 15.43 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -74     27   0.05  40.75 -12.77  -2.56   0.00  -6.19   0.00  19.23
   -74     27   0.00  40.75 -12.22  -2.51   0.00   0.00 -10.59  15.43
-------------------------------------------------------------------

WHEEL (0.00 + 7.07 + 0.00) = 7.07 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -74     27   0.15  40.76 -14.05  -2.68   0.00  -6.19   0.00  17.84
   -74     27   0.00  40.76 -12.22  -2.51   0.00   0.00 -18.96   7.07
-------------------------------------------------------------------

Segment Leq : 16.02 dBA

Total Leq All Segments: 16.02 dBA

🠉
Road data, segment # 1: SomersetSt W (day/night)
------------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
```

```
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: SomersetSt W (day/night)
-----------------------------------------------
Angle1   Angle2           : -36.00 deg   37.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     40 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  95.00 / 95.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Road data, segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Car traffic volume  :  1600/800   veh/TimePeriod
Medium truck volume :   320/160   veh/TimePeriod
Heavy truck volume  :   160/80    veh/TimePeriod
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: BayswaterAve (day/night)
-----------------------------------------------
Angle1   Angle2           : -82.00 deg   77.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: SomersetSt W (day)
---------------------------------------

Source height = 1.50 m
```

ROAD (0.00 + 52.04 + 0.00) = 52.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	37	0.12	68.48	0.00	-8.98	-3.96	0.00	-3.50	0.00	52.04

Segment Leq : 52.04 dBA

↟

Results segment # 2: BayswaterAve (day)

Source height = 1.67 m

ROAD (0.00 + 54.34 + 0.00) = 54.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	77	0.12	60.41	0.00	-5.32	-0.75	0.00	0.00	0.00	54.34

Segment Leq : 54.34 dBA

Total Leq All Segments: 56.35 dBA

↟

Results segment # 1: SomersetSt W (night)

Source height = 1.50 m

ROAD (0.00 + 44.45 + 0.00) = 44.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	37	0.12	60.88	0.00	-8.98	-3.96	0.00	-3.50	0.00	44.45

Segment Leq : 44.45 dBA

↟

Results segment # 2: BayswaterAve (night)

Source height = 1.67 m

ROAD (0.00 + 54.34 + 0.00) = 54.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	77	0.12	60.41	0.00	-5.32	-0.75	0.00	0.00	0.00	54.34

Segment Leq : 54.34 dBA

Total Leq All Segments: 54.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.39
(NIGHT): 54.76