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73 Guigues Avenue

Noise Impact Assessment



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Noise Impact Assessment

73 Guigues Avenue

Prepared by:

NOVATECH

240 Michael Cowpland Drive, Suite 200
Ottawa, Ontario, K2M 1P6

May 9, 2019

Ref: R-2019-067
Novatech File No. 118099

May 9, 2019

BY COURIER

City of Ottawa
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: Mr. Robert Sandercott

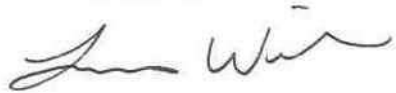
**Reference: 73 Guigues Avenue
Noise Impact Assessment
Our File No.: 118099**

Please find enclosed three (3) copies of the 'Noise Impact Assessment' for the 73 Guigues Avenue development.

Please contact the undersigned with any questions, or if you require additional information.

Sincerely,

NOVATECH



Lucas Wilson, P.Eng.
Project Coordinator

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1.0 INTRODUCTION

The subject site is located in the City of Ottawa at 73 Guigues Avenue. A key plan of the area is presented below in **Figure 1-1**.

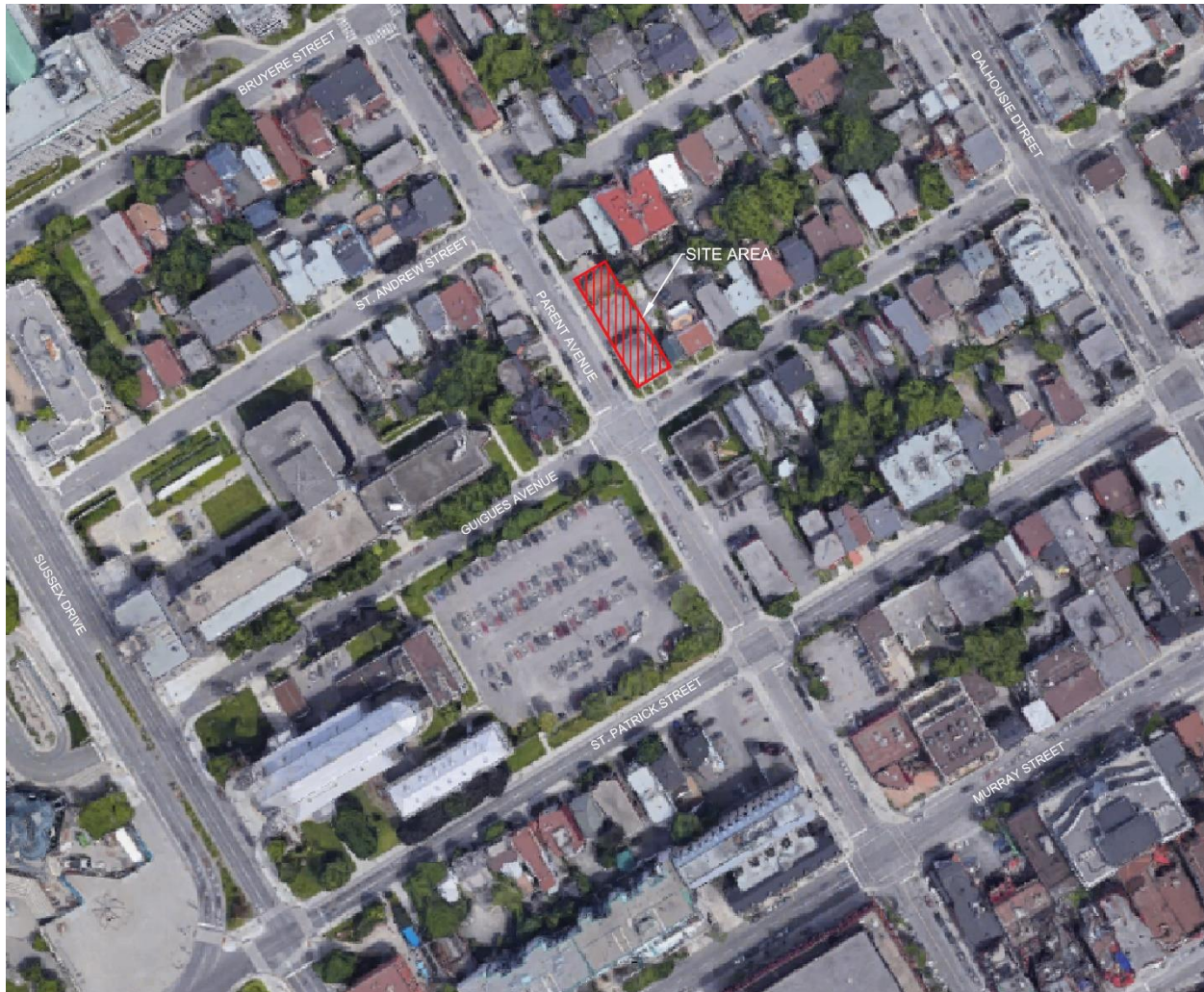
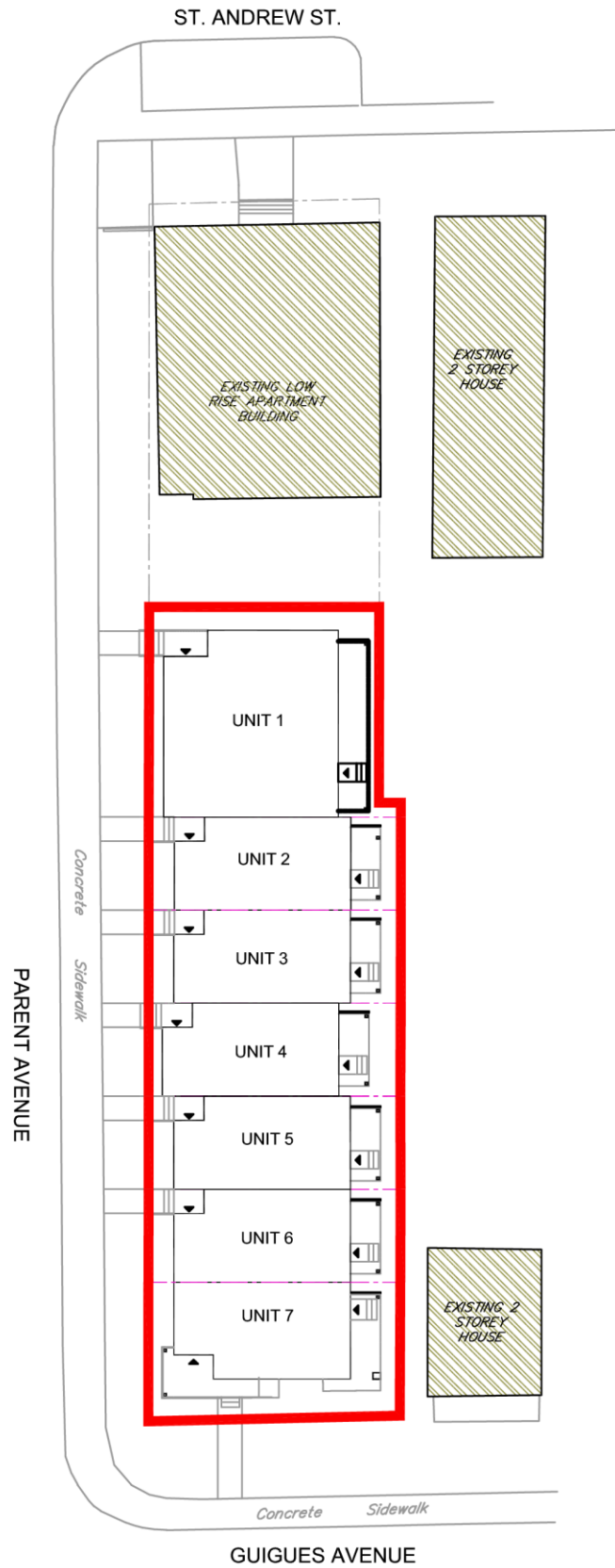


Figure 1-1 Key Plan

The proposed development will consist of 7-three storey townhome units, six (6) fronting onto Parent Avenue and one (1) fronting onto Guigues Avenue. The proposed site plan is shown in **Figure 1-2**. The subject site is located within 100m of St. Patrick Street, a designated arterial road. This proximity to St. Patrick Street triggers the requirement for a noise impact assessment.

This report assesses the impacts of sound from vehicular traffic on the proposed development using the Ministry of the Environment (MOE) Stamson 5.0 software and outlines any necessary noise attenuation requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines (ENCG) and the MOE Environmental Noise Guidelines (MOE Publication NPC-300).

**Figure 1-2 Site Plan**

2.0 CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES

2.1 Sound Level Criteria

The City of Ottawa is concerned with noise from aircraft, roads, railways and transitways as expressed in the City of Ottawa Official Plan (May 2003). These policies are supported by the Environmental Noise Control Guidelines (ENCG) which is a technical document that outlines the specific sound level criteria. The City of Ottawa's *Environmental Noise Control Guidelines (ENCG)*, January, 2016 and the Ministry of Environment's *Environmental Noise Guidelines, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300* have been used for the purpose of this report. As per Section 2.2 of the City of Ottawa Noise Control Guidelines (2016), unless otherwise noted, developments should be consistent with NPC-300 (MOE publication, 2013).

The areas that must be assessed for acoustic protection include the Outdoor Living Area (OLA) and the Outdoor Plane of Window (POW).

These locations are defined as:

- **Outdoor Living Area (OLA):** The Outdoor Living Area is defined as that part of the outdoor amenity area provided for the quiet enjoyment of the outdoor environment during the daytime period. These amenity areas are typically backyards, gardens, terraces, patios and common outdoor living areas. The OLA noise target for traffic noise sources is 55 dBA. This criterion may be exceeded by an amount not greater than 5 dBA, subject to justification and the use of a Warning Clause. OLA noise levels are analysed at 3.0m from the building façade, 1.5m above grade.
- **Plane of Window (POW):** The plane of window is defined as the indoor living space where the sound levels will affect the living room area during daytime hours and bedrooms during night time hours. The residential Plane of Window noise target for traffic noise sources is 55 dBA during the day and 50 dBA at night. If this criterion is exceeded, the property may be subject to building component analysis and warning clauses. The sound criterion is broadly summarized in **Table 2-1**. POW noise levels will be analysed 4.5m above grade during daytime and 7.5m above grade during night time.

Table 2-1 City of Ottawa Plane of Window Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	Plane of Living Room Window	55 dBA
Night time (23:00 - 07:00 hrs)	Plane of Bedroom Window	50 dBA

Compliance with the outdoor sound level criteria generally ensures compliance with the indoor sound level criteria which is summarized below in **Table 2-2**.

Table 2-2 Indoor Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	Living/Dining Rooms of residential dwelling units , hospitals, schools, nursing homes, day-care centres, theatres, places of worship, individual or semiprivate offices, conference rooms etc.	45 dBA
Night Time (23:00 - 07:00 hrs)	Sleeping quarters of residential units , hospitals, nursing homes, senior citizen homes, etc.	40 dBA

2.2 Noise Attenuation Requirements

When sound levels are predicted to be less than the specified criteria for daytime and night time conditions, no attenuation measures are required on the part of the proponent. As the noise criteria are exceeded, a combination of attenuation measures is recommended by the City of Ottawa and the MOE to mitigate noise levels.

These attenuation measures may include any or all of the following:

- Distance setback with soft ground;
- Insertion of noise insensitive land uses between the source and sensitive receptor;
- Orientation of building to provide sheltered zone;
- Construction of a noise barrier wall and/or berm;
- Installation of a forced air ventilation system with provision for central air;
- Installation of central air;
- Acoustically selected building façade components

2.2.1 Noise Barrier

Noise barriers should only be used when other noise control measures have been considered, and there is no other alternative. For the purpose of this study, when noise levels exceed 60 dBA in the Outdoor Living Area, control measures (barriers) are required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

The noise barriers are to be compliant with the City standard for noise barriers and have the following characteristics.

- Minimum height of 2.2m;
- Maximum height of 2.5m (unless approved by the City of Ottawa);
- Situated 0.30m inside the private property;
- A surface mass density not less than 20kg/sq.m; and
- No holes or gaps.

2.2.2 Ventilation Requirements

A forced air heating system with provision for a central air conditioning system is required if the daytime noise levels are between 55 dBA and 60 dBA and/or night time noise levels are between 50 dBA and 60 dBA.

The installation of a central air conditioning system is required when the daytime noise level exceeds 65 dBA and/or night time noise levels exceed 60 dBA.

2.2.3 Building Component Assessment

When noise levels exceed 65 dBA (daytime) or 60 dBA (night time) the exterior cladding system of the building envelope must be acoustically assessed to ensure the indoor sound criteria is achieved. This includes analysis of the exterior wall, door, and/or glazing system specifications as appropriate.

The NRC research *Acoustic Insulation Factor: A Rating for the Insulation of Buildings against Noise* (June 1980, JD Quirt) is used to assess the building components and the required acoustic insulation factor (AIF). This method is recognized by the City of Ottawa.

The required AIF is based on the Outside L_{eq} , Indoor L_{eq} required, and the number of exterior façade components.

Minimum Required AIF = Outside L_{eq} – Indoor L_{eq} + $\log_{10}$ (Number of Components) + 2dB

Where, N = Number of components (walls, windows and roof);
L = Sound Level expressed on a common decibel scale.

2.2.4 Warning Clauses

When predicted noise levels exceed the specified criteria, the City of Ottawa and the MOE recommend warning clauses be registered as a notice on title and incorporated into the sales agreements to warn potential purchaser/buyers/tenants of the possible elevated noise levels.

The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

Warning Clause Type A

“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 City’s and the Ministry of the Environment’s noise criteria.”

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 may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the City’s and the Ministry of the Environment’s noise criteria.”

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 will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

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 City's and the Ministry of the Environment's noise criteria."

2.2.5 Summary of Noise Attenuation Measures

Table 2-3 summarizes the noise attenuation measures and warning clauses should sound criteria be exceeded.

Table 2-3 Outdoor, Ventilation and Warning Clause Requirements (NPC-300)

Assessment Location	Leq (dBA)	Outdoor Control Measures	Indoor Control Measures		Warning Clause
			Ventilation Requirements	Building Components	
Outdoor Living Area (OLA)	Less than 55	None required	N/A	N/A	None required
	Between 55 and 60	Control measures (barriers) may not be required but should be considered	N/A	N/A	Required if resultant Leq exceeds 55 dBA Type A
	More than 60	Barriers required	N/A	N/A	Required if resultant Leq exceeds 55 dBA Type B
Plane of Living Room Window (POW)	Less than 55	N/A	None Required	None Required	None Required
	Between 55 and 65	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More Than 65	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D
Plane of Bedroom Window (POW)	Less than 50	N/A	None Required	None Required	None Required
	Between 50 and 60	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More than 60	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D

3.0 NOISE SOURCE

The City of Ottawa Official Plan and Environmental Noise Control Guidelines (ENCG) stipulate that a noise impact assessment is required when a noise sensitive development is within proximity to a surface transportation (road or rail), stationary and aircraft noise sources.

Due to the site location, only roadway noise will be considered. The following distances to roadway noise sources are applicable to the subject site:

- Within 100m from the right-of-way of an existing/proposed arterial/collector

Figure 3-1 identifies the noise source that triggers the requirement for this noise impact assessment. The subject site is located within 100m of St. Patrick Street (Arterial).

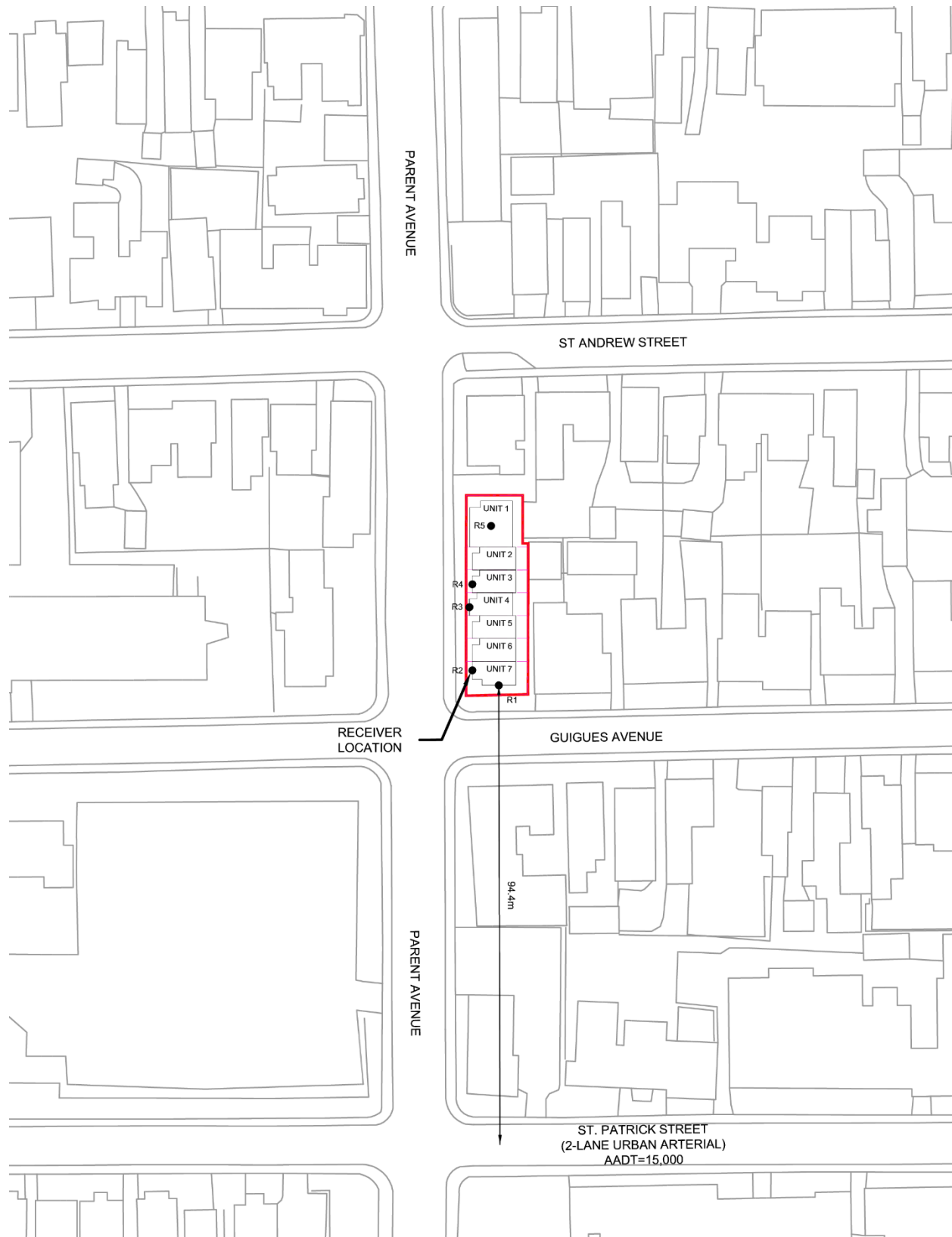
3.1 St. Patrick Street (Arterial)

St. Patrick Street is classified as a 2-Lane Urban Arterial (2-UAU) Roadway in the 2013 Transportation Master Plan with an Annual Average Daily Traffic (AADT) value of 15,000.

As per Table B1 of Appendix B of the ENCG, **Table 3-1** outlines the traffic parameters used to calculate the sound levels for the development.

Table 3-1 St. Patrick Street Noise Parameters

Roadway Classification	2-Lane Urban Arterial
Annual Average Daily Traffic (AADT)	15,000 veh/day
Day/Night Split (%)	92/8
Heavy Trucks (%)	5
Medium Trucks (%)	7
Posted Speed Limit	50 km/hr
Road Gradient	0.5%

**Figure 3-1 Noise Source**

4.0 NOISE LEVEL PREDICTIONS

4.1 Modeling

Noise levels are calculated using the STAMSON computer program, version 5.03. Road data is input into the program as applicable, whereupon the program calculates an A-weighted 16 hour L_{eq} noise level for the daytime and an 8 hour L_{eq} noise level for the night time. The results of these computer calculations are presented in **Appendix B** and summarized in **Table 4-1** and **Table 4-2**. Receiver locations are shown above in **Figure 3-1**.

Table 4-1 POW Noise Level Summary

LOCATION	PLANE OF WINDOW (POW) NOISE LEVEL – L_{eq} - (dBA)	
	DAYTIME	NIGHTTIME
R1 (Unit 7 – Facing Guigues Ave)	57.63	50.04
R2 (Unit 7 – Facing Parent Ave)	57.34	49.74
R3 (Unit 4 – Facing Parent Ave)	55.55	47.83
R4 (Unit 3 – Facing Parent Ave)	55.01	47.24

Table 4-2 OLA Noise Level Summary

LOCATION	OUTDOOR LIVING AREA (OLA) NOISE LEVEL – L_{eq} - (dBA)
R5 (Unit 1 Rooftop)	54.29

4.2 Outdoor Control Measures

Unit 1 includes a rooftop terrace providing the only suitable Outdoor Living Area within the development. The unattenuated OLA noise level at R5 is below 55 dBA (54.29 dBA), therefore no attenuation measures are required.

4.3 Indoor Control Measures

Units 3 to 7 require forced air heating with provision for central air conditioning and a warning clause Type C as daytime plane of window noise levels are above 55 dBA.

Typical wording for Type C warning clause: “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 will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City’s and the Ministry of the Environment’s noise criteria.”

4.4 Building Component Assessment

When noise levels exceed 65 dBA (day-time) the exterior cladding system of the building envelope must be acoustically assessed to ensure the indoor noise criteria is achieved.

All noise levels within the development are below 65 dBA therefore requiring no assessment to the exterior cladding system.

5.0 CONCLUSIONS AND RECOMMENDATIONS

To meet the requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines and the MOE Environmental Noise Guideline the following measures are required.

Outdoor Control Measures

The rooftop terrace noise levels are below 55 dBA requiring no attenuation measures.

Indoor Control Measures

Units 3 to 7 require a warning clause Type C.

Building Component Assessment

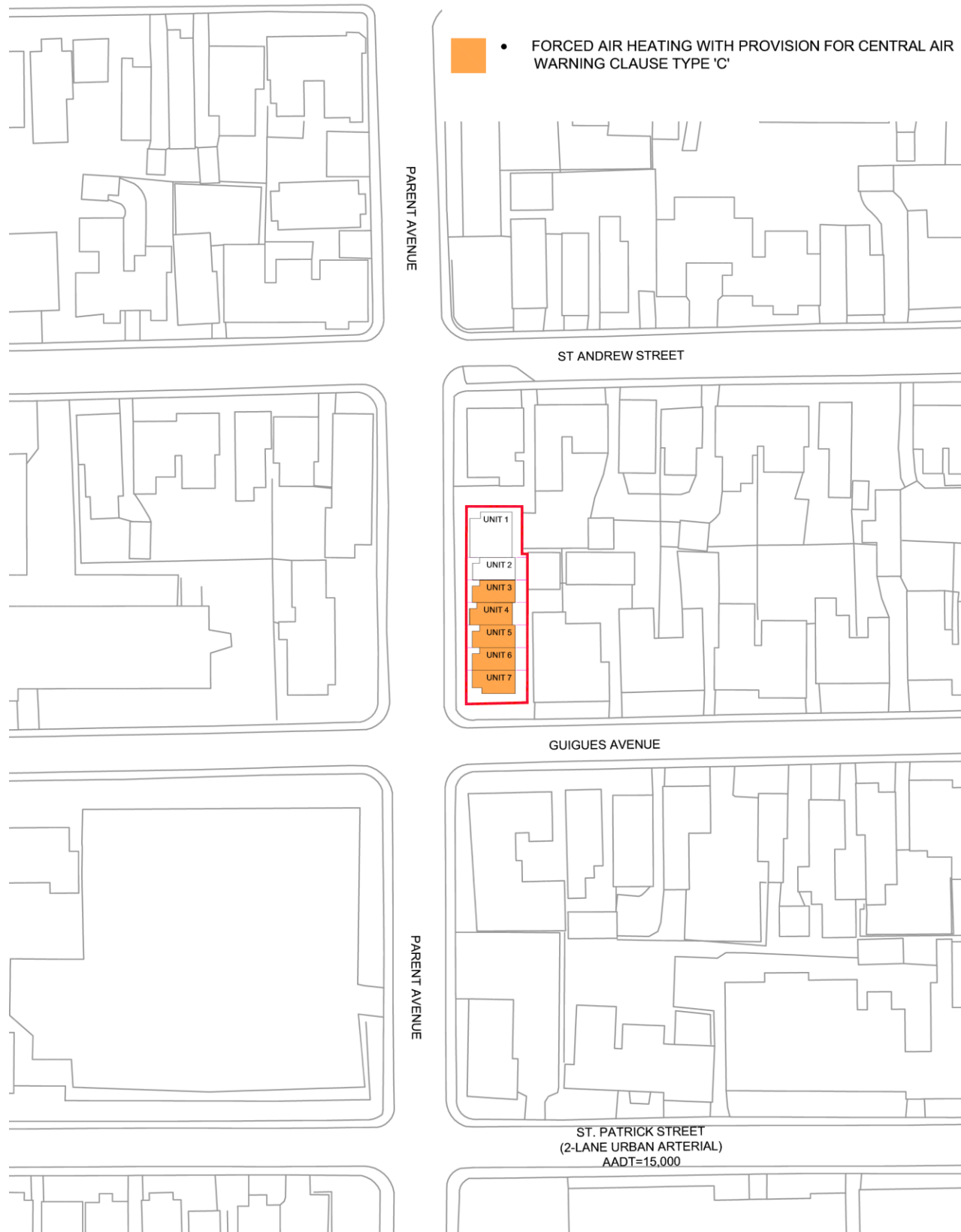
No building component assessment is required as noise levels are below 65 dBA.

Warning Clauses

Warning clauses are to be placed on title and in the purchase and sale agreements as indicated above and in **Figure 5-1**. The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

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 will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

**Figure 5-1 Construction Requirements and Warning Clauses**

If you have any questions or comments with regards to this report, please do not hesitate to contact the undersigned.

Respectfully issued,

NOVATECH

Prepared By:



Lucas Wilson, P.Eng.
Project Coordinator

Reviewed By:

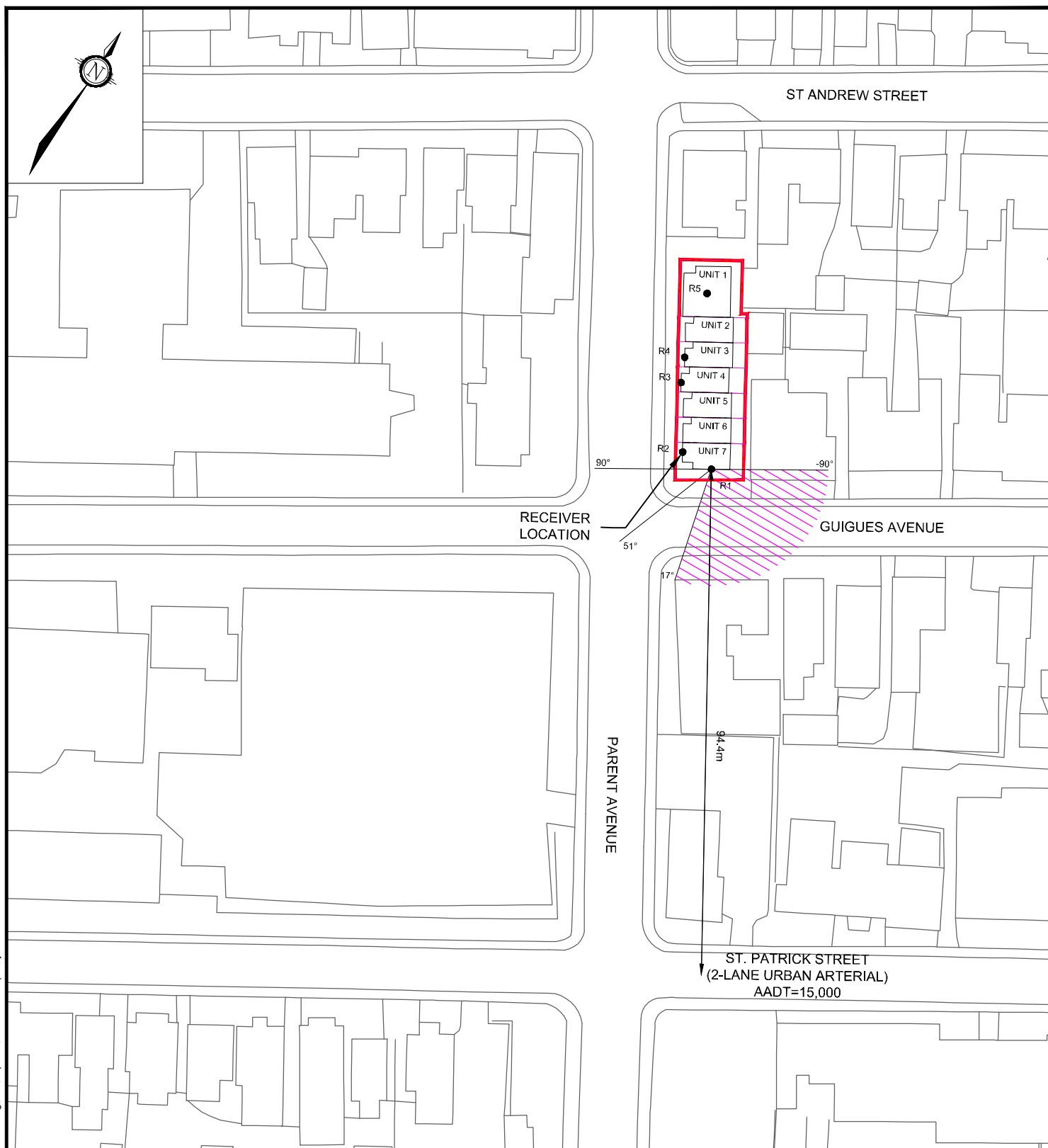


Mark Bissett, P.Eng.
Project Manager

APPENDIX A

Receiver Location Figures Stamson Model Output

M:\2018\118099\CAD\Design\Figures\Noise\118099-BP.dwg, R1, Apr 09, 2019 - 2:00pm, jmarc



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Facsimile (613) 254-5867
Website www.novatech-eng.com



NOISE OBSTRUCTION
ANGLE - ROWS OF
HOUSES

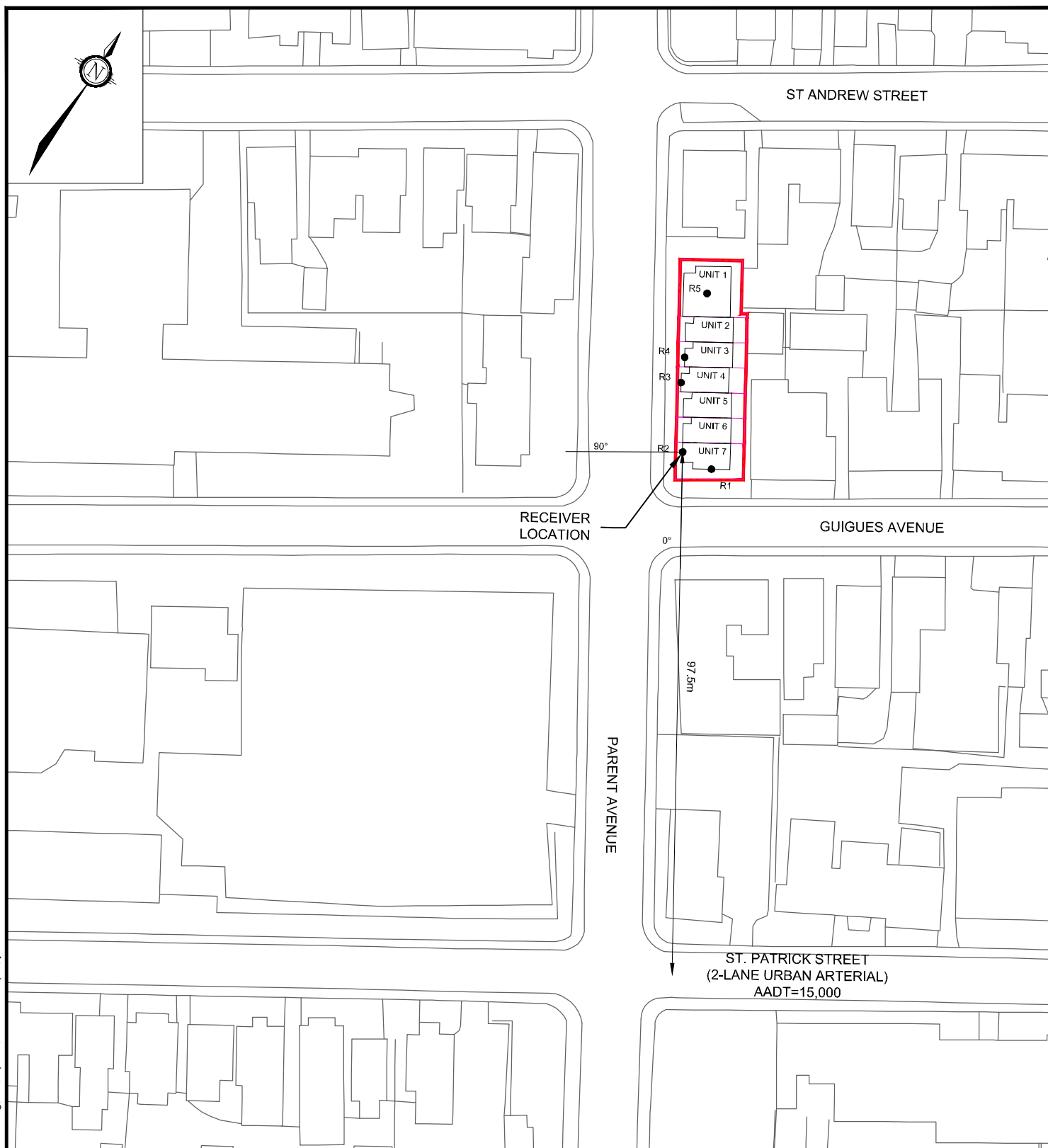
73 GUIGUES AVENUE

RECEIVER LOCATION R1

SCALE 1 : 1000

DATE APR 2019 JOB 118099 FIGURE NS-1

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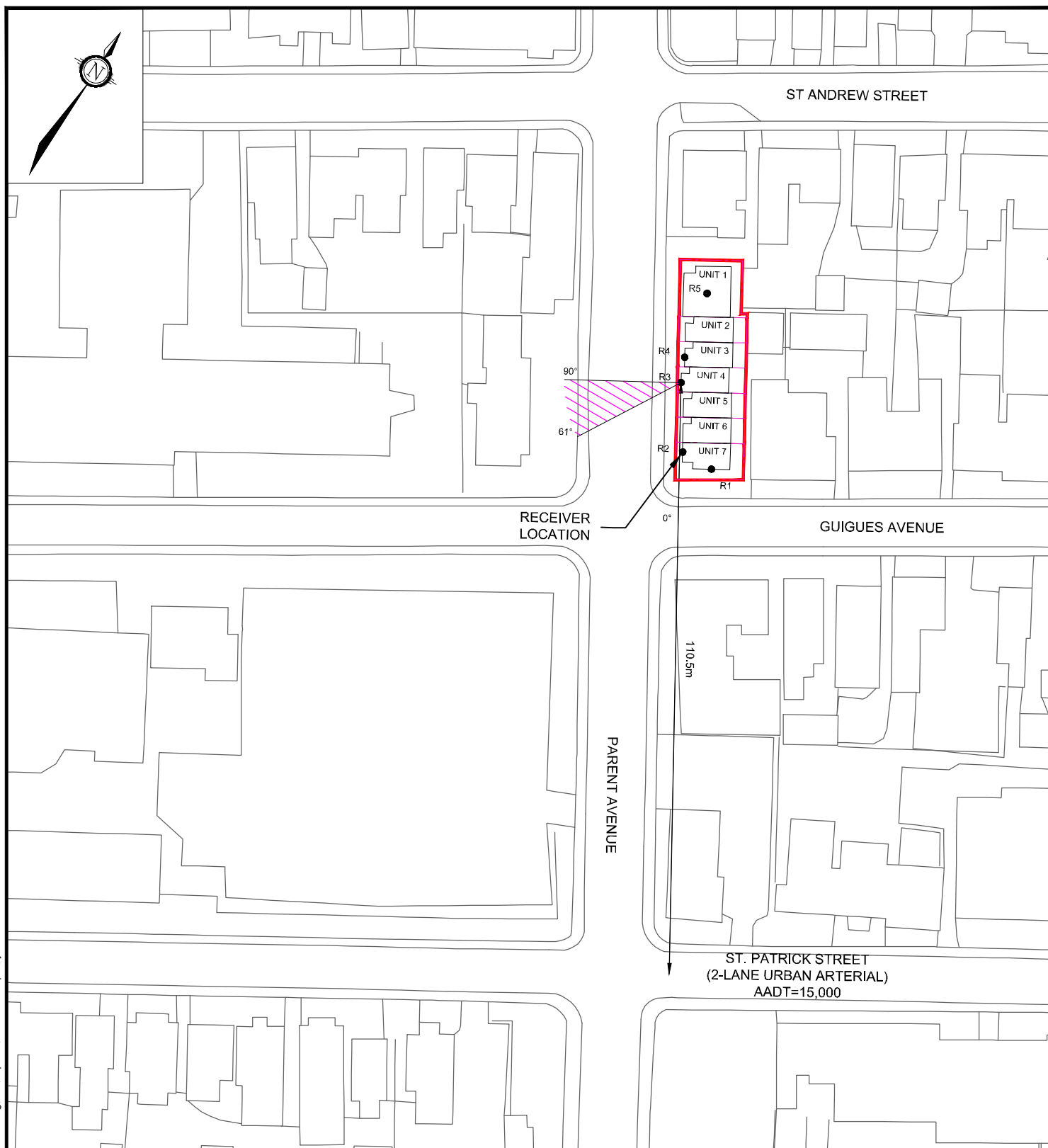
73 GUIGUES AVENUE

RECEIVER LOCATION R2

SCALE 1 : 1000

DATE APR 2019 JOB 118099 FIGURE NS-2

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 NOISE OBSTRUCTION
ANGLE - ROWS OF
HOUSES

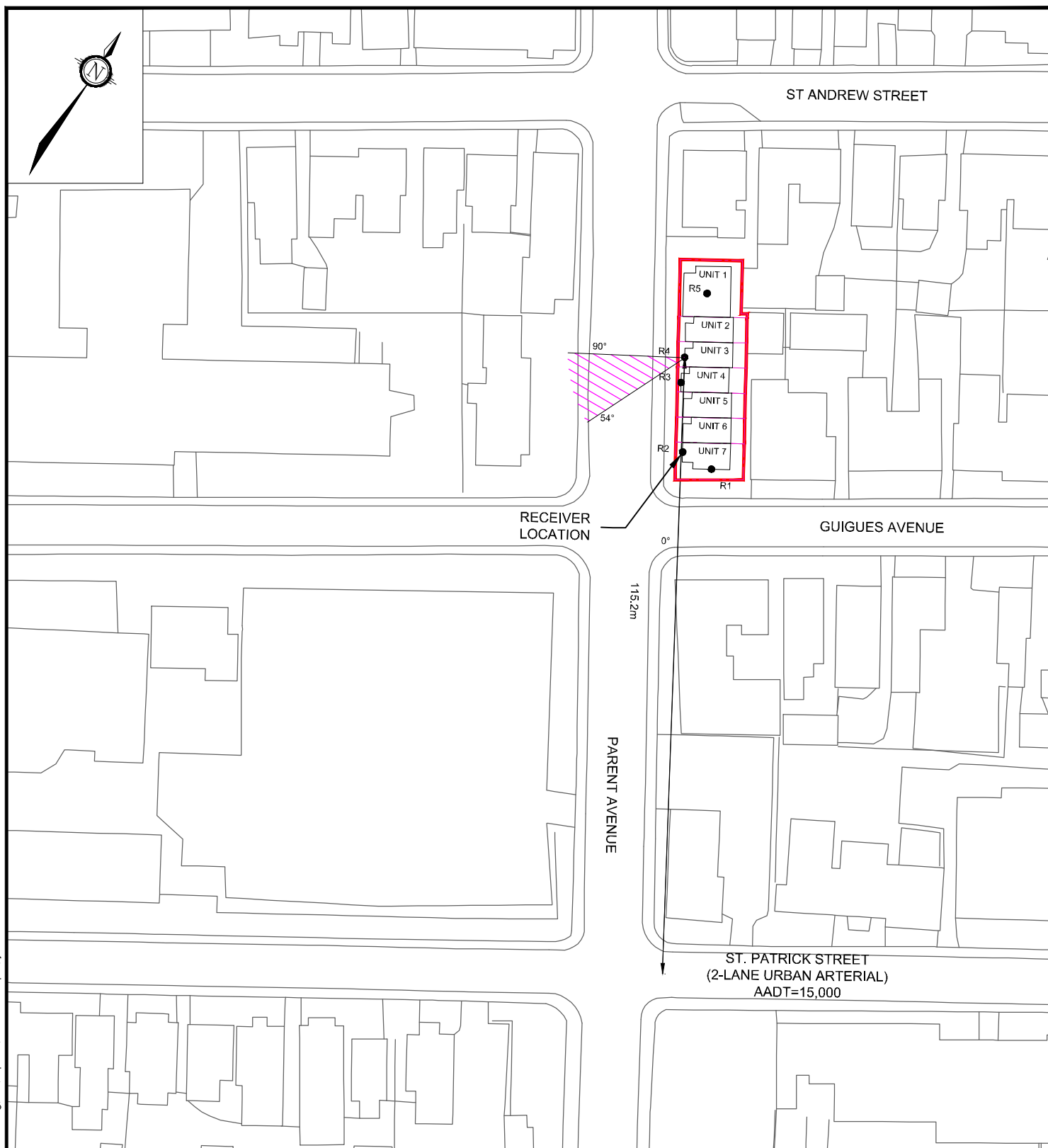
73 GUIGUES AVENUE

RECEIVER LOCATION R3

SCALE 1 : 1000 

DATE APR 2019 JOB 118099 FIGURE NS-3

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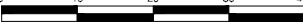
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 NOISE OBSTRUCTION
ANGLE - ROWS OF
HOUSES

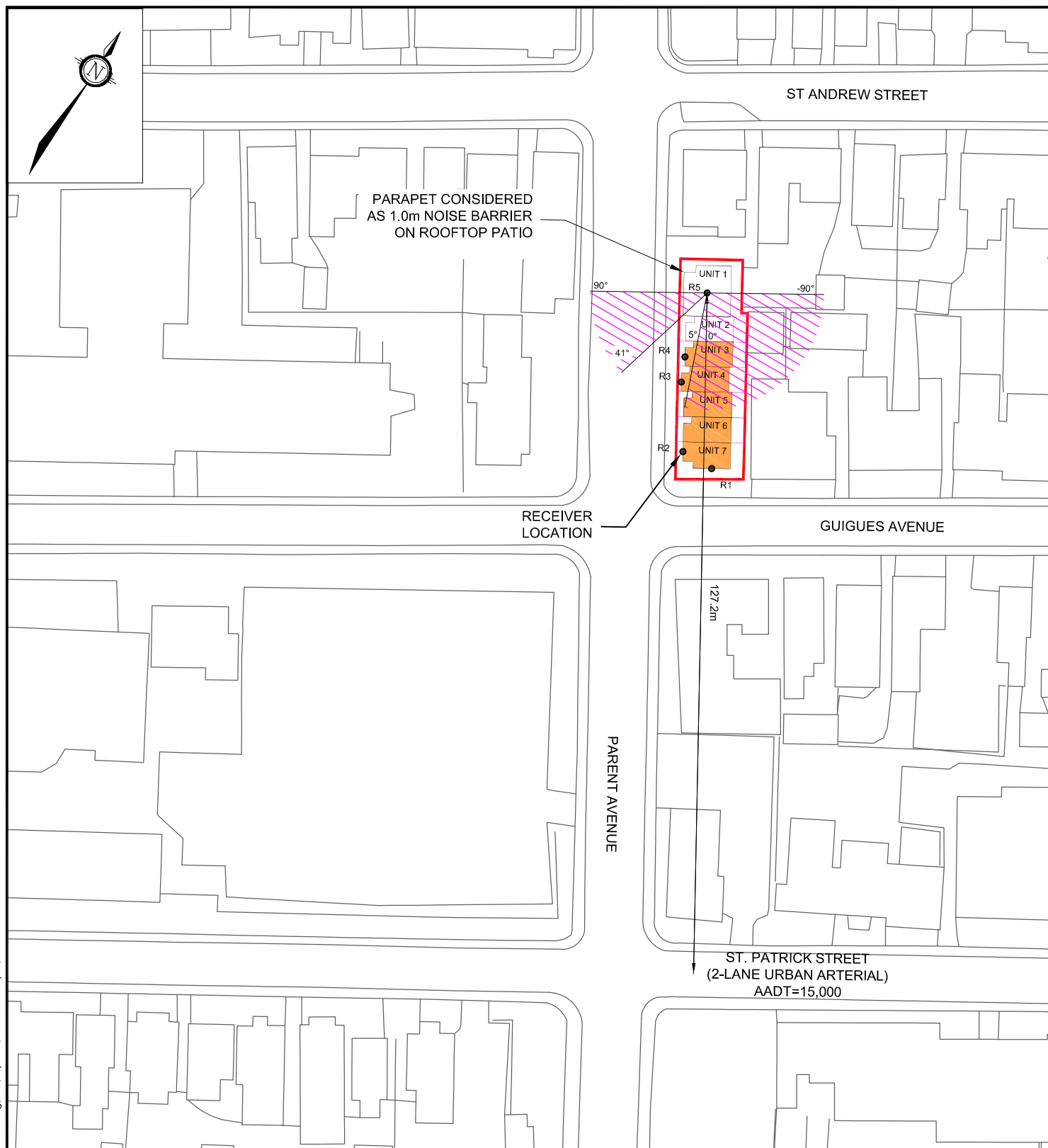
73 GUIGUES AVENUE

RECEIVER LOCATION R4

SCALE 1 : 1000 

DATE APR 2019 JOB 118099 FIGURE NS-4

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NOISE OBSTRUCTION
ANGLE - ROWS OF
HOUSES

73 GUIGUES AVENUE

RECEIVER LOCATION R5

SCALE 1 : 1000

DATE APR 2019 JOB 118099 FIGURE NS-5

Filename: r1.te Time Period: Day/Night 16/8 hours
Description: R1 POW (Facing Guigues)

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

Angle1 Angle2 : -90.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 80 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.40 / 94.40 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Angle1 Angle2 : 17.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.40 / 94.40 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: St Patrick (day)

Source height = 1.50 m

ROAD (0.00 + 51.00 + 0.00) = 51.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	17	0.00	68.48	0.00	-7.99	-2.26	0.00	-7.23	0.00	51.00

Segment Leq : 51.00 dBA

Results segment # 2: St Patrick (day)

Source height = 1.50 m

ROAD (0.00 + 56.57 + 0.00) = 56.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
17	90	0.00	68.48	0.00	-7.99	-3.92	0.00	0.00	0.00	56.57

Segment Leq : 56.57 dBA

Total Leq All Segments: 57.63 dBA

Results segment # 1: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 43.41 + 0.00) = 43.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	17	0.00	60.88	0.00	-7.99	-2.26	0.00	-7.23	0.00	43.41

Segment Leq : 43.41 dBA

Results segment # 2: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 48.98 + 0.00) = 48.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
17	90	0.00	60.88	0.00	-7.99	-3.92	0.00	0.00	0.00	48.98

Segment Leq : 48.98 dBA

Total Leq All Segments: 50.04 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.63
(NIGHT): 50.04

STAMSON 5.0 NORMAL REPORT Date: 04-04-2019 11:00:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description: R2 POW (Facing Parent)

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

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 97.50 / 97.50 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: St Patrick (day)

Source height = 1.50 m

ROAD (0.00 + 57.34 + 0.00) = 57.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	68.48	0.00	-8.13	-3.01	0.00	0.00	0.00	57.34

Segment Leq : 57.34 dBA

Total Leq All Segments: 57.34 dBA

Results segment # 1: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 49.74 + 0.00) = 49.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	60.88	0.00	-8.13	-3.01	0.00	0.00	0.00	49.74

Segment Leq : 49.74 dBA

Total Leq All Segments: 49.74 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.34
(NIGHT): 49.74

Filename: r3.te Time Period: Day/Night 16/8 hours
Description: R3 POW (Facing Parent)

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

Angle1 Angle2 : 0.00 deg 61.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 110.50 / 110.50 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Angle1 Angle2 : 61.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 2
House density : 85 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 110.50 / 110.50 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: St Patrick (day)

Source height = 1.50 m

ROAD (0.00 + 55.11 + 0.00) = 55.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	61	0.00	68.48	0.00	-8.67	-4.70	0.00	0.00	0.00	55.11

Segment Leq : 55.11 dBA

Results segment # 2: St Patrick (day)

Source height = 1.50 m

ROAD (0.00 + 45.42 + 0.00) = 45.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
61	90	0.00	68.48	0.00	-8.67	-7.93	0.00	-6.46	0.00	45.42

Segment Leq : 45.42 dBA

Total Leq All Segments: 55.55 dBA

Results segment # 1: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 47.51 + 0.00) = 47.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	61	0.00	60.88	0.00	-8.67	-4.70	0.00	0.00	0.00	47.51

Segment Leq : 47.51 dBA

Results segment # 2: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 36.32 + 0.00) = 36.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
61	90	0.00	60.88	0.00	-8.67	-7.93	0.00	-7.96	0.00	36.32

Segment Leq : 36.32 dBA

Total Leq All Segments: 47.83 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.55
(NIGHT): 47.83

Filename: r4.te Time Period: Day/Night 16/8 hours
Description: R4 POW (Facing Parent)

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

Angle1 Angle2 : 0.00 deg 54.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 115.20 / 115.20 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Angle1 Angle2 : 54.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 2
House density : 85 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 115.20 / 115.20 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: St Patrick (day)

Source height = 1.50 m

ROAD (0.00 + 54.40 + 0.00) = 54.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	54	0.00	68.48	0.00	-8.85	-5.23	0.00	0.00	0.00	54.40

Segment Leq : 54.40 dBA

Results segment # 2: St Patrick (day)

Source height = 1.50 m

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
54	90	0.00	68.48	0.00	-8.85	-6.99	0.00	-6.43	0.00	46.20

Segment Leq : 46.20 dBA

Total Leq All Segments: 55.01 dBA

Results segment # 1: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 46.80 + 0.00) = 46.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	54	0.00	60.88	0.00	-8.85	-5.23	0.00	0.00	0.00	46.80

Segment Leq : 46.80 dBA

Results segment # 2: St Patrick (night)

Source height = 1.50 m

ROAD (0.00 + 37.11 + 0.00) = 37.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
54	90	0.00	60.88	0.00	-8.85	-6.99	0.00	-7.93	0.00	37.11

Segment Leq : 37.11 dBA

Total Leq All Segments: 47.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.01
(NIGHT): 47.24

Filename: r5.te Time Period: Day/Night 16/8 hours
Description: R5 OLA (Unit 1 Rooftop)

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

Angle1 Angle2 : -90.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 3 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 127.30 / 127.30 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 5.00 deg
Barrier height : 1.00 m
Elevation : 10.00 m
Barrier receiver distance : 4.00 / 4.00 m
Source elevation : 0.00 m
Receiver elevation : 10.00 m
Barrier elevation : 10.00 m
Reference angle : 0.00

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

```

-----
Angle1   Angle2       :   5.00 deg   41.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           0 / 0
Surface         :           2       (Reflective ground surface)
Receiver source distance : 127.30 / 127.30 m
Receiver height  :           1.50 / 4.50 m
Topography      :           4       (Elevated; with barrier)
Barrier angle1   :           5.00 deg   Angle2 : 41.00 deg
Barrier height    :           1.00 m
Elevation        :          10.00 m
Barrier receiver distance : 4.00 / 4.00 m
Source elevation  :           0.00 m
Receiver elevation :          10.00 m
Barrier elevation  :          10.00 m
Reference angle   :           0.00

```

Road data, segment # 3: St Patrick (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 # 3: St Patrick (day/night)

```

-----
Angle1   Angle2       :  41.00 deg   90.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           1 / 0
Surface         :           2       (Reflective ground surface)
Receiver source distance : 127.30 / 127.30 m
Receiver height  :           1.50 / 4.50 m
Topography      :           4       (Elevated; with barrier)
Barrier angle1   :          41.00 deg   Angle2 : 90.00 deg
Barrier height    :           1.00 m
Elevation        :          10.00 m
Barrier receiver distance : 4.00 / 4.00 m
Source elevation  :           0.00 m
Receiver elevation :          10.00 m
Barrier elevation  :          10.00 m
Reference angle   :           0.00

```

Results segment # 1: St Patrick (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	1.19	11.19

ROAD (0.00 + 47.04 + 0.00) = 47.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	5	0.00	68.48	0.00	-9.29	-2.78	0.00	-9.38	0.00	47.04
-90	5	0.00	68.48	0.00	-9.29	-2.78	0.00	0.00	-4.84	51.57*
-90	5	0.00	68.48	0.00	-9.29	-2.78	0.00	0.00	0.00	56.42

* Bright Zone !

Segment Leq : 47.04 dBA

Results segment # 2: St Patrick (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	1.19	11.19

ROAD (0.00 + 52.20 + 0.00) = 52.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
5	41	0.00	68.48	0.00	-9.29	-6.99	0.00	0.00	-4.79	47.42*
5	41	0.00	68.48	0.00	-9.29	-6.99	0.00	0.00	0.00	52.20

* Bright Zone !

Segment Leq : 52.20 dBA

Results segment # 3: St Patrick (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	1.19	11.19

ROAD (0.00 + 47.17 + 0.00) = 47.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
41	90	0.00	68.48	0.00	-9.29	-5.65	0.00	-6.38	0.00	47.17
41	90	0.00	68.48	0.00	-9.29	-5.65	0.00	0.00	-4.91	48.64*
41	90	0.00	68.48	0.00	-9.29	-5.65	0.00	0.00	0.00	53.54

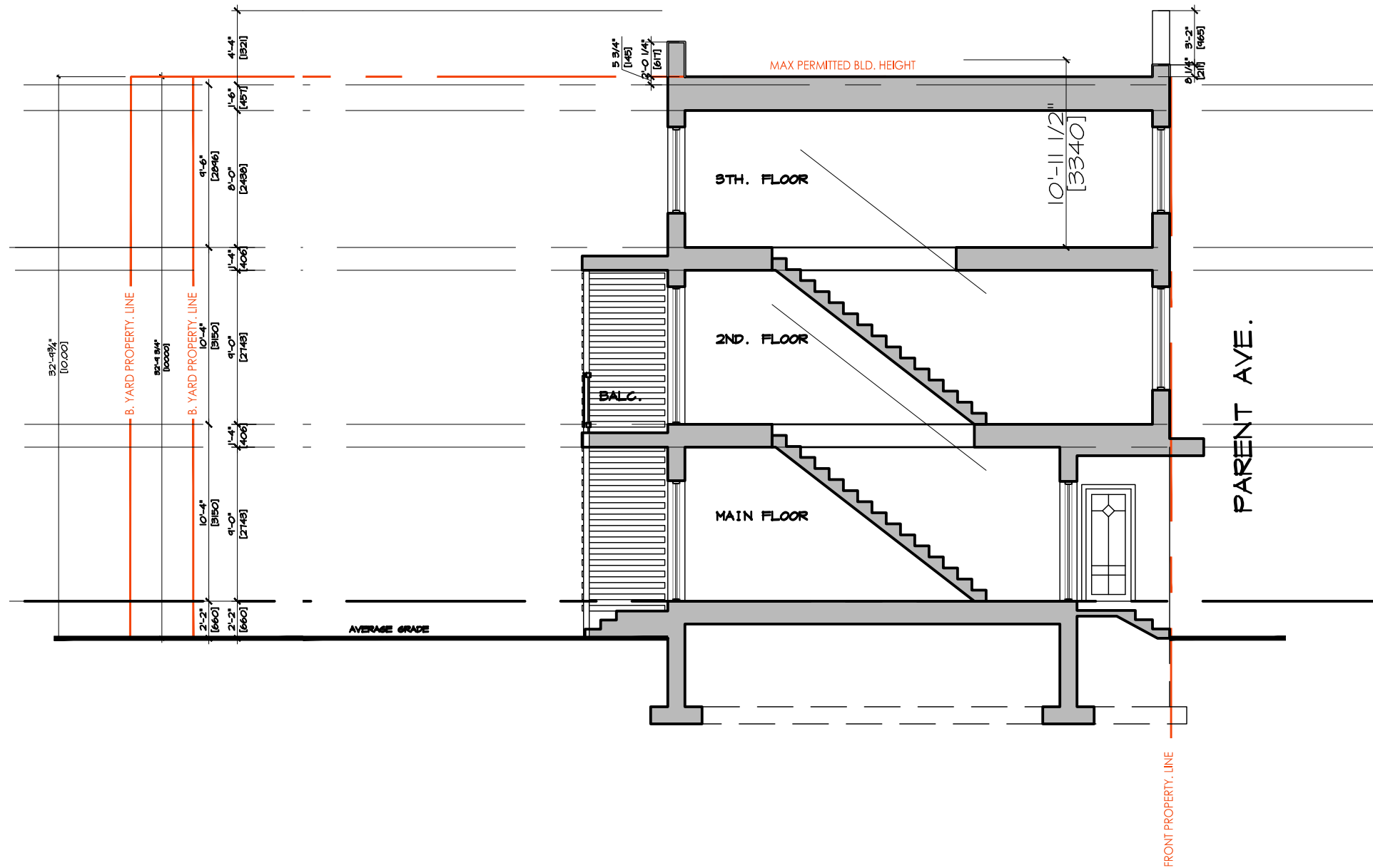
* Bright Zone !

Segment Leq : 47.17 dBA

Total Leq All Segments: 54.29 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.29

APPENDIX B
Elevation Plans



BUILDING SECTION

SCALE: 1/8" = 1'-0"



170 Main Street HAMEL
Ottawa, ON, K1S 1C2 DESIGN
(613) 232 9081 Tel. AND
info@H&DandP.com PLANNING

PROJECT TITLE

73 GIGUES
AVENUE

14	REVISION 14	2018-03-05
13	REVISION 13	2018-02-27
12	REVISION 12	2018-01-18
11	REVISION 11	2018-01-18
10	REVISION 10	2018-01-02
9	REVISION 9	2018-12-11
8	REVISION 8	2018-08-22
7	UNIT 8 REV.	2018-07-10
6	PRE-CONSULT.	2018-06-18
5	CLIENT REVISIONS	2018-06-14
4	CLIENT REVISIONS	2018-04-12
3	CLIENT REVISIONS	2018-04-07
2	CLIENT REVISIONS	2018-04-06
1	CLIENT REVIEW	2018-03-20

DRAWING TITLE:

PROPOSED
SECTION

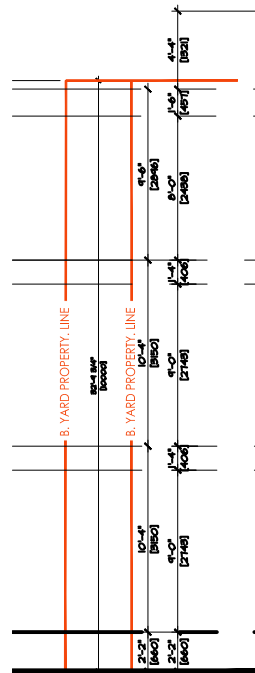
PROJECT No. :

2018-14

DATE:	2018-03-05
SCALE:	NOTED
DWG BY:	JH, LT

DWG No:

A-8



PROPOSED GUIGUES STREET (EAST ELEVATION)

SCALE: 3/32" = 1'-0"



170 Main Street
Ottawa, ON, K1S 1C2
(613) 232-9081 Tel. AND
info@H&DandP.com PLANING

PROJECT TITLE

73 GUIGUES
AVENUE

14	REVISION 14	2018-03-05
13	REVISION 13	2018-02-27
12	REVISION 12	2018-01-18
11	REVISION 11	2018-01-05
10	REVISION 10	2018-01-02
9	REVISION 9	2018-12-14
8	REVISION 8	2018-08-22
7	UNIT 8 REV.	2018-07-10
6	PRE-CONSULT.	2018-06-08
5	CLIENT REVISIONS	2018-06-04
4	CLIENT REVISIONS	2018-04-12
3	CLIENT REVISIONS	2018-04-07
2	CLIENT REVISIONS	2018-04-06
1	CLIENT REVIEW	2018-03-20

DRAWING TITLE:

PROPOSED
ELEVATION

PROJECT No. :

2018-14

DATE: 2018-03-05

SCALE: NOTED

DWG BY: JH, L.T

DWG No:

A-9



PROPOSED PARENT STREET (SOUTH ELEVATION)

SCALE: 3/32" = 1'-0"

