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Tuesday 4 June 2019

Biogiene Property Investments Pty Ltd
C/- AC Homes
Suite 310, 7 Railway Street
CHATSWOOD NSW 2067

Our Reference 181033-01L-DD Rev01

For the attention of Mr Joe Yuan

Noise Assessment – Development Application (DA) Phase
Proposed Mixed-Use Development
38-40 Orth Street and 26 Somerset Street, Kingswood

1.0 INTRODUCTION

Acoustic Consulting Engineers Pty Ltd was engaged by Biogiene Property Investments Pty Ltd to prepare a noise assessment for the proposed mixed-use development at 38-40 Orth Street and 26 Somerset Street, Kingswood.

This report presents the findings from the noise assessment for the purpose of development application (DA) consideration only.

The findings from the noise assessment and recommendation are site specific and have been prepared for the particular investigation described in this report. The report should not be used in any other context or for any other purposes.

2.0 DESCRIPTION OF SITE AND PROPOSAL

The subject site at 38-40 Orth Street and 26 Somerset Street, Kingswood currently consists of single-storey residential dwellings.

The proposal is to re-develop the subject site to provide a mixed-use building, consisting of:

- car-parks on Basement Levels 1-3;
- entry lobbies and offices on Ground Level;
- offices on First Floor; and
- residential units on Second to Sixth Floors

Figure 1 shows the location of the subject site and the surrounding. *Appendix 1* provides the floor plans of the proposed mixed-use development.

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Figure 1 Site Location

3.0 POTENTIAL ACOUSTIC ISSUES

From the site inspections and review of the drawings, potential acoustic issues associated with the proposed mixed-use residential development include:

- environmental noise from mechanical plant such as car-park supply and exhaust air fans and air-conditioning equipment; and
- acoustic privacy between the residential units.

4.0 NOISE MEASUREMENT

For the purpose of ascertaining existing background noise environment at the surrounding residences, a data logger was installed at the rear (southern) site boundary of the subject site from Friday 30 November 2018 to Friday 7 December 2018 (*Figure 1*).

Measurement instrumentation consisted of a Type 1 SVAN977 sound and vibration analyser and a Type 1 ACO Pacific 7052E prepolarised condenser microphone. The instrumentation was checked before and after the measurements with a SVAN SV30A acoustic calibrator and no significant drift in calibration was detected.

As environmental noise varies with time and the human ear is not equally sensitive to noise at different frequencies, A-weighted statistical levels are used to describe environmental noise. The common parameters used to describe environmental noise are the L_{Amax}, L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels measured over 15-minute intervals.

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The L_{Amax} level is the maximum A-weighted sound pressure level over the sampling period. The L_{A1}, L_{A10} and L_{A90} levels are the A-weighted sound pressure levels exceeded for 1%, 10% and 90% of the sampling periods respectively. The L_{A90} level is usually referred to as the background noise level. The L_{Aeq} level is the A-weighted continuous equivalent (energy average) sound pressure level over the sampling period.

Appendix 2 provides graphical presentation of the measured statistical noise levels at 15-minute intervals. The L_{A90} and L_{Aeq} acoustic parameters are used for the present noise assessment. Other acoustic parameters are provided for information only.

Table 1 presents the day/evening/night L_{A90} background noise levels measured during the monitoring period.

Table 1 Measured Existing Noise Environment (rear site boundary), dB(A)

Date	Measured Existing L_{A90} Background Noise, dB(A)		
	Day[1]	Evening[2]	Night[3]
Friday 30 November 2018		40.3	33.0
Saturday 1 December 2018	37.9	39.3	33.2
Sunday 2 December 2018	40.4	40.9	33.3
Monday 3 December 2018	40.1	40.3	35.7
Tuesday 4 December 2018	42.4	39.0	31.4
Wednesday 5 December 2018	42.0	38.5	32.1
Thursday 6 December 2018	43.9	41.6	34.3
Rating L_{A90} Background Level	**41**	**40**	**33**

Notes: 1. Day is from 7:00am-6:00pm, Monday to Saturday and 8:00am-6:00pm, Sunday
2. Evening is from 6:00pm-10:00pm
3. Night is from 10:00pm-7:00am, Monday to Saturday and 10:00pm-8:00am, Sunday

5.0 NOISE ASSESSMENT OBJECTIVES

Environmental noise from mechanical plant associated with the proposed mixed-use development would mainly be due to car-park exhaust and supply air fans and air-conditioning equipment.

The Environment Protection Authority (EPA) Noise Policy for Industry (NPfI, October 2017) recommends project noise trigger level as a benchmark for assessing and managing noise from large industrial and agricultural sources. The project noise trigger level is not a noise limit, but a trigger level above which feasible and reasonable mitigation measure should be identified.

In the event that feasible and reasonable mitigation measure cannot reduce noise from the development under consideration to within the project noise trigger level, the residual noise level (noise level above the trigger level) should be assessed and reported.

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Although the EPA:NPfI states that project noise trigger level as a benchmark for assessing and managing noise from large industrial and agricultural sources that may not be applicable to the types of noise sources councils need to address, in the absence of Council's specific guidelines, the EPA:NPfI is used as a reference to assess environmental noise from mechanical plant such as supply and exhaust air fans and air-conditioning equipment associated with the proposed mixed-use development.

The EPA:NPfI recommends the:

- $L_{Aeq,15min}$ noise levels from mechanical plant associated with a proposed development not to exceed the day/evening/night rating background L_{A90} noise levels by more than 5dB(A) at the residential receivers; and
- $L_{Aeq,period}$ noise levels (period being entire day/evening/night) from a proposed development to be at least 5dB below the recommended amenity noise levels from existing and/or future industrial sources for the particular receiver areas.

Due to different averaging periods, the intrusiveness noise level (determined over 15-minute period) and amenity noise level (determined over an assessment period (day/evening/night)) may lead to situations where the same numerical value does not necessarily represent the same amount of noise for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, the NPfI assumes a default correction of +3dB to convert the $L_{Aeq,period}$ to $L_{Aeq,15min}$ noise level.

Table 2 provides the recommended $L_{Aeq,15min}$ noise levels from mechanical plant associated with the proposed mixed-use development, established from the measured background noise levels presented in *Table 1* and the EPA:NPfI guideline. The recommended amenity noise levels are based on an urban residential area.

The project noise trigger levels are the lower of the intrusive and amenity noise levels. That is, noise from the development will achieve with both the intrusive and amenity noise levels, provided that the project noise trigger levels are achieved.

Table 3 Recommended Environmental Noise Assessment Level, dB(A)

Time of Day		Recommended $L_{Aeq,15min}$ Noise Level		
		Intrusiveness Level	**Amenity Level**	**Trigger Level**
Day	(7:00am-6:00pm)	46	58	46
Evening	(6:00pm-10:00pm))	45	48	45
Night	(10:00pm-7:00am)	38	43	38

Notes: 1. Day is from 7:00am-6:00pm, Monday to Saturday and 8:00am-6:00pm, Sunday
2. Evening is from 6:00pm-10:00pm
3. Night is from 10:00pm-7:00am, Monday to Saturday and 10:00pm-8:00am, Sunday

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6.0 ASSESSMENT

6.1 Environmental Noise

As the proposal is conceptual and development application has not been approved, mechanical plant and equipment has not been selected or finalised and details of equipment noise levels are not available at this time.

Based on similar development, it is considered that with appropriate equipment specification/selection, siting and provision of mitigation measures, noise from mechanical plant would be controlled to within the environmental noise assessment objectives presented in *Table 3*.

6.2 Acoustic Privacy between Sole-Occupancies

Acoustic privacy between the residential units and between the residential units and common spaces relates to airborne sound insulation and impact sound isolation for walls and floors and control of noise from waste services.

The acoustic privacy between spaces can be controlled by incorporating:

- appropriate construction materials/systems to control air-borne noise;
- appropriate floor covering and/or isolation of plasterboard ceiling and ceiling cavity insulation to control floor impact sound; and
- wrapping services/waste pipes with acoustic lagging and/or construction of appropriate ceiling and ceiling cavity insulation to control noise from waste services.

7.0 RECOMMENDATION

7.1 Environmental Noise

During the detailed design and construction certificate (CC) phase of the project, when mechanical plant/equipment is selected and details of equipment locations and noise emission levels are available, environmental noise associated with the proposed development should be reviewed and assessed by a qualified acoustic consultant and control measures should be implemented to ensure compliance with the EPA:NPfI guidelines and any pending DA condition requirements.

Measures that could be considered to reduce noise from mechanical plant and equipment associated with the project include:

- appropriate equipment specification and selection based on acoustic performance;
- incorporating engineering measures such as acoustic attenuators and acoustic treatment of ductwork;
- appropriate equipment siting (eg. air-conditioning outdoor condenser units located on balconies facing away from the adjoining residences); and
- locating noisy plant and equipment within purpose-built plant room(s).

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7.2 Acoustic Privacy

It is recommended that acoustic privacy between sole-occupancies should be reviewed by a qualified acoustic consultant during the design phase of the project and appropriate construction systems should be incorporated into the design and construction to ensure the National Construction Code (NCC)/Building Code of Australia (BCA) acoustic requirements for sole-occupancies are achieved.

8.0 SUMMARY

The assessment has shown that with the incorporation of mitigation measures (to be determined during the Design/Construction Certificate (CC) Phase), environmental noise from the proposed mixed-use development will be controlled to within the recommended assessment objectives.

It is recommended that a qualified acoustic consultant be engaged during the design phase of the project, when details of mechanical plant and equipment noise emission levels are available, to review the potential environmental noise impact from the development. Where necessary, mitigation measures should be incorporated into the development to ensure that the environmental noise assessment objectives recommended in *Section 5.0* of this report are achieved.

Additionally, it is recommended that acoustic privacy between sole-occupancies should be reviewed by a qualified acoustic consultant during the design phase of the project and appropriate construction systems should be incorporated into the design and construction to ensure the BCA acoustic requirements for sole-occupancies are achieved.

The assessment and recommendations in this report relate to acoustic considerations only. Any other requirements such as ventilation, structural adequacy, etc., should be addressed by others.

We trust the information in this letter is satisfactory. Please do not hesitate to contact our office should further information or clarification be required.

Yours sincerely,

Dan Dang
Principal Acoustic Engineer
Acoustic Consulting Engineers Pty Ltd

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Appendix 1

FLOOR PLANS

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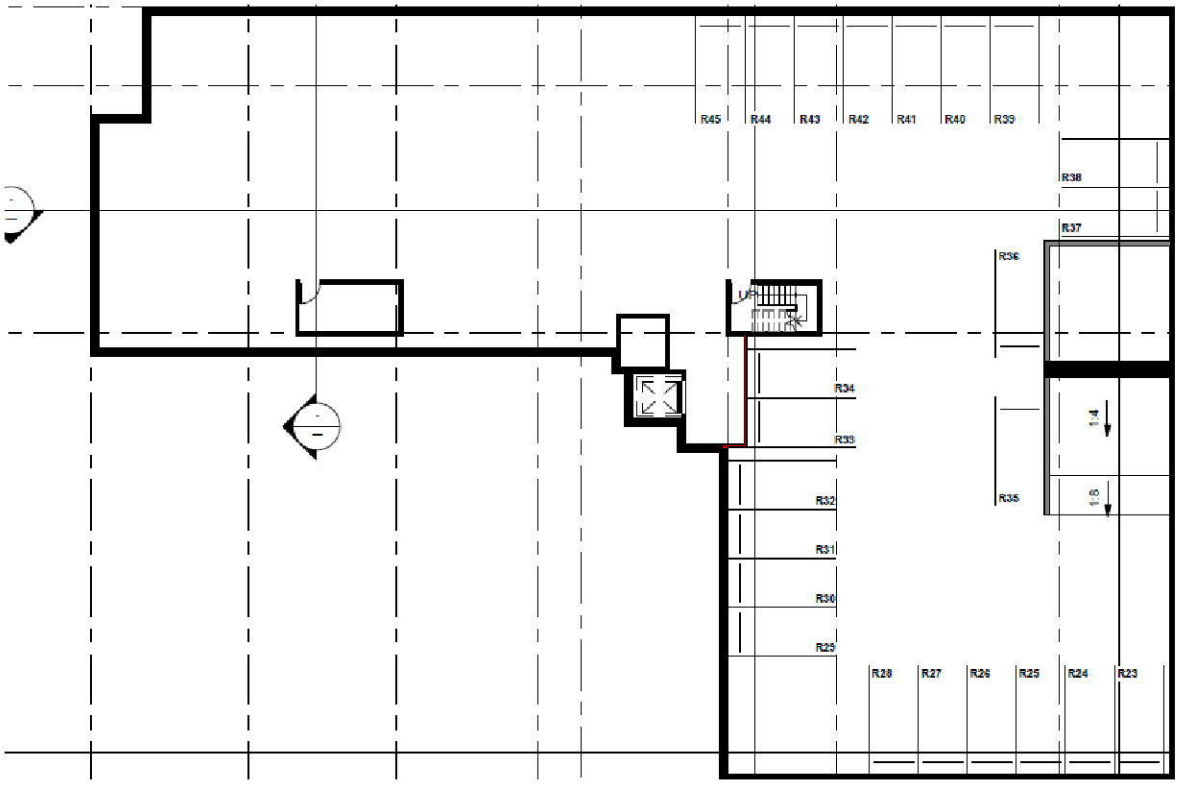
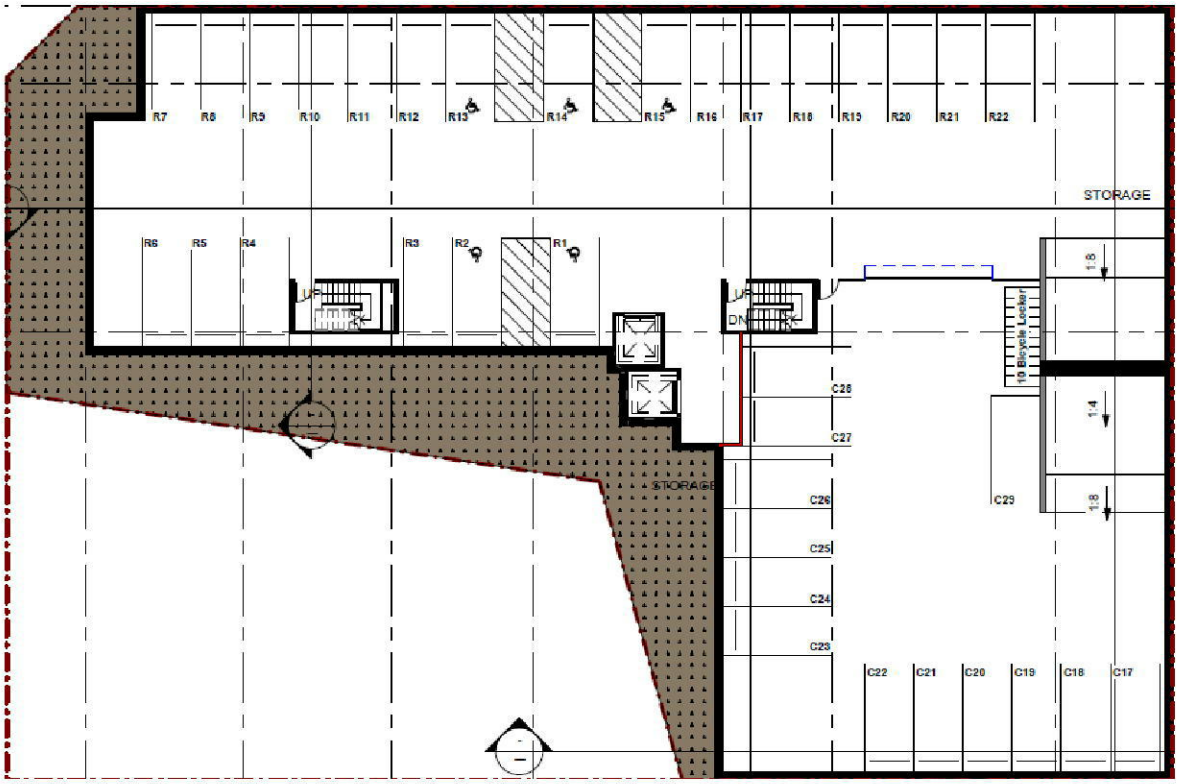
Basement Level 3



Basement Level 2



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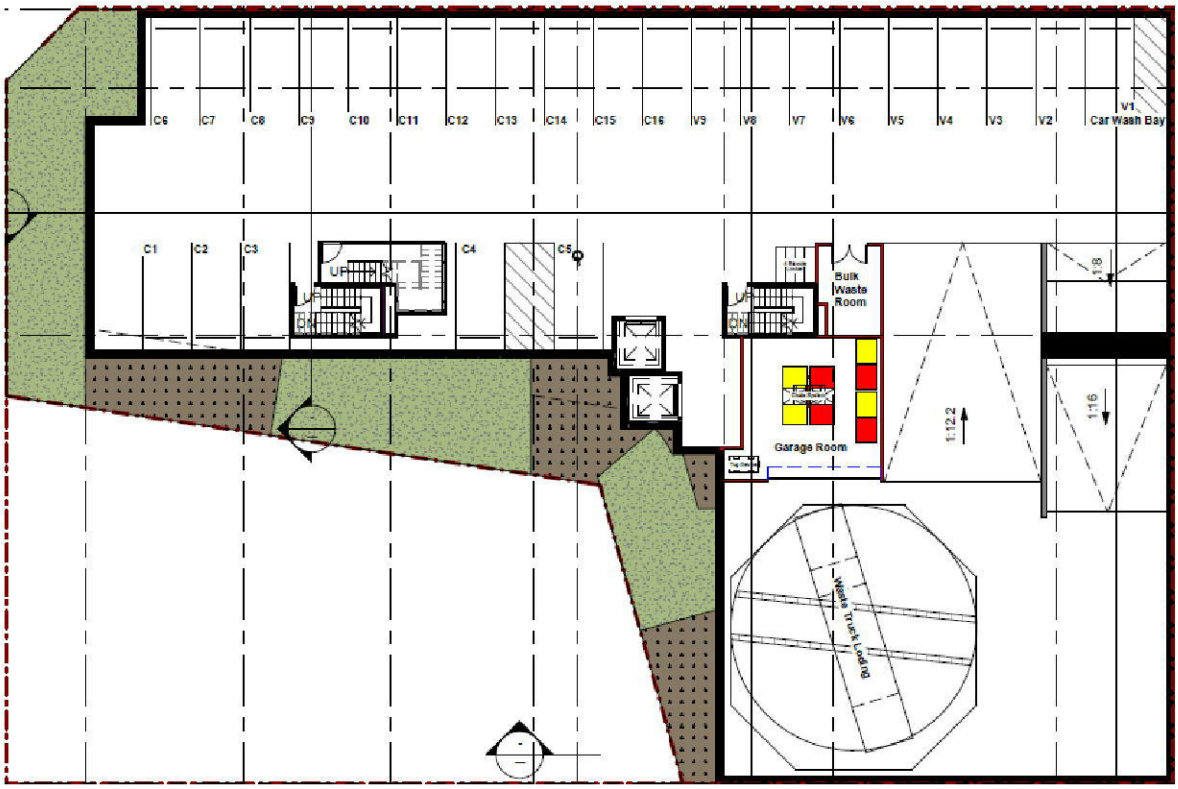
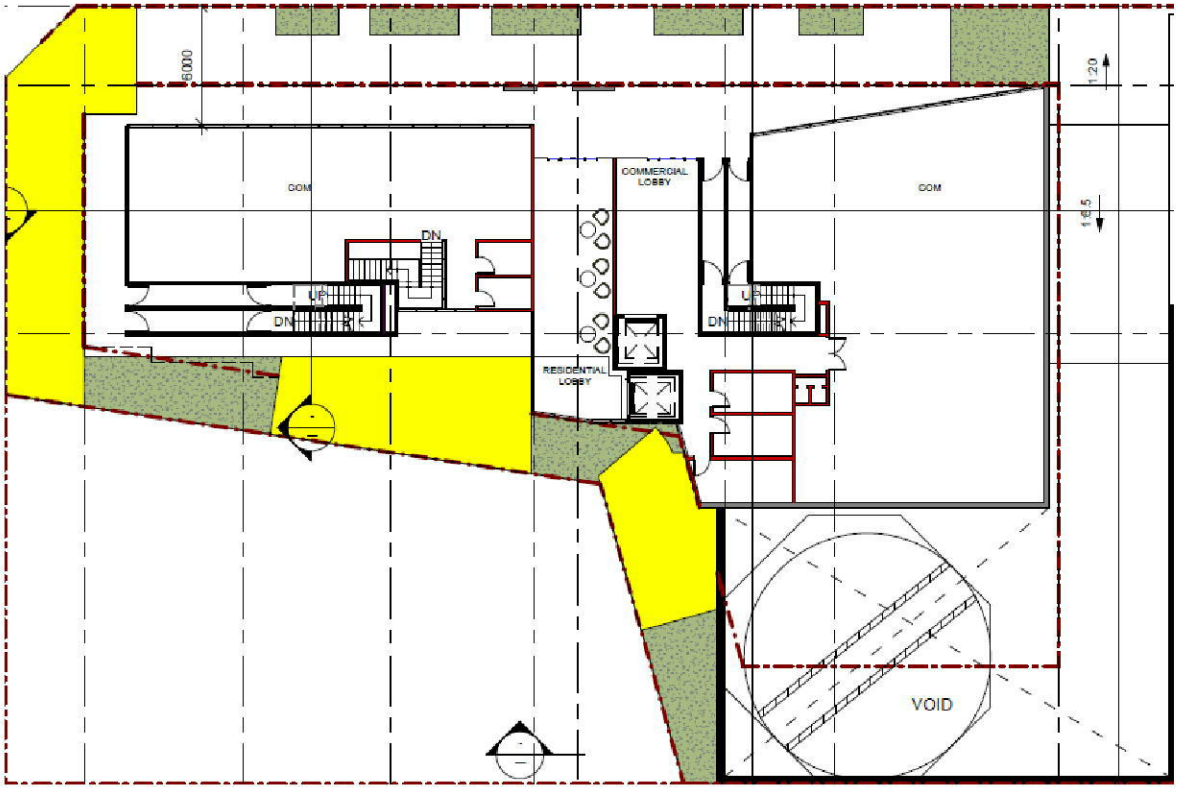
Basement Level 1



Ground Floor



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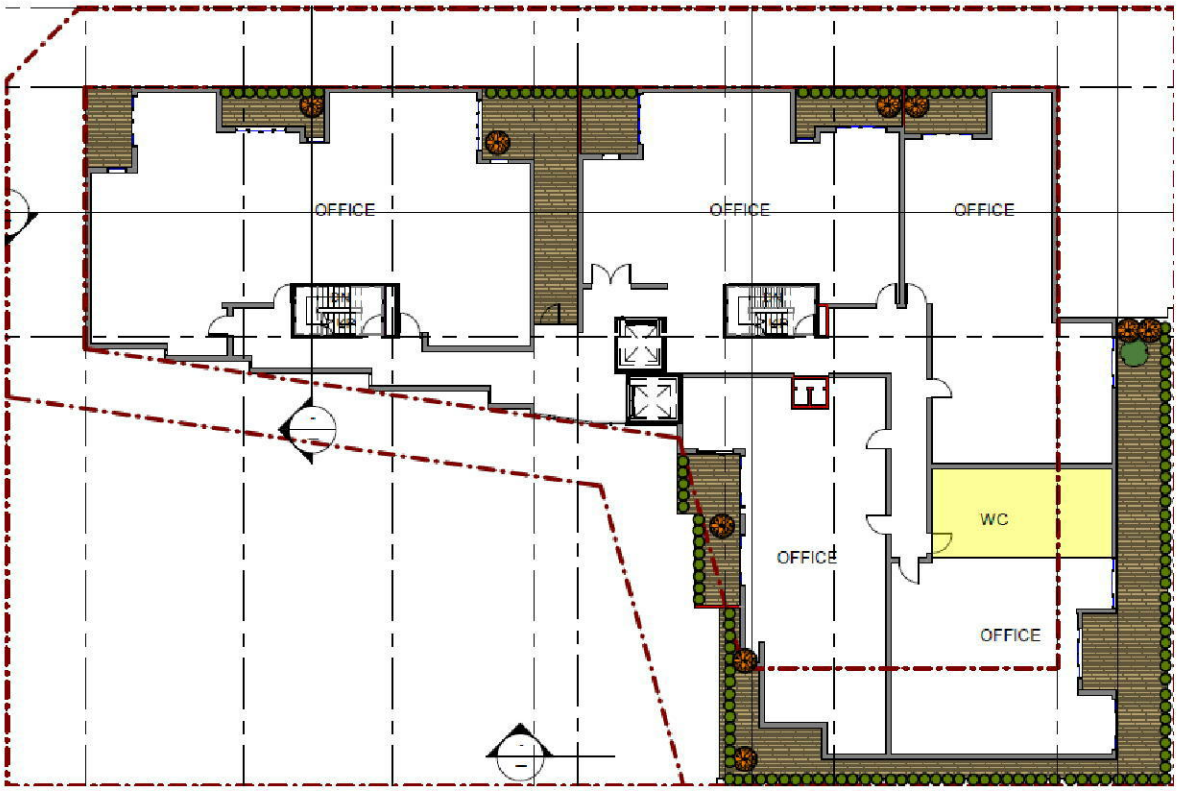
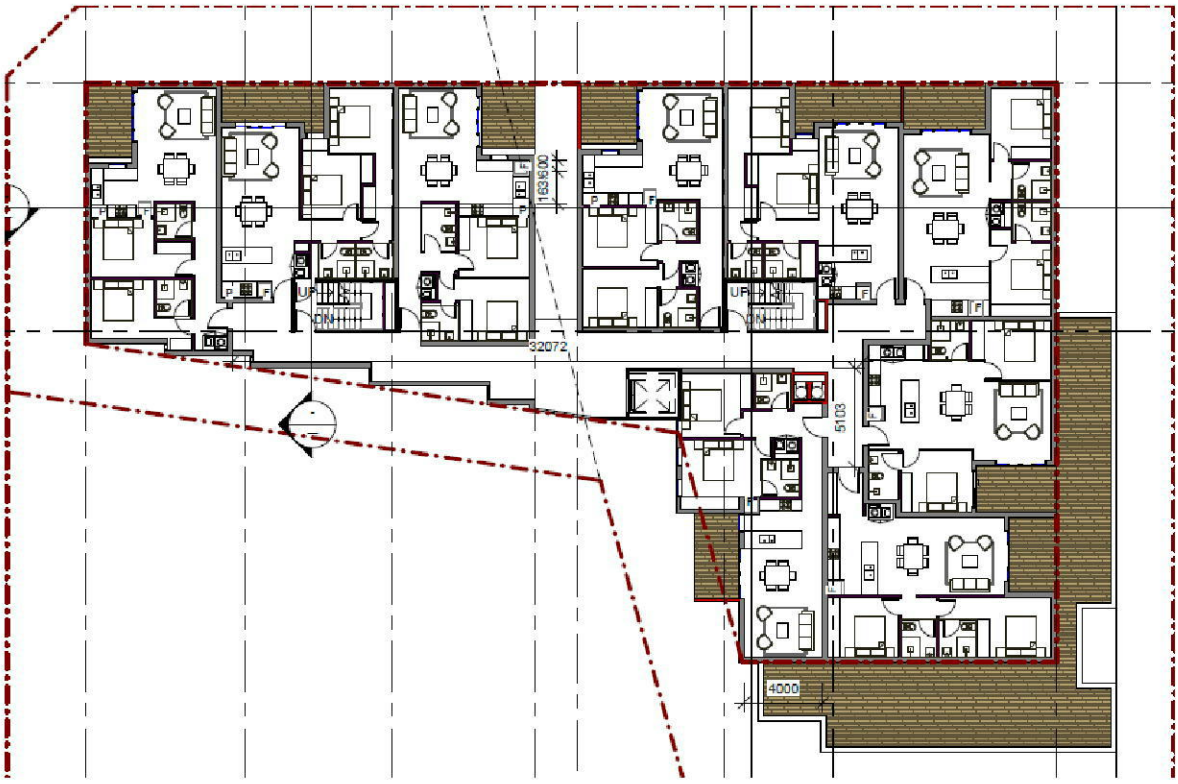
First Floor



Second Floor



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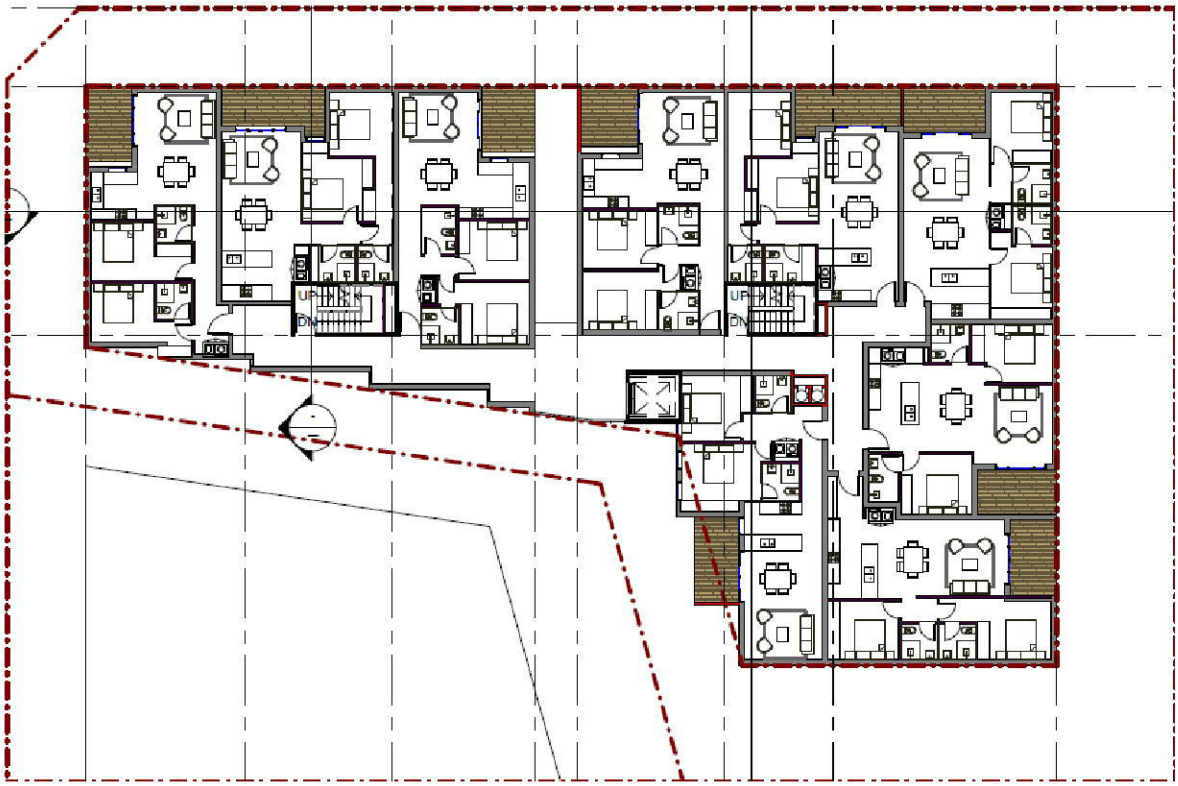
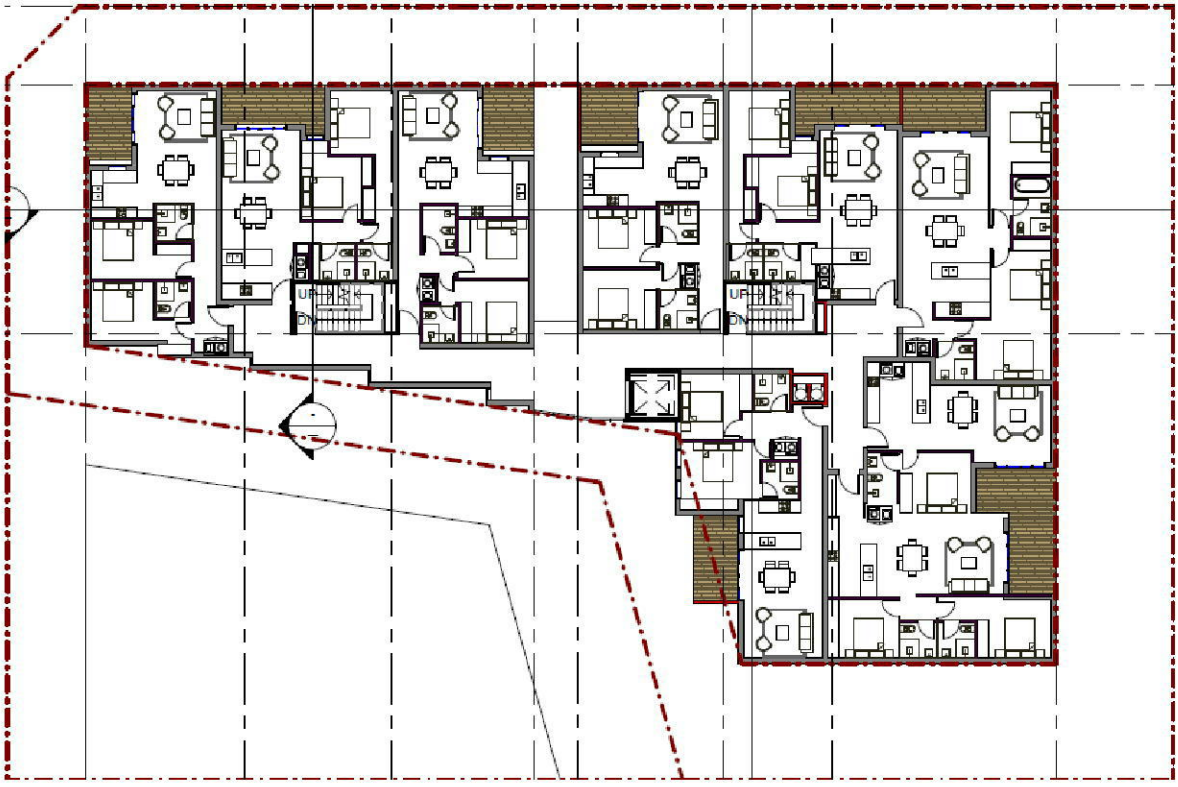
Third Floor



Fourth and Fifth Floors



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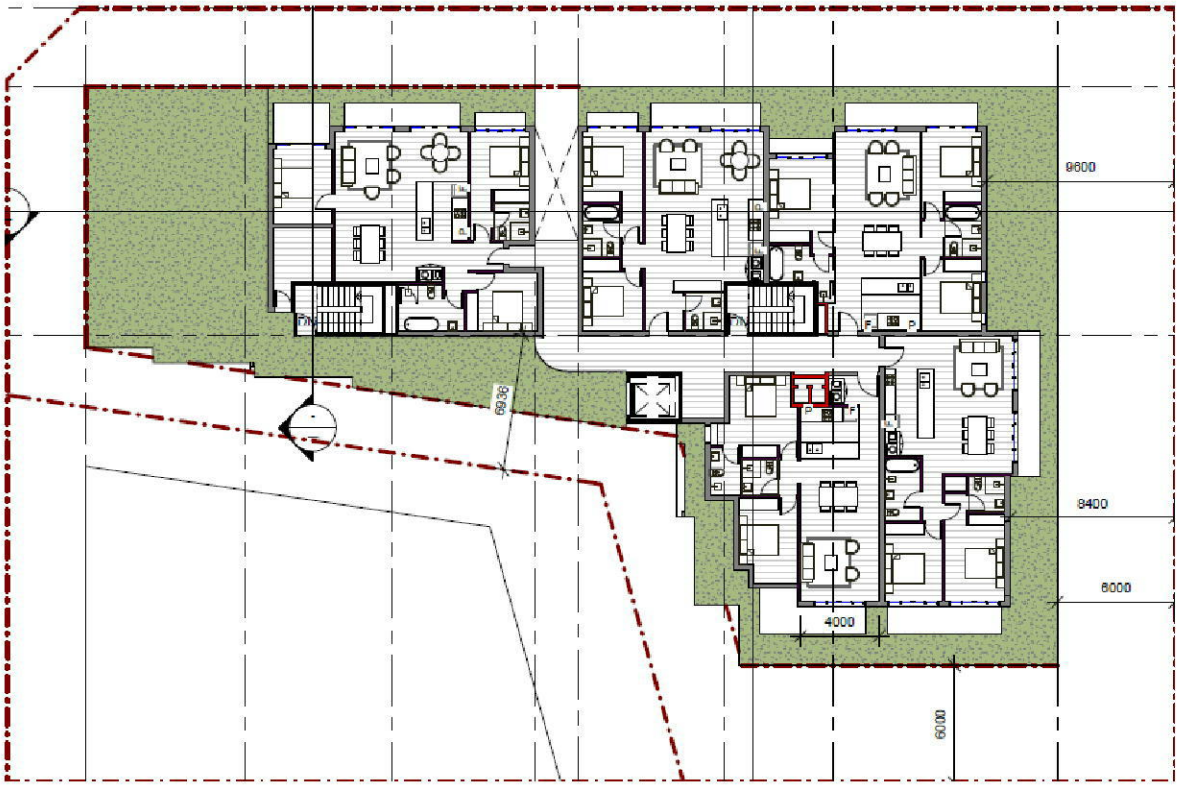
Sixth Floor



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Appendix 2

NOISE MEASUREMENT RESULTS

Rear Site Boundary

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Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

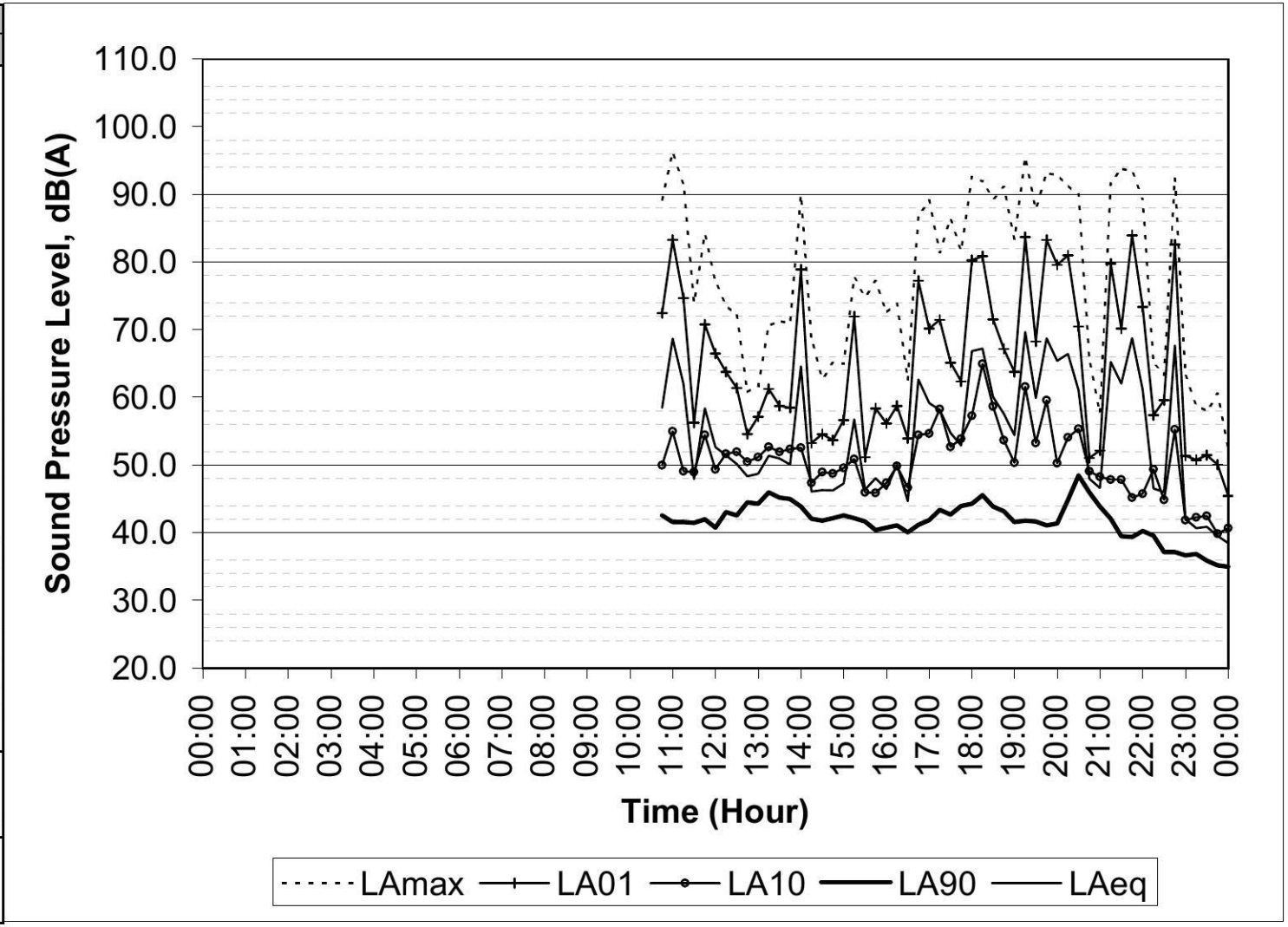
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Friday, 30 November 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00				
01:00-02:00				
02:00-03:00				
03:00-04:00				
04:00-05:00				
05:00-06:00				
06:00-07:00				
07:00-08:00				
08:00-09:00				
09:00-10:00				
10:00-11:00				
11:00-12:00	58.0	67.1	50.5	41.0
12:00-13:00	49.9	59.3	51.4	42.8
13:00-14:00	59.1	64.4	52.4	44.2
14:00-15:00	46.5	54.6	48.7	41.9
15:00-16:00	52.0	59.5	47.6	40.5
16:00-17:00	58.5	65.1	51.5	40.4
17:00-18:00	61.8	69.9	55.6	42.9
18:00-19:00	62.5	70.9	57.0	42.1
19:00-20:00	67.3	78.7	56.2	41.2
20:00-21:00	61.6	63.7	51.7	44.2
21:00-22:00	65.4	76.9	46.7	39.4
22:00-23:00	61.7	62.8	47.9	36.9
23:00-24:00	40.0	49.5	41.4	35.1
Day				
Evening	65.1	73.0	53.6	40.3
Night	53.7	51.9	42.4	33.0
LAeq,15hr				
LAeq,9hr	53.7			
LAeq,24hr				



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Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

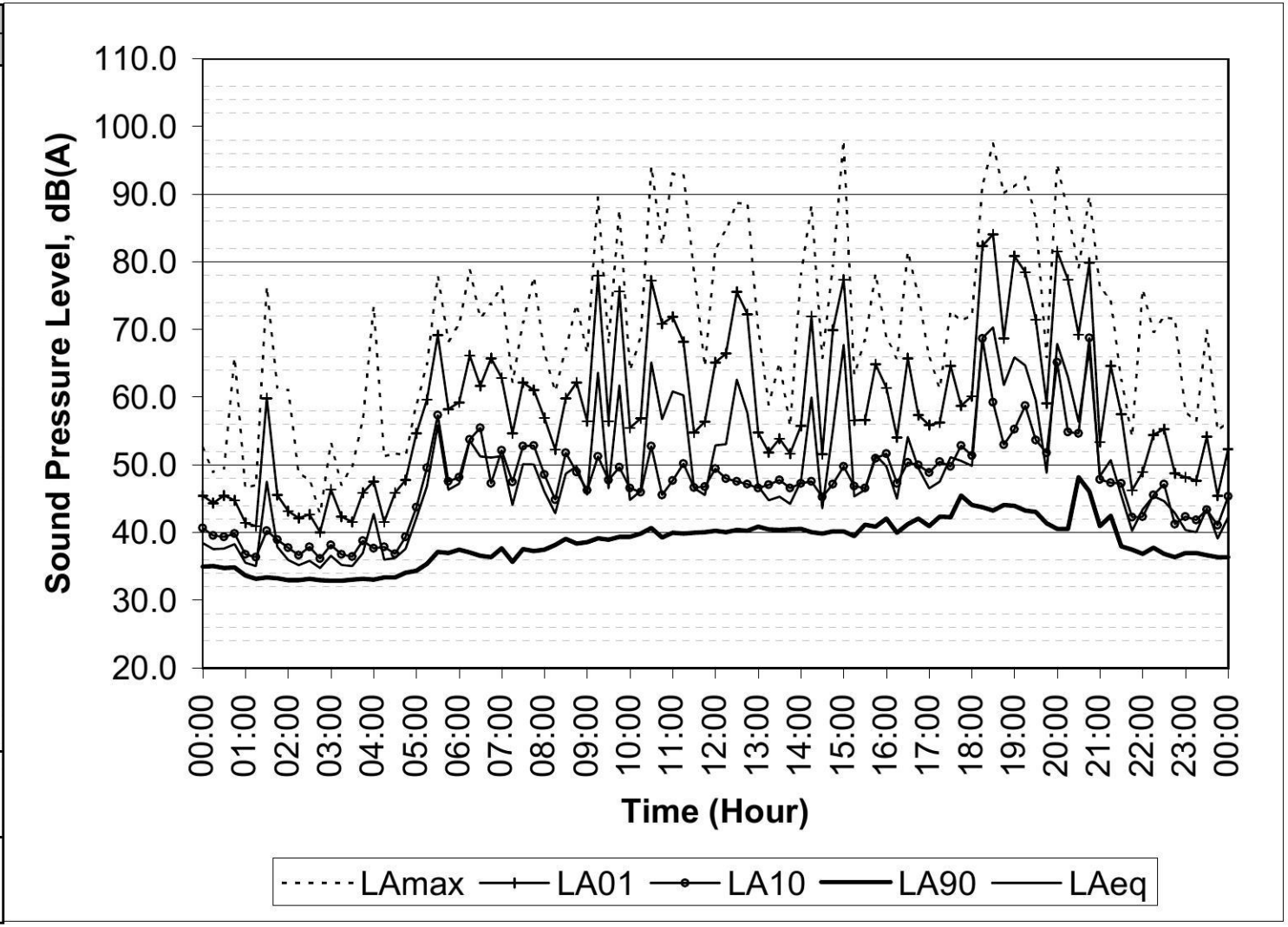
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Saturday, 1 December 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	37.4	44.1	38.9	34.0
01:00-02:00	42.5	47.4	38.4	33.1
02:00-03:00	35.7	42.9	37.3	32.9
03:00-04:00	38.8	44.4	37.5	33.0
04:00-05:00	38.9	47.5	39.5	33.4
05:00-06:00	51.3	61.6	50.7	35.9
06:00-07:00	52.0	64.2	52.2	36.5
07:00-08:00	48.3	58.8	50.5	36.2
08:00-09:00	47.5	57.7	48.0	38.3
09:00-10:00	59.9	66.4	48.9	39.1
10:00-11:00	61.0	69.3	48.0	39.5
11:00-12:00	55.3	61.2	48.3	39.9
12:00-13:00	58.3	67.3	47.4	40.2
13:00-14:00	45.7	53.3	47.2	40.4
14:00-15:00	62.6	67.8	47.5	40.0
15:00-16:00	49.0	59.9	49.1	39.9
16:00-17:00	50.3	58.3	49.2	40.3
17:00-18:00	50.0	60.0	51.2	42.3
18:00-19:00	67.8	79.0	59.1	43.5
19:00-20:00	64.1	72.7	57.4	40.8
20:00-21:00	62.9	70.0	56.6	40.7
21:00-22:00	46.7	54.4	44.9	37.1
22:00-23:00	43.8	51.7	44.1	36.6
23:00-24:00	41.6	50.0	43.0	36.4
Day	57.0	61.9	48.7	37.9
Evening	64.2	69.7	55.0	39.3
Night	42.6	48.6	41.2	33.2
LAeq,15hr	60.3			
LAeq,9hr	42.6			
LAeq,24hr	58.5			



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Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

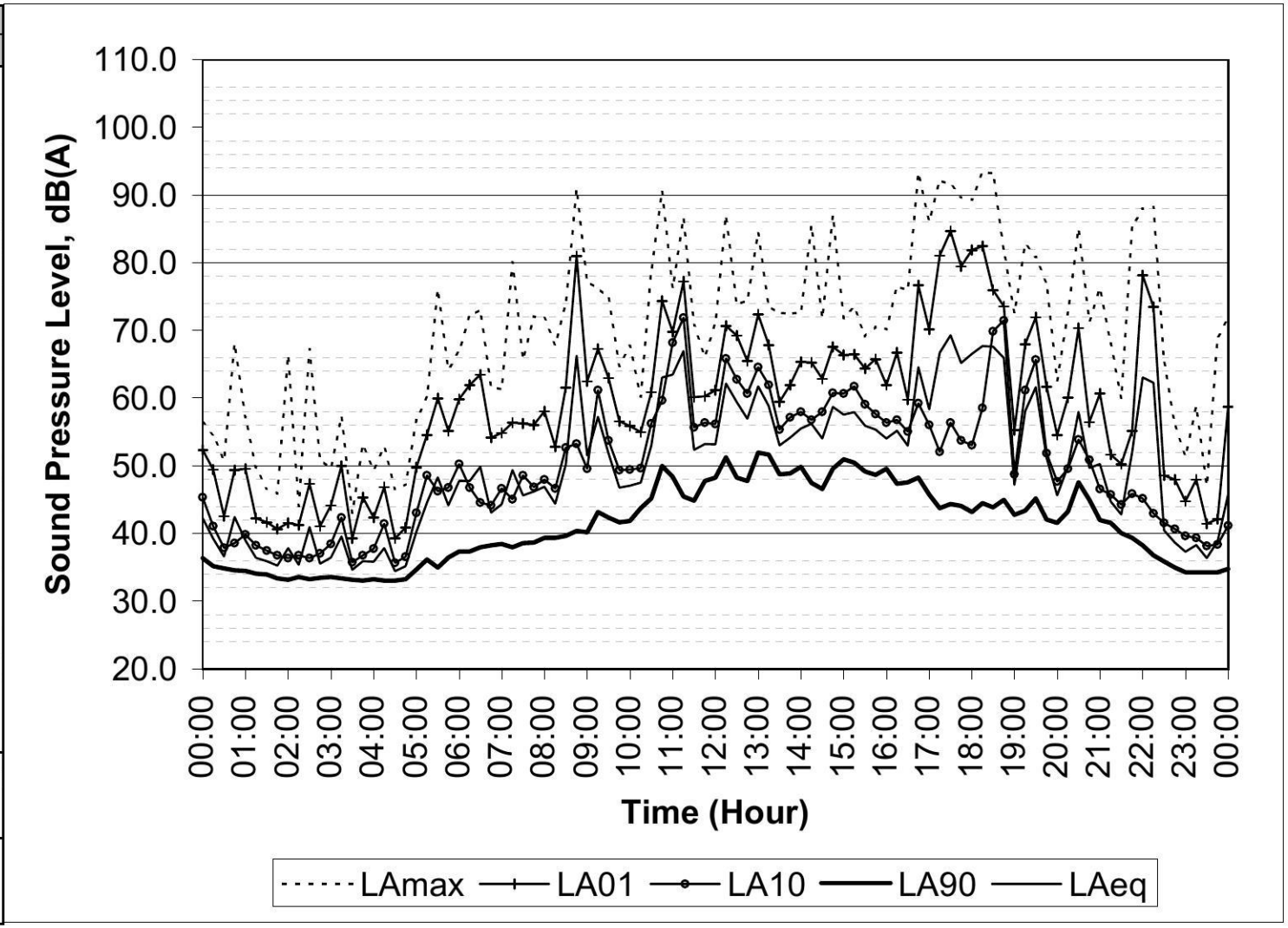
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Sunday, 2 December 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	39.8	47.8	39.4	34.5
01:00-02:00	36.5	41.6	37.3	33.3
02:00-03:00	37.8	43.5	37.2	33.4
03:00-04:00	36.9	44.3	38.2	33.1
04:00-05:00	37.6	44.2	39.2	33.1
05:00-06:00	46.6	57.4	48.0	35.4
06:00-07:00	47.1	58.7	45.6	37.6
07:00-08:00	47.3	56.7	47.2	38.2
08:00-09:00	60.5	64.5	50.6	39.5
09:00-10:00	52.9	60.7	53.5	41.8
10:00-11:00	60.5	65.0	58.5	44.2
11:00-12:00	61.5	64.8	60.1	45.1
12:00-13:00	60.6	69.5	63.5	48.0
13:00-14:00	56.0	63.7	58.2	48.8
14:00-15:00	57.0	65.6	59.1	46.9
15:00-16:00	56.1	64.7	58.8	48.9
16:00-17:00	60.1	68.4	56.8	46.3
17:00-18:00	67.2	81.8	53.9	43.4
18:00-19:00	66.0	71.9	62.2	43.1
19:00-20:00	57.6	64.1	56.6	41.8
20:00-21:00	53.7	61.9	50.3	42.4
21:00-22:00	57.5	58.9	45.3	38.6
22:00-23:00	56.3	53.7	41.3	34.5
23:00-24:00	41.5	47.6	39.3	34.3
Day	60.6	66.3	57.1	40.4
Evening	61.7	64.4	54.1	40.9
Night	50.6	49.9	41.5	33.3
LAeq,15hr	60.7			
LAeq,9hr	50.8			
LAeq,24hr	59.1			



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Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

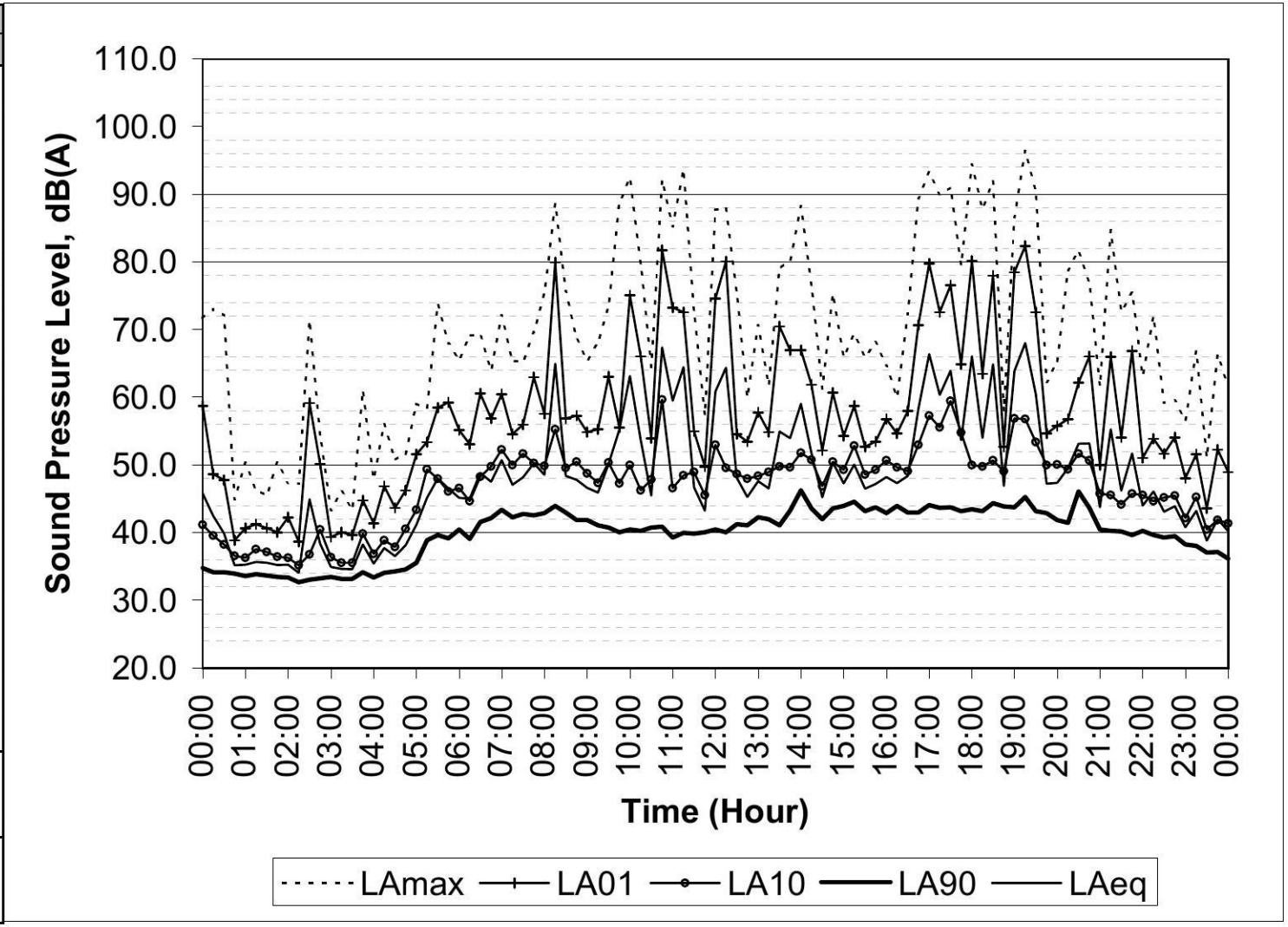
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Monday, 3 December 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	39.3	44.0	37.7	33.7
01:00-02:00	35.5	41.1	36.9	33.4
02:00-03:00	40.4	46.9	37.2	32.8
03:00-04:00	36.0	41.5	37.0	33.2
04:00-05:00	38.8	47.1	40.2	34.2
05:00-06:00	46.4	56.6	47.5	39.0
06:00-07:00	48.5	57.8	48.8	39.9
07:00-08:00	48.7	57.8	50.5	42.4
08:00-09:00	59.2	62.3	51.1	41.9
09:00-10:00	58.1	62.3	48.8	40.2
10:00-11:00	62.2	68.8	50.1	39.6
11:00-12:00	60.1	63.0	49.0	39.9
12:00-13:00	58.6	61.5	48.7	40.4
13:00-14:00	55.5	64.9	50.1	41.4
14:00-15:00	49.4	57.3	49.4	42.5
15:00-16:00	48.2	55.5	50.4	43.0
16:00-17:00	61.1	65.8	52.3	43.0
17:00-18:00	62.9	73.6	55.0	43.3
18:00-19:00	61.6	68.2	51.6	43.4
19:00-20:00	62.8	66.4	52.6	42.2
20:00-21:00	51.2	58.8	49.4	40.8
21:00-22:00	51.4	59.5	45.3	39.9
22:00-23:00	43.9	52.0	44.4	38.6
23:00-24:00	41.4	49.1	42.3	36.5
Day	58.5	62.5	50.5	40.1
Evening	60.6	65.0	50.0	40.3
Night	45.8	50.4	43.9	35.7
LAeq,15hr	59.2			
LAeq,9hr	45.8			
LAeq,24hr	57.4			



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Version: 1, Version Date: 18/10/2019

Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

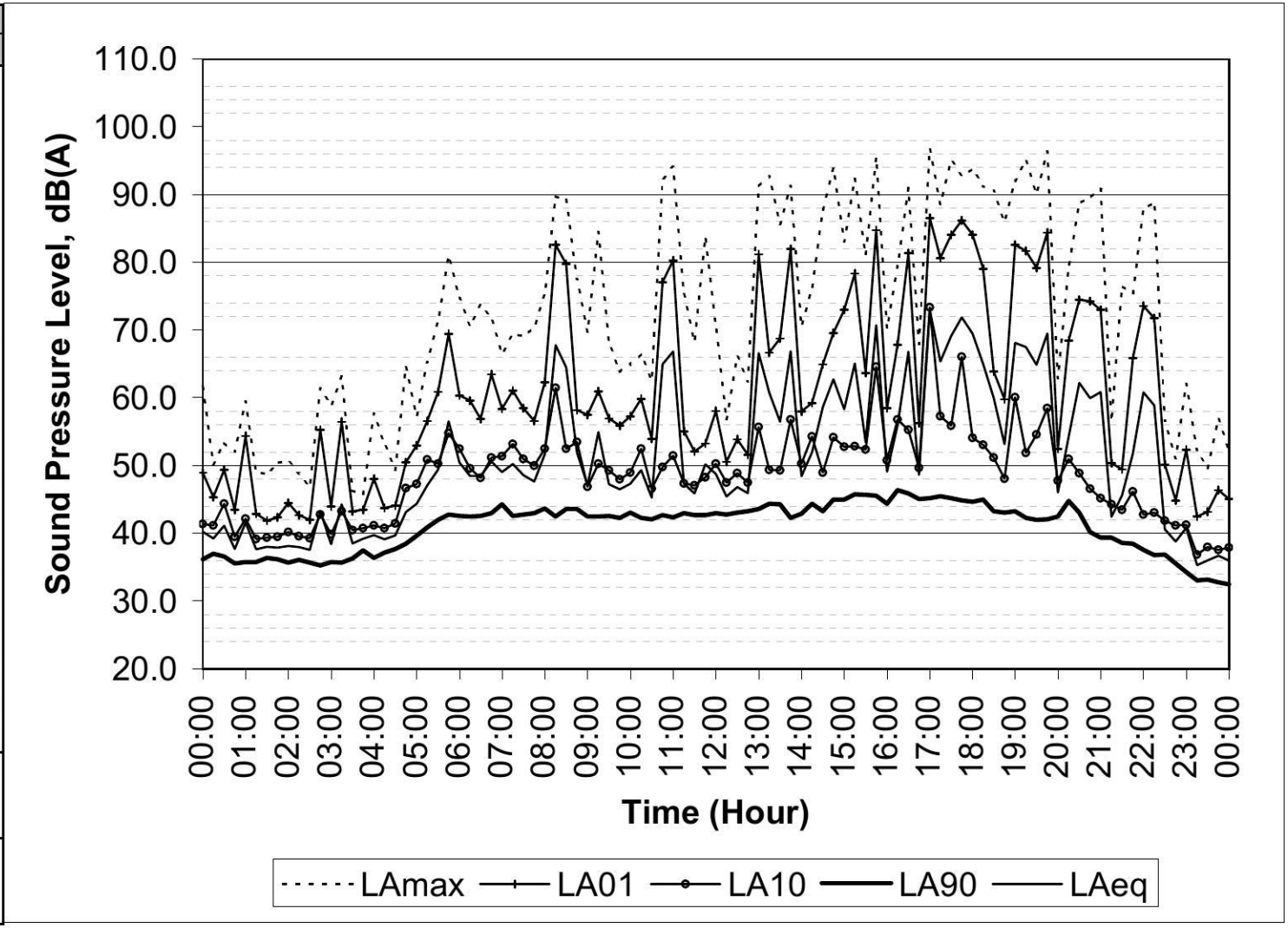
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Tuesday, 4 December 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	40.2	48.2	41.8	35.7
01:00-02:00	37.9	42.9	39.6	35.7
02:00-03:00	40.1	46.0	40.4	35.4
03:00-04:00	41.2	47.9	41.5	35.9
04:00-05:00	42.2	47.9	44.1	37.4
05:00-06:00	52.5	61.9	52.1	41.2
06:00-07:00	49.3	59.6	50.1	42.5
07:00-08:00	49.8	59.6	51.7	42.7
08:00-09:00	63.6	69.5	53.6	42.5
09:00-10:00	50.7	57.8	49.2	42.4
10:00-11:00	63.1	67.8	50.1	42.2
11:00-12:00	48.4	54.7	48.3	42.7
12:00-13:00	60.7	59.3	49.9	42.9
13:00-14:00	62.2	68.9	51.5	42.5
14:00-15:00	59.4	66.7	52.6	43.6
15:00-16:00	65.9	71.4	55.2	44.8
16:00-17:00	68.0	73.1	58.8	45.1
17:00-18:00	69.5	83.8	58.4	44.8
18:00-19:00	64.4	71.4	53.1	43.2
19:00-20:00	66.5	74.5	53.2	42.0
20:00-21:00	60.2	72.6	47.9	39.6
21:00-22:00	55.5	59.9	44.2	37.9
22:00-23:00	53.1	54.8	41.9	34.7
23:00-24:00	36.0	44.3	37.6	32.6
Day	63.6	66.0	52.6	42.4
Evening	64.2	70.2	50.3	39.0
Night	49.1	49.8	41.2	31.4
LAeq,15hr	63.8			
LAeq,9hr	49.1			
LAeq,24hr	62.0			



Document Set ID: 8893775
Version: 1, Version Date: 18/10/2019

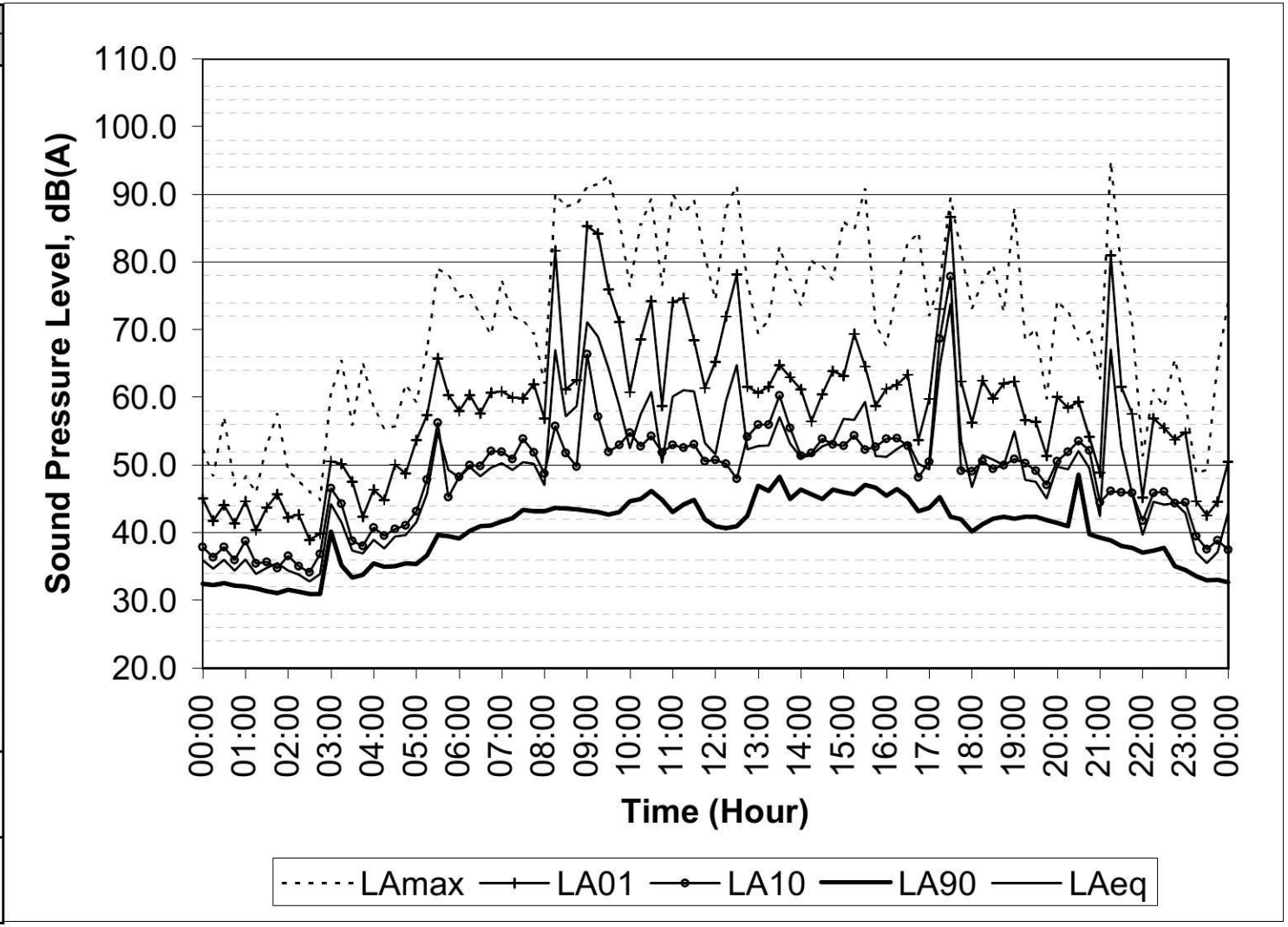
Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Wednesday, 5 December 2018

Notes
1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	35.4	43.0	37.3	32.1
01:00-02:00	34.7	43.1	35.7	31.2
02:00-03:00	39.2	43.1	38.2	31.0
03:00-04:00	39.1	46.7	40.5	33.5
04:00-05:00	39.8	49.4	41.1	35.0
05:00-06:00	51.0	60.4	49.5	37.5
06:00-07:00	49.6	59.9	51.0	40.5
07:00-08:00	49.5	59.7	51.4	42.5
08:00-09:00	66.8	72.7	56.0	43.4
09:00-10:00	64.6	73.1	54.3	42.8
10:00-11:00	58.6	69.0	53.0	43.6
11:00-12:00	58.6	67.5	51.8	41.3
12:00-13:00	60.3	68.1	52.1	40.8
13:00-14:00	54.2	62.7	55.8	45.4
14:00-15:00	54.1	61.0	52.9	45.2
15:00-16:00	56.0	63.5	53.3	45.6
16:00-17:00	51.7	59.7	51.4	43.4
17:00-18:00	68.4	69.6	61.2	40.7
18:00-19:00	52.3	61.7	50.3	41.5
19:00-20:00	47.9	56.2	49.3	41.6
20:00-21:00	49.5	55.3	50.6	39.5
21:00-22:00	61.3	61.4	45.0	37.3
22:00-23:00	44.1	55.3	45.2	34.7
23:00-24:00	39.3	45.6	38.4	32.8
Day	62.2	66.2	54.0	42.0
Evening	56.2	59.3	49.2	38.5
Night	44.4	49.1	41.5	32.1
LAeq,15hr	61.2			
LAeq,9hr	44.4			
LAeq,24hr	59.4			



Document Set ID: 8893775
Version: 1, Version Date: 18/10/2019

Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

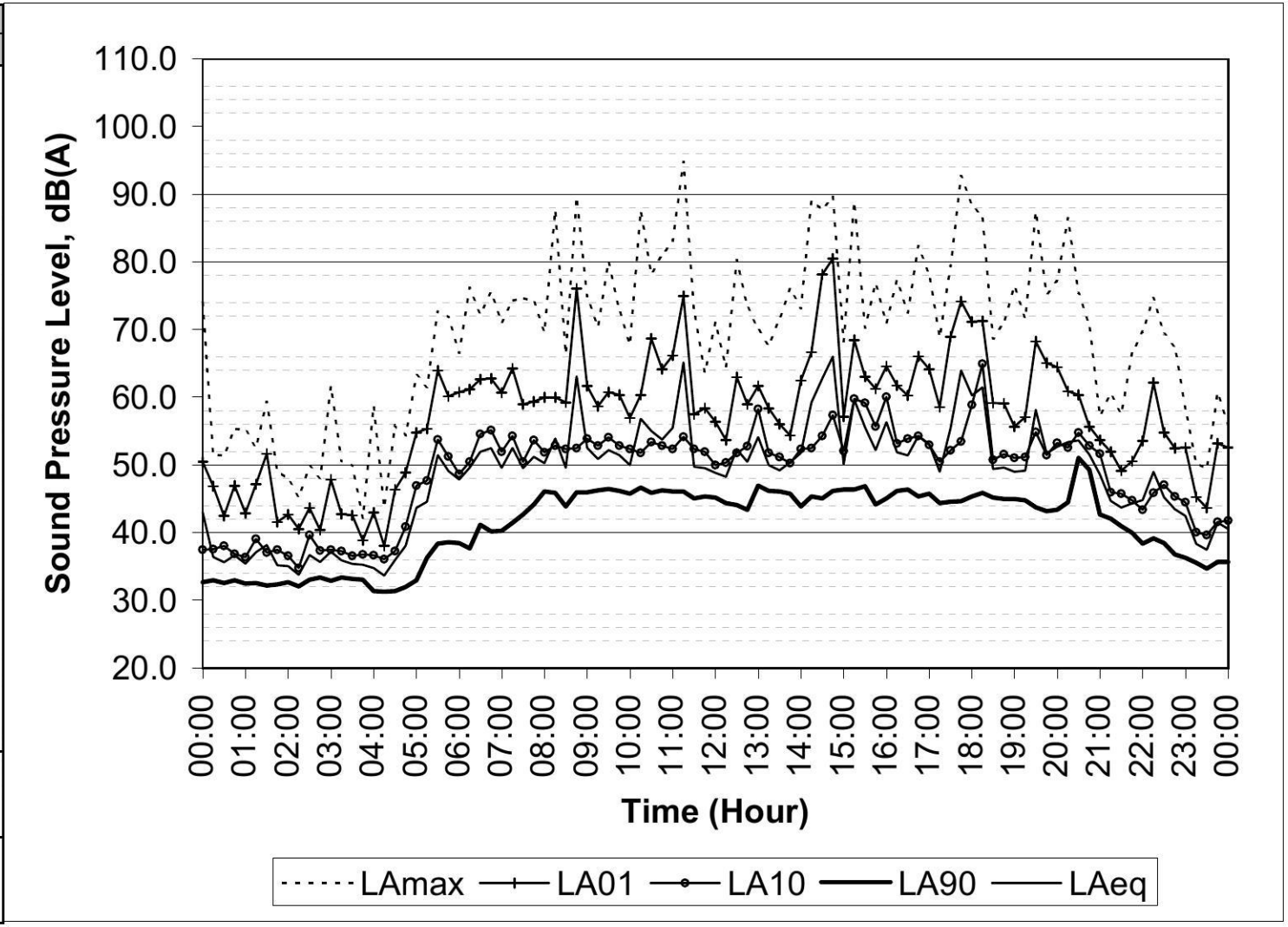
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Thursday, 6 December 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	36.1	44.8	37.3	32.5
01:00-02:00	36.6	45.8	37.6	32.3
02:00-03:00	36.1	43.2	37.4	32.3
03:00-04:00	35.4	41.8	36.9	31.9
04:00-05:00	39.6	47.1	40.3	31.3
05:00-06:00	49.0	60.1	50.4	36.9
06:00-07:00	51.1	61.9	53.1	38.5
07:00-08:00	51.1	60.7	52.6	41.9
08:00-09:00	58.1	64.3	52.9	44.5
09:00-10:00	51.2	59.2	53.1	45.9
10:00-11:00	55.4	64.9	52.6	46.0
11:00-12:00	59.5	61.8	52.2	45.1
12:00-13:00	51.8	59.4	53.3	43.6
13:00-14:00	50.5	57.9	51.4	44.5
14:00-15:00	62.4	70.7	54.1	45.2
15:00-16:00	56.7	64.4	58.7	44.5
16:00-17:00	52.9	63.1	53.6	45.5
17:00-18:00	60.0	68.3	53.8	44.5
18:00-19:00	56.2	61.3	54.6	45.0
19:00-20:00	54.3	63.8	52.7	43.3
20:00-21:00	52.2	57.7	53.0	43.2
21:00-22:00	44.4	51.4	45.0	38.9
22:00-23:00	45.9	55.5	45.7	36.5
23:00-24:00	39.8	48.7	40.8	35.0
Day	57.0	62.9	53.3	43.9
Evening	54.6	59.6	52.3	41.6
Night	45.4	50.3	43.0	34.3
LAeq,15hr	56.5			
LAeq,9hr	45.4			
LAeq,24hr	54.8			



Document Set ID: 8893775
Version: 1, Version Date: 18/10/2019

Measurement Location 38-40 Orth Street, Kingswood
Rear Site Bouncary

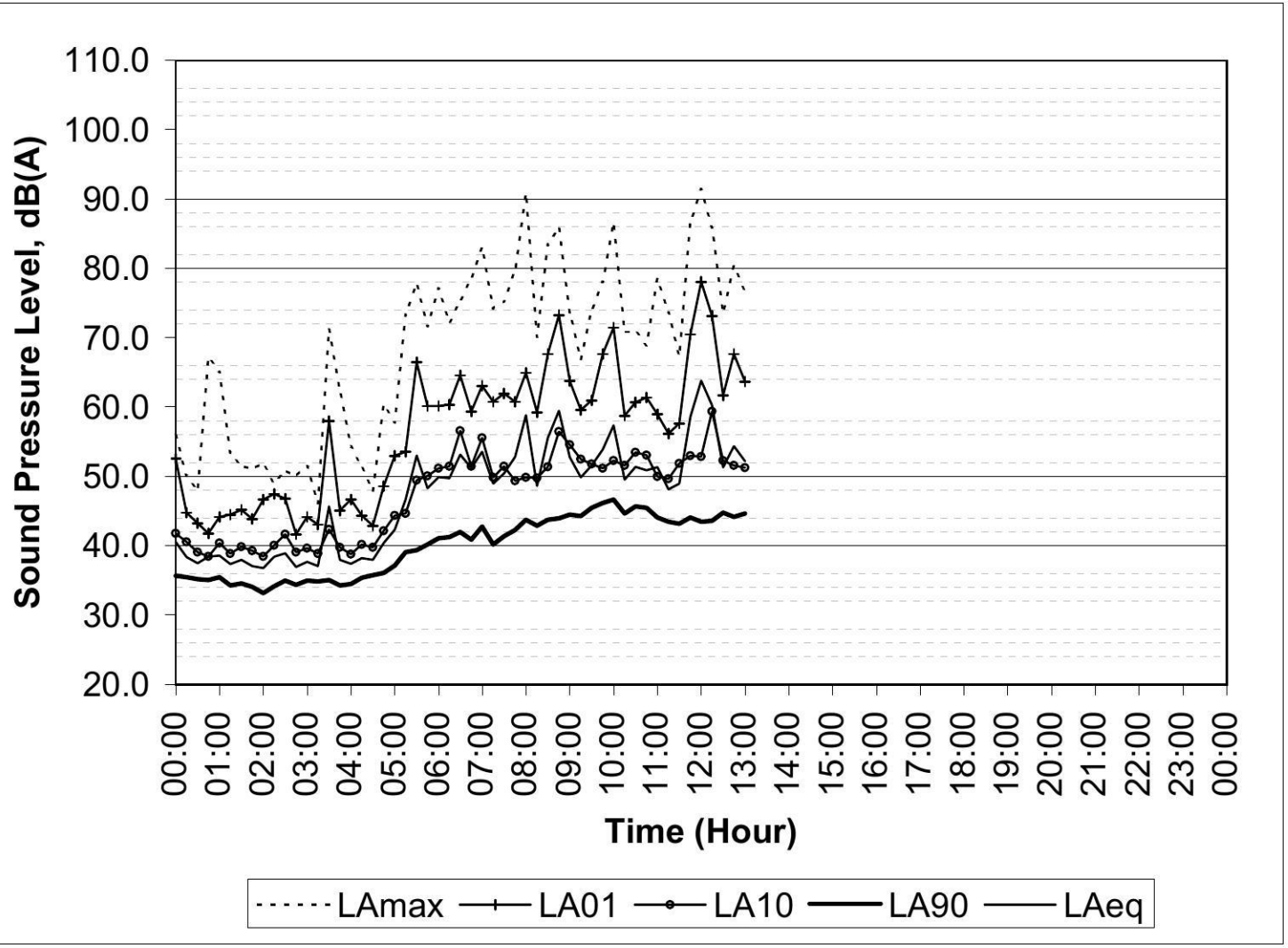
Project Title Proposed Mix-used Development
38-40 Orth Street, Kingswood

Measurement Date Friday, 7 December 2018

Notes

1. Tabulated L_{Aeq} are logarithically averaged
2. Tabulated L_{A01} and L_{A10} are arithmetically averaged
3. Tabulated L_{A90} are the lowest 10-percentile levels

Time	Average Noise Level			
	L_{Aeq}	L_{A01}	L_{A10}	L_{A90}
00:00-01:00	38.3	43.5	39.7	35.1
01:00-02:00	37.3	45.1	39.2	33.5
02:00-03:00	38.1	45.1	40.2	34.3
03:00-04:00	41.3	48.2	40.0	34.4
04:00-05:00	40.1	47.2	41.7	35.5
05:00-06:00	50.2	60.1	48.9	39.2
06:00-07:00	52.2	61.9	53.8	41.0
07:00-08:00	54.6	62.2	50.2	40.6
08:00-09:00	55.8	66.0	53.1	43.2
09:00-10:00	54.1	65.0	52.0	44.7
10:00-11:00	50.9	60.0	52.1	44.3
11:00-12:00	59.1	65.6	51.9	43.3
12:00-13:00	56.1	66.6	53.7	43.8
13:00-14:00				
14:00-15:00				
15:00-16:00				
16:00-17:00				
17:00-18:00				
18:00-19:00				
19:00-20:00				
20:00-21:00				
21:00-22:00				
22:00-23:00				
23:00-24:00				
Day				
Evening				
Night				
LAeq,15hr				
LAeq,9hr				
LAeq,24hr				



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