

Wednesday 29 August 2018

Mr Ming Li
C/- Ghazi Al Ali Architect
Level 2, Unit 2, 14 Railway Parade
BURWOOD NSW 2134

Our Reference 180986-01L-DD
Rev01

For the attention of Ghazi Al Ali Architect

**Noise Assessment – Development Application (DA) Phase
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury**

1.0 INTRODUCTION

Acoustic Consulting Engineers Pty Ltd was engaged by Mr Ming Li to prepare a noise assessment for the proposed residential boarding house development at 263-267 Canterbury Road, Canterbury.

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 is located at the corner of Canterbury Road and Phillips Avenue and currently consists of an existing mixed-use building. The mixed-use building is occupied by noodle making factory on ground level and residents on the first level.

The proposal is to re-develop the subject site to provide:

- car-parks on Basement Levels 01 to 03;
- a managers room, communal rooms and space and residential boarding rooms on Ground Level and Level 5; and
- residential boarding rooms on Levels 1-4

The development site is exposed to road traffic noise from Canterbury Road to the south. Along Canterbury Road are existing commercial and high-rise residential developments. To the north of the subject site are residential dwellings. *Figure 1* shows the location of the subject site and the surrounding. *Appendix 1* provides the conceptual floor plans of the proposed development.

Figure 1 **Site Location**



3.0 POTENTIAL ACOUSTIC ISSUES

From the site inspection and review of the drawings, potential acoustic issues associated with the proposed residential development include:

- external road traffic noise intrusion into the proposed residential development;
- environmental noise (eg. car-park supply and exhaust fans and air-conditioning equipment); and
- acoustic privacy between the residential units and between the residential units and common spaces.

4.0 NOISE MEASUREMENT

4.1 Background Noise

A data logger was installed from Friday 8 June 2018 to Saturday 16 June 2018 at the rear site boundary (*Figure 1*) to measure existing background noise environment at the surrounding residential development.

Measurement instrumentation consisted of a Type 1 SVAN977 sound and vibration analysers and a Type 1 ACO Pacific 7052-E 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.

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 common statistical noise levels at 15-minute intervals.

Table 1 present the measured day/evening/night L_{A90} background noise levels during the monitoring period. The L_{A90} levels represent the existing background noise levels at the nearby existing residential dwellings.

Table 1 Measured Existing Noise Environment, dB(A)

Date	Measured Existing L_{A90} Background Noise, dB(A)		
	Day ¹	Evening ²	Night ³
Friday, 8 June 2018		50.2	41.0
Saturday, 9 June 2018	49.2	49.4	44.4
Sunday, 10 June 2018	50.6	49.2	44.3
Monday, 11 June 2018	48.6	47.9	40.6
Tuesday, 12 June 2018	48.9	47.9	41.7
Wednesday, 13 June 2018	49.4	49.8	43.0
Thursday, 14 June 2018	49.0	48.6	41.8
Friday, 15 June 2018	50.2	48.6	42.9
Rating L_{A90} Background Level	49	49	42

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

4.2 Road Traffic Noise

Long-term road traffic from Canterbury Road was measured previously in the front yard of 247 Canterbury Road, Canterbury (approximately 60m further to the north-east of the subject site) for a separate development. The results were provided in Acoustic Consulting Engineers' *Report No. 130387-01L-DD*.

Previous measurement showed daytime ($L_{Aeq,15hr}$) noise level was 4dB higher than the night-time ($L_{Aeq,9hr}$) noise level.

Additional measurement was conducted from Friday 8 June 2018 to Saturday 9 June 2018, using a noise data logger installed above the awning and at 1m from the existing front building façade (*Figure 1*).

Measurement instrumentation consisted of a Type 1 SVAN977 sound and vibration analyser and a Type 1 ACO Pacific 7052-E prepolarised condenser microphone.

Measurement result shows night-time road traffic noise level of 70dB(A) ($L_{Aeq,9hr}$) at 1m from the front façade of the existing building. Taking account of the difference of 4dB between the daytime and night-time noise levels and the proposed building façade being slightly further from the Canterbury Road, the following road traffic levels are determined at the most exposed façade of the proposed development are:

- 73dB(A) ($L_{Aeq,15hr}$) (daytime); and
- 69dB(A) ($L_{Aeq,9hr}$) (night-time)

5.0 NOISE ASSESSMENT OBJECTIVES

5.1 Environmental Noise

Environmental noise from mechanical plant associated with the proposed residential boarding house development would mainly be due to air-conditioning equipment and ca-park exhaust air-fan (if provided).

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.

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 air-conditioning equipment associated with the proposed residential boarding house 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 presents a summary of the recommended $L_{Aeq,15min}$ noise levels from mechanical plant associated with the proposed residential boarding house 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 2 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)	54	58	54
Evening (6:00pm-10:00pm))	54	48	48
Night (10:00pm-7:00am)	47	43	43

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

5.2 External Road Traffic Noise Intrusion

For residential developments affected by noise from existing roads, the Environmental Protection Authority (EPA) Road Noise Policy (RNP) refers to the State Environmental Planning Policy (SEPP) (Infrastructure) 2007 and Department of Planning “*Development near Rail Corridors and Busy Roads – Interim Guideline*” to set appropriate indoor noise levels.

The requirements of Clause 102 of State Environmental Planning Policy (SEPP) (Infrastructure) 2007 are as follows:

“If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following L_{Aeq} levels are not exceeded:

- *35dB(A) at any time between 10:00pm and 7:00am in any bedroom in the building; and*
- *40dB(A) at any time anywhere else in the building (other than a garage, kitchen, bathroom or hallway)”.*

The acoustic requirements of the Department of Planning “*Development near Rail Corridors and Busy Roads – Interim Guideline*” are the same as those in SEPP (Infrastructure) 2007.

Table 3 presents a summary of the recommended indoor design noise objectives for the proposed residential development with windows and doors closed.

Table 3 Indoor Noise Design Objectives

Type of Occupancy	Indoor Design L_{Aeq} Noise Objective, dB(A)	Assessment Period
Bedrooms	35	10:00pm to 7:00am
Other habitable areas (other than garage, kitchen, bathroom and hallway)	40	any time

With reference to the Department of Planning “*Development near Rail Corridors and Busy Roads – Interim Guideline*”, airborne noise is calculated as $L_{Aeq,9hr}$ (night-time) and $L_{Aeq,15hr}$ (daytime).

6.0 ASSESSMENT

6.1 Environmental Noise

Environmental noise from mechanical plant associated with the proposed residential boarding development would mainly be due to a car-park exhaust air fan (if provided) and air-conditioning equipment.

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

Based on similar development and given the site location, it is considered that with appropriate equipment siting and provision of mitigation measures, noise from mechanical plant and equipment would readily be controlled to within the environmental noise assessment objectives presented in *Table 2*.

6.2 External Road Traffic Noise Intrusion

To reduce the indoor night-time road traffic noise levels to within 35dB(A) L_{Aeq} for sleeping areas, a noise reduction of 34dB(A) is required across the building envelope.

For other habitable areas (except garage, kitchen, bathroom and hallway), a noise reduction of 33dB(A) is required across the building envelope to reduce indoor daytime road traffic noise levels to within 40dB(A) L_{Aeq} .

6.3 Acoustic Privacy between Sole-Occupancies

Acoustic privacy between the residential units (boarding rooms) and between the residential units (boarding rooms) 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 and floor covering and/or isolation of plasterboard ceiling and ceiling cavity insulation to control floor impact sound. Noise from waste services can be controlled by wrapping services/waste pipes with acoustic lagging and/or construction of appropriate ceiling and ceiling cavity insulation below the services/waste pipes.

7.0 RECOMMENDATION

7.1 Environmental Noise

It is recommended that a qualified acoustic consultant be engaged during the design phase of the project, when details of mechanical plant and equipment and noise emission levels are available, to review the potential environmental noise impact from the development.

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, internally lined ductwork and bends to car-park supply and exhaust fan intakes and discharges; and
- appropriate equipment siting air-conditioning equipment

7.2 External Road Traffic Noise Intrusion

With typical residential building constructions, the weakest path for external noise intrusion into the development would be the exposed windows/doors.

It is recommended that all corridor doors (entry doors to the boarding rooms) shall:

- consist of a minimum of 34-40mm thick solid core doors (surface density $\geq 25\text{kg/m}^2$);
- installed in rebated door frames;
- fitted with perimeter and bottom drop acoustic rate door seals to achieve a weighted sound reduction index of not less than $R_w 32$; and
- acoustic door seals shall be set/adjusted to full closure and under slight compression with even pressure all round when doors are closed

Table 4 presents a summary of the recommended glazing construction for exposed windows/doors in order to reduce the external road traffic noise intrusion to within the recommended indoor design noise objectives.

Table 4 Recommended Glazing Construction

Floor Level	Room Number	Recommendation	Required R_w
Ground	RM 02 and RM 03	Double/secondary glazed window/door systems (acoustic construction)	40
	Communal Room 001	Upgraded glazed window/door systems (acoustic construction)	31
	Communal Room 002	Double/secondary glazed window/door systems (acoustic construction)	40
1	RM 1.04 (south-west)	Upgraded glazed window system (acoustic construction)	31
	RM 1.05, RM 1.06 and RM 1.07	Upgraded glazed window/door systems (acoustic construction)	33
	RM 1.08, RM 1.09 and RM 1.10	Double/secondary glazed window/door systems (acoustic construction)	40
	RM 1.11 and RM 1.12	Upgraded glazed window systems (acoustic construction)	31

Table 4 Recommended Glazing Construction (contd.)

Floor Level	Room Number	Recommendation	Required R_w
2	RM 2.04 (south-west)	Upgraded glazed window system (acoustic construction)	31
	RM 2.05, RM 2.06 and RM 2.07	Upgraded glazed window/door systems (acoustic construction)	33
	RM 2.08, RM 2.09 and RM 2.10	Double/secondary glazed window/door systems (acoustic construction)	40
	RM 2.11 and RM 2.12	Upgraded glazed window systems (acoustic construction)	31
3	RM 3.03 (south-west)	Upgraded glazed window system (acoustic construction)	31
	RM 3.04, RM 3.05 and RM 3.06	Upgraded glazed window/door systems (acoustic construction)	33
	RM 3.07, RM 3.08 and RM 3.09	Double/secondary glazed window/door systems (acoustic construction)	40
	RM 3.10 and RM 3.11	Upgraded glazed window systems (acoustic construction)	31
4	RM 4.01, RM 4.02 and RM 4.03	Upgraded glazed window/door systems (acoustic construction)	33
	RM 4.04, RM 4.05 and RM 4.06	Double/secondary glazed window/door systems (acoustic construction)	40
	RM 4.07 and RM 4.08	Upgraded glazed window systems (acoustic construction)	31
5	RM 5.01 and RM 5.02	Upgraded glazed window/door systems (acoustic construction)	31
	RM 5.03	Upgraded glazed window systems (acoustic construction)	33
	5.03, 5.04, 5.05 and 5.06	Double/secondary glazed window system (acoustic construction)	40

All windows/doors shall be specified to achieve the recommended sound reduction indices (R_w) in *Table 4* for the entire window/door systems, not just the glass. As a guide, typical window/door systems (acoustic construction) to achieve the weighted sound reductions recommended in *Table 4* are:

- $R_w 40$ 6mm float glass/100mm air gap/5mm float glass or propriety double glazed window system achieving the required R_w value (acoustic construction)
- $R_w 33$ 10.38mm laminated glass (acoustic construction)
- $R_w 31$ 6.38mm laminated glass (acoustic construction)

It is recommended that:

- manufacturers/suppliers/installers be consulted for a specific design solution to satisfy the recommended R_w rating in *Table 4*, for the window/door systems.
- approved Q-lon acoustic rated seals or equivalent be fitted to all acoustically rated windows/doors. Brush/mohair/fin/felt seals are not satisfactory for acoustic performance.
- window/door acoustic rated seals set to full closure and under slight compression with even pressure all round when windows/doors are closed.
- all gaps around/between the door/window frames and façade openings be sealed air-tight with silicon or similar non-hardening mastic prior to fitting any weather strips.
- all open extrusions forming perimeter frames to aluminium windows/doors be detailed to ensure that the frames do not de-rate the acoustic performance of the windows/doors.
- there shall be no penetrations in the external walls that could de-rate the acoustic performance of the building.
- penetrations for mechanical ventilation/air-conditioning shall be detailed, caulked and sealed air-tight with non-hardening acoustic sealant to ensure that the acoustic performances of the external wall systems are not de-rated.

7.3 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 Building Code of Australia (BCA) acoustic requirements for sole-occupancies are achieved.

8.0 SUMMARY

The assessment has shown that road traffic noise intrusion into the proposed residential boarding house development at 263-267 Canterbury Road, Canterbury can be controlled with appropriate building constructions.

The recommended R_w values for the external window/door glazing are minimum. Alternative glazing performances (R_w values) equivalent or higher than those recommended in *Table 4* may be used.

It is recommended that a qualified acoustic consultant be engaged during the design phase of the project, when details of mechanical plant and equipment and 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 5.1* 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.

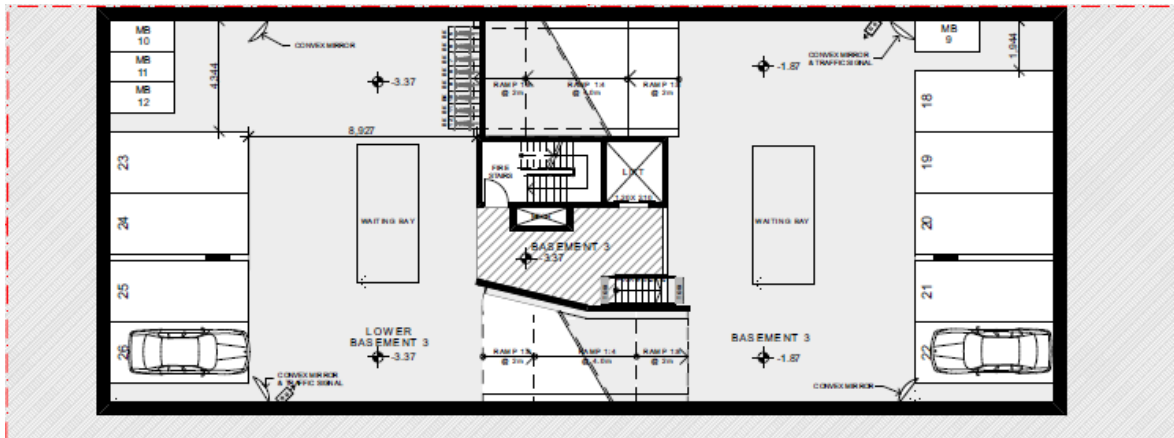
Yours sincerely,

A handwritten signature in black ink, appearing to read 'D. Dang', with a stylized flourish extending from the end.

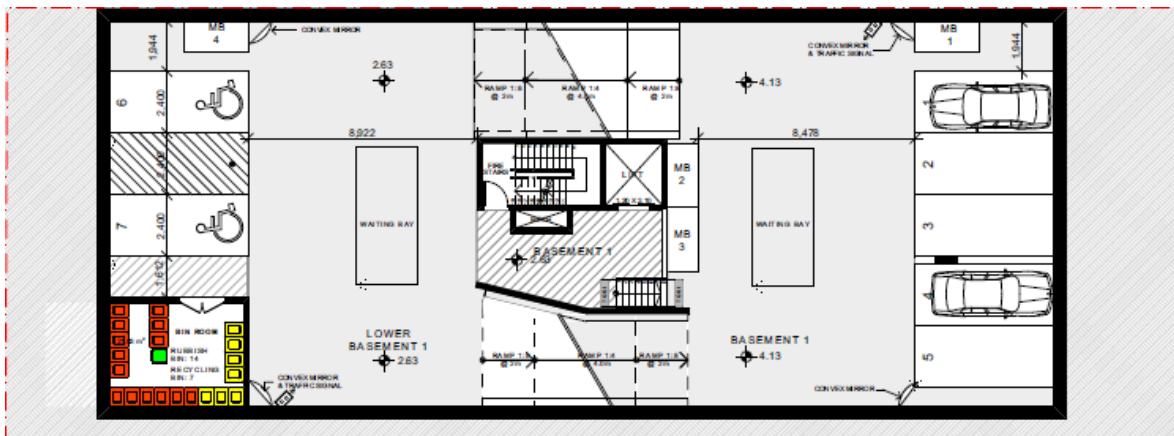
Dan Dang
Principal Acoustic Engineer
Acoustic Consulting Engineers Pty Ltd

Appendix 1
FLOOR PLANS

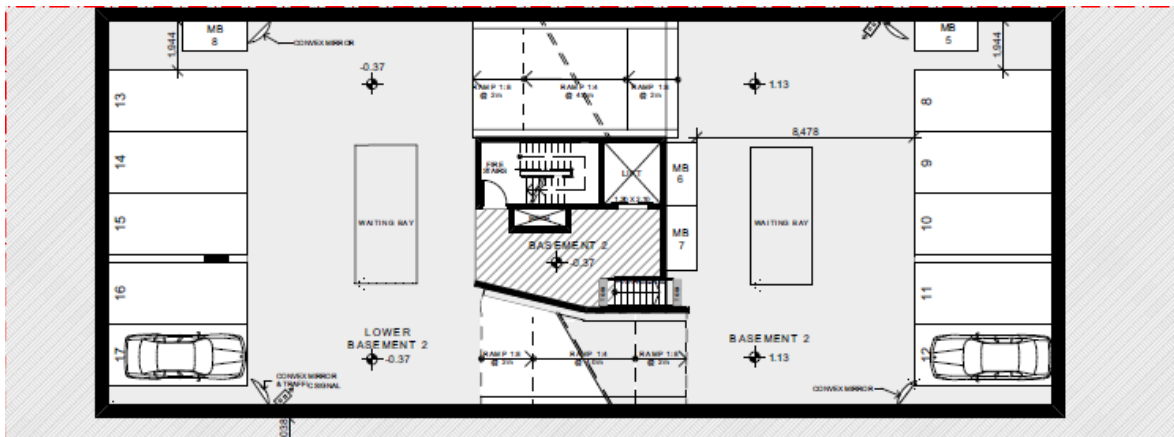
Basement Level 03



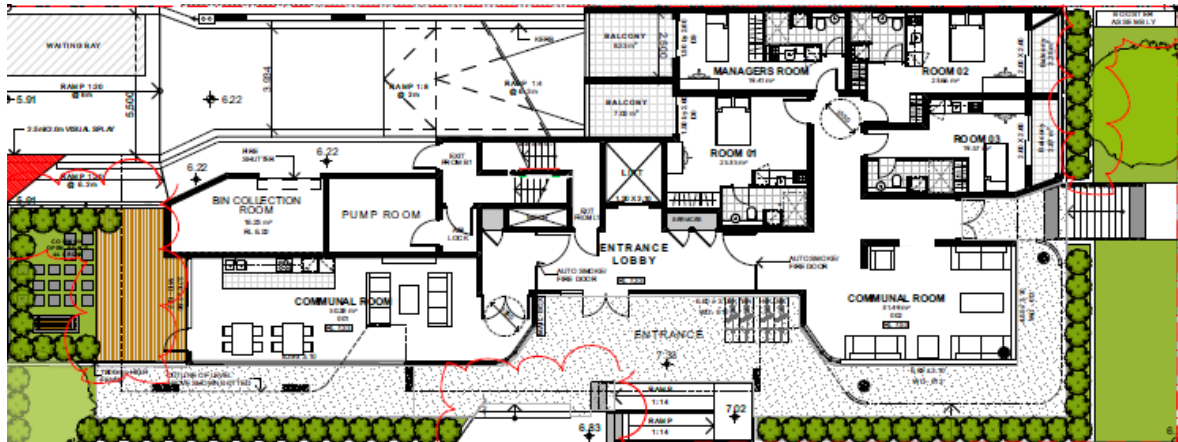
Basement Level 02



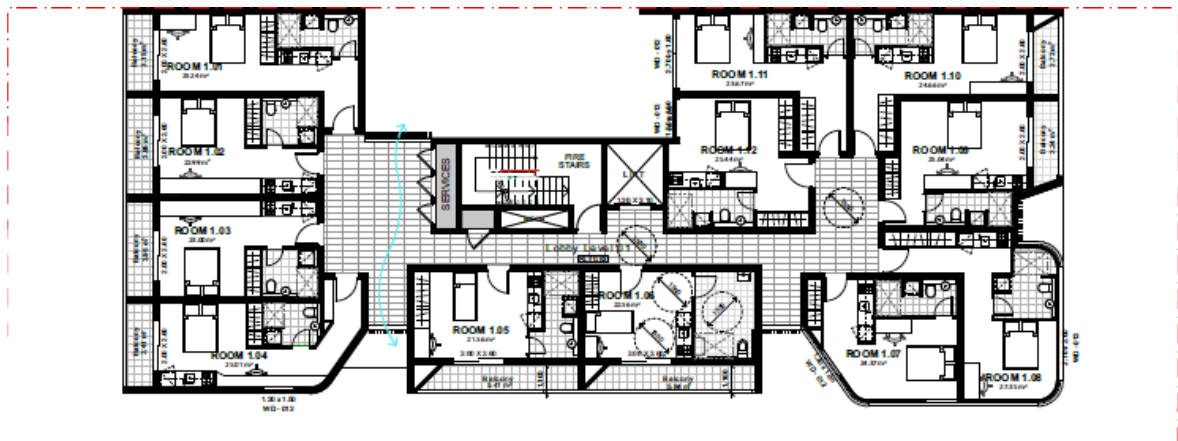
Basement Level 01



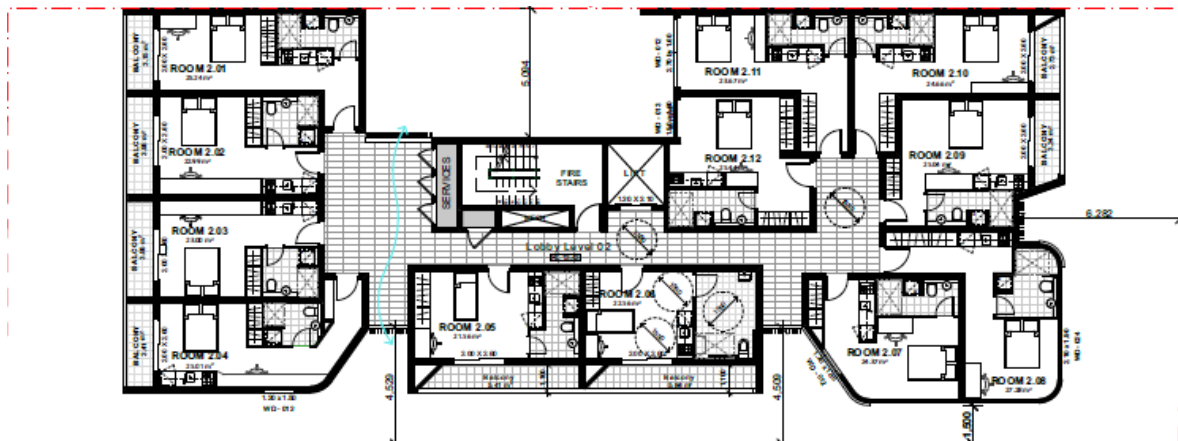
Ground Level



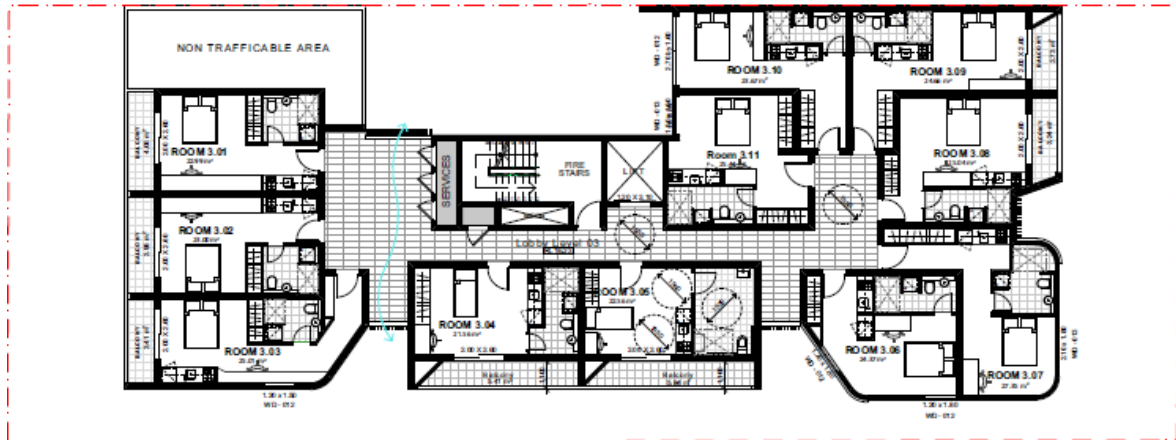
Level 1



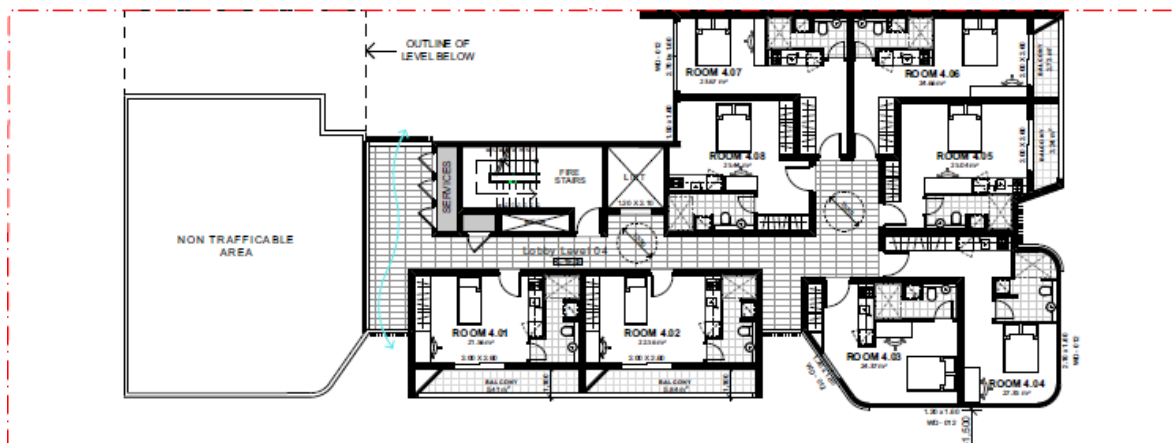
Level 2



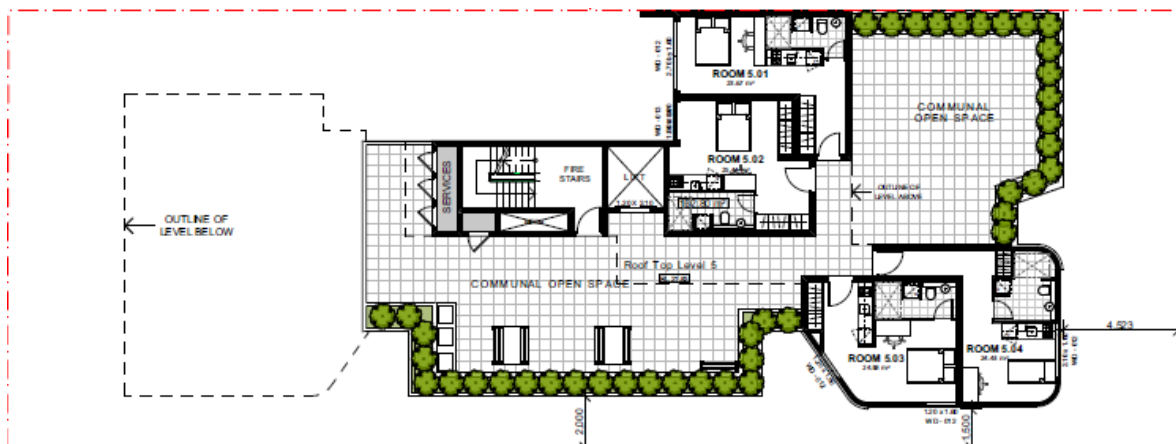
Level 3



Level 4



Level 5



Appendix 2
NOISE MEASUREMENT RESULTS

Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

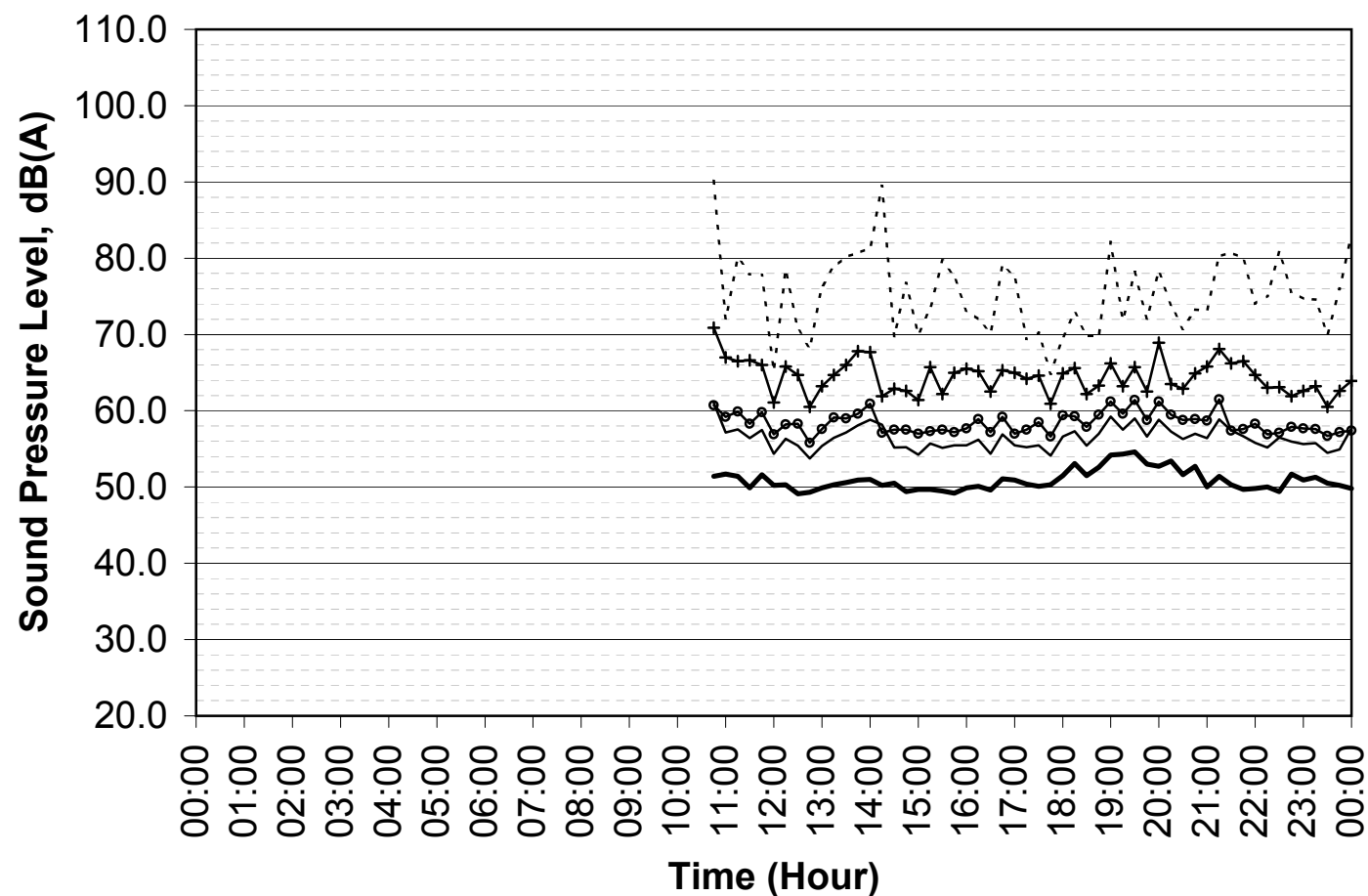
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Friday, 8 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	56.6	65.1	58.7	50.0
12:00-13:00	55.3	63.6	57.5	49.2
13:00-14:00	57.7	66.6	59.7	50.4
14:00-15:00	56.0	62.2	57.3	49.5
15:00-16:00	55.5	64.6	57.4	49.3
16:00-17:00	55.8	64.5	58.1	49.8
17:00-18:00	55.5	63.7	58.0	50.2
18:00-19:00	57.5	64.3	59.5	51.8
19:00-20:00	58.1	65.1	60.3	52.8
20:00-21:00	56.8	64.3	59.0	50.5
21:00-22:00	57.3	66.4	58.7	49.7
22:00-23:00	55.9	62.7	57.4	49.6
23:00-24:00	55.9	62.6	57.2	49.9
Day				
Evening	57.5	65.0	59.4	50.2
Night	52.8	58.9	54.1	41.0
$L_{Aeq,15hr}$				
$L_{Aeq,9hr}$		52.8		
$L_{Aeq,24hr}$				



..... L_{Amax} —+— L_{A01} —o— L_{A10} — L_{A90} — L_{Aeq}

Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

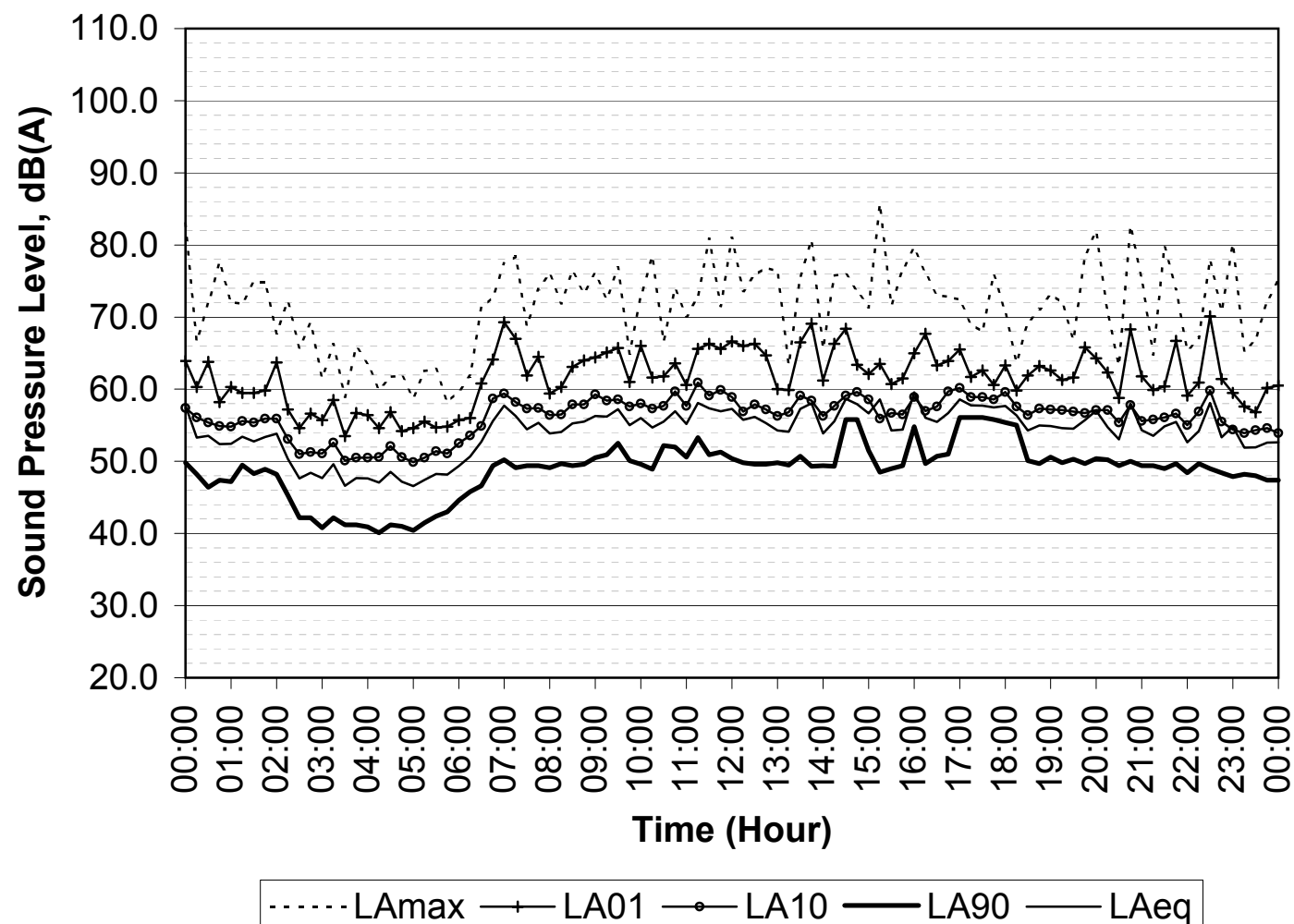
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Saturday, 9 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	52.9	60.7	55.3	46.6
01:00-02:00	53.4	60.6	55.7	48.2
02:00-03:00	48.7	56.0	51.6	41.2
03:00-04:00	48.0	56.3	50.9	41.0
04:00-05:00	47.4	55.1	50.8	40.2
05:00-06:00	48.4	55.2	51.4	41.8
06:00-07:00	55.0	62.6	56.7	46.0
07:00-08:00	55.1	63.2	57.3	49.1
08:00-09:00	55.4	63.0	57.9	49.5
09:00-10:00	56.2	64.5	58.2	49.8
10:00-11:00	55.7	61.9	58.1	49.4
11:00-12:00	57.4	66.0	59.7	50.6
12:00-13:00	55.4	64.3	57.1	49.6
13:00-14:00	56.2	64.2	57.7	49.3
14:00-15:00	57.4	65.1	58.8	50.0
15:00-16:00	57.4	62.7	57.0	48.7
16:00-17:00	56.9	65.1	58.6	50.0
17:00-18:00	57.7	62.1	59.0	55.5
18:00-19:00	55.2	61.9	57.1	49.8
19:00-20:00	55.6	63.3	57.0	49.7
20:00-21:00	55.4	62.8	56.5	49.4
21:00-22:00	54.3	61.5	55.9	48.6
22:00-23:00	55.5	63.0	56.7	48.1
23:00-24:00	52.3	58.8	54.2	47.4
Day	56.5	63.9	58.1	49.2
Evening	55.5	62.6	56.9	49.4
Night	52.3	58.8	53.5	44.4
$L_{Aeq,15hr}$	56.3			
$L_{Aeq,9hr}$	52.3			
$L_{Aeq,24hr}$	55.2			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

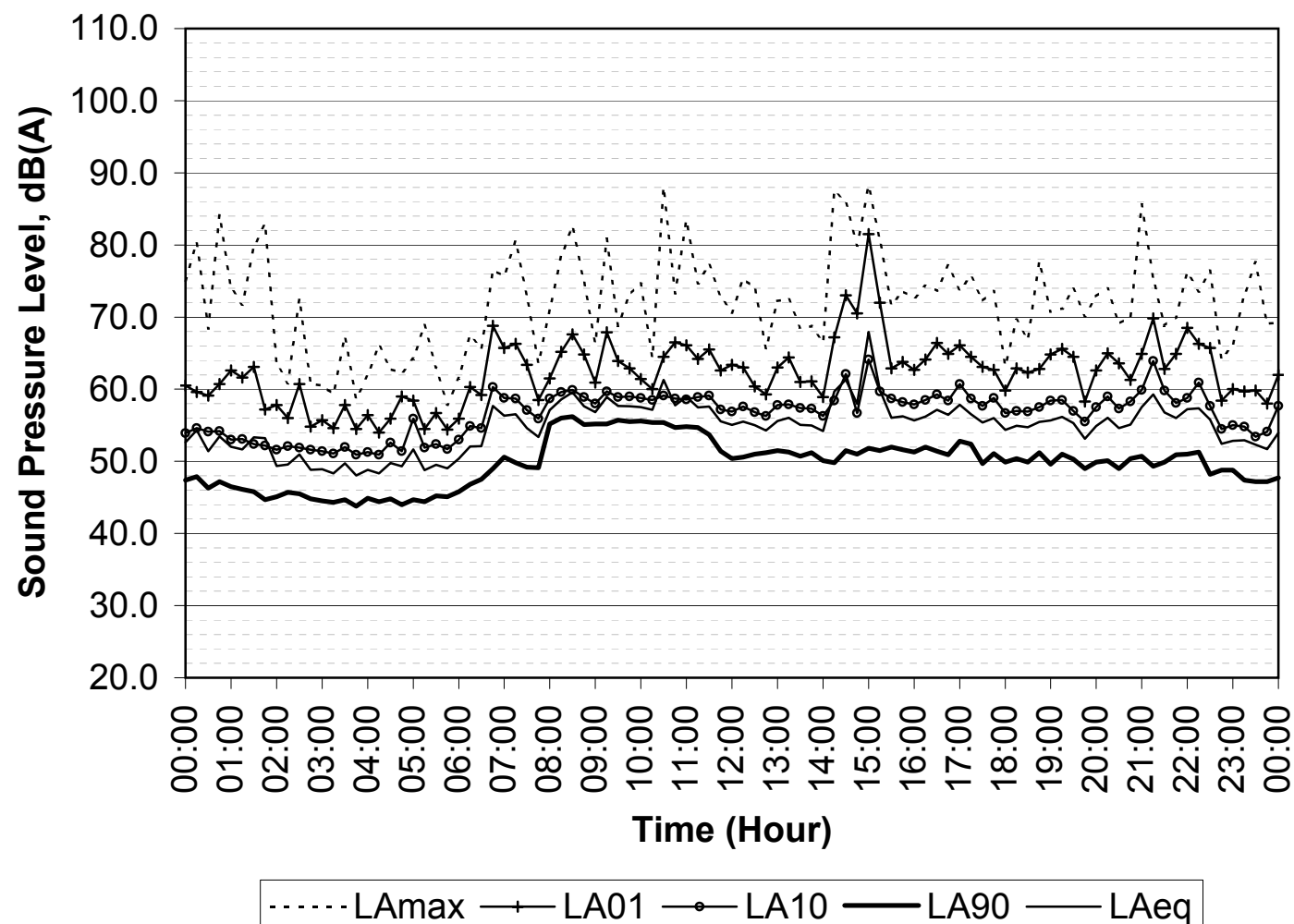
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Sunday, 10 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	52.9	60.5	54.0	46.4
01:00-02:00	52.2	59.9	52.3	44.8
02:00-03:00	49.7	56.8	51.8	44.6
03:00-04:00	48.8	55.8	51.3	44.0
04:00-05:00	49.9	56.8	52.7	44.1
05:00-06:00	49.5	55.4	52.3	44.6
06:00-07:00	55.3	63.5	57.2	47.0
07:00-08:00	55.7	62.4	57.6	49.1
08:00-09:00	58.3	64.6	59.1	55.1
09:00-10:00	58.0	64.0	59.1	55.3
10:00-11:00	59.1	64.3	58.7	54.7
11:00-12:00	56.6	63.9	58.0	50.7
12:00-13:00	55.1	61.4	57.1	50.7
13:00-14:00	55.1	61.4	57.2	50.3
14:00-15:00	63.6	73.1	60.3	50.2
15:00-16:00	57.3	65.4	58.6	51.4
16:00-17:00	57.0	65.4	59.2	51.1
17:00-18:00	55.6	62.5	58.0	49.8
18:00-19:00	55.2	63.2	57.5	49.7
19:00-20:00	55.0	62.8	57.1	49.3
20:00-21:00	56.0	63.7	58.6	49.3
21:00-22:00	57.5	66.5	60.2	49.5
22:00-23:00	55.1	62.6	57.0	48.4
23:00-24:00	52.8	59.9	55.0	47.2
Day	58.4	64.6	58.6	50.6
Evening	55.9	63.5	58.2	49.2
Night	53.0	59.7	54.3	44.3
$L_{Aeq,15hr}$	57.7			
$L_{Aeq,9hr}$	52.7			
$L_{Aeq,24hr}$	56.5			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

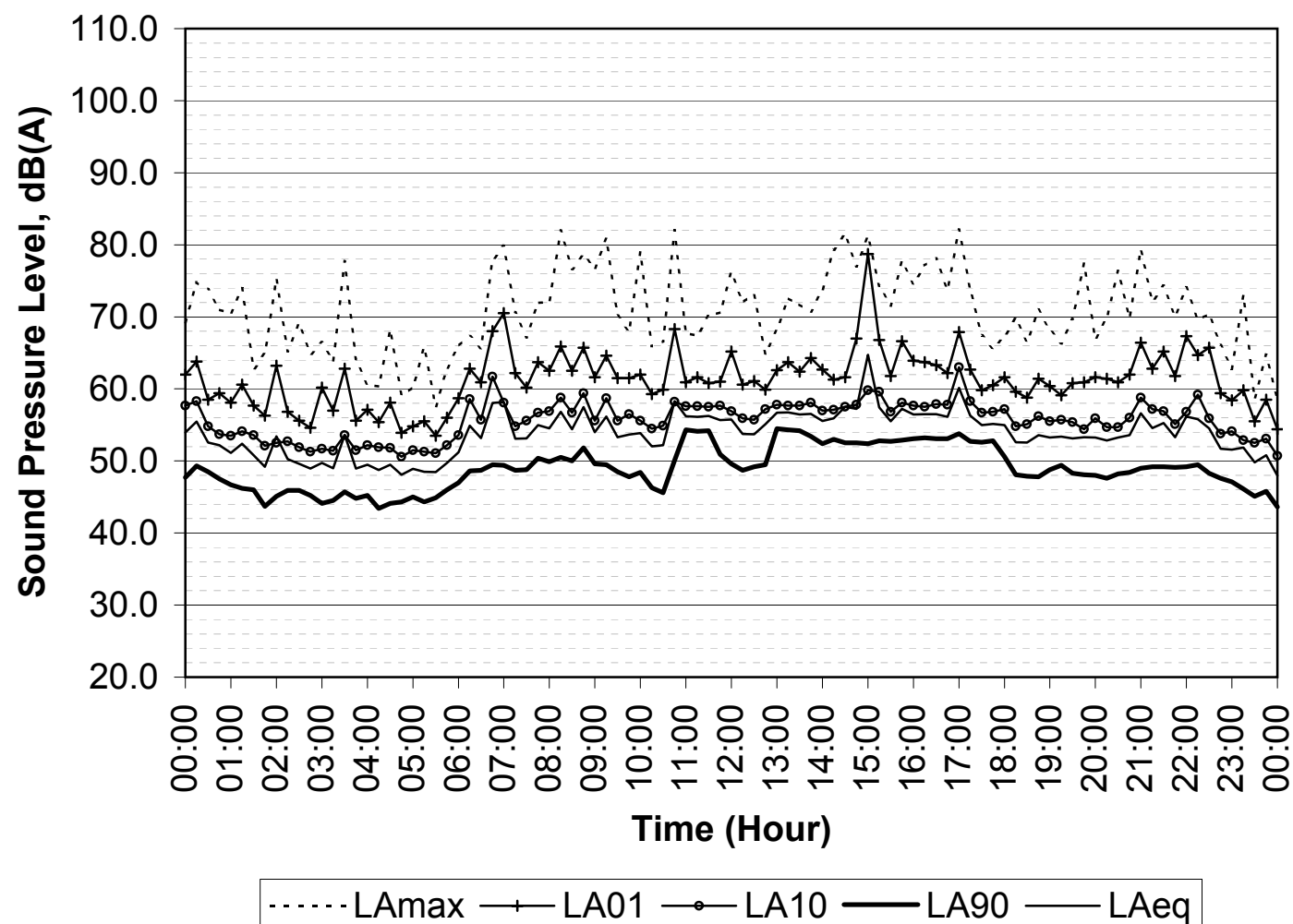
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Monday, 11 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	53.1	60.0	55.1	46.9
01:00-02:00	51.7	59.5	53.1	44.1
02:00-03:00	49.6	56.8	51.9	44.4
03:00-04:00	50.8	58.1	52.2	44.6
04:00-05:00	48.8	55.6	51.5	43.6
05:00-06:00	49.6	55.9	52.1	44.5
06:00-07:00	56.6	65.6	58.5	48.6
07:00-08:00	54.0	62.2	56.0	48.7
08:00-09:00	55.9	63.9	57.6	49.7
09:00-10:00	54.4	62.4	56.6	48.0
10:00-11:00	55.5	62.1	56.3	45.8
11:00-12:00	56.0	62.2	57.4	50.0
12:00-13:00	55.0	61.1	56.7	48.9
13:00-14:00	56.3	63.3	57.6	52.7
14:00-15:00	60.5	67.2	58.1	52.4
15:00-16:00	56.7	64.8	58.1	52.7
16:00-17:00	57.7	64.3	59.1	53.1
17:00-18:00	55.4	61.2	57.3	51.2
18:00-19:00	53.0	60.1	55.4	47.8
19:00-20:00	53.3	60.6	55.4	48.0
20:00-21:00	54.4	62.7	56.1	47.8
21:00-22:00	55.0	64.3	56.5	49.1
22:00-23:00	53.8	62.1	55.8	47.3
23:00-24:00	50.3	57.1	52.3	44.1
Day	56.6	63.3	57.4	48.6
Evening	53.9	61.5	55.9	47.9
Night	52.3	58.2	52.9	40.6
$L_{Aeq,15hr}$	56.0			
$L_{Aeq,9hr}$	52.3			
$L_{Aeq,24hr}$	55.1			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

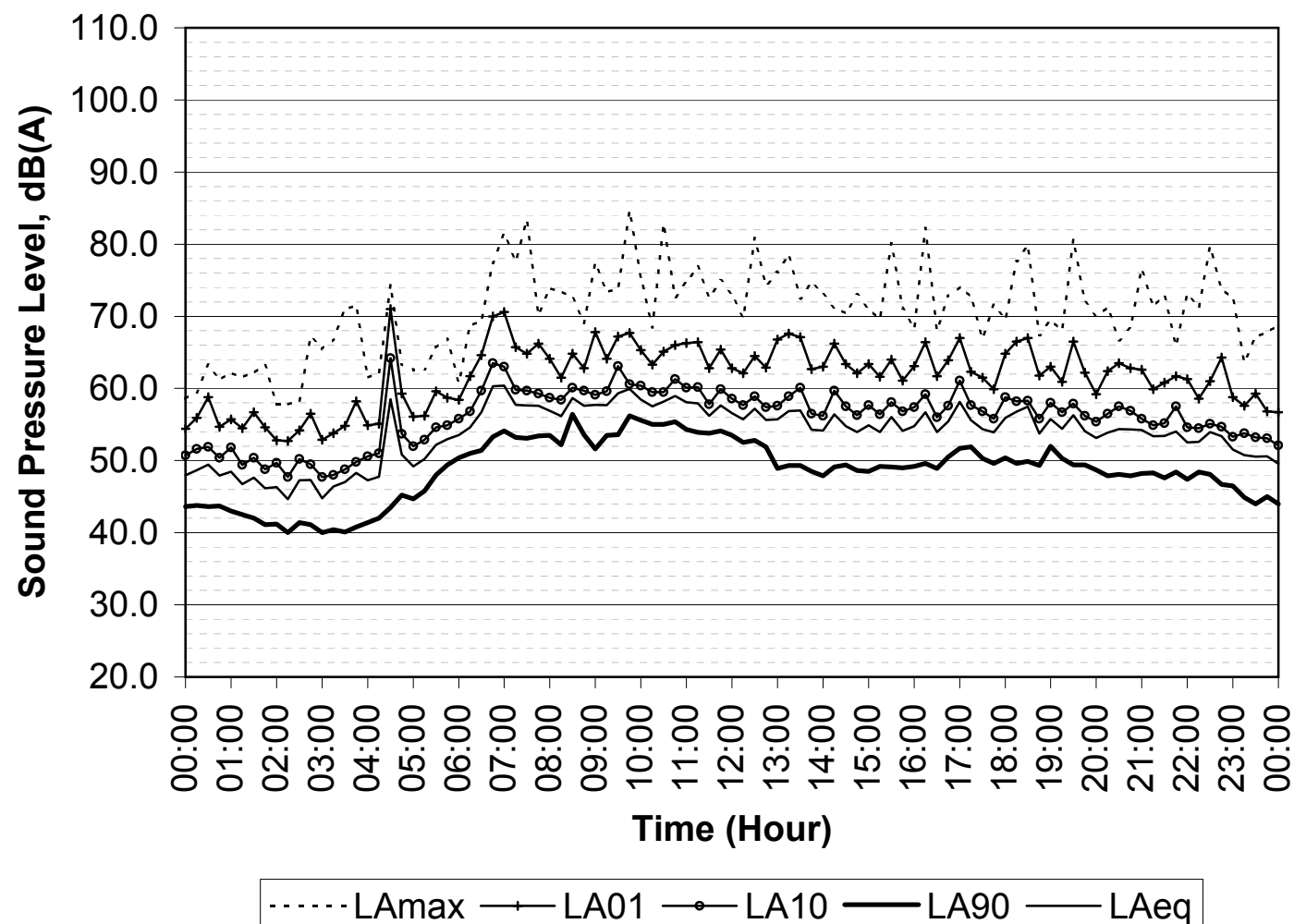
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Tuesday, 12 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	48.6	56.3	51.4	43.2
01:00-02:00	46.8	54.7	49.6	41.1
02:00-03:00	46.2	54.1	48.8	40.0
03:00-04:00	47.3	55.4	49.3	40.2
04:00-05:00	53.9	60.4	55.2	42.5
05:00-06:00	52.4	58.2	54.6	46.5
06:00-07:00	58.6	66.7	60.8	51.1
07:00-08:00	57.5	65.2	59.4	53.1
08:00-09:00	57.6	64.2	59.3	51.8
09:00-10:00	58.9	66.1	60.9	53.5
10:00-11:00	58.2	65.2	60.1	54.5
11:00-12:00	57.1	64.4	59.1	53.6
12:00-13:00	56.1	64.1	57.9	49.8
13:00-14:00	55.8	65.1	57.9	48.1
14:00-15:00	55.1	63.8	57.8	48.5
15:00-16:00	54.8	62.5	57.2	49.0
16:00-17:00	56.3	64.8	58.5	49.1
17:00-18:00	55.0	62.1	57.3	49.8
18:00-19:00	56.2	64.6	57.6	49.4
19:00-20:00	54.6	62.2	56.6	48.9
20:00-21:00	54.2	62.8	56.7	47.9
21:00-22:00	53.4	60.9	55.6	47.5
22:00-23:00	53.0	60.7	54.4	46.6
23:00-24:00	50.4	57.6	53.1	44.0
Day	56.9	64.4	58.8	48.9
Evening	54.9	62.9	56.9	47.9
Night	51.9	58.3	53.2	41.7
$L_{Aeq,15hr}$	56.5			
$L_{Aeq,9hr}$	51.9			
$L_{Aeq,24hr}$	55.4			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

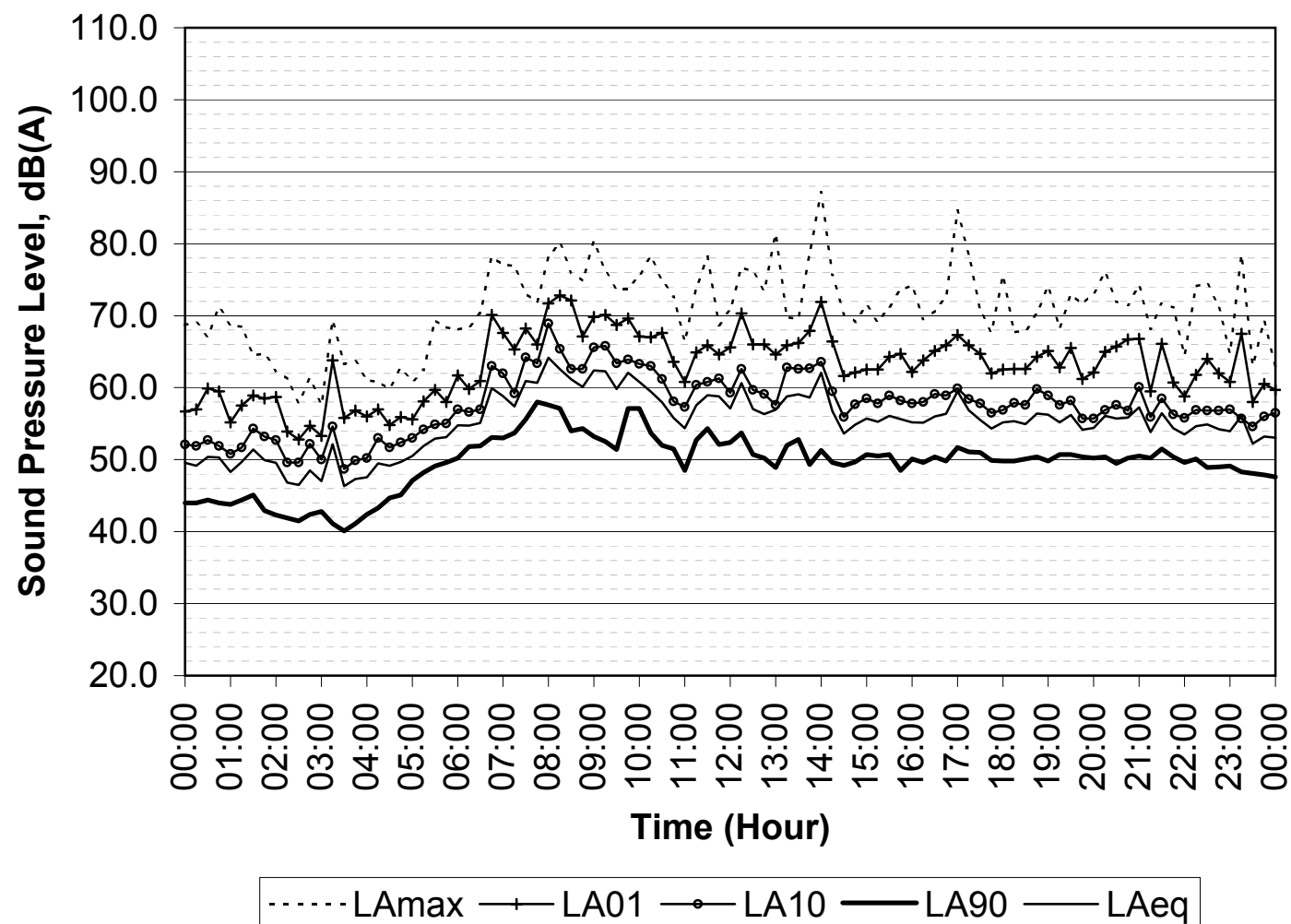
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Wednesday, 13 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	49.6	57.9	51.8	43.9
01:00-02:00	50.2	58.4	53.0	42.5
02:00-03:00	47.3	53.7	50.4	41.6
03:00-04:00	49.0	58.1	50.9	40.4
04:00-05:00	49.7	55.8	52.5	43.7
05:00-06:00	53.3	59.4	55.3	48.5
06:00-07:00	57.7	64.6	59.7	51.8
07:00-08:00	61.4	67.8	63.9	54.3
08:00-09:00	61.7	70.5	64.1	53.4
09:00-10:00	61.3	68.9	64.1	51.7
10:00-11:00	57.3	64.8	59.9	49.4
11:00-12:00	58.2	65.3	60.5	52.2
12:00-13:00	58.1	66.7	59.8	49.3
13:00-14:00	59.9	68.0	62.9	49.9
14:00-15:00	55.4	63.2	57.9	49.3
15:00-16:00	55.5	63.4	58.2	49.0
16:00-17:00	57.1	65.5	59.0	49.7
17:00-18:00	55.6	63.8	57.4	49.8
18:00-19:00	55.8	63.7	58.6	49.8
19:00-20:00	55.1	62.9	56.8	50.3
20:00-21:00	56.3	66.1	57.9	49.7
21:00-22:00	54.7	61.3	56.6	49.8
22:00-23:00	54.4	62.2	56.9	48.9
23:00-24:00	53.9	61.4	55.7	47.7
Day	59.0	66.3	60.8	49.4
Evening	55.6	63.7	57.5	49.8
Night	53.5	59.4	54.4	43.0
$L_{Aeq,15hr}$	58.3			
$L_{Aeq,9hr}$	53.5			
$L_{Aeq,24hr}$	57.0			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

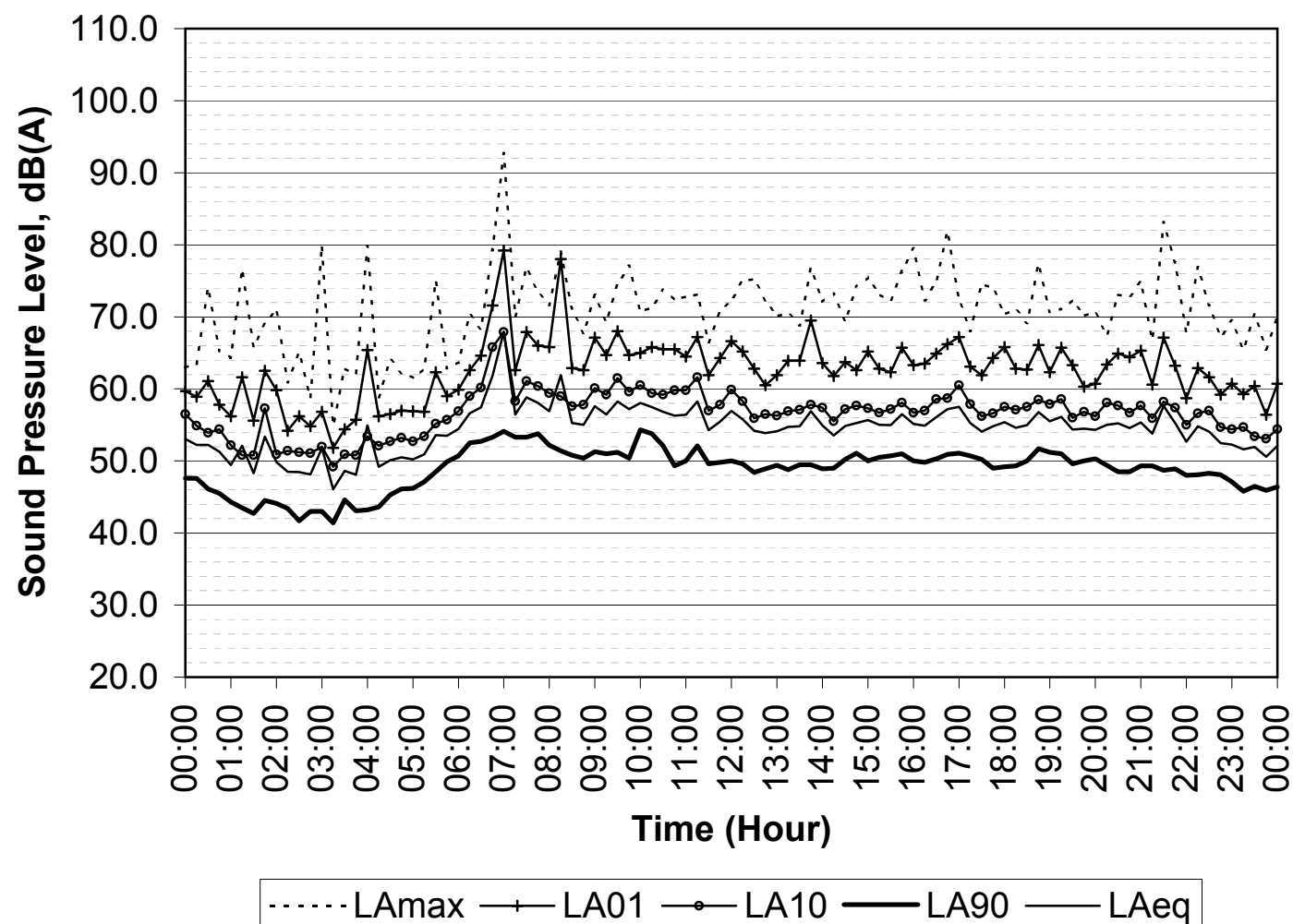
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Thursday, 14 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	51.4	58.5	53.9	44.7
01:00-02:00	51.3	59.9	52.5	42.9
02:00-03:00	49.5	55.5	51.4	42.1
03:00-04:00	50.9	56.8	51.1	41.9
04:00-05:00	50.0	56.7	52.7	44.1
05:00-06:00	53.3	59.5	55.3	47.5
06:00-07:00	63.4	69.5	63.2	52.6
07:00-08:00	57.6	65.6	59.8	52.5
08:00-09:00	58.4	67.7	58.6	50.5
09:00-10:00	57.5	65.6	60.2	50.6
10:00-11:00	56.8	65.3	59.6	49.5
11:00-12:00	56.5	65.0	59.1	49.7
12:00-13:00	54.6	62.6	56.8	48.6
13:00-14:00	55.5	65.2	57.3	48.8
14:00-15:00	54.9	63.3	56.9	49.3
15:00-16:00	55.5	63.5	57.2	50.2
16:00-17:00	56.5	65.5	58.7	50.0
17:00-18:00	54.9	63.8	57.1	49.1
18:00-19:00	55.5	63.5	57.8	49.5
19:00-20:00	54.9	62.5	56.9	49.7
20:00-21:00	55.0	64.5	57.6	48.5
21:00-22:00	55.2	62.4	56.6	48.2
22:00-23:00	53.5	61.1	55.7	47.4
23:00-24:00	51.6	59.2	53.9	45.8
Day	57.6	65.1	58.5	49.0
Evening	55.3	63.7	57.4	48.6
Night	54.3	59.1	53.8	41.8
$L_{Aeq,15hr}$	57.1			
$L_{Aeq,9hr}$	54.3			
$L_{Aeq,24hr}$	56.1			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

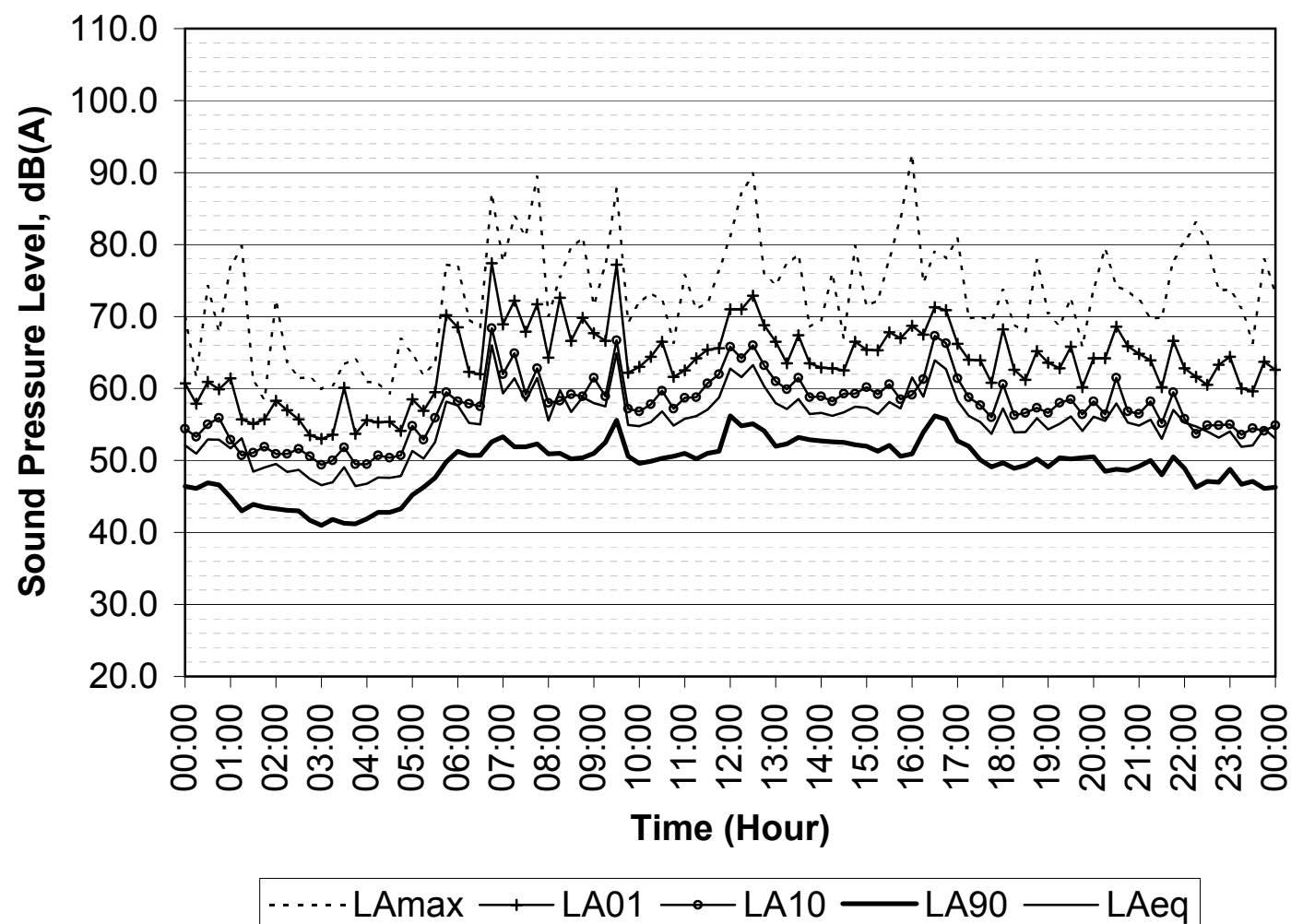
Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Friday, 15 June 2018

Notes

1. Tabulated L_{Aeq} are logarithmically 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	52.2	60.0	54.3	45.3
01:00-02:00	50.4	56.2	51.2	43.1
02:00-03:00	47.8	54.8	50.6	41.2
03:00-04:00	47.5	55.8	50.2	41.2
04:00-05:00	48.9	55.8	51.7	42.8
05:00-06:00	55.8	63.8	56.6	46.7
06:00-07:00	61.4	67.7	61.5	50.7
07:00-08:00	59.8	69.0	61.2	51.2
08:00-09:00	58.5	69.2	59.5	50.3
09:00-10:00	60.3	67.3	59.9	49.9
10:00-11:00	55.8	63.8	58.4	50.0
11:00-12:00	59.5	66.6	61.8	50.4
12:00-13:00	61.2	69.8	63.6	52.6
13:00-14:00	57.3	64.3	59.8	52.4
14:00-15:00	56.9	64.3	59.3	52.1
15:00-16:00	58.8	67.2	59.4	50.7
16:00-17:00	61.6	69.0	64.1	53.1
17:00-18:00	55.8	64.2	58.3	49.3
18:00-19:00	54.6	63.2	56.7	49.0
19:00-20:00	55.4	63.3	57.8	50.3
20:00-21:00	56.1	65.9	57.8	48.5
21:00-22:00	55.5	63.4	57.2	48.3
22:00-23:00	54.0	62.5	54.6	46.5
23:00-24:00	53.0	61.5	54.3	46.2
Day	59.1	66.8	60.5	50.2
Evening	55.6	64.3	57.7	48.6
Night	53.9	60.6	53.8	42.9
$L_{Aeq,15hr}$	58.4			
$L_{Aeq,9hr}$	53.9			
$L_{Aeq,24hr}$	57.4			



Measurement Location 263-267 Canterbury Road, Canterbury
Rear Site Boundary

Project Title

Proposed Residential Boarding House Development
263-267 Canterbury Road, Canterbury

Measurement Date Saturday, 16 June 2018

Notes

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

