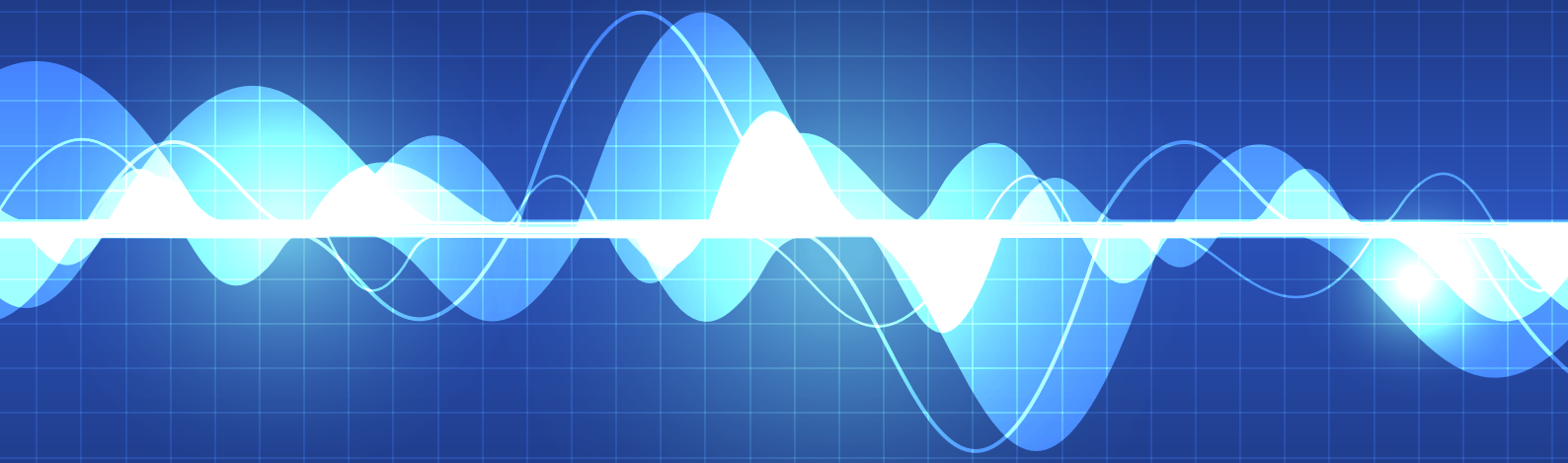
Stage 2, 11-17 Columbia Lane Homebush

Acoustic assessment report

Prepared for JQZ Pty Limited
July 2020



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Stage 2, 11-17 Columbia Lane Homebush

Acoustic assessment report

Report Number

J17289 RP1

Client

JQZ Pty Limited

Date

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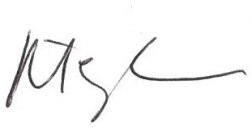
Final

Prepared by



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17 July 2020

Approved by

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Director
17 July 2020

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1 Introduction

EMM Consulting Pty Limited (EMM) has been commissioned by JQZ Pty Limited (JQZ) to complete an acoustic assessment to support a development application (DA) for a proposed mixed use building development at 11-17 Columbia Lane, Homebush NSW.

The minutes of the pre-development application meeting dated 25 September 2017 outline the requirements for an acoustic report in accordance with Clause 87 of *SEPP (Infrastructure) 2007* "*Impact of rail noise or vibration on non-rail development"* to accompany the formal development application.

Strathfield Council provided correspondence dated 22 May 2020 that included acoustic matters and these have been addressed in this revised report.

The acoustic assessment has been guided by the following relevant guidelines, policies, and standards:

- State Environmental Planning Policy (Infrastructure) 2007 – Clause 87 and Clause 102;
- Strathfield Council Consolidated Development Control Plan (DCP) (2005) Part C Multiple-unit housing;
- Strathfield Council Development Control Plan No 20 Parramatta Rd Corridor Area (2005);
- Department of Planning 2008 *Development Near Rail Corridors and Busy Roads - Interim Guidelines*;
- NSW Environmental Protection Authority (EPA) 2017, *Noise Policy for Industry* (NPfI);
- Australian Standard AS 1055-1997 '*Acoustics – Description and measurement of environmental noise';*
- Australian Standard AS/NZS 2107-2016: '*Acoustics – Recommended design sound levels and reverberation times for building interiors'*; and
- National Construction Code (NCC) 2016 / Building Code of Australia (BCA) acoustic amenity requirements (Part F5).

In addition to establishing environmental noise criteria for the proposed development in accordance with the above standards, plans and guidelines, the acoustic assessment provides JQZ with:

- design criteria in accordance with BCA/NCC to control internal noise transfer for noise sensitive areas of the development; and
- recommendations on façade upgrades to provide the appropriate internal noise levels in accordance with AS/NZS 2107-2016 and SEPP (Infrastructure) 2007 requirements.

2 Project and site description

2.1 Proposed development

The development is shown in Mosca Pserras Architects revised drawings, plans and details as attached in Appendix C.

2.2 Site and surroundings

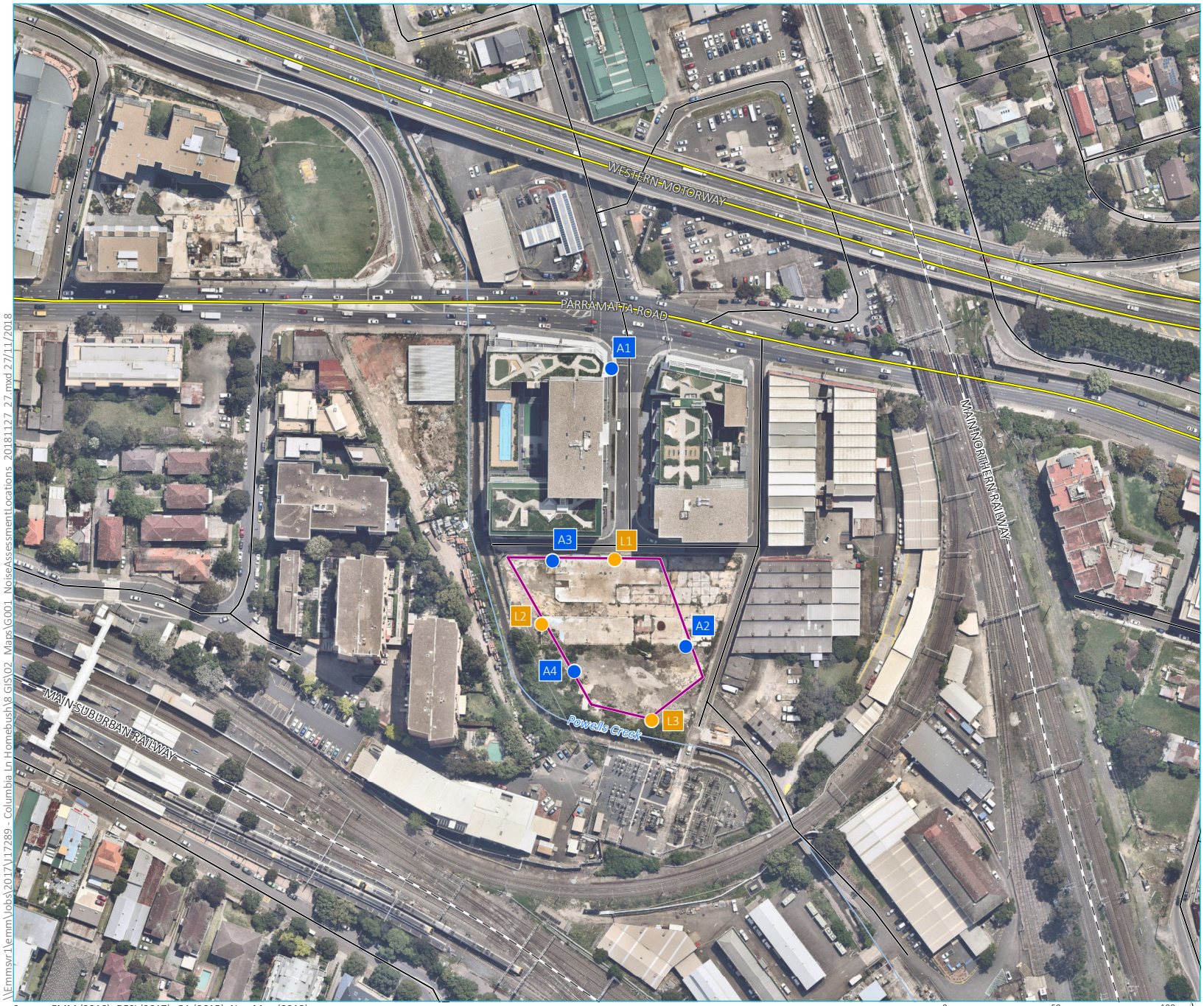
The subject site is surrounded by existing residential areas and commercial facilities and is also located near an electrical substation, Homebush railway station and major transport routes; Parramatta Road and the M4 Western Motorway. The subject site and surrounding features are shown in Figure 2.1. Features of the surrounding environment are summarised as follows:

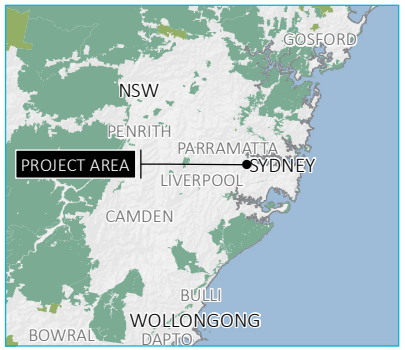
- The M4 Western Motorway and Parramatta Road are located approximately 160 m and 100 m, respectively, from the northern boundary of the subject site. Commercial and residential apartment buildings are located between the subject site and these roads and will provide considerable acoustic shielding.

- An electrical substation is located south of the water canal which is immediately south of the subject site. The nearest transformer is located approximately 15 m from the boundary of the subject site. We understand that Ausgrid has confirmed to JQZ that the substation is to be decommissioned. As such, noise from the substation will be eliminated and therefore not affect the development post occupancy.

- Homebush railway station is located approximately 150 m west south west of the subject site with several residential apartment buildings located in between the subject site and the station.

- The nearest railway line is located approximately 70 m south of the site's southern boundary. This line carries both freight and passenger trains.





KEY

- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Development site
- Attended measurement location
- Noise logger location

Source: EMM (2018); DFSI (2017); GA (2015); NearMap (2018)

0 50 100 m

GDA 1994 MGA Zone 56

N

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Proposed development site, noise monitoring locations and surrounding area

Stage 2, 11-17 Columbia Ln Homebush
Acoustic assessment report
Figure 2.1

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3 Existing noise levels

3.1 Methodology

Noise monitoring was conducted to establish the existing prevailing noise environment at the proposed development site. Three unattended noise loggers were used at points on the site's northern, western and south-eastern boundaries. Attended monitoring was also conducted at several locations around the site's boundary. Noise monitoring locations can be seen in Figure 2.1.

The noise monitoring locations were selected after careful inspection of the proposed development site, giving due consideration to other noise sources which may influence the readings (e.g. mechanical plant near the site), the proximity of neighbouring sensitive locations to the proposed site, and security issues for the noise monitoring devices.

The location of L1 was selected to represent the northern site boundary's road traffic noise levels from Parramatta Road, perpendicular to Nipper Street. The location of L2 was selected to represent the western site boundary's noise levels, taking into account shielding from the projects already completed in the area. Logger L3 was selected to represent the southern site boundary's noise levels from the freight and passenger train lines and station located to the south of the site. All measurement locations were also used to represent background and ambient noise levels at residential neighbours.

The long-term unattended noise monitoring results were supplemented by operator-attended noise surveys by EMM on 2 November 2018. The operator-attended noise surveys were conducted with the aim of determining the existing level of road and rail traffic noise across the subject site since completion of the Stage 1 development to the north of the subject site.

The unattended measurements were carried out using two Acoustic Research Laboratories EL316 noise loggers (serial numbers 16-306-037, 16-707-038) and one Rion EL-52X noise logger (serial number 186647). The loggers were left in place from Friday 2 to Monday 12 November (10 days). Loggers were programmed to record statistical noise level indices continuously in 15 minute intervals in accordance with the requirements of the NPfI, including the L_{Amax}, L_{A1}, L_{A10}, L_{A50}, L_{A90}, L_{A99}, L_{Amin} and the L_{Aeq}. Calibration of all instrumentation was checked prior to and following measurements. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

Weather data for the survey period was obtained from a Davis Vantage Vue weather station installed on site next to L2. The wind speed and the rainfall data were used to exclude noise data during periods of any rainfall and/or wind speed in excess of 5 m/s (approximately 9 knots) at the microphone height in accordance with NPfI methods.

A summary of the existing background and ambient noise levels is provided in Table 3.1. Daily results and charts from the noise logger are provided in Appendix A.

Table 3.1 Ambient noise monitoring summary

Noise monitoring location	Time period	Existing noise levels	
		$L_{Aeq(period)}$, dB	Rating background Level (RBL), dB
L1	Day	60	52
	Evening	62	51
	Night	57	47
L2	Day	56	50
	Evening	56	49
	Night	54	47
L3	Day	60	55
	Evening	60	55
	Night	59	54

Notes. 1. The daytime is 7 am to 6 pm; evening 6 pm to 10 pm; night-time 10 pm to 7 am.
On Sundays and Public Holidays, the daytime is 8 am to 6 pm; evening 6 pm to 10 pm; night-time 10 pm to 8 am.
2. The RBL is an NPI term and is used represent the background noise level.
3. L_{Aeq} is the energy averaged noise level over the measurement period and representative of general ambient noise. It is used for day (7 am to 10 pm) and night (10 pm to 7 am).

3.2 Operator-attended noise surveys

The results of the attended noise measurement are summarised in Table 3.2.

Table 3.2 Summary of operator-attended noise measurements

Location	Start time	Measured noise level dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}	
A1	2/11/2018 12:10	72	75	64	90	62 dB when traffic stopped at lights and M4 traffic/general hum can be heard 72 dB when Parra Rd is busy and traffic flowing 83 dB when vehicles cross sewer opening (metal clunk sound) 75 dB agi truck pass-by 83 dB Car horn across road M4 traffic is still audible when Parra Rd is busy
L1	2/11/2018 13:30	65	66	57	84	55 - 57dB when Parra Rd quiet 60 - 62dB when Parra Rd busy 78dB reversing beep from garbage truck 55dB M4 traffic/hum 65 - 72dB pass-bys on Gramophone lane - coming to and from carpark (10 in total) 62dB freight train passby, lasted 1.5minutes 62dB truck pass-by on M4.

Table 3.2 Summary of operator-attended noise measurements

Location	Start time	Measured noise level dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}	
A2	2/11/2018 13:47	56	57	52	72	50dB constant hum from substation 51dB quiet on Parra Rd 55dB Parra road busy 56dB truck compression breaks 58 dB two aircraft flyovers 52 dB occasional birdsong 54 dB truck pass-by – Ausgrid 53 dB train pass-by (no stop at station
A3	2/11/2018 14:04	62	61	52	77	53 dB when Parra Rd quiet 55 dB when Parra Rd busy 50 dB hum of substation 56 – 63 dB vehicle pass-by into carpark (roughly 9) 60 – 67 dB aircraft flyovers (3 in total) 55 dB heavy vehicle pass-by on Parra Rd
L2	2/11/2018 14:30	61	60	53	76	53 - 60dB carpark entry/exit pass-bys 54 dB when Parra Rd busy 51 – 53 dB general traffic hum (Parra Rd + M4 not discernible from each other) 66 dB one aircraft flyover No trains heard.
A4	2/11/2018 14:45	55	56	52	69	50 dB sub-station constant and dominant 55 dB when busy traffic 52 dB general traffic hum 53 dB occasional birdsong 62 dB one aircraft flyover No trains heard
L3	2/11/2018 15:01	58	59	57	71	55 dB substation dominant and constant 56 – 59 dB occasional birdsong 57 dB busy traffic from Parra Rd/m4 59 dB four Passenger train pass-bys (mostly low freq - 10-630Hz filter only 0.4dB less than LAeq) 62 dB Ausgrid truck pass-bys (3)

3.3 Correlation of attended measurements

The results from the operator-attended 15-minute measurements have been correlated to the results from the nearest unattended noise logger in order to establish criteria for the facades and areas nearby to the attended measurements. This has been performed by comparing the results from the attended measurements to the results from the loggers for the same 15-minute period and adjusting accordingly. Results from this correlation are shown in Table 3.3. Refer to Figure 2.1 for monitoring locations.

Table 3.3 Correlated attended measurement results

Attended measurement position	Logger correlated to	Attended measurement dB		Logger 15-minute result dB		Difference dB		Attended locations derived long term data, dB					
								Day		Evening		Night	
		L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}
A2	L3	56	52	63	57	7	5	53	50	53	50	52	49
A3	L1	62	52	61	55	0	3	60	49	62	48	57	44
A4	L2	55	52	57	52	2	0	54	50	54	49	52	47

Note: 1. Correlation at A1 is not relevant to the study and hence was not completed.

4 Assessment guidelines

4.1 Strathfield DCP No. 20 – Parramatta Rd Corridor Area

Where there is any inconsistency between any site specific DCP and the Strathfield Council Development Control Plan 2005, the site specific DCP prevails. DCP No. 20 Parramatta Rd Corridor Area is relevant to the subject site. Section 2.8 of DCP No. 20 provides requirements for residential development in relation to visual and acoustic privacy. An extract from DCP No. 20 relevant to this acoustic assessment is reproduced below.

2.8 Visual and Acoustic Privacy

Visual and acoustic privacy are important environmental considerations in relation to the existing and future residential development of the Corridor Area.

Objectives

a) Ensure adequate visual and acoustic privacy to residential apartments in the area and to private open space areas.

b) Protect the privacy of adjacent neighbours.

c) Protect residential development from the noise impact emanating from the various transport infrastructures in the area – i.e., the M4 Motorway, Parramatta Road and the railways line.

d) Provide personal and property security for residents and visitors and enhance perceptions of community safety.

Design Principles

…

3. The acoustic privacy of all development shall be considered in the context of the proposed development itself and its relationship to the surrounding environment. The site layout and building design shall ensure that:

(i) active communal recreation areas, parking areas, accessways and service equipment areas are separated from bedrooms and minimise the entry of high levels of external noise to dwellings;

(ii) bedrooms of one dwelling do not adjoin living rooms of adjacent dwellings; and

(iii) dwellings close to high-noise sources (such as busy roads and railway lines) are designed to locate habitable rooms and private open space away from noise sources and are protected by appropriate noise shielding devices.

4. Buildings are to be sited and designed to minimise the transmission of external noise to other buildings on the site and on adjacent land.

5. Noise impact associated with goods delivery and garbage collection, particularly early morning, should be minimised.

6. Developments adjoining a major road or railway line shall take into consideration impacts of the noise source on the future amenity of residents on the site, ensuring noise sensitive uses are placed in more shielded locations (refer to figure 23). For development located close to busy roads, reference should be made to AS2107 – "Acoustics – Recommended Design Sound Levels & Reverberation Times for Building Interiors" and AS3671-1989 "Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction". For development located close to railway lines, reference should be made to Hornsby Shire Council's Code of Practice for Sound Insulation of Residential Building and the State Rail's Publication titled "Rail Related Noise & Vibration". For development that may be impacted by vibration from road or rail, reference should be made to AS2670.2 Evaluation of Human Exposure to Vibration – Part 2: Continuous and Shock Induced Vibration in Buildings (1Hz to 80Hz). Such sites are also required to demonstrate adequate noise attenuation can be achieved within all dwellings through the use of materials and mitigative measure such as double-glazing in windows. The costs of any on-site noise attenuation measures required for the amenity of a development are to be borne entirely by the developer. Council may require a Noise Assessment report to be submitted with such applications, evaluating the likely noise environment of proposed developments.

7. Utilise noise barrier planning principles (no bedrooms facing noise source; locate service rooms, kitchens, bathrooms and stairs to separate living areas and bedrooms away from the noise source). Refer to Figure 23).

8. Council may require a Noise Impact Assessment Report to accompany a Development Application, particularly in respect of noise impact from Parramatta Road, the M4 Motorway and the Railway lines within the Parramatta Road Corridor Area.

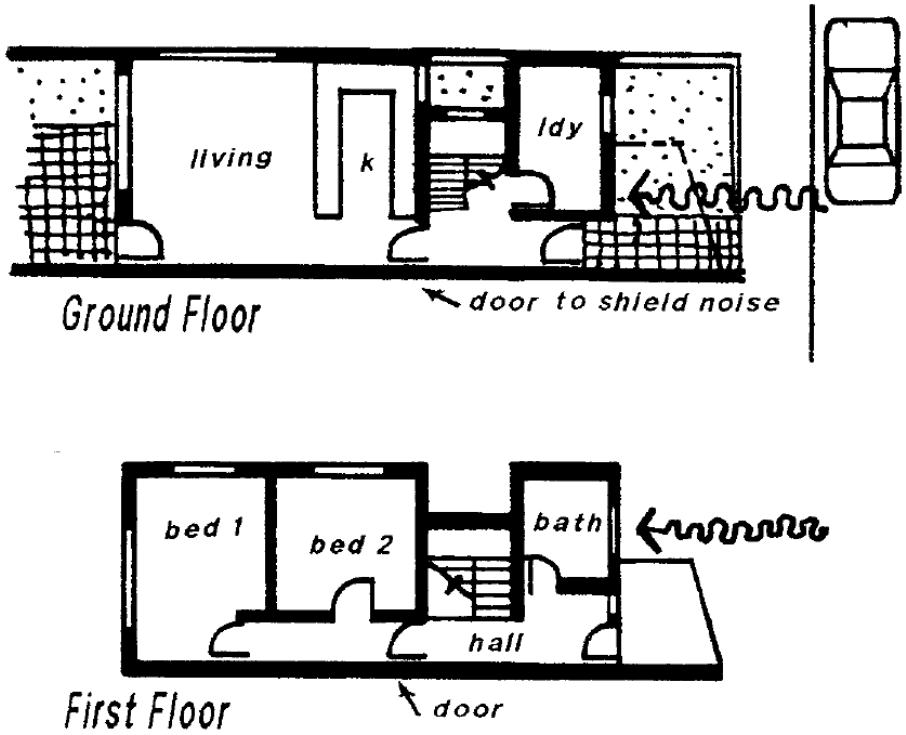


FIGURE 23: SERVICE ROOMS LOCATED CLOSE TO NOISE SOURCE SHIELDING NOISE SENSITIVE ROOMS

SOURCE: AMCORD 1997

4.2 Noise Policy for Industry (NPfI)

The NPfI provides noise assessment criteria to protect the community from excessive intrusive noise and preserve amenity for specific land uses. To ensure these objectives are met, the EPA provides two separate criteria: intrusiveness criteria and amenity criteria. The fundamental difference being intrusiveness criteria apply over 15 minutes in any period (day, evening or night), whereas the amenity criteria apply to the entire assessment period (day, evening or night).

4.2.1 Intrusiveness criteria

The intrusiveness criteria require that $L_{Aeq\ (15\ min)}$ noise levels from the proposed development do not exceed the RBL by more than 5 dB. Measured RBLs have been used to derive intrusiveness criteria that would apply at neighbouring residences based on each noise monitoring location.

Table 4.1 presents the intrusive noise criteria determined for the site based on the adopted RBLs.

Table 4.1 Intrusive noise criteria

Location	Period[1]	Adopted RBL, dB[2]	Intrusive criteria dB, $L_{Aeq\ (15\ min)}$[3]
L1	Day	52	57
	Evening	51	56
	Night	47	52
L2	Day	50	55
	Evening	49	54
	Night	47	52
L3	Day	55	60
	Evening	55	60
	Night	54	59
A2[3]	Day	50	55
	Evening	50	55
	Night	49	54
A3[3]	Day	49	54
	Evening	48	53
	Night	44	49
A4[3]	Day	50	55
	Evening	49	54
	Night	47	52

Notes. 1.The daytime is 7.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 7.00 am. On Sundays and Public Holidays, the daytime is 8.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 8.00 am.
2. The RBL is an NPfI term and is used represent the background noise level.
3. Adopted RBLs for these locations were calculated by correlating attended measurement with results from unattended logging from the nearest logger for the same 15-minute period. The night RBLs are considered conservative using this method were attended monitoring locations resulted in lower values compared to logger locations.

4.2.2 Amenity criteria

The assessment of amenity is based on noise criteria specific to the land use. The amenity criteria are used to assess the cumulative impacts of industrial noise. Where the measured existing industrial noise approaches recommended amenity criteria, it needs to be demonstrated that noise levels from new industry will not contribute to existing industrial noise such that criteria are exceeded. In accordance with the NPfI (Section 2.2.1), residential assessment locations potentially affected by the proposed development have been categorised in the NPfI 'urban' amenity category, meaning that the surrounding noise environment is an area that:

- is dominated by 'urban hum' or industrial source noise;
- has through traffic with characteristically heavy and continuous traffic flows during peak periods;
- is near commercial or industrial districts; or
- has any combination of the above.

The corresponding recommended amenity criteria for the proposed development are given in Table 4.2.

Table 4.2 Amenity criteria

Receiver type	Indicative area	Period[1]	Recommended noise level dB, $L_{Aeq\ (period)}$
Residential	Urban	Day	60
		Evening	50
		Night	45

Notes. The daytime is 7.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 7.00 am.
On Sundays and Public Holidays, the daytime is 8.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 8.00 am.

The recommended amenity noise levels represent the objective for total industrial noise at a receiver location, whereas the project amenity noise level represents the objective for noise from a single industrial development at a receiver location. To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project amenity noise level for industrial developments equals the recommended amenity noise level (Table 4.2) minus 5 dB.

The following exceptions to the above method to derive the project amenity noise level apply:

- in areas with high traffic noise levels;
- in proposed developments in major industrial clusters;
- where the resultant project amenity noise level is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time; and
- where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future. In such cases the relevant amenity noise level is assigned as the project amenity noise level for the development.

4.2.3 Project noise trigger level

The project-specific noise trigger level (PNTL) is the lower of the calculated intrusive or amenity criteria. Mechanical services and other general noise from the proposed development will have to satisfy NPfI PNTLs at surrounding existing residential properties, and at residential properties within the proposed development itself.

The PNTLs are provided in Table 4.6. Where existing L_{Aeq} levels are above the acceptable amenity levels and the resultant project amenity noise level is 10dB or more lower than the measured existing levels, it is set at 10dB below existing (ie $L_{Aeq,period}$ from Table 3.1) as per the NPfI. The NPfI conversion from $L_{Aeq,period}$ to $L_{Aeq,15minute}$ is +3dB, and was applied to the amenity targets below.

Table 4.3 NPfI background noise levels and PNTL, dB, $L_{Aeq(15min)}$

Assessment location	Period[1]	Intrusive criteria	Project amenity criteria	Project noise trigger level (PNTL) $L_{Aeq\ (15min)}$
L1	Day	57	60	57
	Evening	56	52 (10dB below existing)	55 (52+3)
	Night	52	47 (10dB below existing)	50 (47+3)
L2	Day	55	60	55
	Evening	54	50	53 (50+3)
	Night	52	45	48 (45+3)
L3	Day	60	60	60
	Evening	60	50	53 (50+3)
	Night	59	49 (10dB below existing)	52 (49+3)
A2	Day	55	60	55
	Evening	55	50	53 (50+3)
	Night	54	45	48 (45+3)
A3	Day	54	60	54
	Evening	53	52 (10dB below existing)	53
	Night	49	47 (10dB below existing)	49
A4	Day	55	60	55
	Evening	54	50	53 (50+3)
	Night	52	45	48 (45+3)

Notes. 1. The daytime is 7.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 7.00 am. On Sundays and Public Holidays, the daytime is 8.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 8.00 am.

4.3 Road traffic noise

4.3.1 Development near rail corridors and busy road – interim guideline

The Department of Planning (DoP) document 'Development near Rail Corridors and Busy Roads - Interim Guideline' provides internal noise levels that should be achieved for developments near busy roads. These are identified in State Environmental Planning Policy (SEPP) Infrastructure (2007 clause 102(3)) and are as follows:

> (3) 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:
>
> (a) in any bedroom in the building - 35 dB(A) at any time between 10 pm and 7 am,
>
> (b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) - 40 dB(A) at any time.

Section 3.6 of the Guideline also states that:

> If internal noise levels with windows or doors open exceed the criteria by more than 10 dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia.

4.3.2 AS/NZS 2107:2016

The Australian Standard AS/NZS 2107-2016: '*Acoustics – Recommended design sound levels and reverberation times for building interiors*' recommends design criteria for conditions affecting the acoustic environment within occupied spaces.

Table 4.4 provides a summary of recommended internal noise levels for houses, apartments, and retail buildings near 'major roads', shop and commercial buildings as per AS/NZS 2107-2016.

Table 4.4 AS/NZS 2107:2016 recommended design sound levels

Type of occupancy/activity	Recommended design sound level, dB, $L_{Aeq\ (15\ min)}$	
	Satisfactory	Maximum
Houses and apartments near major roads		
Living areas	35	45
Sleeping areas	30	40
Apartment common areas	45	55
Enclosed car parks	55	65
Shop buildings		
Department stores (main floor)	50	55
Department stores (upper floor)	45	50
Small retail stores (general)	45	50
Supermarkets	50	55
Speciality shops (where detailed discussion in necessary in transactions)	40	45
Office Buildings		
Board and conference rooms	30	40
Corridors and lobbies	45	50
General office areas	40	45
Private offices	35	40

4.4 Rail noise

The Department of Planning (DoP) document 'Development near Rail Corridors and Busy Roads - Interim Guideline' provides internal noise levels that should be achieved for developments near road corridors. These are identified in State Environmental Planning Policy (SEPP) Infrastructure (2007 clause 87) and are as follows:

> (3) 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:
>
> (a) in any bedroom in the building - 35 dB(A) at any time between 10 pm and 7 am,
>
> (b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) - 40 dB(A) at any time.

These recommended levels are consistent with those which apply to developments near busy roads (refer Section 4.4). In this instance, because the development is exposed to both road and rail, the total noise level from both noise sources has been considered in the building facade and ventilation recommendations.

There are no specific rail noise targets established for outdoor areas for developments near existing rail lines. However, this issue was considered as discussed in the assessment section of this report.

4.5 Building Code of Australia (BCA) sound insulation requirements (Part F5 BCA)

For sound transmission and insulation between sole occupancy units (SOU) within the proposed development, walls and floors are to be constructed in accordance with requirements of Part F5 of the Building Code of Australia (BCA) (and National Construction Code, NCC). Sound insulation requirements are summarised in Table 4.5.

Table 4.5 NCC Part F5 Requirements (Class 2 or 3)

Building Element	Minimum Part F4 Requirements
Sound insulation Rating of Walls (Class 2 or 3)	
Walls between separate sole occupancy units.	Rw+ Ctr 50 (airborne)
Walls between wet areas (bathrooms, sanitary compartment, laundry or kitchen) and a habitable room (other than kitchen) and adjoining apartments.	Rw + Ctr (airborne) & of discontinuous construction
Walls between sole occupancy unit and stairway, public corridors, public lobby or the like or parts of a different classification.	Rw 50 (airborne)
Walls between a plant room or lift shaft and a sole occupancy unit.	Rw 50 (airborne) & of discontinuous construction
Sound Insulation Rating of Floors (Class 2 or 3)	
Floors between sole occupancy units or between a sole occupancy unit and plant room, lift shaft, stairway, public corridor, public lobby or the like.	Rw + Ctr 50 (airborne) & Ln,w < 62 (impact)
Apartment Entry Doors (Class 2 or 3)	
A door incorporated in a wall that separates a sole-occupancy unit from a stairway, public corridor, public lobby or the like.	Rw 30 (airborne)
Services (Class 2, 3 or 9c)	
If a storm water pipe, a duct, soil, waste or water supply pipe including a duct or pipe that is located in a wall or floor cavity serves or passes through more than one sole occupancy unit must be separated:	
If the adjacent room is a habitable room (other than a kitchen); or	Rw + Ctr 40
If the room is a kitchen or non-habitable room	Rw + Ctr 25

4.5.1 Construction deemed to satisfy

The forms of construction must be installed as follows (as per the BCA):

(a) Masonry – Units must be laid with all joints filled solid, including those between the masonry and any adjoining construction.

(b) Concrete slabs – Joints between concrete slabs or panels and any adjoining construction must be filled solid.

(c) Sheeting materials –
- (i) if one layer is required on both sides of a wall, it must be fastened to the studs with joints staggered on opposite sides;
- (ii) if two layers are required, the second layer must be fastened over the first layer so that the joints do not coincide with those of the first layer; and
- (iii) joints between sheets or between sheets and any adjoining construction must be taped and filled solid.

(d) Timber or steel-framed construction – perimeter framing members must be securely fixed to the adjoining structure and –
- (i) bedded in resilient compound; or
- (ii) the joints must be caulked so that there are no voids between the framing members and the adjoining structure.

(e) Services –
- (i) Services must not be chased into concrete or masonry elements.

(ii) A door or panel required to have a certain Rw + Ctr that provides access to duct, pipe or other service must –
  (A) not open onto any habitable room (other than a kitchen); and
  (B) be firmly foxed so as to overlap the frame or rebate of the frame by not less than 10 mm, be fitted with sealing gasket along all edges and be constructed of –
    (aa) wood, particleboard or blockboard not less than 33 mm thick; or
    (bb) compressed fibre reinforced cement sheeting not less than 9Â mm thick; or
    (cc) other suitable material with a mass per unit area not less than 24.4 kg/m^2.

(iii) A water supply pipe must –
  (A) only be installed in the cavity of discontinuous construction; and
  (B) in the case of a pipe that serves only one sole-occupancy unit, not be fixed to the wall leaf on the side adjoining any other sole-occupancy unit and have a clearance not less than 10 mm to the other wall leaf.

(iv) Electrical outlets must be offset from each other –
  (A) in masonry walling, not less than 100 mm; and
  (B) in timber or steel framed walling, not less than 300 mm.

The Council DCP No.20 design principles as described in Section 4.1 will be largely adopted throughout the development. For a limited number of apartments, bedrooms do adjoin lounge or dining areas, an outcome of achieving a higher solar amenity to specific apartments. Although not a requirement of the BCA, where this is the case, the party wall construction detail will be considered for redesign to achieve a rating greater than the minimum BCA requirement of Rw+Ctr 50 and hence will mitigate any potential acoustic consequences for such apartments. The redesign will maintain the existing party wall depth so that consistency with other apartments is maintained.

4.6 Construction noise

4.6.1 Interim Construction Noise Guideline ICNG

The latest construction noise guidelines are provided in the Interim Construction Noise Guideline (ICNG) (DECC 2009). Table 4.6 is an extract from the ICNG and provides noise management levels for residential receivers during and outside standard construction hours.

Table 4.6 ICNG residential noise management levels

Time of day	Management level $L_{Aeq\ (15\ min)}$	How to apply
Recommended standard hours: Monday to Friday 7 am to 6pm Saturday 8 am to 1 pm No work on Sundays or public holidays.	Noise affected RBL + 10 dB.	The noise affected level represents the point above which there may be some community reaction to noise: • Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A).	The highly noise affected level represents the point above which there may be strong community reaction to noise: • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: – times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. – if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected RBL + 5 dB.	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2.

Source: ICNG (DECC, 2009).

Table 4.7 is an extract from the ICNG and provides noise management levels for commercial and industrial land uses for standard and out of hours periods.

Table 4.7 ICNG noise management levels at commercial and industrial land uses

Land use	Management level, $L_{Aeq\ (15\ min)}$
Industrial premises.	External noise level 75 dB(A) (when in use)
Offices, retail outlets.	External noise level 70 dB(A) (when in use)

Source: ICNG (DECC, 2009).

4.6.2 Noise management levels

The construction noise management levels (NMLs) for the proposed development have been developed using the unattended noise monitoring data collected at the noise monitoring locations in accordance with the ICNG. These are provided in Table 4.8.

Table 4.8 Construction noise management levels

Assessment location	Period	Representative RBL[1], dB	NML, $L_{Aeq\ (15min)}$
Residential near L1 (or similar acoustic environment)	Day	52	62
	Evening	51	56
	Night	47	52
Residential near A3 (or similar acoustic environment)	Day	49	59
	Evening	48	53
	Night	44	49
Residential near A2 (or similar acoustic environment)	Day	50	60
	Evening	50	55
	Night	49	54
Residential near L3 (or similar acoustic environment)	Day	55	65
	Evening	55	60
	Night	54	59
Neighbouring industrial premises	When in use	n/a	75
Offices, retail outlets.	When in use	n/a	70

4.7 Construction vibration

4.7.1 Human comfort – Assessing vibration a technical guideline

Environmental Noise Management – Assessing Vibration: a technical guideline (DEC, 2006) is based on guidelines contained in BS 6472 – 2008, Evaluation of human exposure to vibration in buildings (1-80Hz).

The guideline presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques. At vibration values below the preferred values, there is a low probability of adverse comment or disturbance to building occupants. Where all feasible and reasonable mitigation measures have been applied and vibration values are still beyond the maximum value, it is recommended the operator negotiate directly with the affected community.

The guideline defines three vibration types and provides direction for assessing and evaluating the applicable criteria. Table 2.1 of the guideline provides examples of the three vibration types and has been reproduced in Table 4.9.

Table 4.9 Examples of types of vibration (from Table 2.1 of the guideline)

Continuous vibration	Impulsive vibration	Intermittent vibration
Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery).	Infrequent: Activities that create up to 3 distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading. Blasting is assessed using ANZECC (1990).	Trains, intermittent nearby construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer these would be assessed against impulsive vibration criteria.

4.7.2 Continuous vibration

Appendix C of the guideline outlines acceptable criteria for human exposure to continuous vibration (1-80Hz). The criteria are dependent on both the time of activity and the occupied place being assessed. Table 4.10 reproduces the preferred and maximum criteria relating to measured peak velocity.

Table 4.10 Criteria for exposure to continuous vibration

Place	Time	Peak velocity (mm/s)	
		Preferred	Maximum
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day or night-time	0.14	0.28
Residences	Daytime	0.28	0.56
	Night-time	0.20	0.40
Offices	Day or night-time	0.56	1.1
Workshops	Day or night-time	1.1	2.2

Notes: 1. RMS velocity (mm/s) and vibration velocity value (dB re 10^{-9} mm/s).
2. Values given for most critical frequency >8 Hz assuming sinusoidal motion.

4.7.3 Intermittent vibration

Intermittent vibration (as defined in Section 2.1 of the guideline) is assessed using the vibration dose concept which relates to vibration magnitude and exposure time.

Intermittent vibration is representative of activities such as impact hammering, rolling or general excavation work (such as an excavator tracking).

Section 2.4 of the Guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV) which requires the measurement of the overall weighted RMS (root mean square) acceleration levels over the frequency range 1 Hz to 80 Hz. To calculate VDV the following formula (refer to Section 2.4.1 of the guideline) was used:

$$VDV = \left[\int_0^T a^4(t)dt\right]^{0.25}$$

Where VDV is the vibration dose value in $m/s^{1.75}$, *a (t)* is the frequency-weighted rms of acceleration in m/s^2 and *T* is the total period of the day (in seconds) during which vibration may occur.

The Acceptable Vibration Dose Values (VDV) for Intermittent Vibration are reproduced in Table 4.11.

Table 4.11 Acceptable vibration dose values (VDV) for intermittent vibration ($m/s^{1.75}$)

Location	Day[1]		Night[1]	
	Preferred value, $m/s^{1.75}$	Maximum value, $m/s^{1.75}$	Preferred value, $m/s^{1.75}$	Maximum value, $m/s^{1.75}$
Critical Areas	0.10	0.20	0.10	0.20
Residences	0.20	0.4	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Notes: 1.The daytime is 7.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 7.00 am. On Sundays and Public Holidays, the daytime is 8.00 am to 6.00 pm; evening 6.00 pm to 10.00 pm; night-time 10.00 pm to 8.00 am.
2. These criteria are indicative only, and there may be a need to assess intermittent values against continuous or impulsive criteria for critical areas.

There is a low probability of adverse comment or disturbance to building occupants at vibration values below the preferred values. Adverse comment or complaints may be expected if vibration values approach the maximum values. The Guideline states that activities should be designed to meet the preferred values where an area is not already exposed to vibration.

Impulsive vibration is typically not characteristic of construction activity and for assessment purposes continuous and intermittent vibration criteria should primarily be applied.

4.7.4 Structural vibration criteria

Most commonly specified "safe" structural vibration limits are designed to minimise the risk of threshold or cosmetic surface cracks and are set well below the levels that have potential to cause damage to the main structure.

In terms of the most recent relevant vibration damage criteria, Australian Standard AS 2187.2 - 2006 "*Explosives - Storage and Use - Use of Explosives*" recommends the frequency dependent guideline values and assessment methods given in BS 7385 Part 2-1993 *"Evaluation and measurement for vibration in buildings Part 2*" be used as they are "applicable to Australian conditions".

The standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

Table 4.12 Transient vibration guide values - minimal risk of cosmetic damage

Line	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

The standard states that the guide values in Table 4.12 relate predominantly to transient vibration which does not give rise to resonant responses in structures and low-rise buildings.

Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table 4.12 may need to be reduced by up to 50%.

Sheet piling activities (for example) are considered to have the potential to cause dynamic loading in some structures (eg residences) and it may therefore be appropriate to reduce the transient values by 50%.

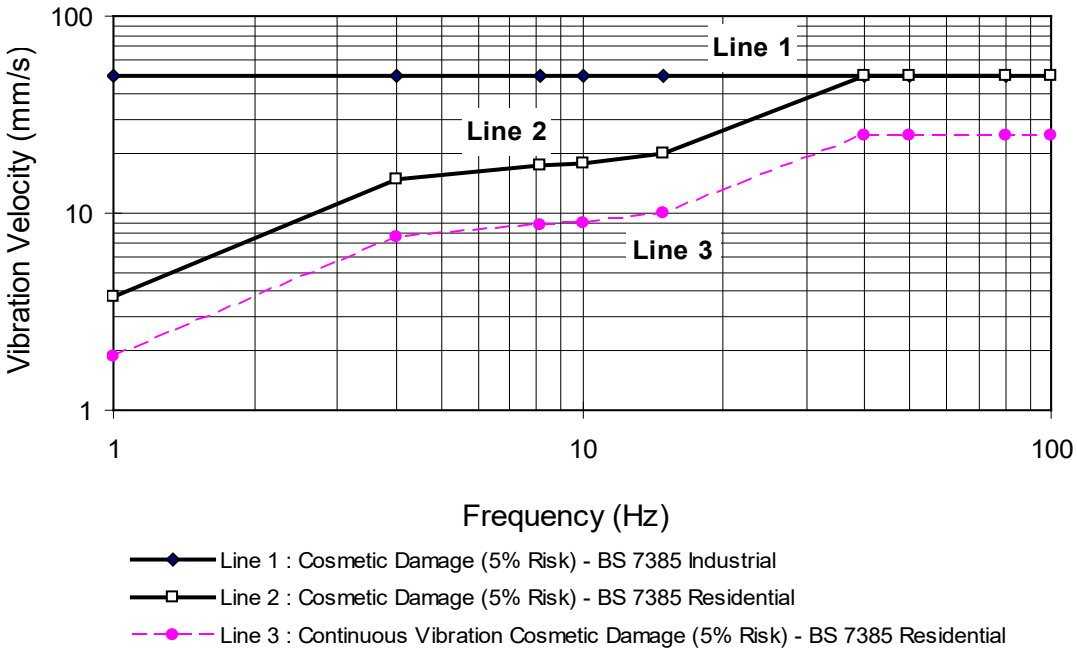


Figure 4.1 Graph of transient vibration guide values for cosmetic damage

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the guide values for building types corresponding to Line 2 are reduced.

Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard goes on to state that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 4.12, and major damage to a building structure may occur at values greater than four (4) times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the guide values in Table 4.12 should not be reduced for fatigue considerations.

In order to assess the likelihood of cosmetic damage due to vibration, AS2187 specifies that vibration measured should be undertaken at the base of the building and the highest of the orthogonal vibration components (transverse, longitudinal and vertical directions) should be compared with the criteria curves presented in Table 4.12.

It is noteworthy that extra to the guide values nominated in Table 4.12, the standard states that:

> "Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK."

Also that:

> "A building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive."

4.8 Ground-borne noise

Ground-borne noise is noise generated by vibration transmitted through the ground into a structure. The ICNG provides guidance on the assessment of ground-borne noise and relevant internal noise levels for the evening and night-time periods above which management actions should be implemented.

It is understood that vibration-generating events, such as vibratory rolling and compacting, would occur during the daytime only. As such, ground-borne noise impacts are not expected at the nearest residences.

4.9 Rail traffic vibration

With respect to ground borne vibration due to rail operations, the DP&I guideline at Figure 3.2 (Figure 4.2 below) provides an assessment zone. The guideline states, "Developments within this zone will need a vibration assessment". The subject site is outside the 60m zone where an assessment is required for "Other Vibration Sensitive Buildings". Hence, vibration impacts are unlikely according to the guideline and are not considered further.

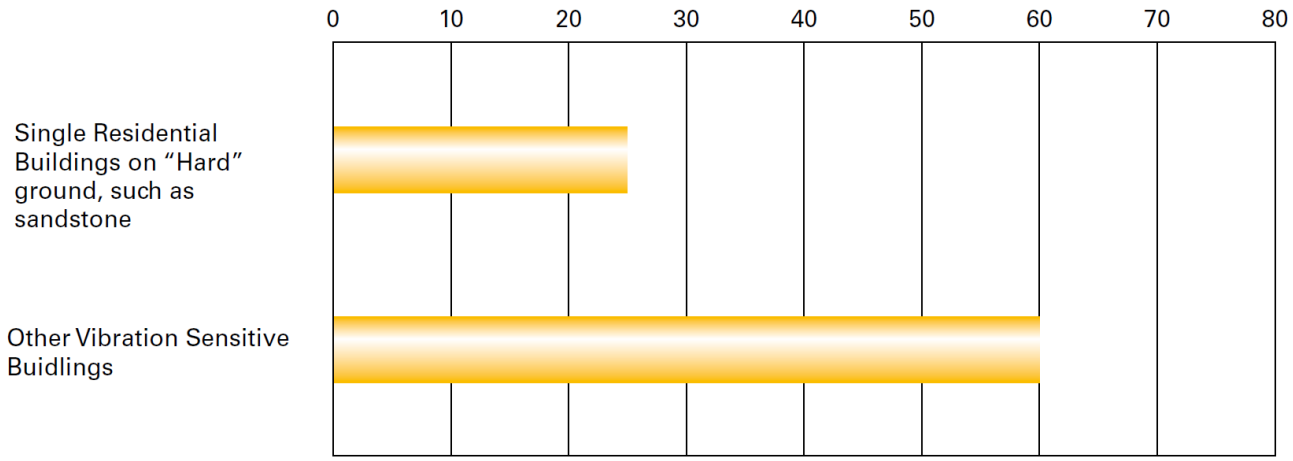


Figure 4.2 **Acoustic assessment zones based on distance (m) of noise-sensitive development from operational track (not corridor) - Source: DP&I 2008**

5 Acoustic assessment

5.1 Mechanical plant noise

The precise plant selections are unknown at this stage, however most plant areas will likely either be on a basement or roof level. Assuming the use of conventional plant equipment and noise mitigation methods such as the selection of equipment based on quiet operation and appropriate use of enclosures, localised barriers, acoustic attenuators and acoustically treated ductwork, it is expected that criteria defined in Section 4.2.3 will be met.

During the detailed design stage an assessment of external mechanical plant and equipment will be conducted to assess against noise criteria defined in Section 4.2.3.

5.2 Acoustic performance of building elements

If internal noise limits cannot be met by standard construction, building upgrades may be required. The DoP's *"Development near rail corridors and busy roads - interim guideline"* (2008) – Appendix C – "*Acoustic Treatment of Residences"* provides categories of building upgrades and the associated Weighted Sound Reduction Index (Rw) of each building element. This is reproduced in Table 5.1.

Table 5.1 Acoustic performance of building elements

Category of Noise Control Treatment	R_w of Building Elements (minimum assumed)				
	Windows/Sliding Doors	Frontage Facade	Roof	Entry Door	Floor
Category 1	24	38	40	28	29
Category 2	27	45	43	30	29
Category 3	32	52	48	33	50
Category 4	35	55	52	33	50
Category 5	43	55	55	40	50

Source: Development near rail corridors and busy roads - interim guideline (2008) – Appendix C – "Acoustic Treatment of Residences" (DoP).

5.3 Residential construction recommendations

The external noise levels were calculated using the ISO9613 algorithm in Brüel & Kjær Predictor noise mapping and modelling software. The road and rail noise impact on the proposed development can be visualised for the day and night periods using the noise maps in Appendix B. The noise mapping has been calibrated based on unattended and attended noise monitoring described in this report. This includes at attended location A1 positioned close to Parramatta Road. Surrounding existing buildings were included in modelling as shown in Appendix B. Any future buildings will likely further improve the noise incident on the subject development by virtue of providing additional shielding from roads or rail noise sources.

Recommendations for the external building fabric were not required based on acoustics and standard construction and adopting 6.38mm thick laminated glazing (usually standard for JQZ developments) will be adequate in mitigating noise to acceptable internal levels. However, for some areas of the development, operable façade elements (windows and doors) will be required to remain closed to achieve internal noise targets. This requirement applies to apartments in Table 5.2 where daytime or night time noise levels exceed 50dB and 45dB respectively (for open windows, these external noise levels equate to 40dB and 35dB internally respectively, ie the targets recommended in SEPP (Infrastructure) 2007)).

The SEPP Infrastructure trigger for BCA compliant mechanical ventilation applies where noise levels are more than 10dB above internal noise targets. Applying this to levels 1 – 9, being those where natural ventilation requirements apply (for non-acoustic reasons), would mean noise levels in Table 5.2 above 60dB and 55dB for the daytime and night time respectively require consideration. The sections of each façade where this occurs can be seen in the modelling results presented in Appendix B. Portions of the façade where predictions exceed 60dB for day and 55dB for night can be seen in these figures for each period respectively (ie non-green areas).

Based on this, only Building B east and south facades trigger the need for BCA compliant mechanical ventilation and only during the night time period (bold text in Table 5.2). That is, at night external building elements to bedrooms need to be closed so that internal acoustic criteria are satisfied. The cross ventilation solution for the apartments on the east and south façade of Building B (the only building requiring BCA compliant mechanical ventilation for acoustic reasons) are understood to utilise the living rooms and study areas for natural cross venting. Hence, bedrooms will not be compromised for this purpose. Note that daytime levels within 2dB of the 60dB threshold are within industry accepted measurement tolerances and therefore are not triggered for treatment.

Whilst unlikely, where the living and study spaces cannot be used to achieve adequate cross ventilation, façade acoustic transfer grilles and ducts will be adopted for any affected bedrooms of Building B. The revised architectural design includes the introduction of glazed louvre winter garden arrangements to balconies for apartments B2.01 and B2.02, and otherwise a façade acoustic plenum or acoustic transfer duct system for bedrooms on the east and southern facades for the first nine levels of Building B (ie apartments on levels 1 to 8 of the proposal). Specific acoustic design detail for plenums or transfer ducts will be developed together with product suppliers to achieve the desired acoustic benefits. Refer to Appendix A for acoustic treatments in nominated areas.

Table 5.2 Façade noise levels

Building	Facade	Levels	Noise level range, L_{Aeq} dB	
			Day	Night
A	North	1-9	48 - 58	46 - 55
		10+	53 - 61	50 - 58
	West	1-9	48 - 57	47 - 55
		10+	49 - 58	47 - 56
	South (inward facing)	1-9	46 - 54	44 - 52
		10+	54 - 56	52 - 54
Building joining A and B	East	1-9	56 – 58	54 - 56
B	East	1-9	56 - 61	55 – **60**
		10+	58 - 60	56 - 59
	Southeast	1-9	58 - 61	**57 - 59**
		10+	57 - 59	56 - 59
	Southwest	1-9	56 - 58	54 - 56
		10+	56 - 59	55 - 57

5.4 Communal space

Another area considered in the assessment is the central outdoor communal space on the ground that is generally bounded by the proposed buildings. This area of the site is screened from the existing electricity asset to the south and partially protected from the rail operations by the proposed site layout (ie Building B largely shields the outdoor space). The electricity asset is expected to cease noise emission when it is largely decommissioned in 2020 and well before occupation of this development. Irrespective of its decommissioning, the subject communal space is completely shielded from such noise. There are no outdoor rail noise target levels for development near existing rail lines. Nonetheless, the rail operational noise for this communal area is expected to be well below the 65 dB $L_{Aeq,15hour}$ daytime and 60 dB $L_{Aeq,9hour}$ night time amenity target for residences near redeveloped rail corridors (albeit not applicable to this development) as stipulated in the NSW EPA's Rail Infrastructure Noise Guideline (EPA 2013). Table 5.2 and Appendix B confirms at façade external noise levels from road and rail combined of no greater than 61 dB L_{Aeq} day and 60dB L_{Aeq} night. The central part of the courtyard is well shielded from rail operations and hence noise levels will be significantly lower. Hence additional measures are not warranted for the purposes of external noise amenity.

5.5 Other matters

5.5.1 Waste management facilities noise

Waste chutes are strategically situated away from apartment entry doors and circulation corridors, and waste garbage rooms and compactors are located in the basement level 1 within enclosed rooms. This is considered good practice for apartment developments and adequately controls noise from such activities. Further management measures that should be considered include limiting waste management activities such as truck movements to the hours of 7am to 6pm weekdays and 8am to 6pm on weekends and public holidays, generally consistent with the NSW EPA's defined daytime period.

5.5.2 Apartments facing the 8-storey gallery cut-out below Building A

Council raised acoustics in their correspondence of 22 May 2020 relating to this matter and cross ventilation. The revised design means that the apartments in this area are no longer counted in the cross ventilation group required to achieve design guides.

6 Conclusion

EMM has completed an acoustic assessment of the proposed development at 11-17 Columbia Lane, Homebush, NSW.

Existing background and ambient noise levels were measured, and noise criteria were set for emissions from the development during operation and construction.

Although the precise mechanical plant selections are unknown at this stage, mechanical plant noise emissions from the proposed development are expected to satisfy relevant criteria if conventional plant and noise mitigation methods are used.

Computational modelling indicates that the development is exposed to road traffic noise from the M4 Motorway, Parramatta Road and rail traffic noise to the south of the site. In order to achieve appropriate internal noise levels, upgrades to building elements are not required for acoustic purposes. Treatments such as winter gardens, façade acoustic plenums or transfer ducts are however included in the revised building design to manage cross ventilation requirements and acoustics.

A construction noise and vibration management plan is being prepared for the proposed development for the construction certificate stage and the relevant criteria relating to construction noise and vibration derived in this report will be adopted.

The rail traffic vibration assessment indicates that the impacts will be negligible and within (satisfy) criteria; no special building design features are required to mitigate rail traffic vibration.

Glossary

Several technical terms are required for the discussion of noise. These are explained in Table G.6.1.

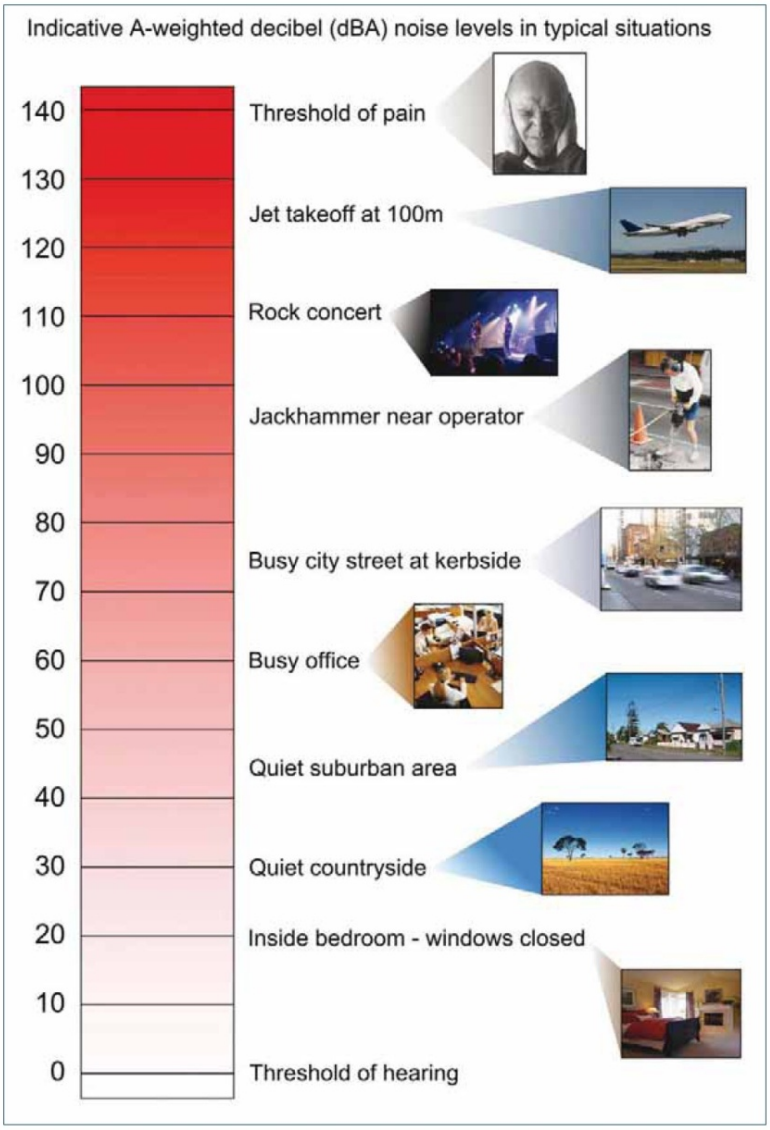
Table G.6.1 Glossary of acoustic terms

Term	Description
dB	Noise is measured in units called decibels (dB).
A-weighting	There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
AWS	Automatic weather station
L_{A1}	The A-weighted noise level exceeded for 1% of a measurement period.
L_{A10}	The A-weighted noise level which is exceeded 10% of the time. It is approximately equivalent to the average of maximum noise levels.
L_{A90}	Commonly referred to as the background noise, this is the A-weighted level exceeded 90% of the time.
L_{Aeq}	The A-weighted energy average noise from a source and is the equivalent continuous sound pressure level over a given period. The $L_{eq,15min}$ descriptor refers to an Leq noise level measured over a 15-minute period.
L_{Amax}	The maximum root mean squared A-weighted sound pressure level received at the microphone during a measuring interval.
PNTL	Project noise trigger level
RBL	The Rating Background Level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period.
Rw	Weighted Sound Reduction Index. Rw describes the airborne sound insulating power of a building element. It is a laboratory measured value. It can apply to walls, ceiling/floors, ceiling/roofs, doors, or windows.
Ctr	Spectrum adaptation term. An adjustment for low frequencies used when assessing sound insulation performance.
VDV	Vibration dose values

It is useful to have an understanding of decibels, the unit of noise measurement. Table G.6.2 gives an indication as to what an average person perceives about changes in noise levels. Examples of common noise levels are provided in Figure G.1.

Table G.6.2 Perceived change in noise levels

Change in sound level (dB)	Perceived change in noise level
1 to 2	typically indiscernible
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times as loud (or quarter) as loud



Source: Road Noise Policy (Department of Environment, Climate Change and Water (DECCW) 2011).

Figure G.1 Common noise levels

Appendix A

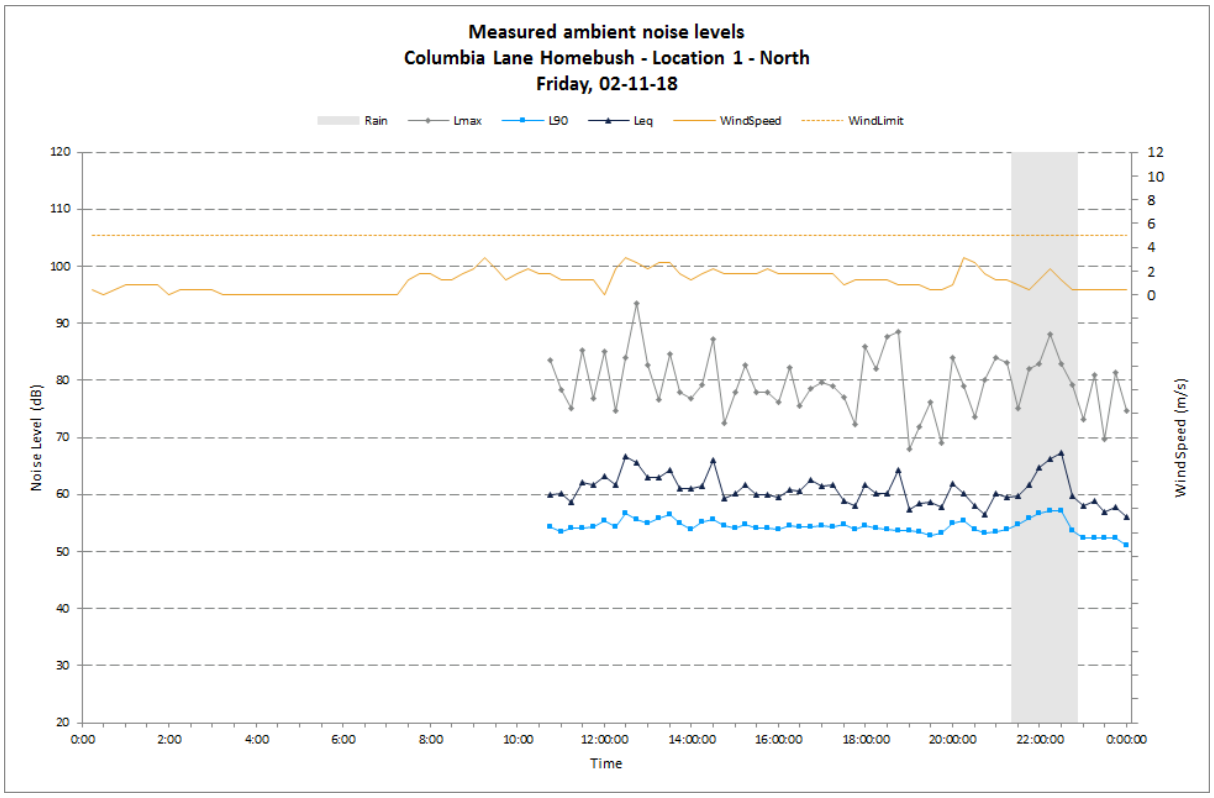
Unattended noise monitoring results

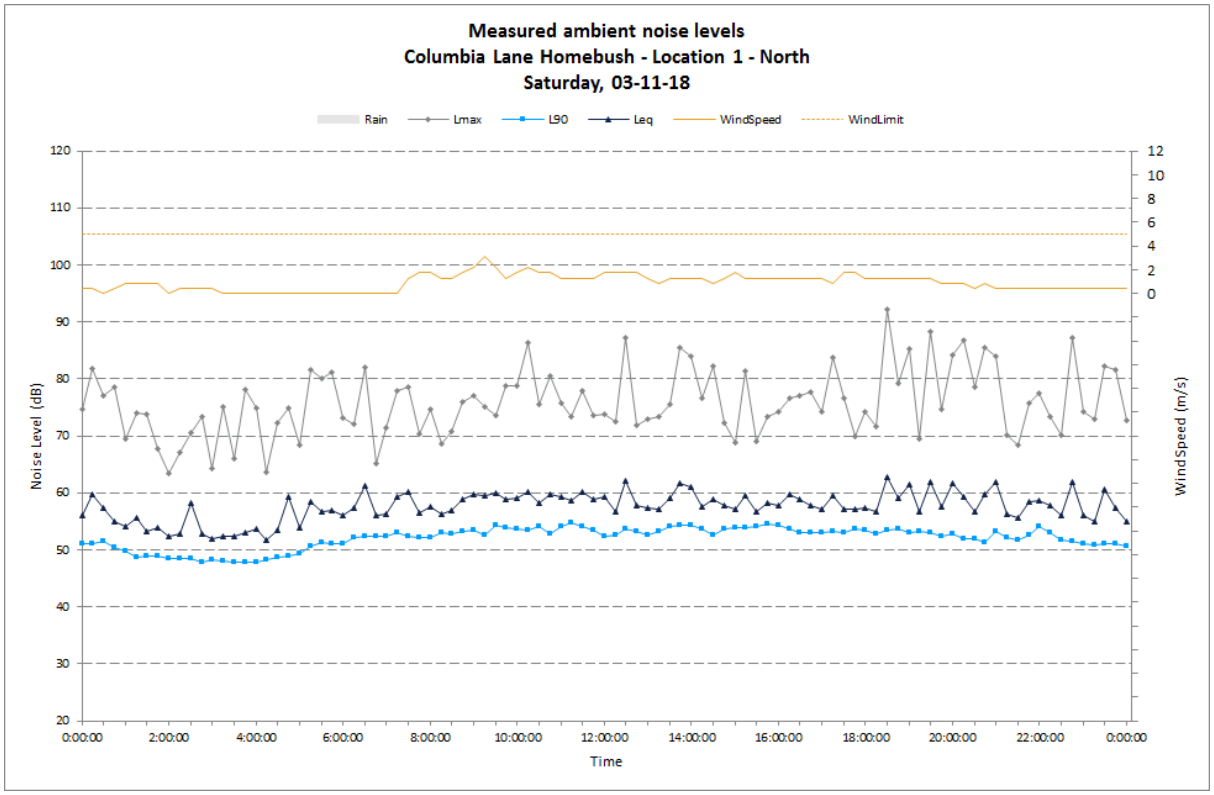
A.1 Location 1 – Summary

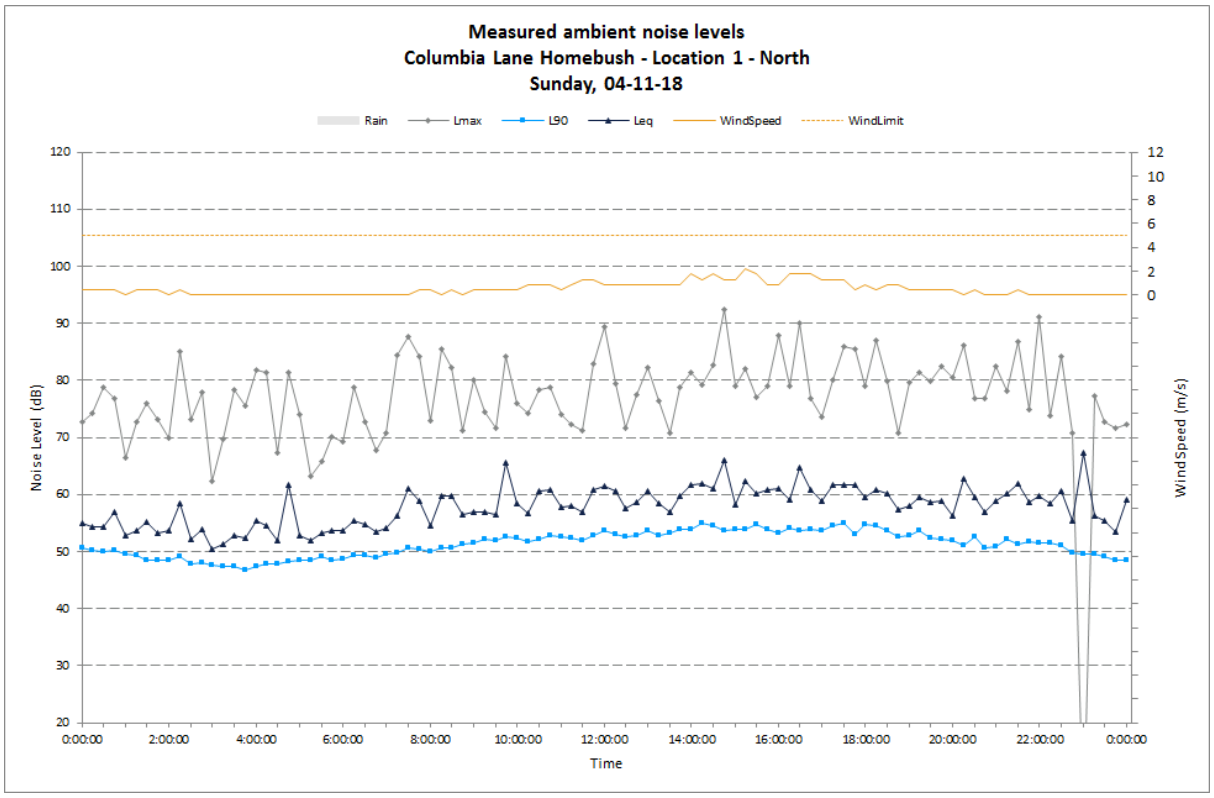
Table A.1 Summary values – Location 1

Date	ABL Day	ABL Evening	ABL Night	LAeq,11 hour Day	LAeq,4 hour Evening	LAeq,9 hour Night	LAeq,15 hour Day	LAeq,24 hour Day	LAeq,8 hour Night
Friday, 02-11-18	0	0	48	0	0	56	0	0	56
Saturday, 03-11-18	53	52	47	59	60	56	59	58	56
Sunday, 04-11-18	51	51	47	61	60	58	60	60	58
Monday, 05-11-18	52	51	47	60	59	58	60	59	57
Tuesday, 06-11-18	53	53	48	60	60	57	60	59	57
Wednesday, 07-11-18	0	51	0	0	60	0	0	0	0
Thursday, 08-11-18	52	51	46	60	59	57	60	59	57
Friday, 09-11-18	53	51	46	62	68	58	65	63	58
Saturday, 10-11-18	52	51	46	59	59	57	59	58	57
Sunday, 11-11-18	51	51	46	59	60	57	60	59	57
Monday, 12-11-18	0	0	0	0	0	0	0	0	0
Summary Values	52	51	47	60	62	57	61	60	57

Notes: 1. 0 indicates periods with too few valid samples due to weather or logger operation.
2. Leq24hr encompasses the period 7am to 7am.


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Friday, 02-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Saturday, 03-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Sunday, 04-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
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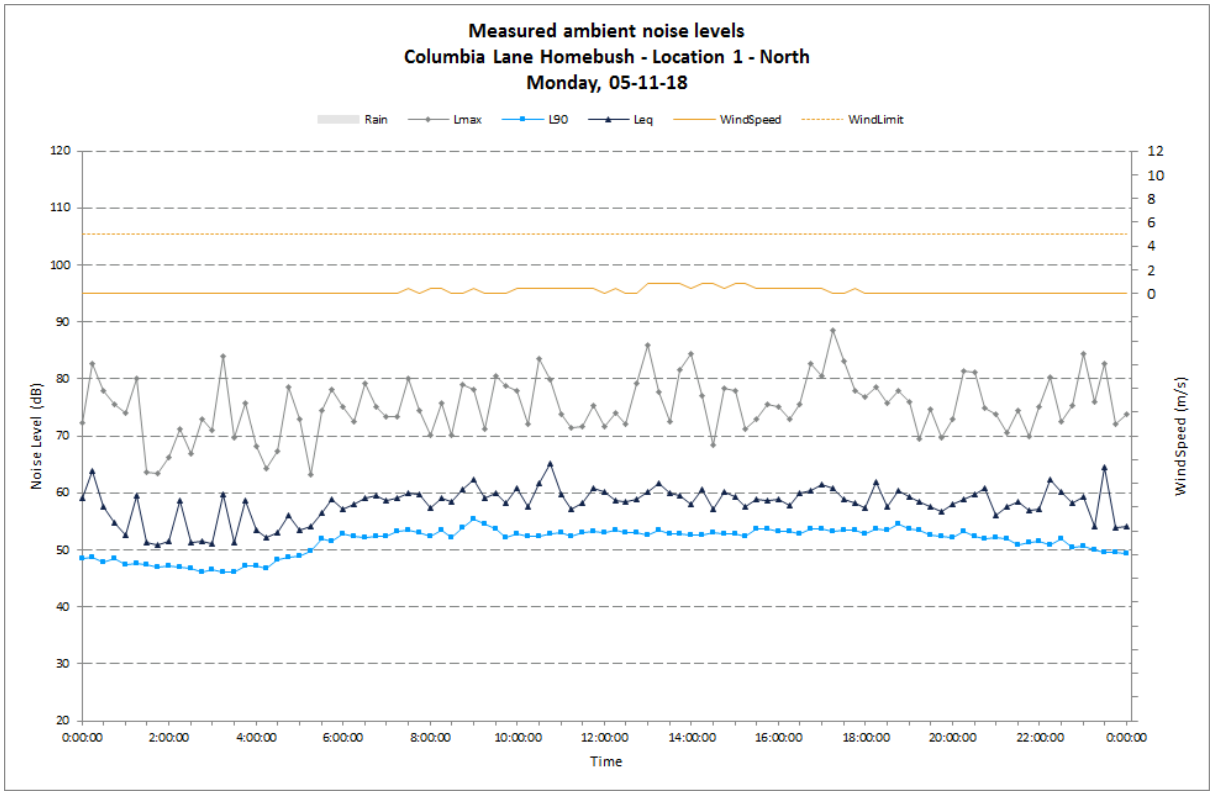
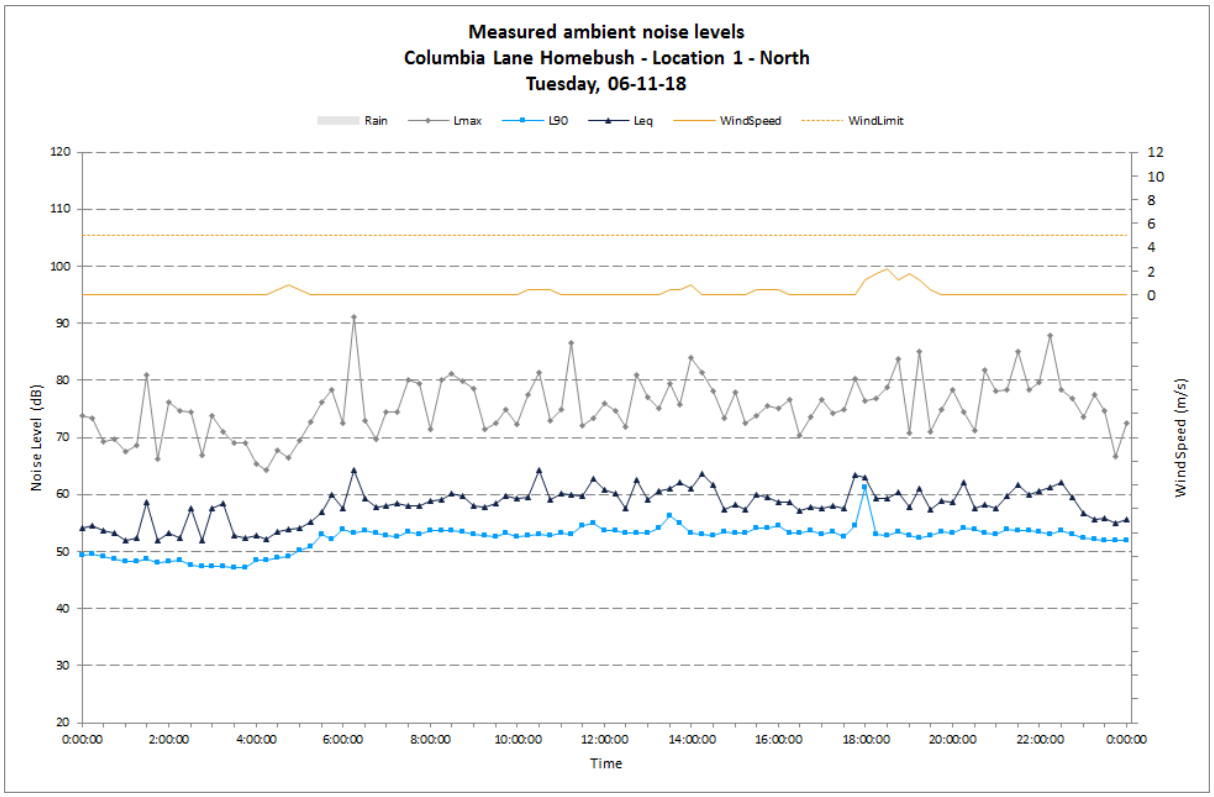
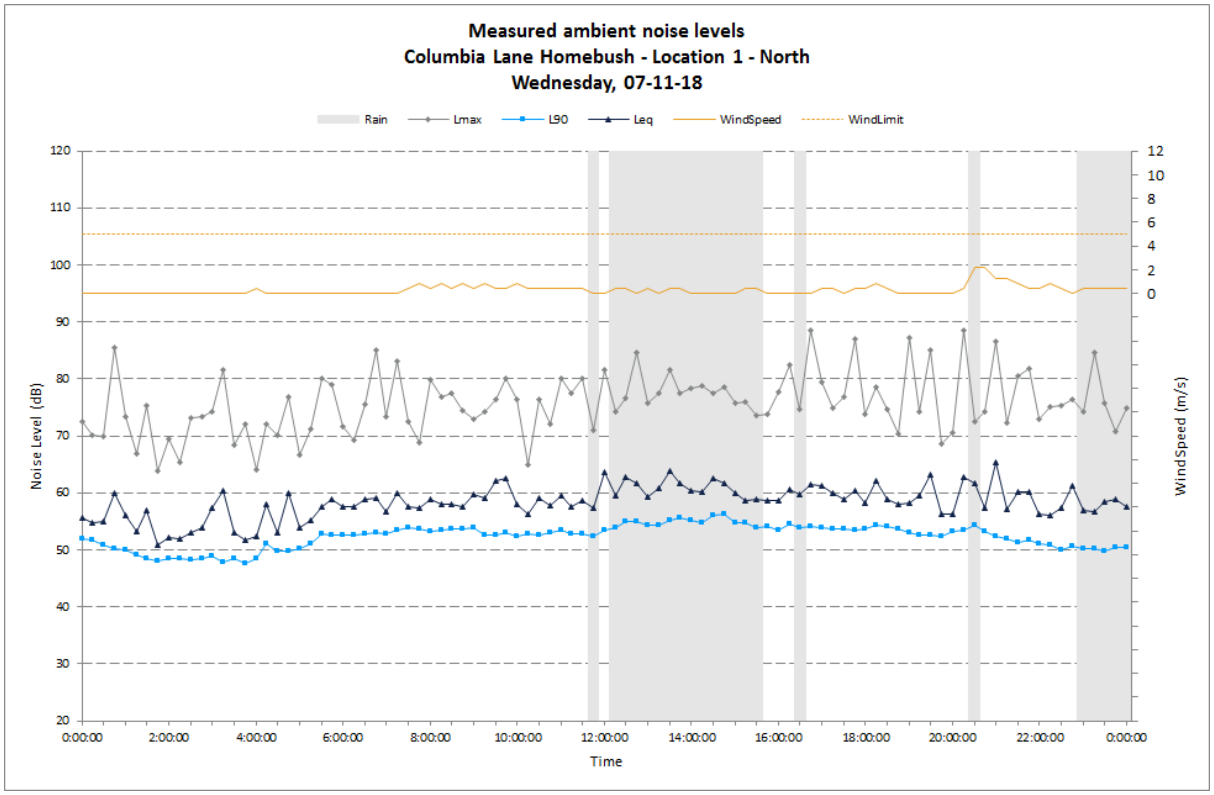
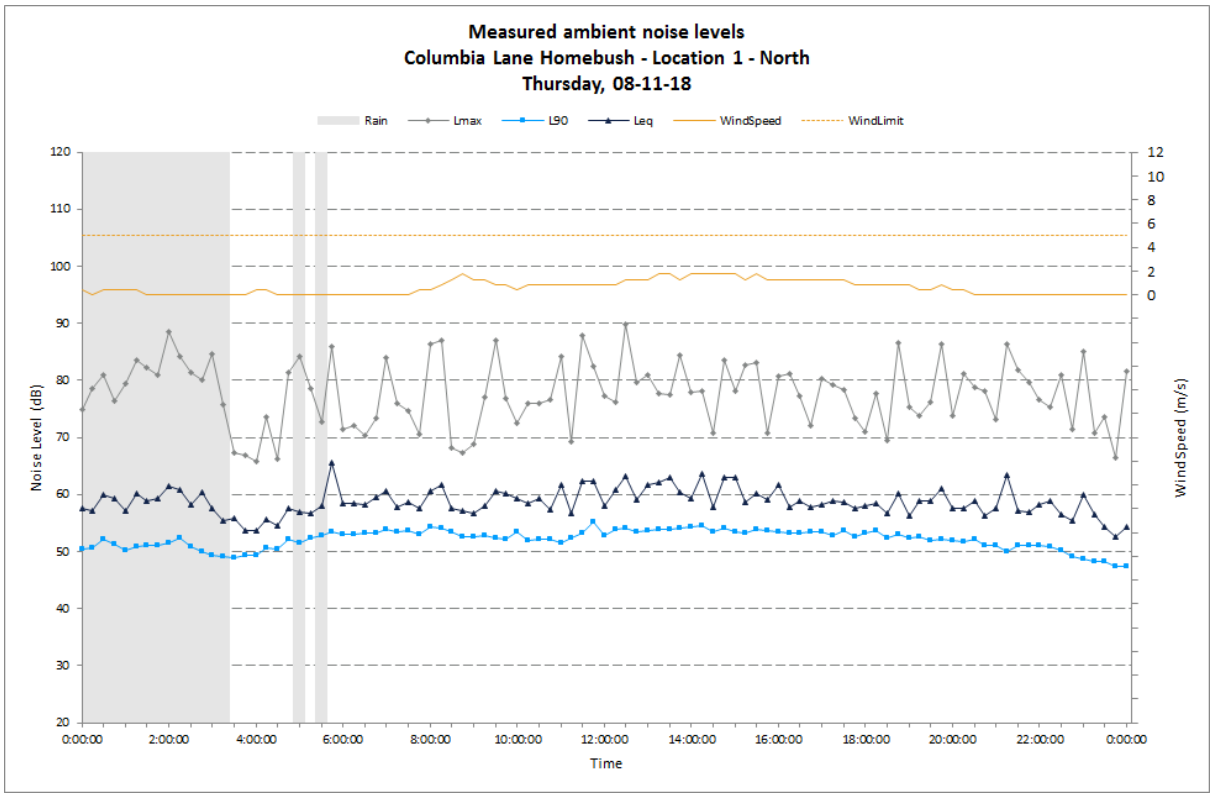
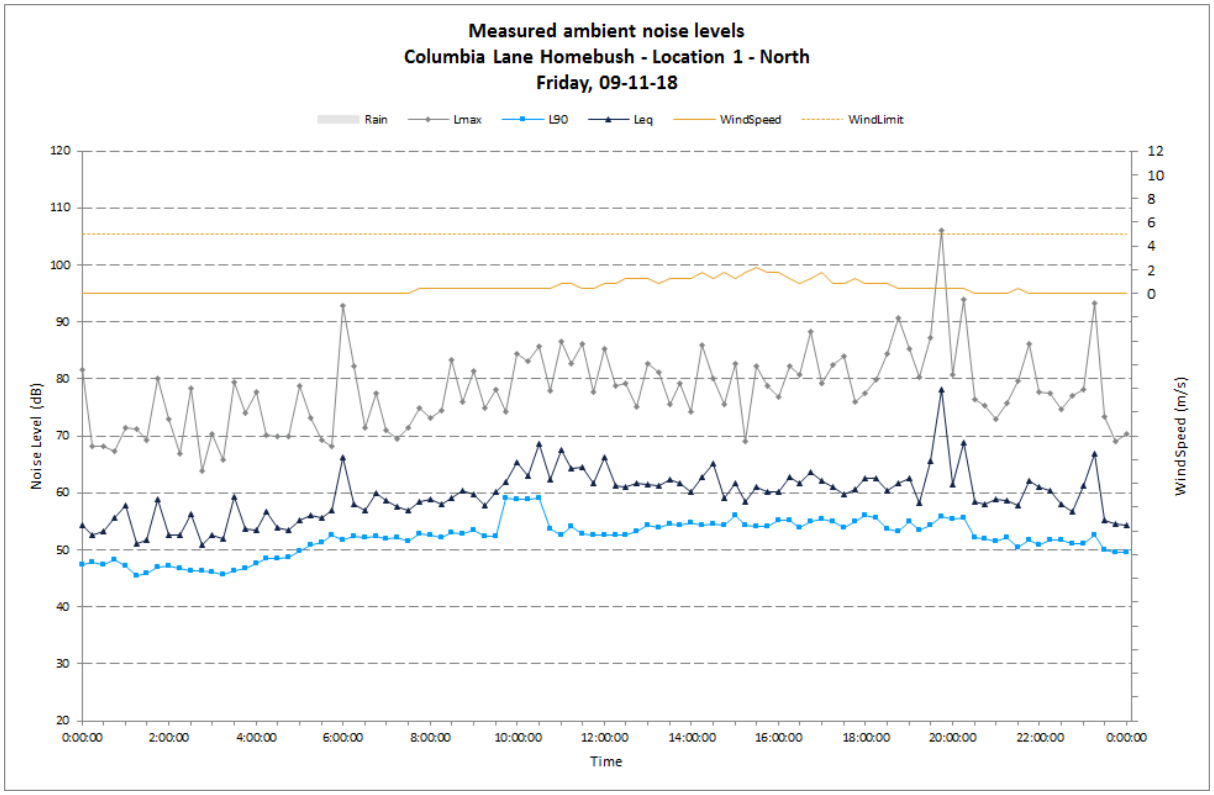
22:00:00
0:00:00

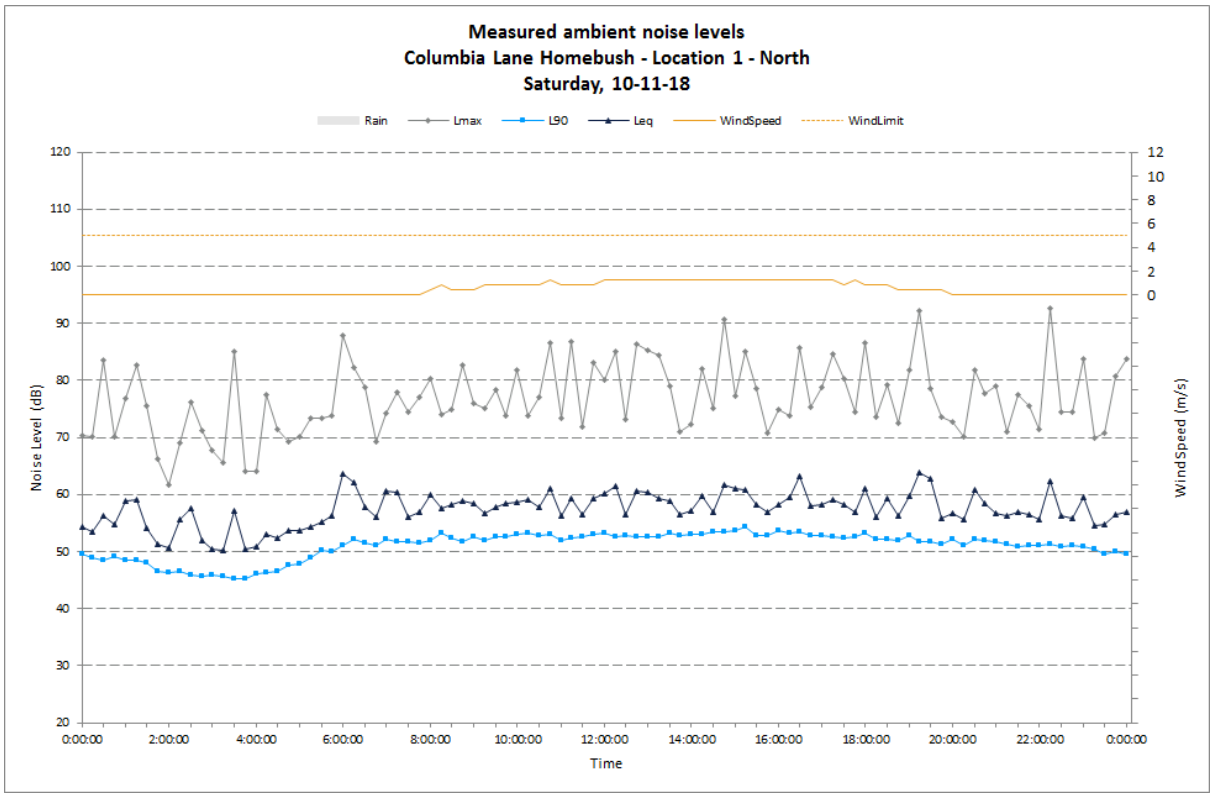

Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Monday, 05-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00

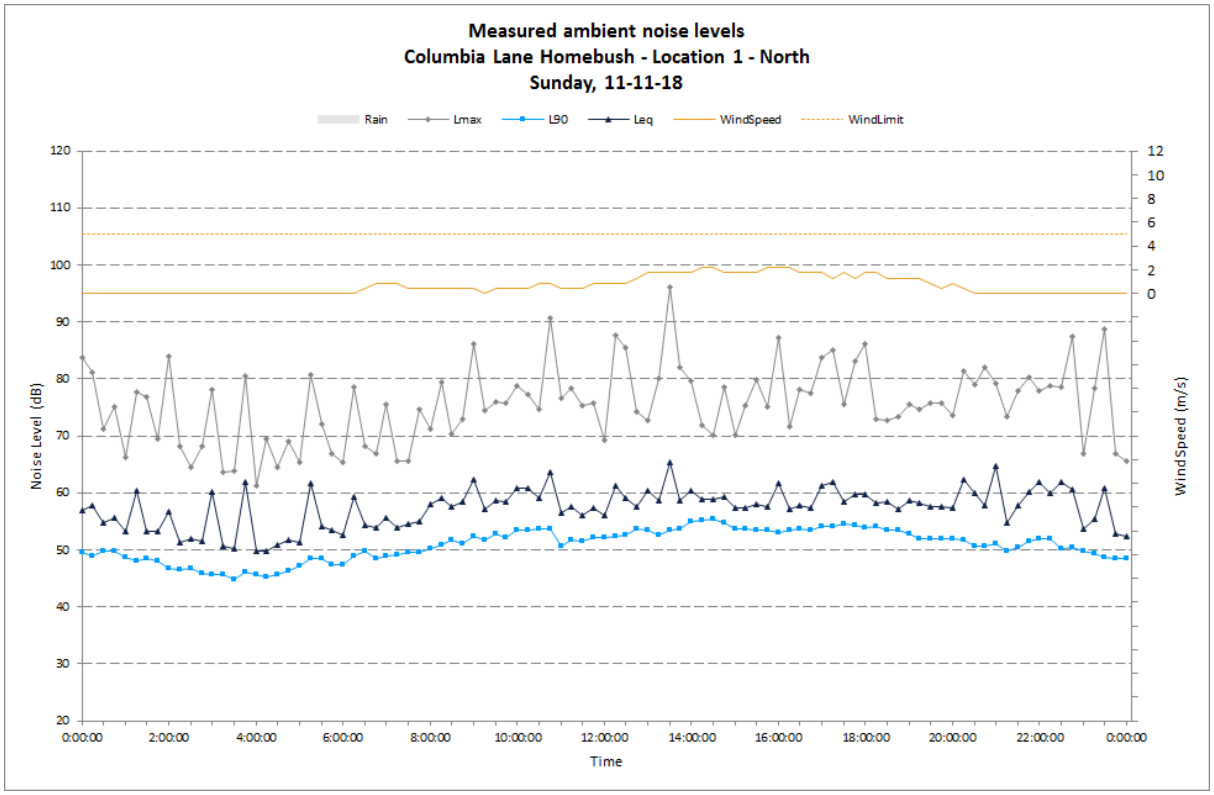

Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Tuesday, 06-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00

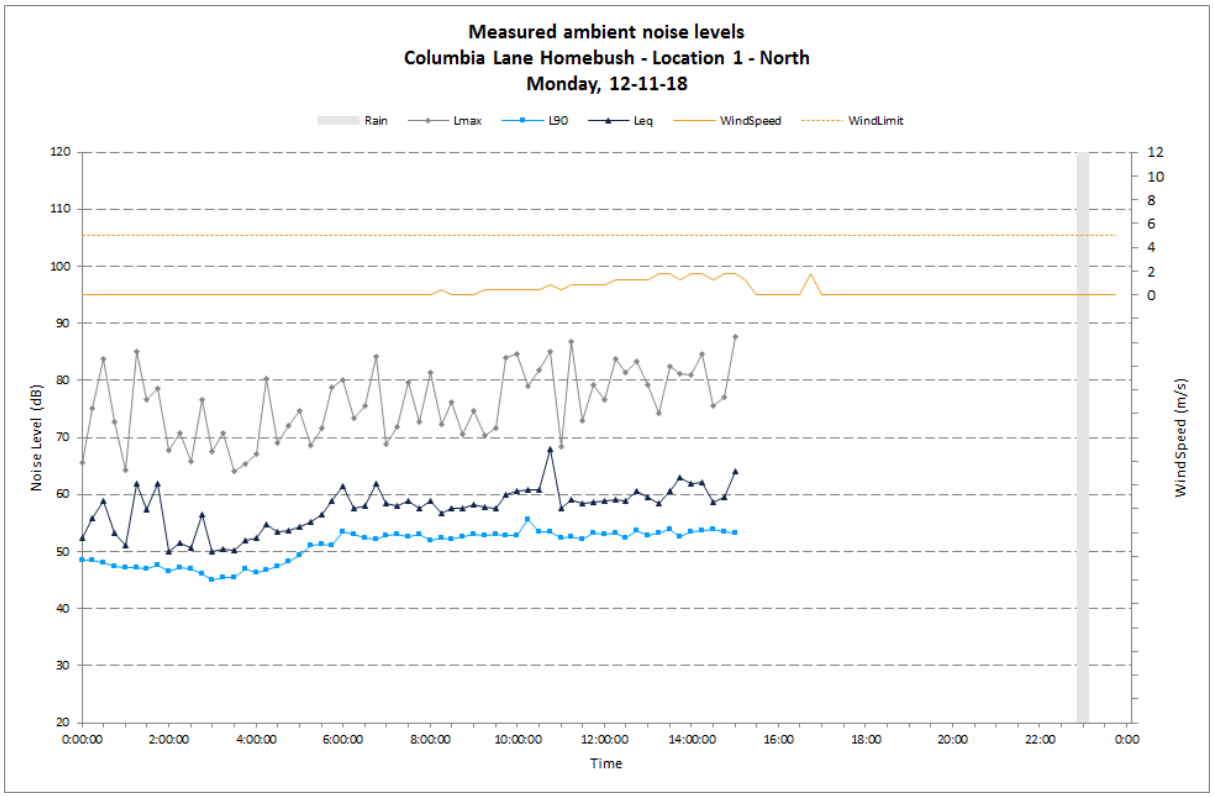

Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Wednesday, 07-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Thursday, 08-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Friday, 09-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Saturday, 10-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00


Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Sunday, 11-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00
0:00:00

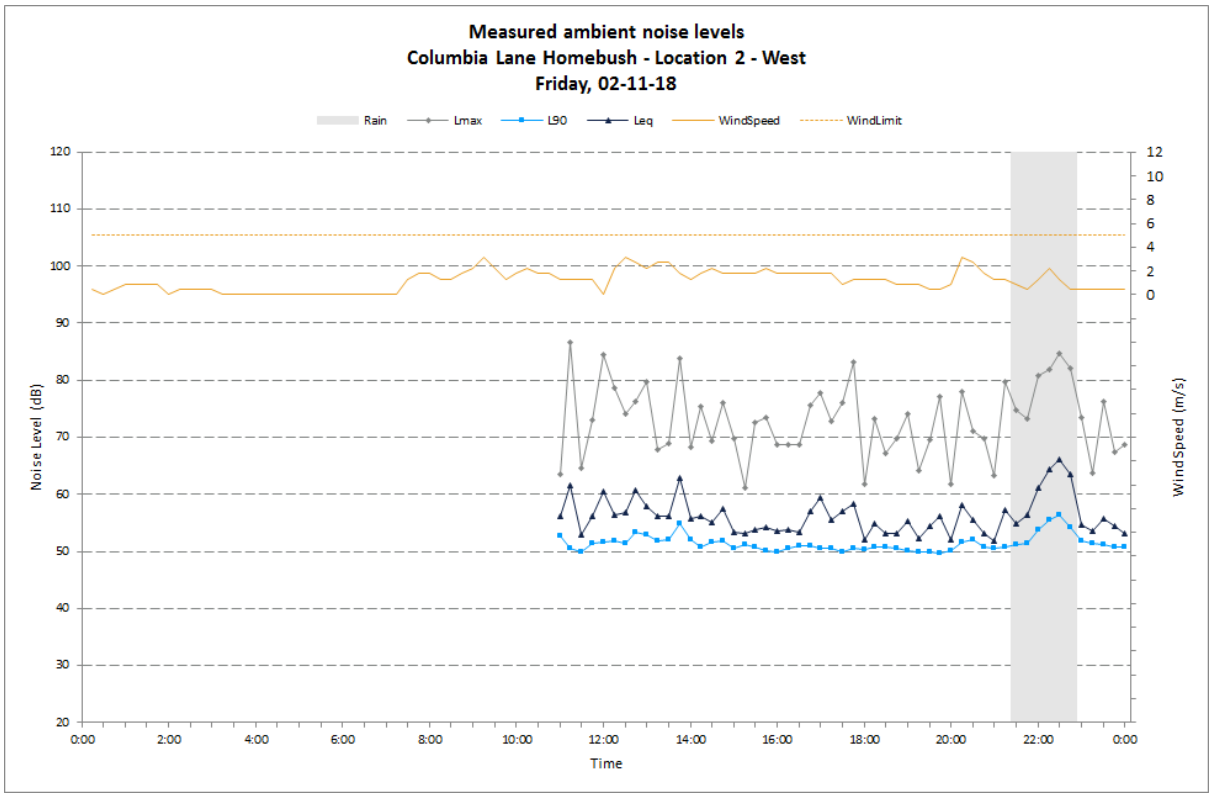

Measured ambient noise levels
Columbia Lane Homebush - Location 1 - North
Monday, 12-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00:00
2:00:00
4:00:00
6:00:00
8:00:00
10:00:00
12:00:00
14:00:00
16:00
18:00
20:00
22:00
0:00

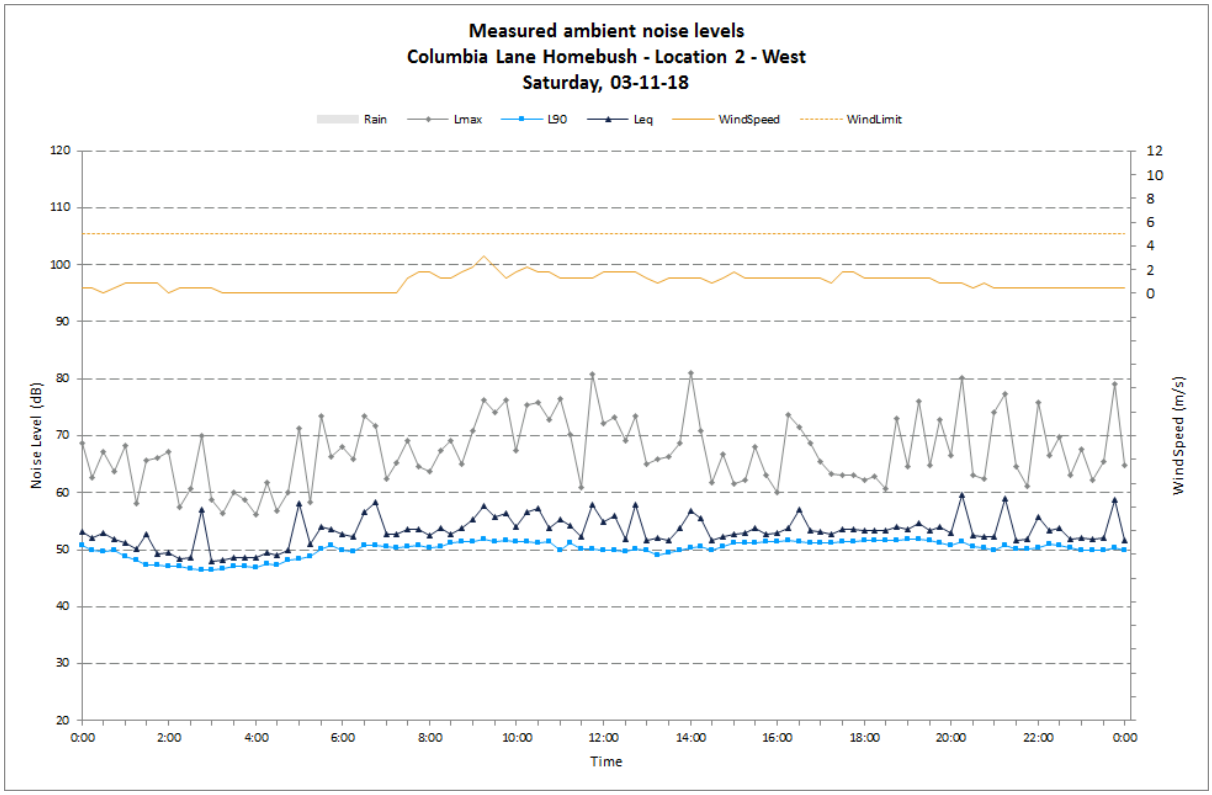
A.2 Location 2 – Summary

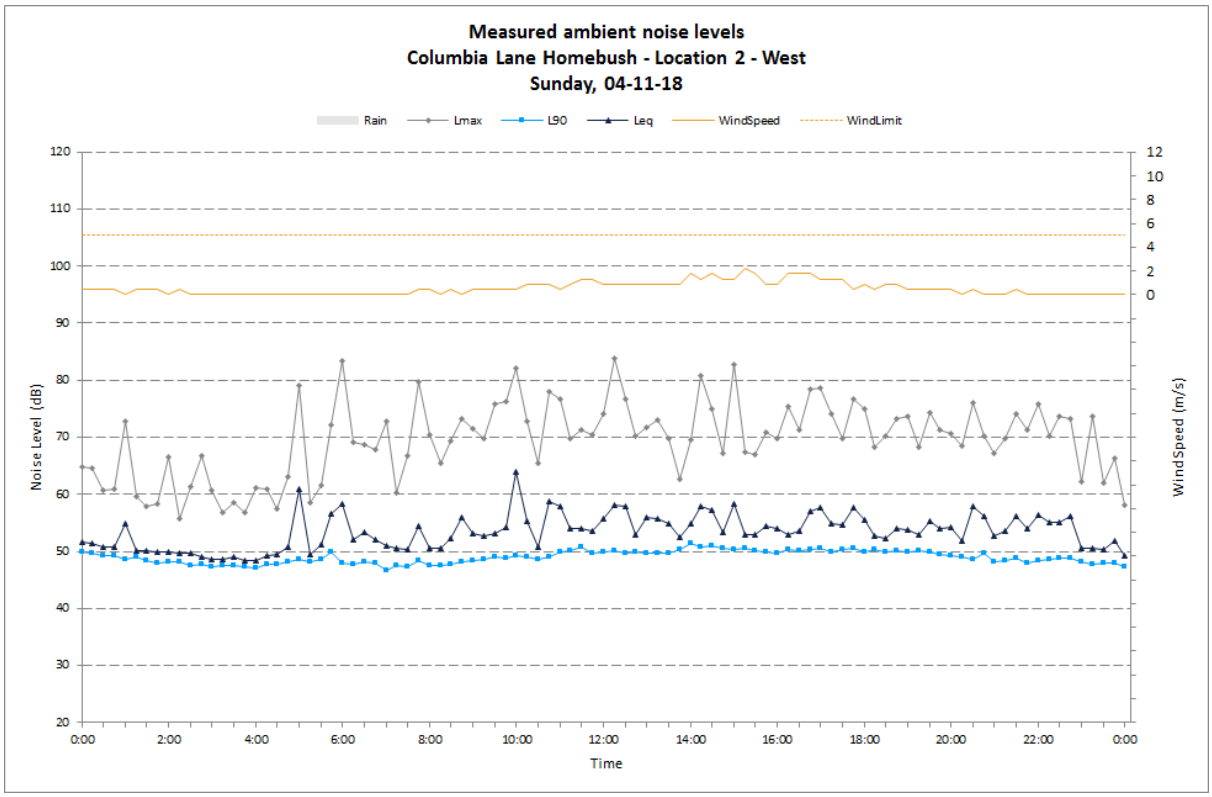
Table A.2 Summary values – Location 2

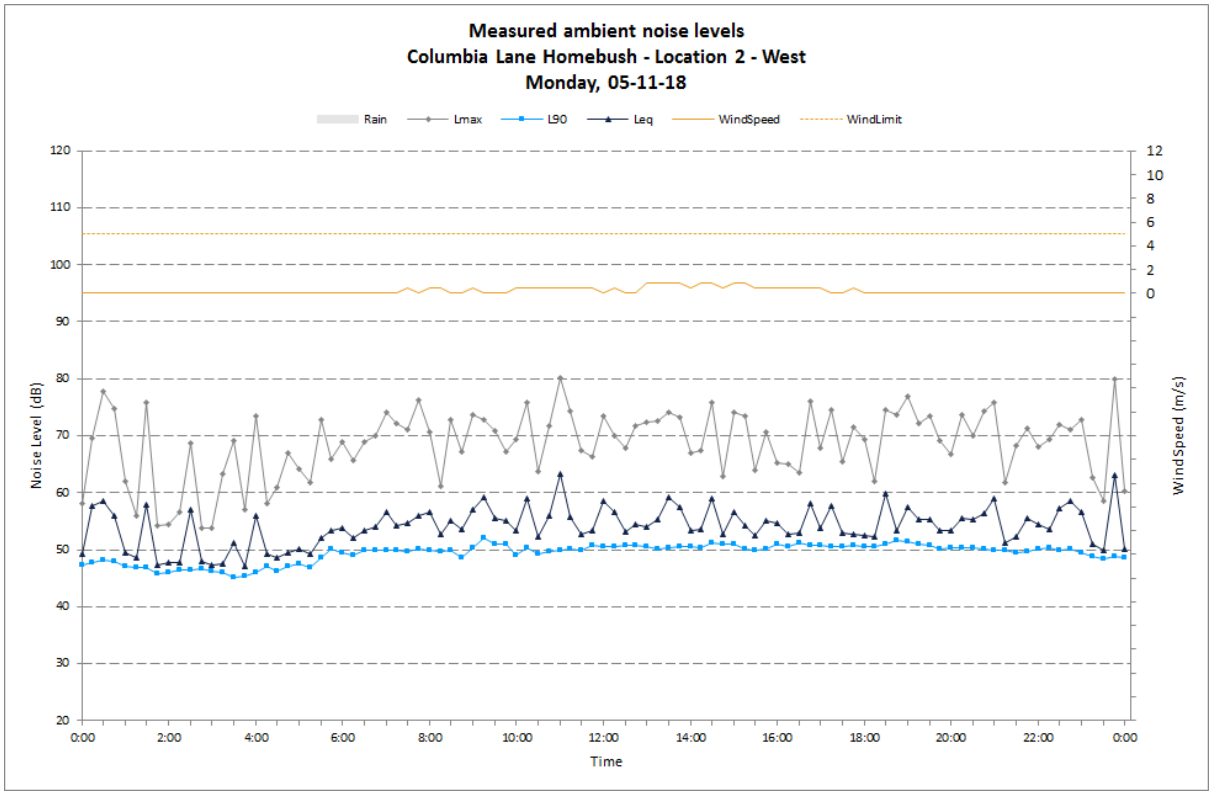
Date	ABL Day	ABL Evening	ABL Night	LAeq,11 hour Day	LAeq,4 hour Evening	LAeq,9 hour Night	LAeq,15 hour Day	LAeq,24 hour Day	LAeq,8 hour Night
Friday, 02-11-18	0	0	47	0	0	53	0	0	53
Saturday, 03-11-18	50	50	47	55	55	53	55	54	53
Sunday, 04-11-18	48	48	46	56	55	53	56	55	53
Monday, 05-11-18	50	50	47	56	56	54	56	55	54
Tuesday, 06-11-18	50	50	48	56	55	54	56	55	54
Wednesday, 07-11-18	0	50	0	0	57	0	0	0	0
Thursday, 08-11-18	50	49	47	57	54	53	56	55	53
Friday, 09-11-18	50	49	47	59	58	54	59	58	53
Saturday, 10-11-18	50	49	46	55	54	54	55	54	54
Sunday, 11-11-18	48	49	46	55	57	54	56	55	54
Monday, 12-11-18	0	0	0	0	0	0	0	0	0
Summary Values	50	49	47	56	56	54	56	55	53

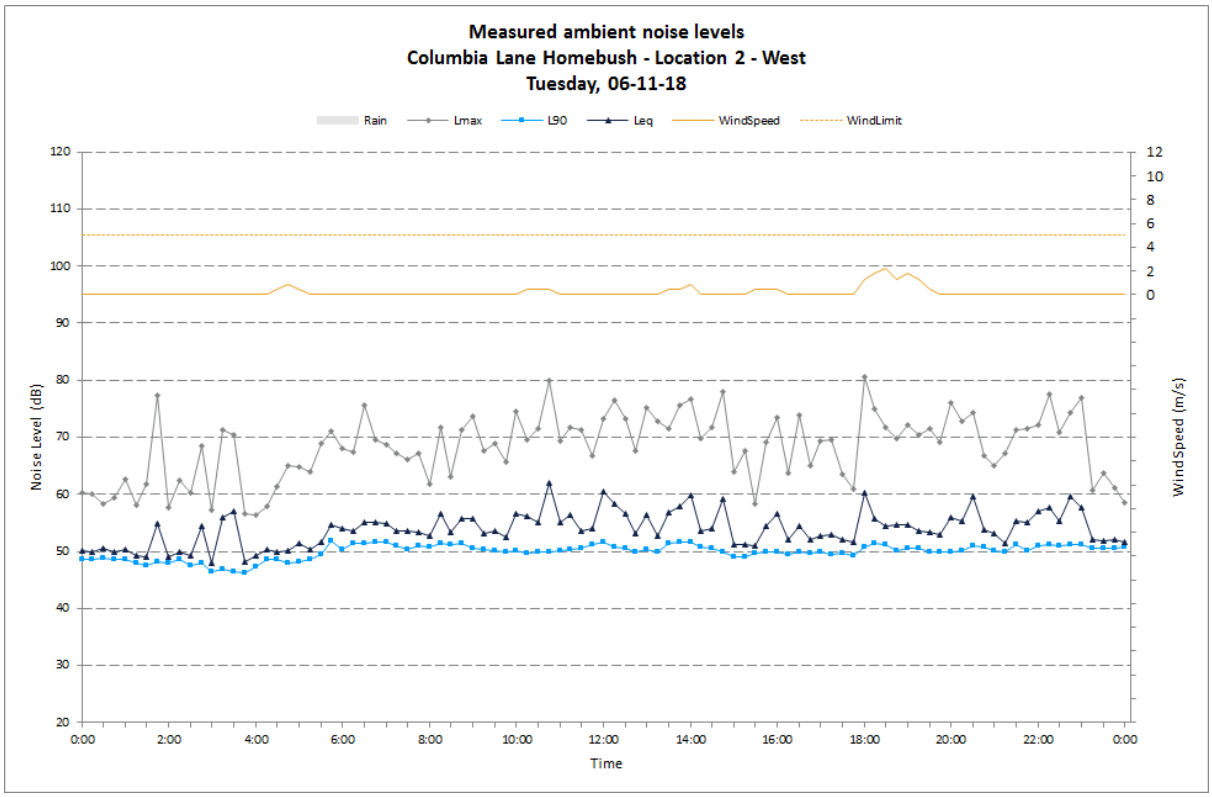
Notes: 1. 0 indicates periods with too few valid samples due to weather or logger operation.
2. Leq24hr encompasses the period 7am to 7am.

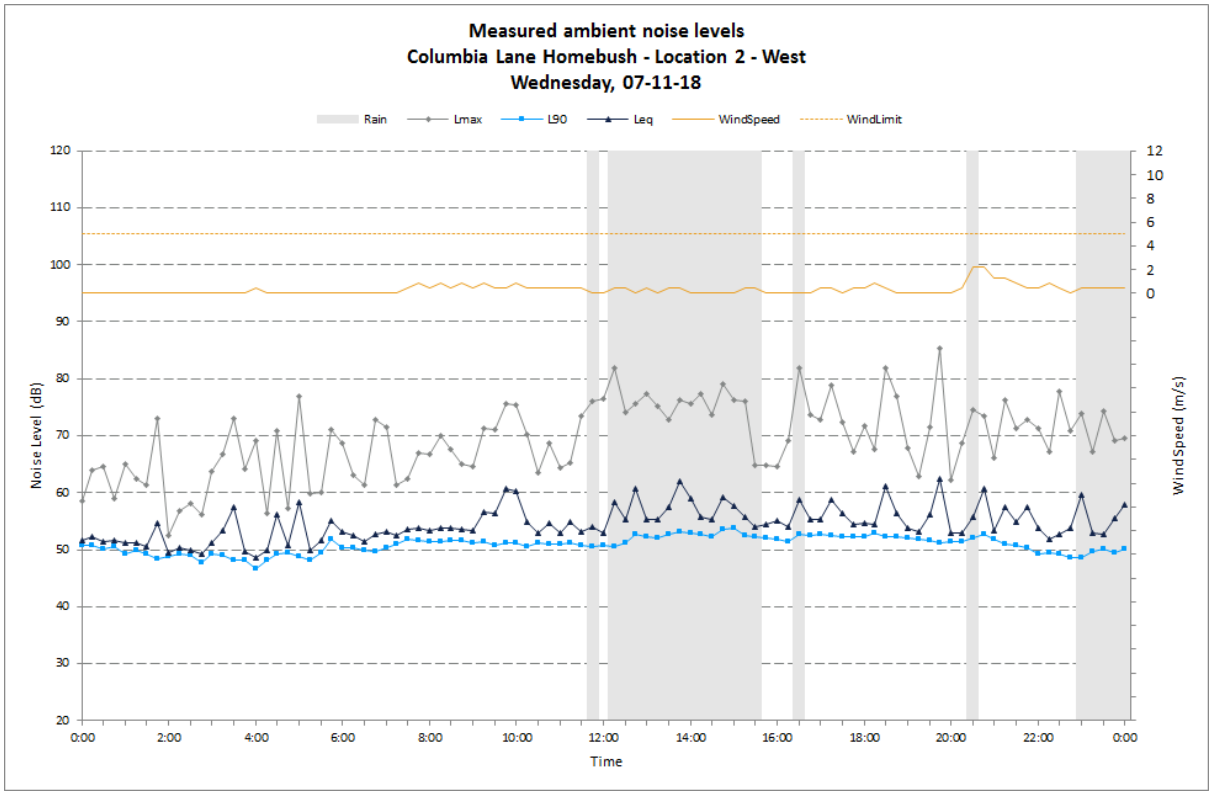

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Friday, 02-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

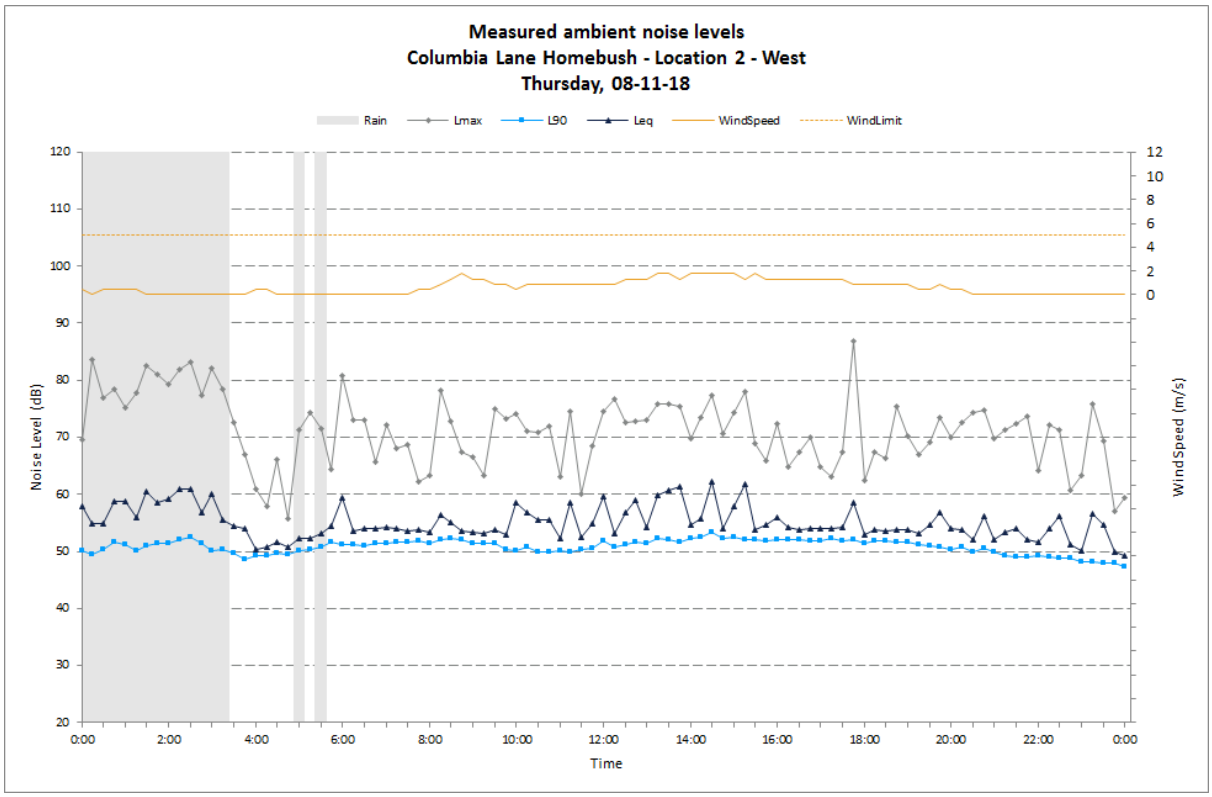

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Saturday, 03-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

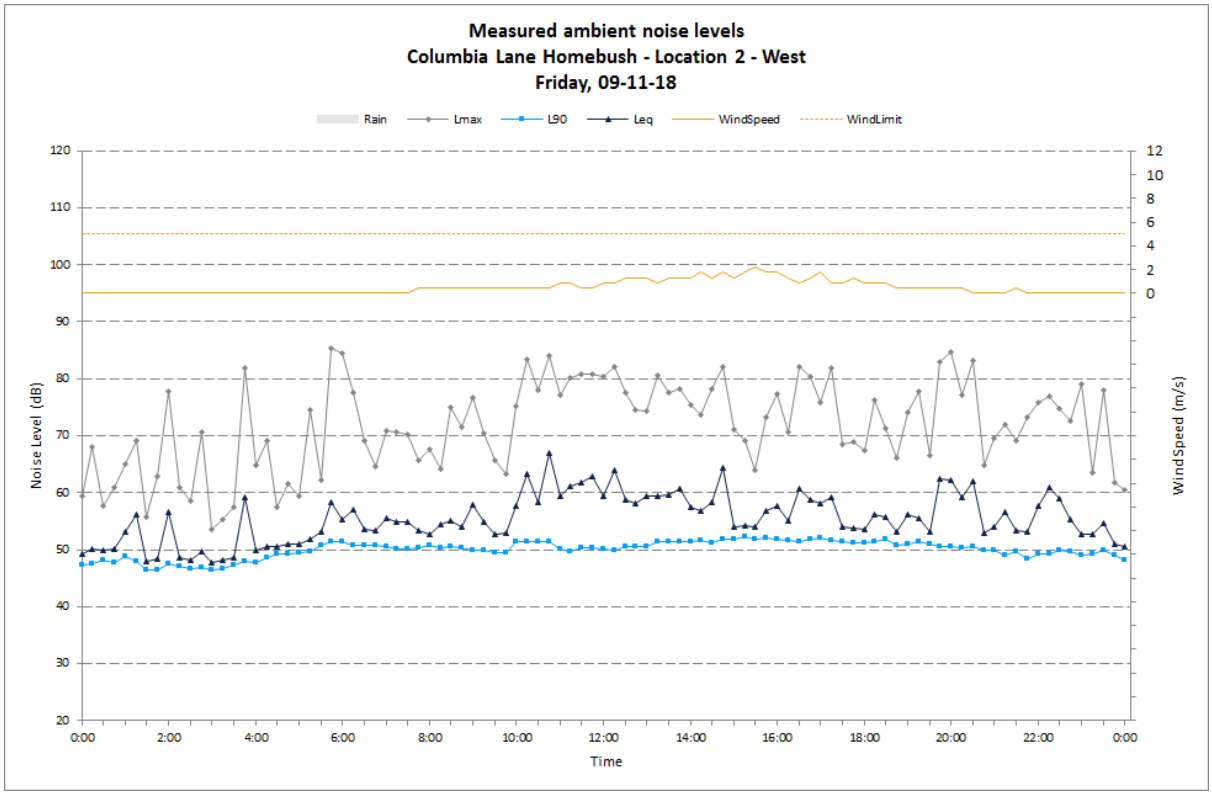

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Sunday, 04-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

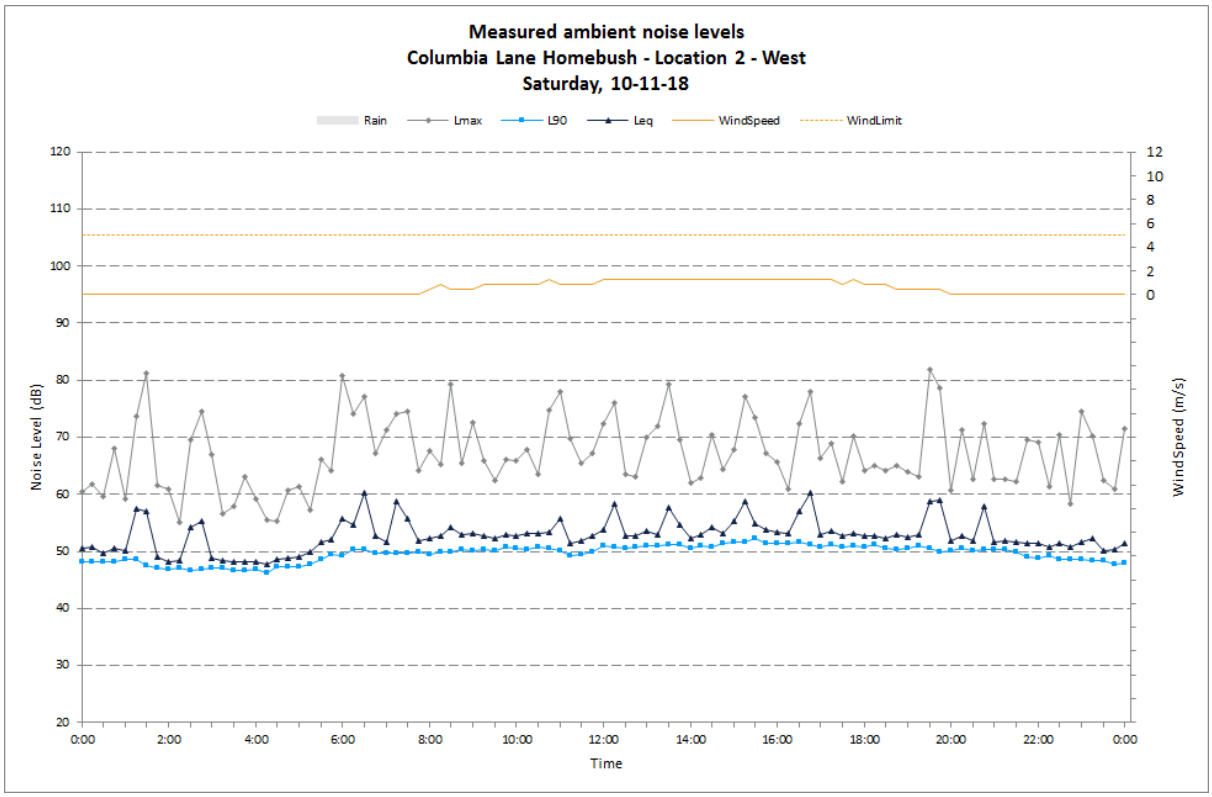

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Monday, 05-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

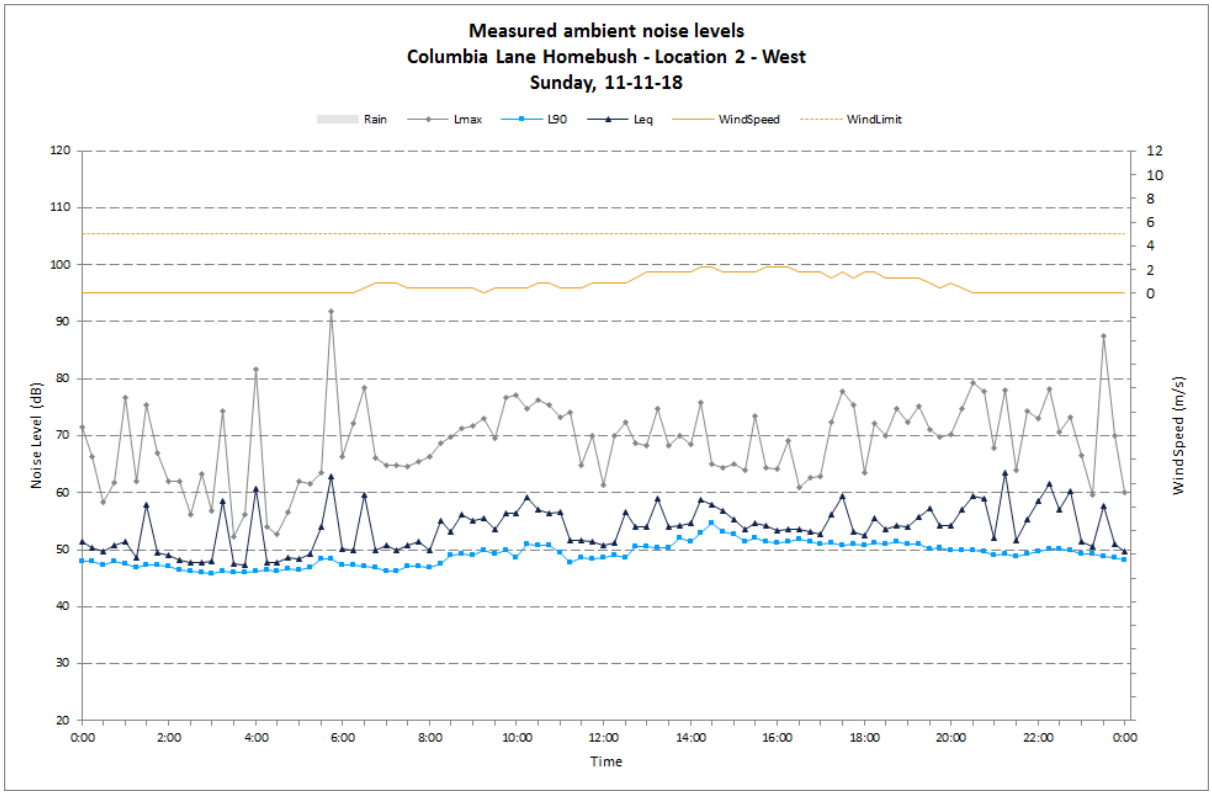

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Tuesday, 06-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

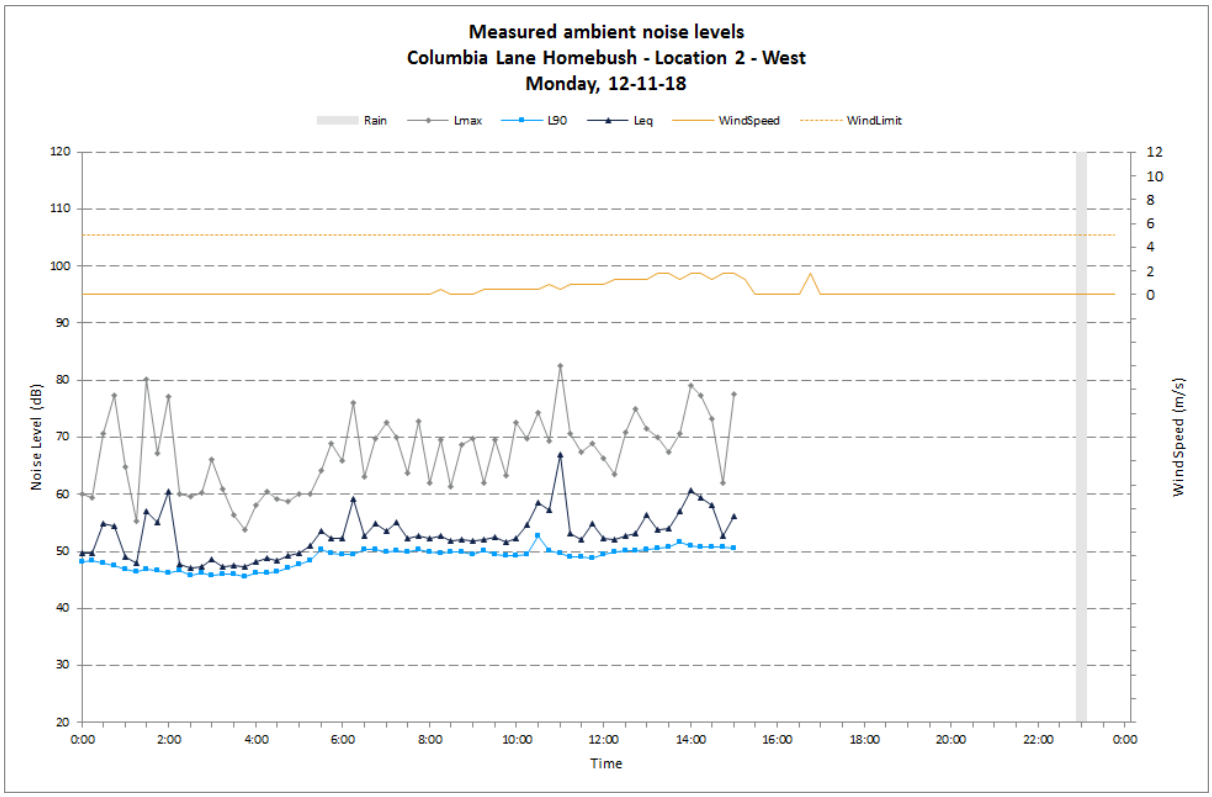

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Wednesday, 07-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Thursday, 08-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00


Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Friday, 09-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00


Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Saturday, 10-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Sunday, 11-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

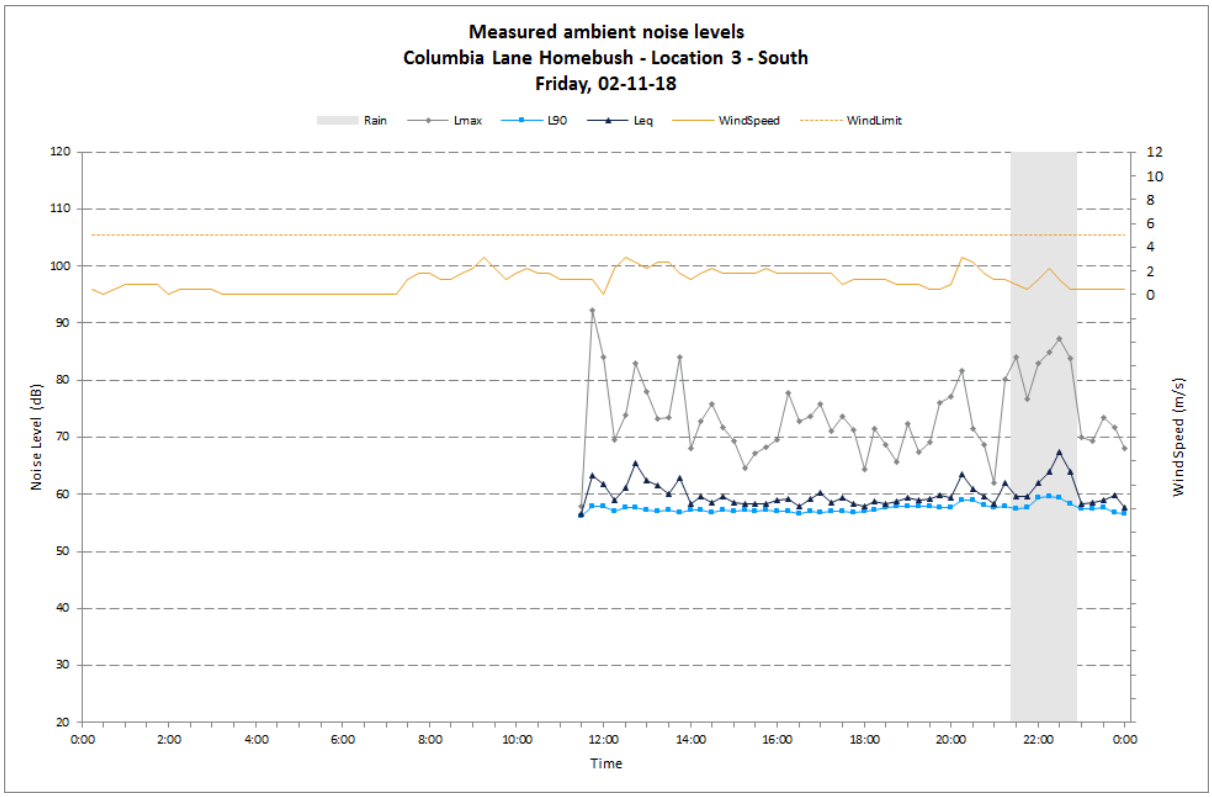

Measured ambient noise levels
Columbia Lane Homebush - Location 2 - West
Monday, 12-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00

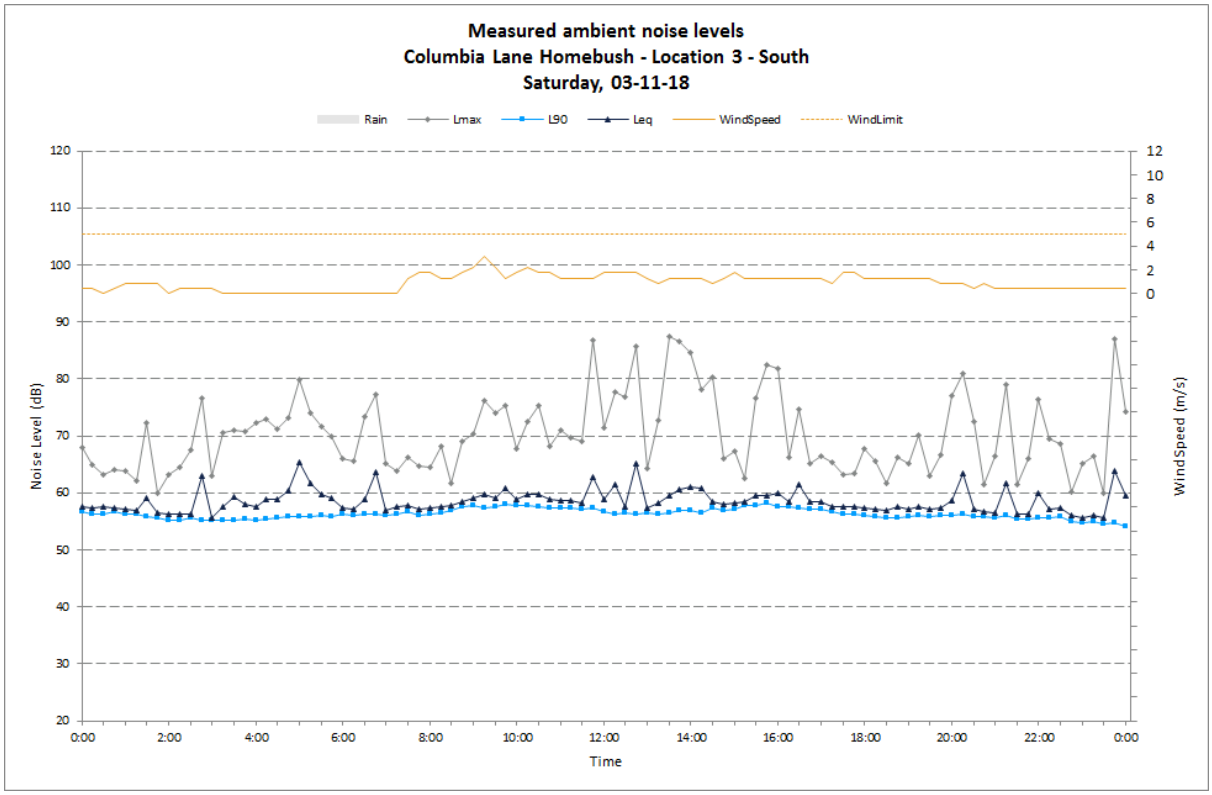
A.3 Location 3 – Summary

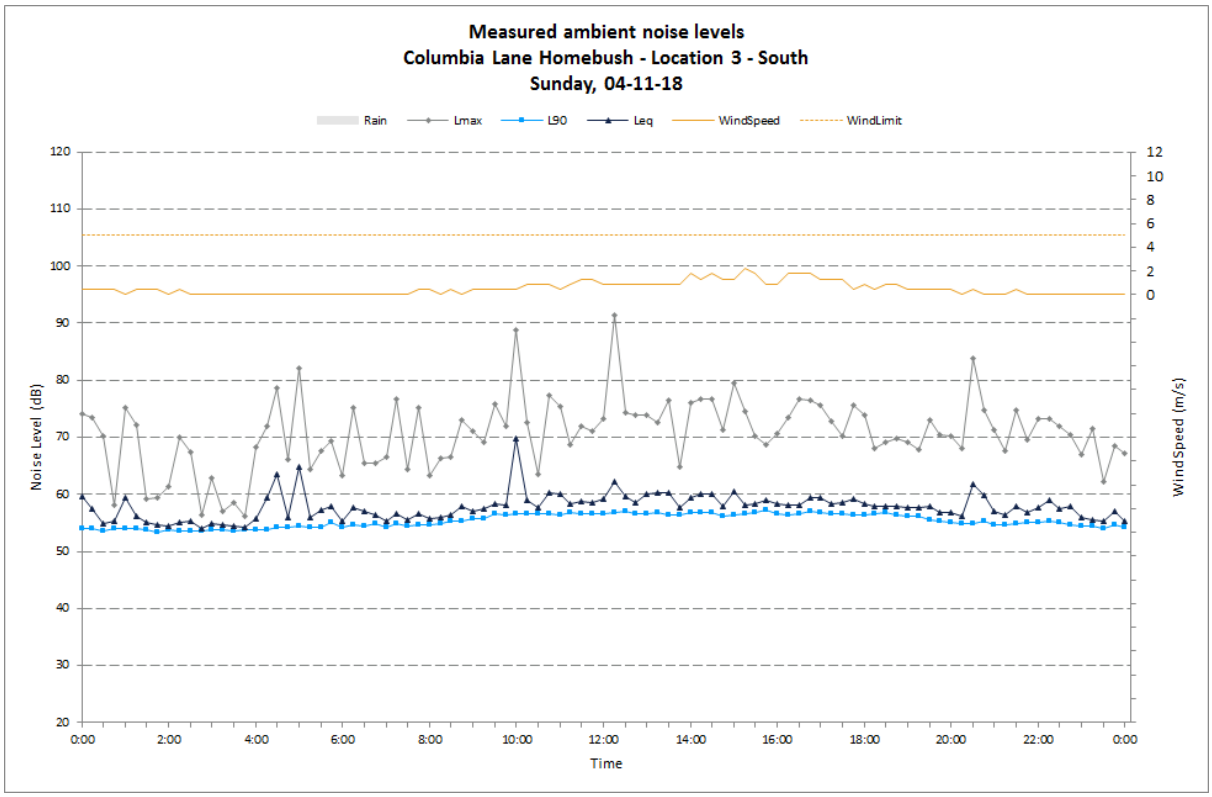
Table A.3 Summary values – Location 3

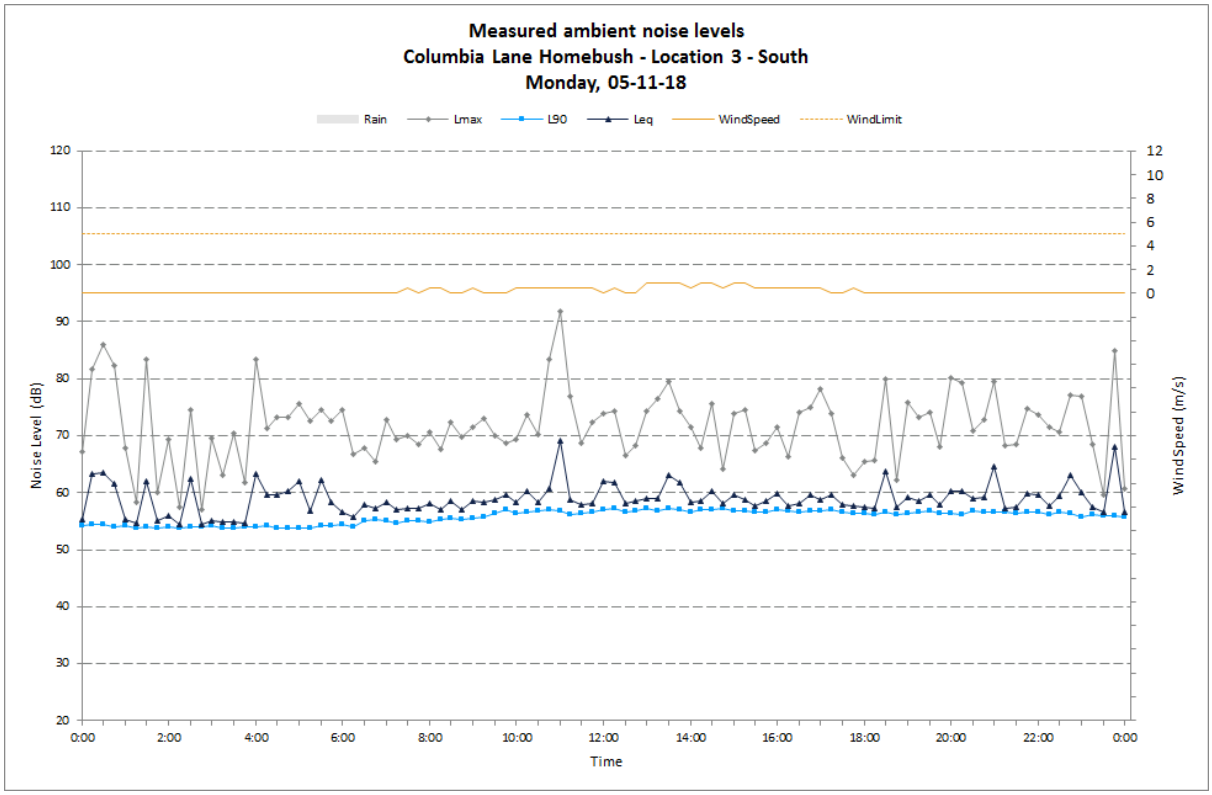
Date	ABL Day	ABL Evening	ABL Night	LAeq,11 hour Day	LAeq,4 hour Evening	LAeq,9 hour Night	LAeq,15 hour Day	LAeq,24 hour Day	LAeq,8 hour Night
Friday, 02-11-18	0	0	55	0	0	59	0	0	59
Saturday, 03-11-18	56	56	54	59	59	58	59	59	58
Sunday, 04-11-18	55	55	54	60	58	59	59	59	59
Monday, 05-11-18	55	56	55	60	60	60	60	60	60
Tuesday, 06-11-18	57	56	55	61	60	60	61	60	60
Wednesday, 07-11-18	0	56	0	0	61	0	0	0	0
Thursday, 08-11-18	56	54	54	60	58	58	60	59	58
Friday, 09-11-18	56	54	53	62	60	58	61	60	58
Saturday, 10-11-18	55	54	53	59	58	59	59	59	59
Sunday, 11-11-18	55	53	53	59	61	59	59	59	59
Monday, 12-11-18	0	0	0	0	0	0	0	0	0
Summary Values	55	55	54	60	60	59	60	59	59

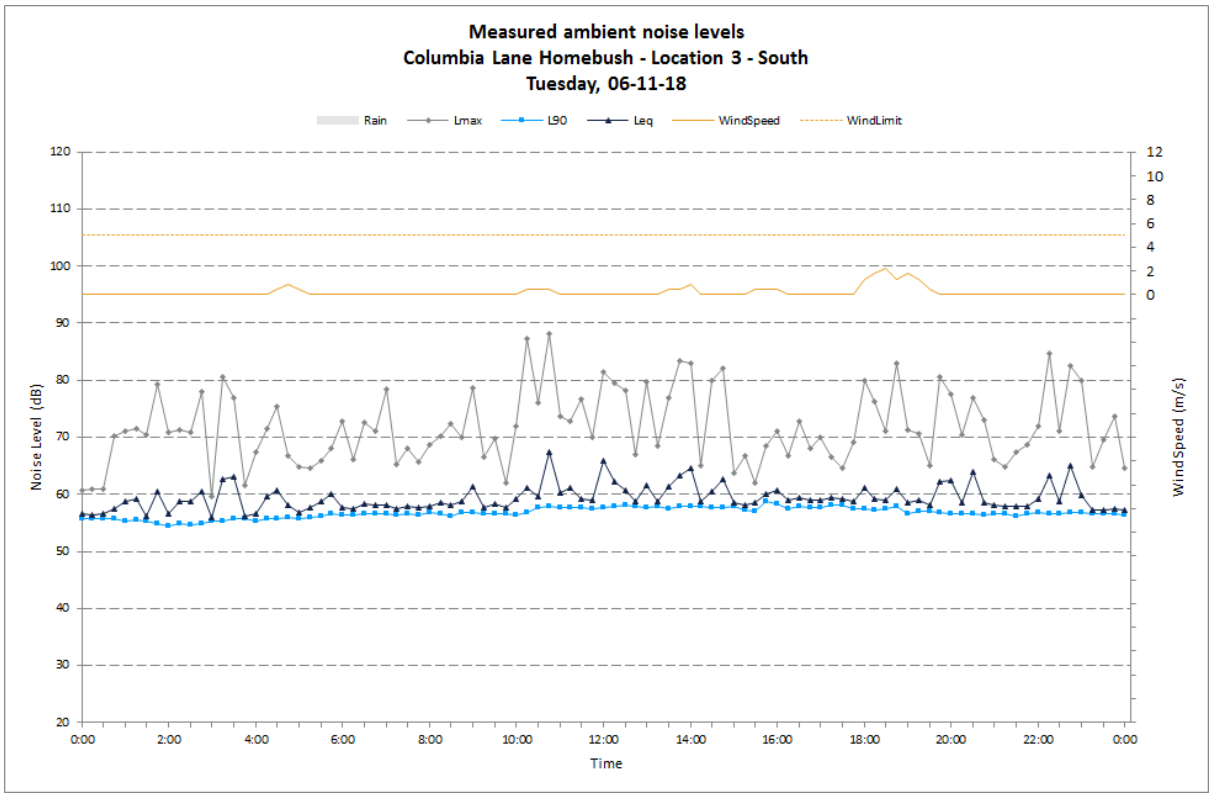
Notes: 1. 0 indicates periods with too few valid samples due to weather or logger operation.
2. Leq24hr encompasses the period 7am to 7am.

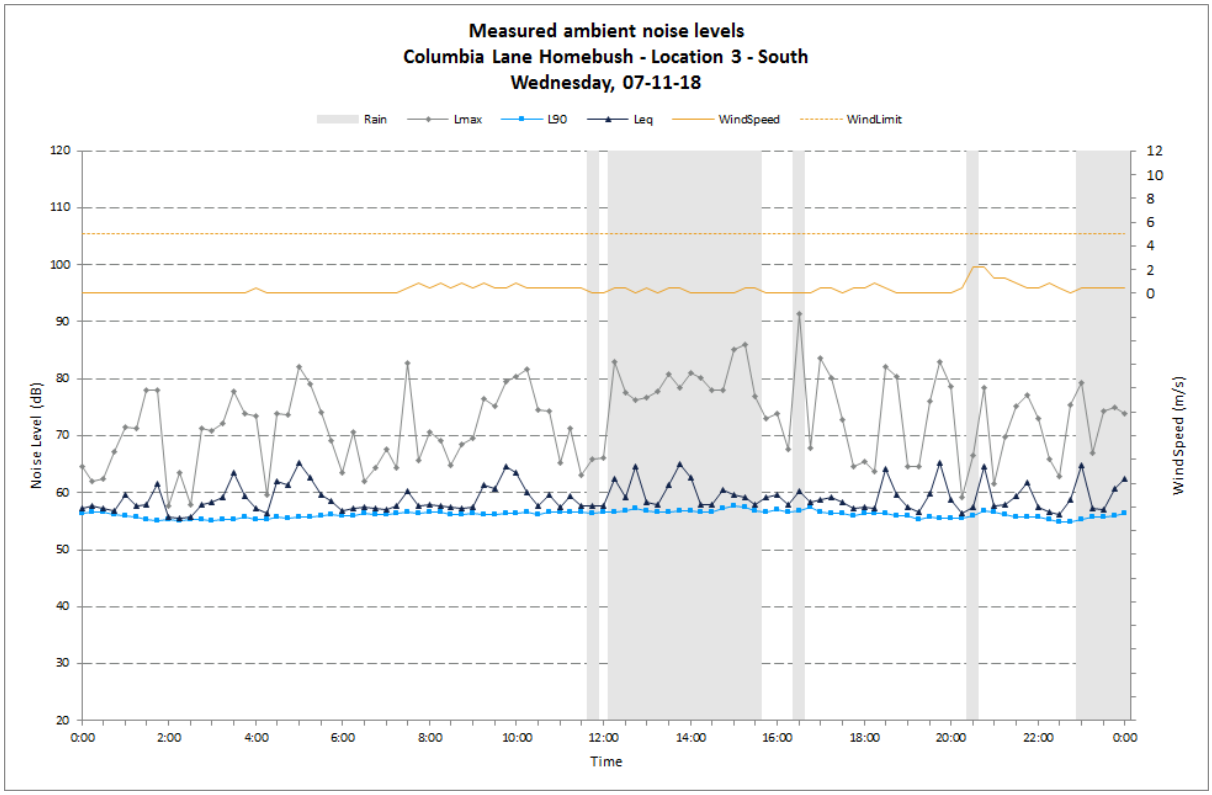

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Friday, 02-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

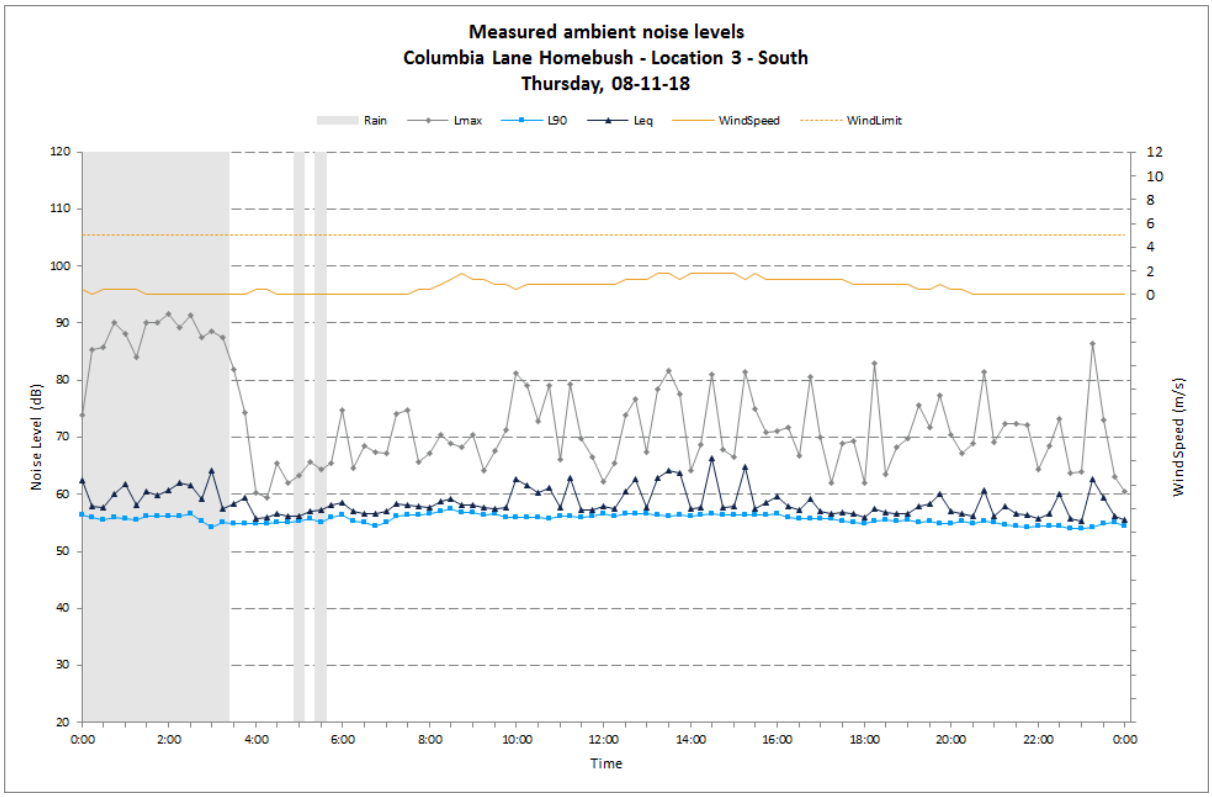

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Saturday, 03-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

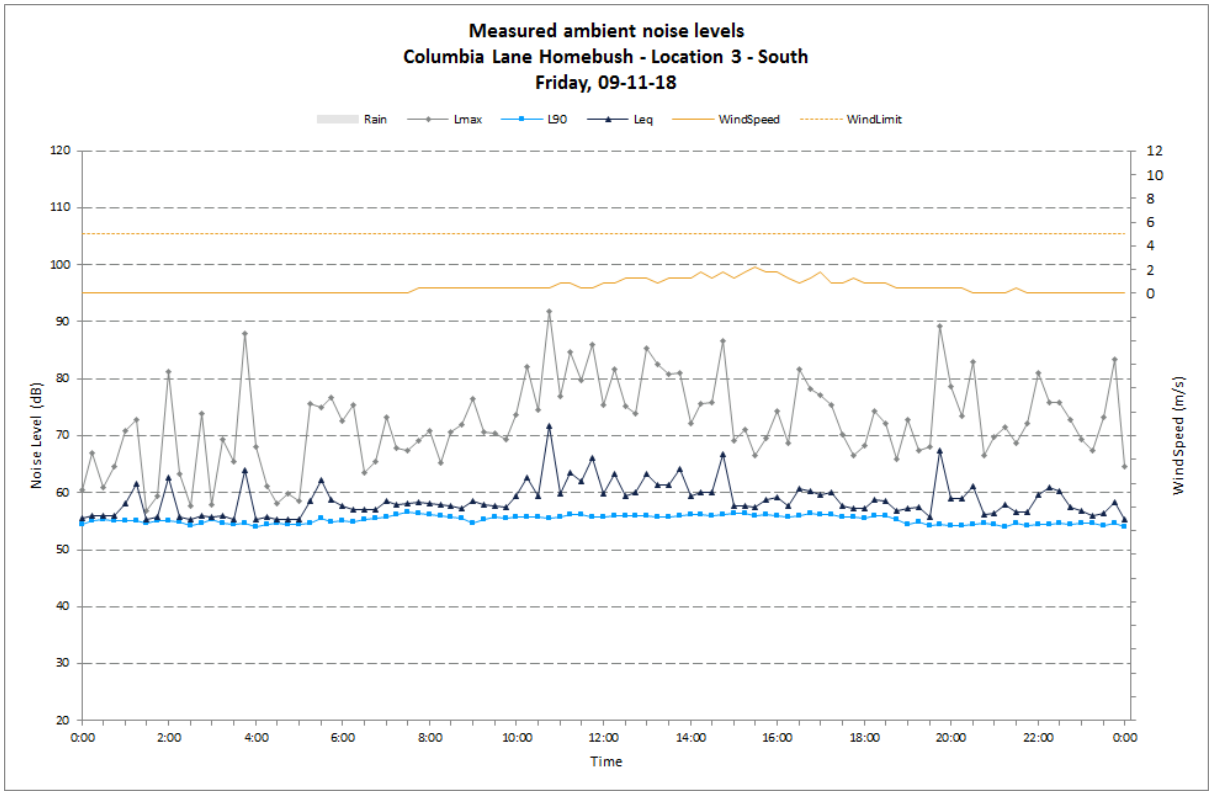

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Sunday, 04-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

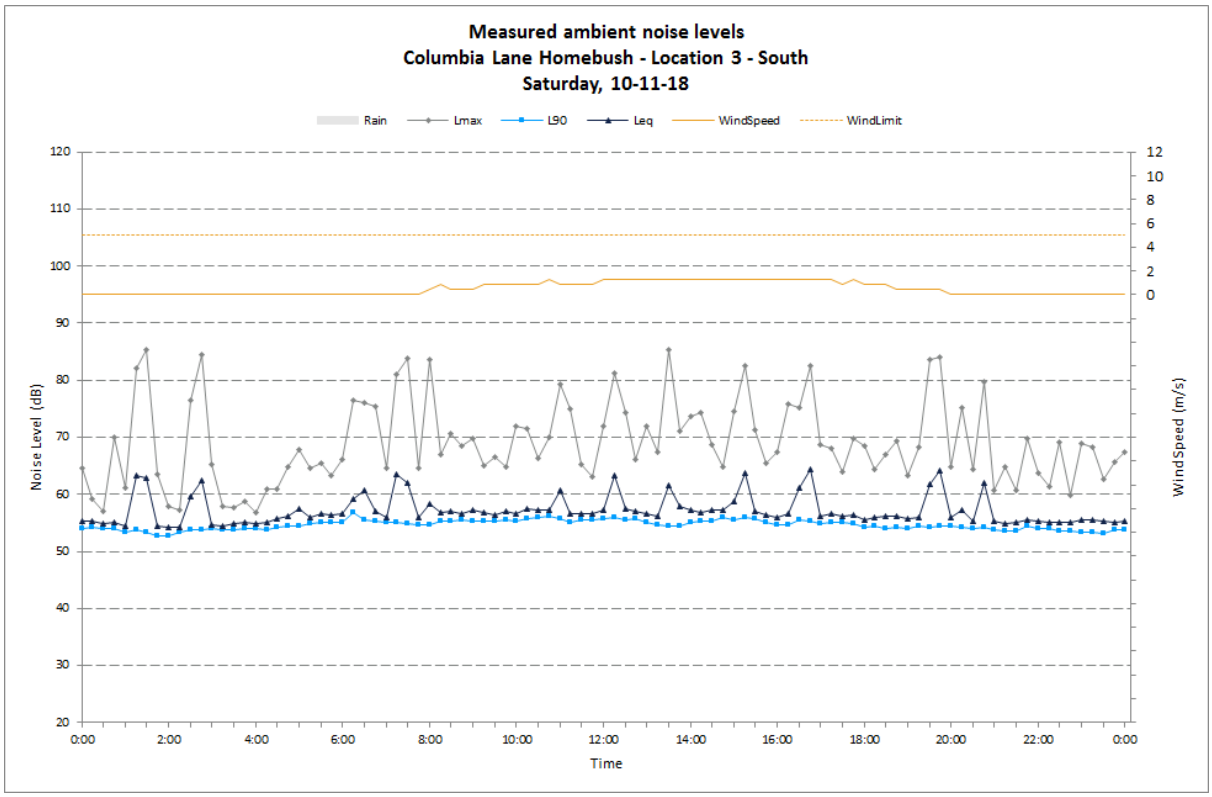

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Monday, 05-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

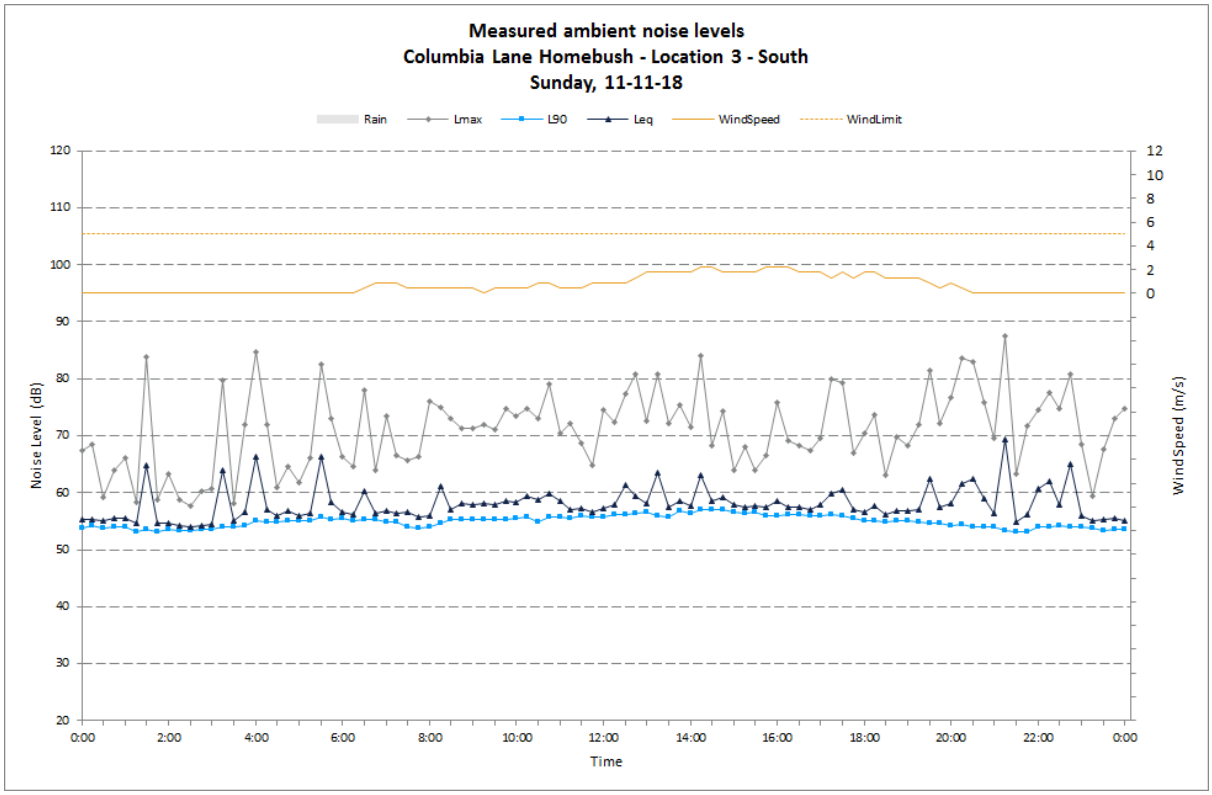

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Tuesday, 06-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

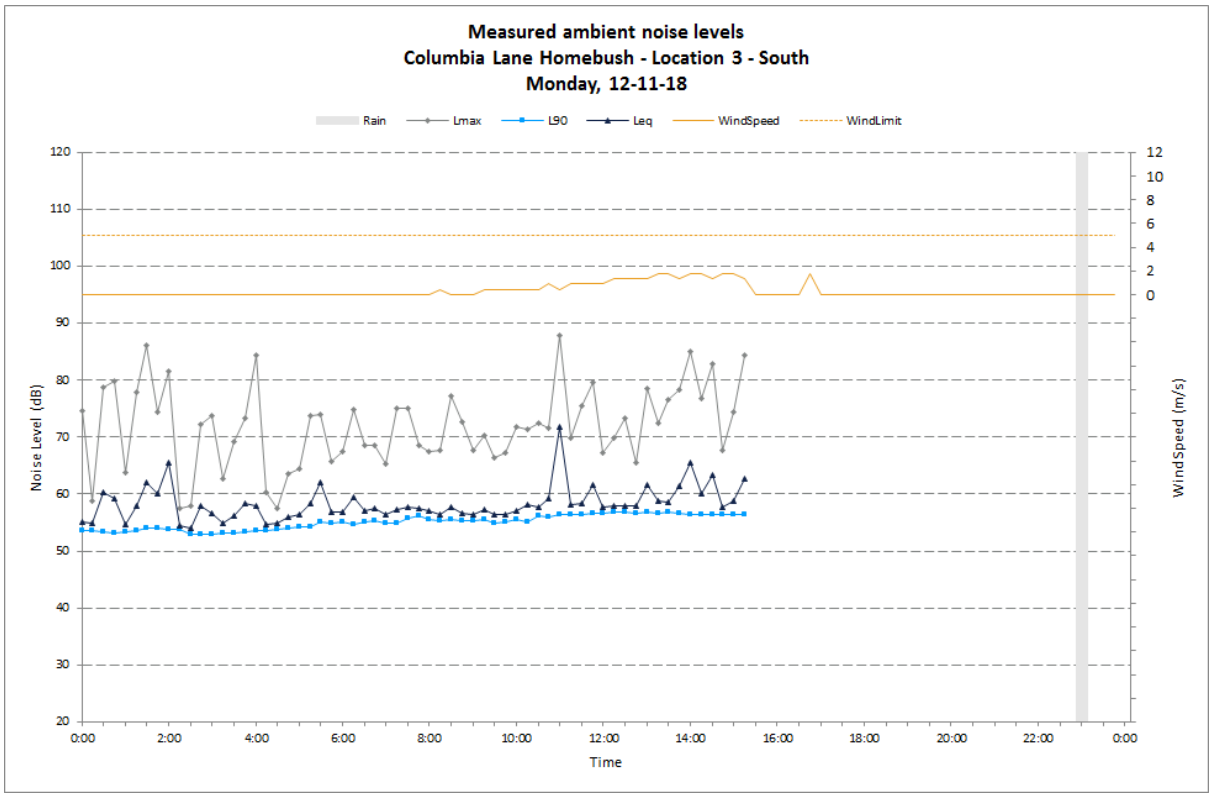

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Wednesday, 07-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Thursday, 08-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Friday, 09-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time


Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Saturday, 10-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

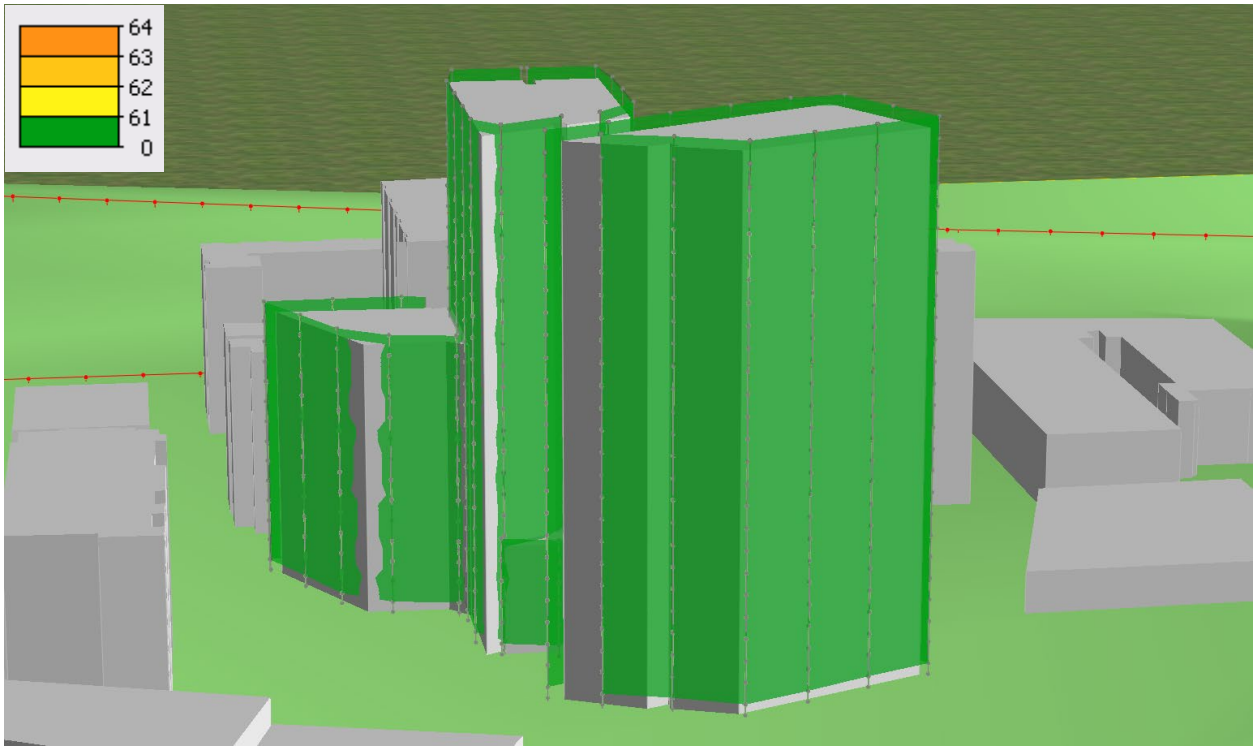

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Sunday, 11-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time

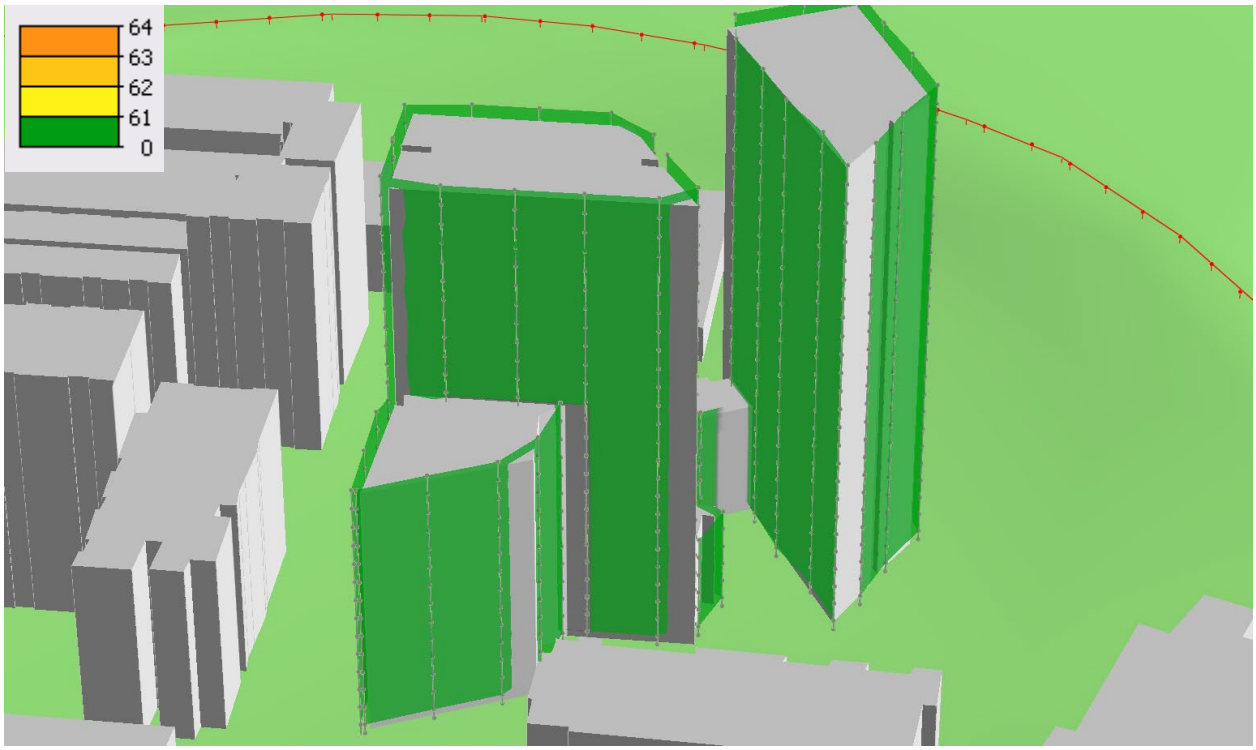

Measured ambient noise levels
Columbia Lane Homebush - Location 3 - South
Monday, 12-11-18
Rain
Lmax
L90
Leq
WindSpeed
WindLimit
Noise Level (dB)
WindSpeed (m/s)
Time
120
110
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00

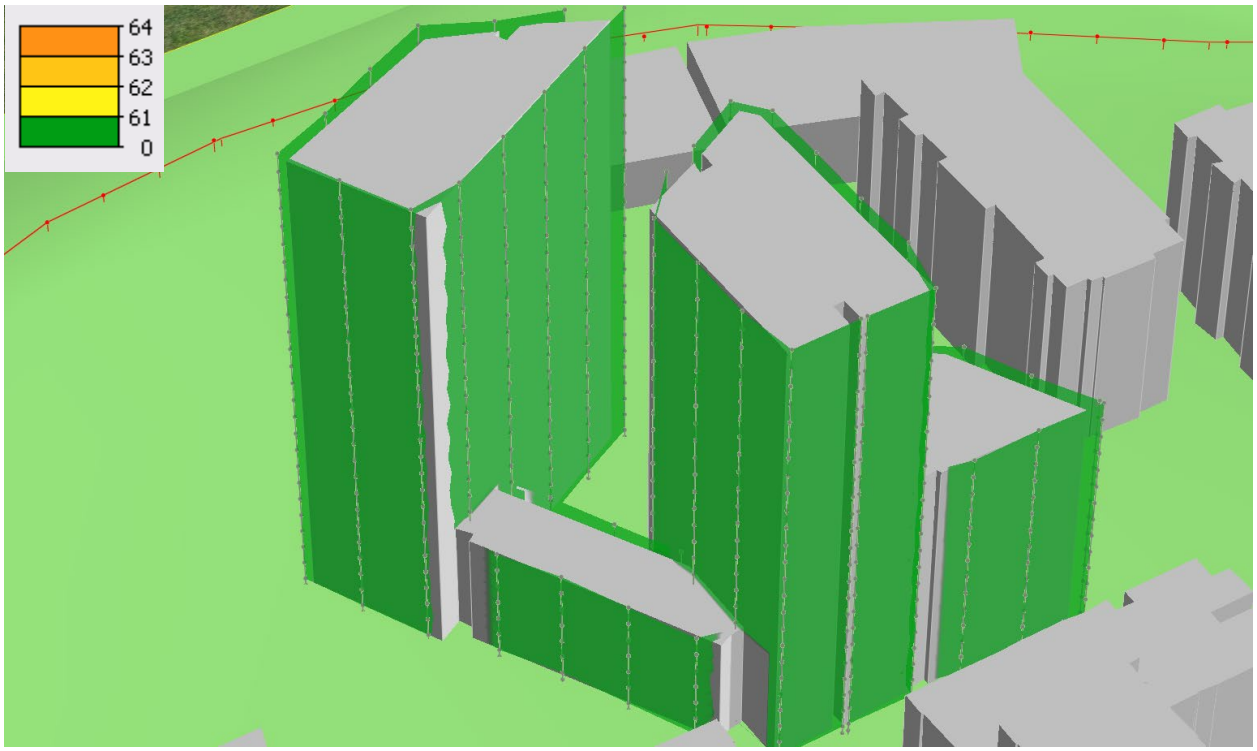
Appendix B

Incident noise contours

B.1 Incident noise on façade contours - Day



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63
62
61
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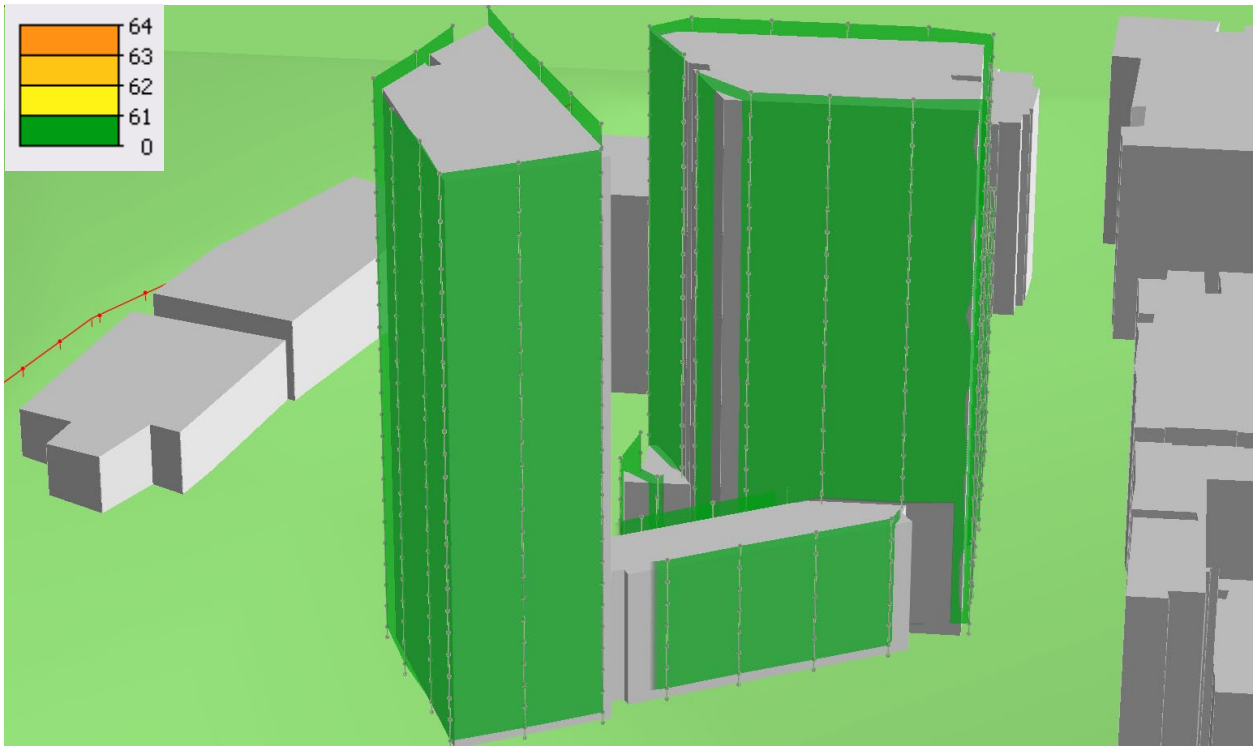
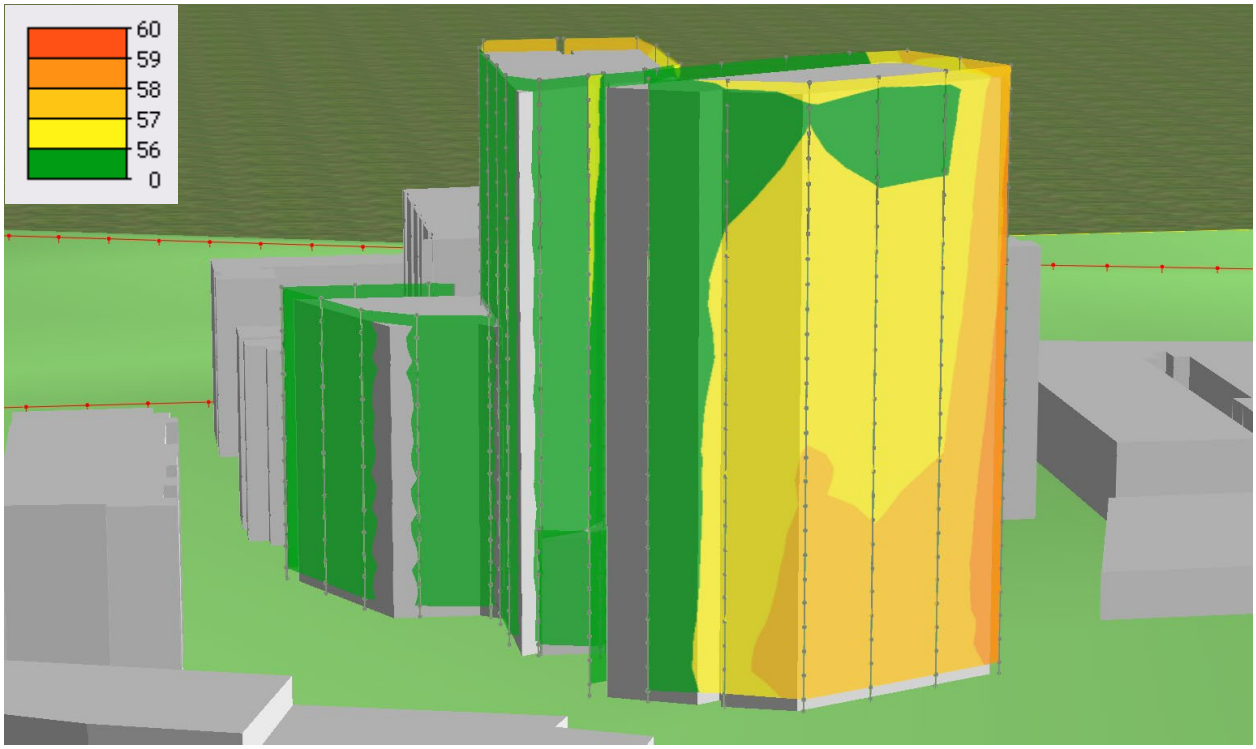
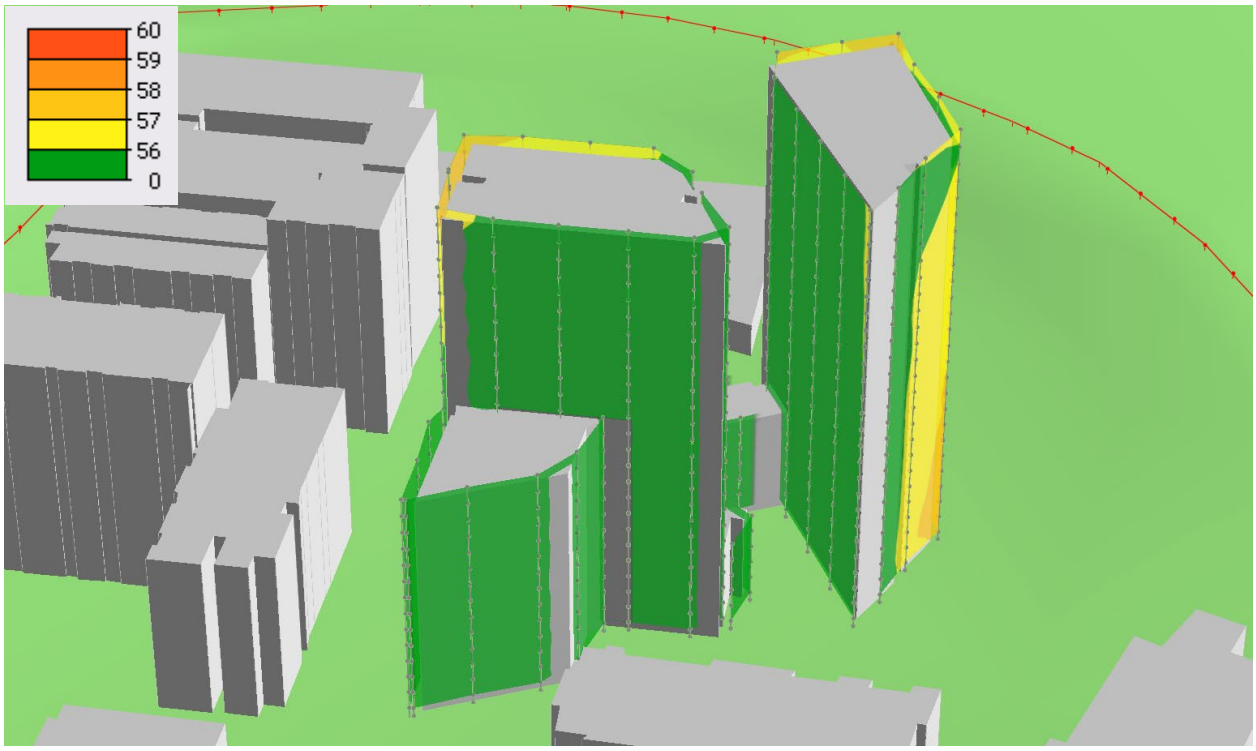
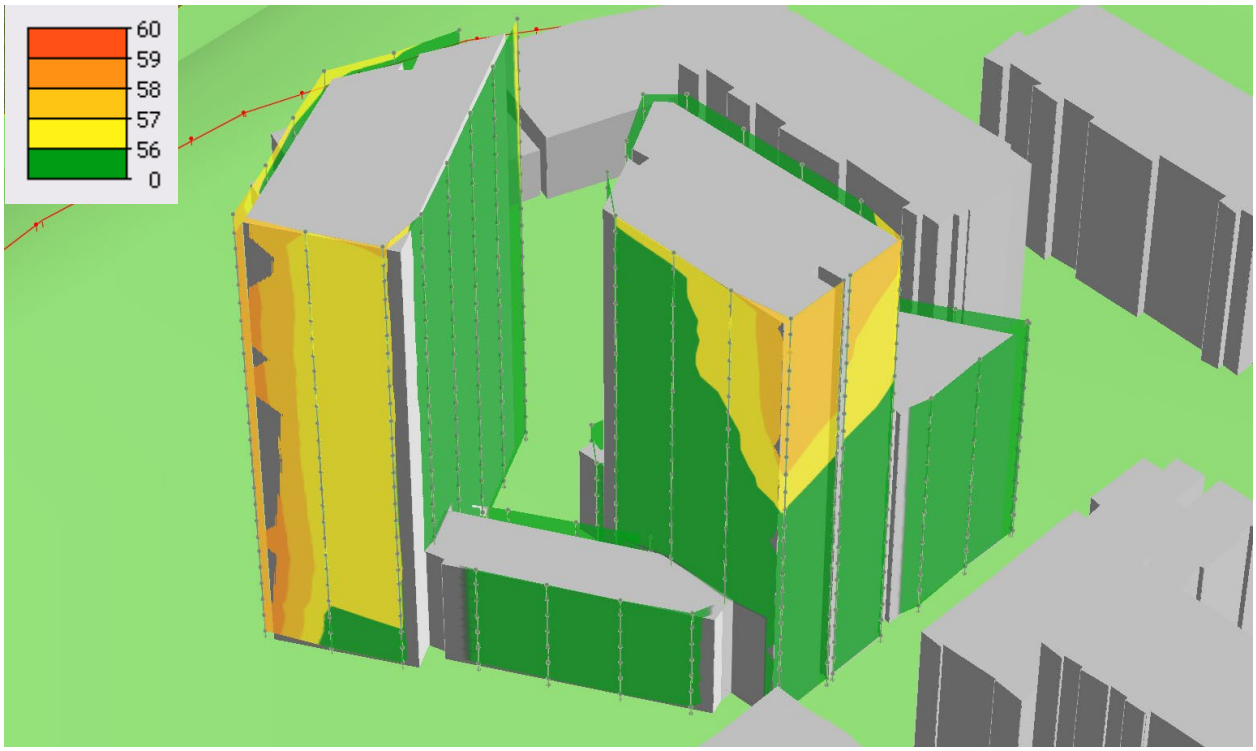

64
63
62
61
0

B.2 Incident noise on façade contours - Night



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56
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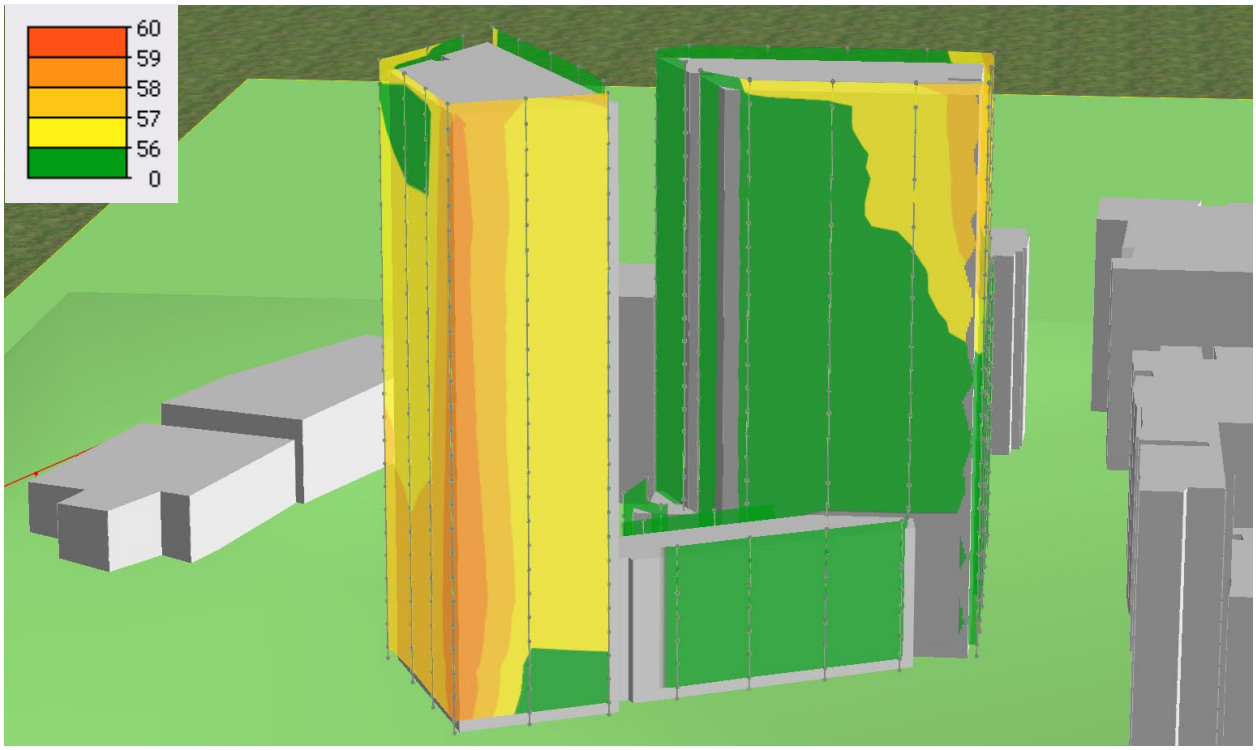
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57
56
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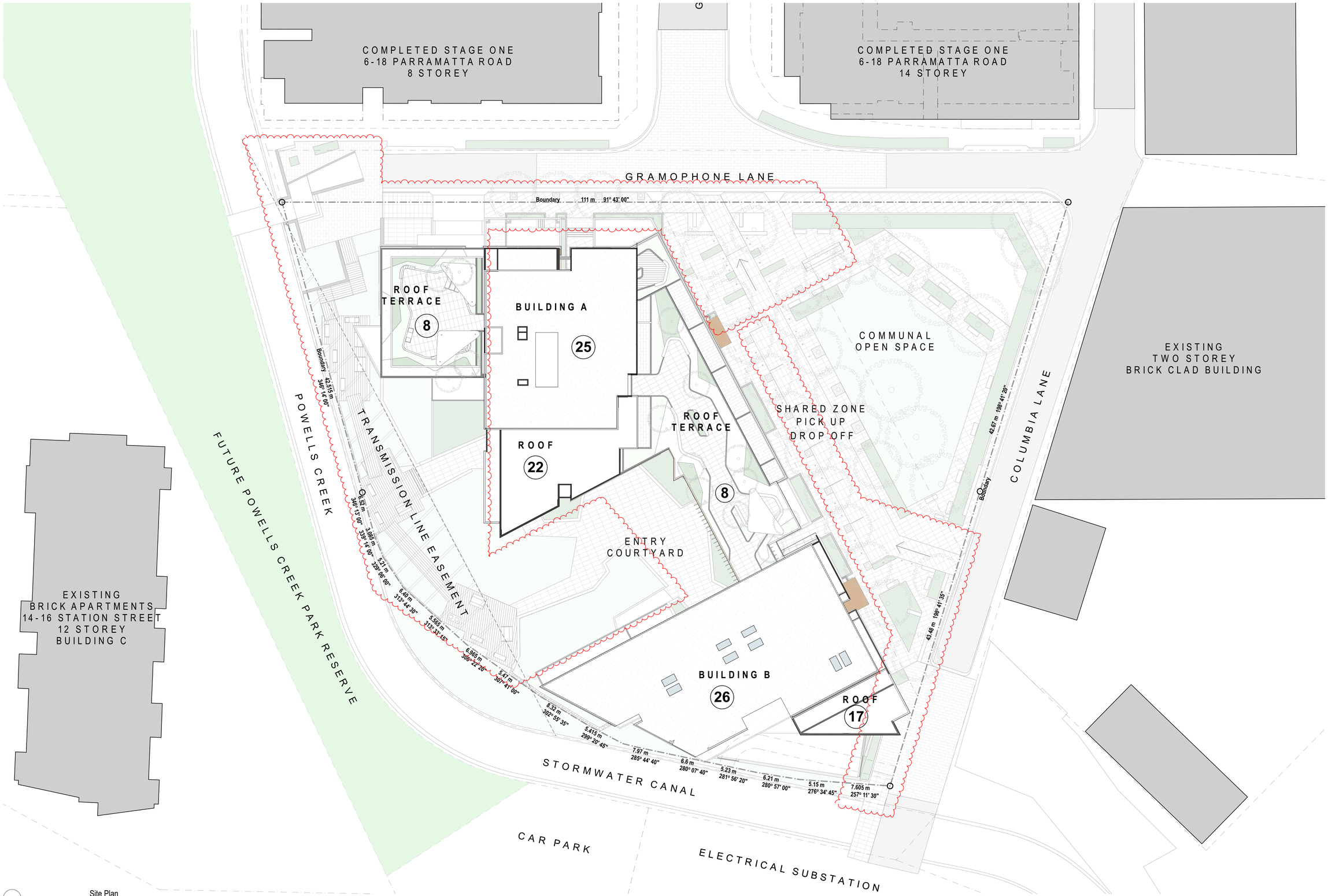
Appendix C

Architectural drawings



Site Plan
1:250

e reception@moscapserras.com.au
w www.moscapserras.com.au

north point:

N

key plan:

notes:

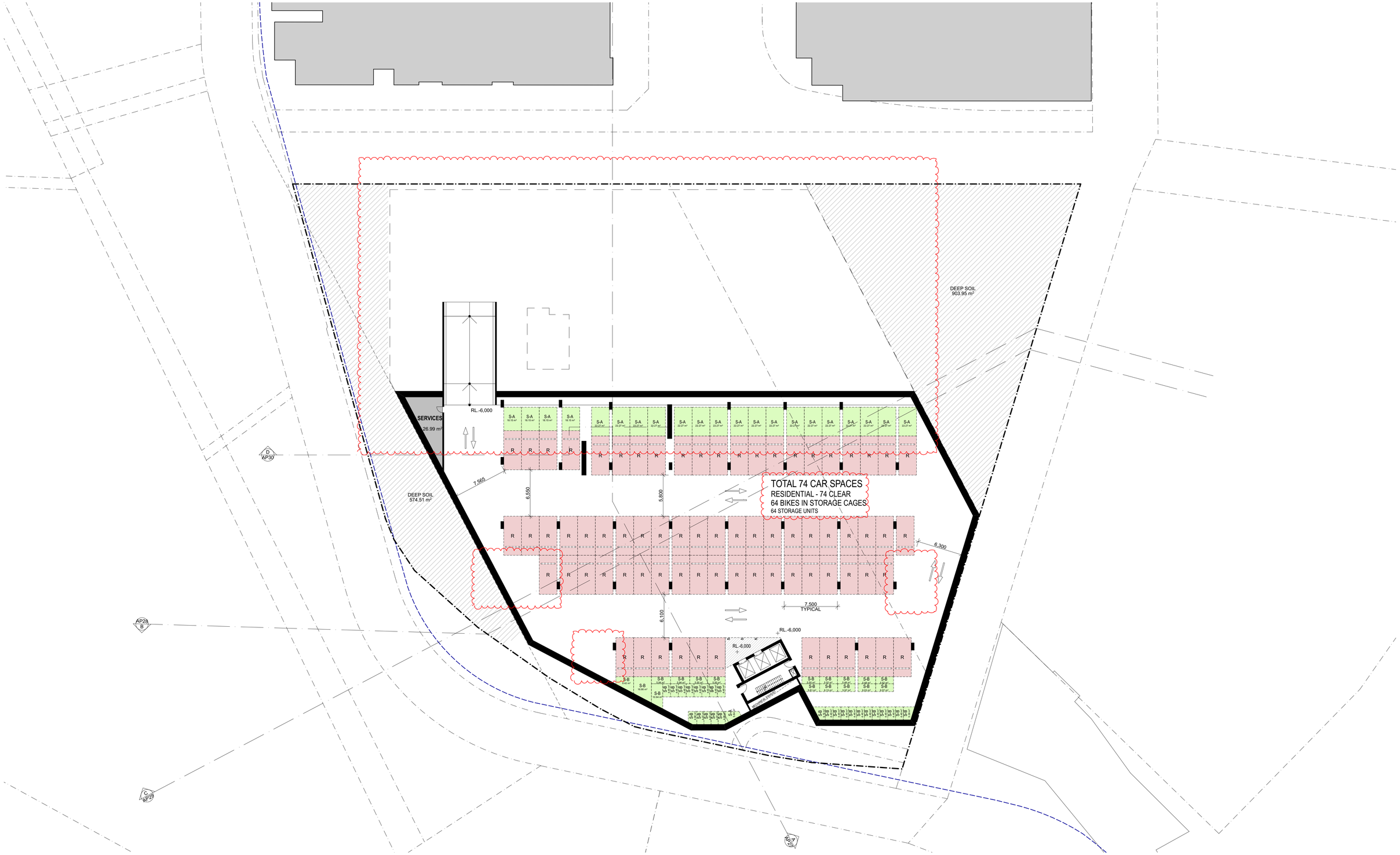
amendments:

Revision	Description	By	Date
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mpa
mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Site Plan

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP03	issue	D



Basement 4
1:250

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north point:

N

key plan:

notes:

amendments:

Revision	Description	By	Date
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mpa
mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Basement 4

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP04	issue	D

Basement 3
1:250

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north point:

N

key plan:

notes:

amendments:

Revision	Description	By	Date
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

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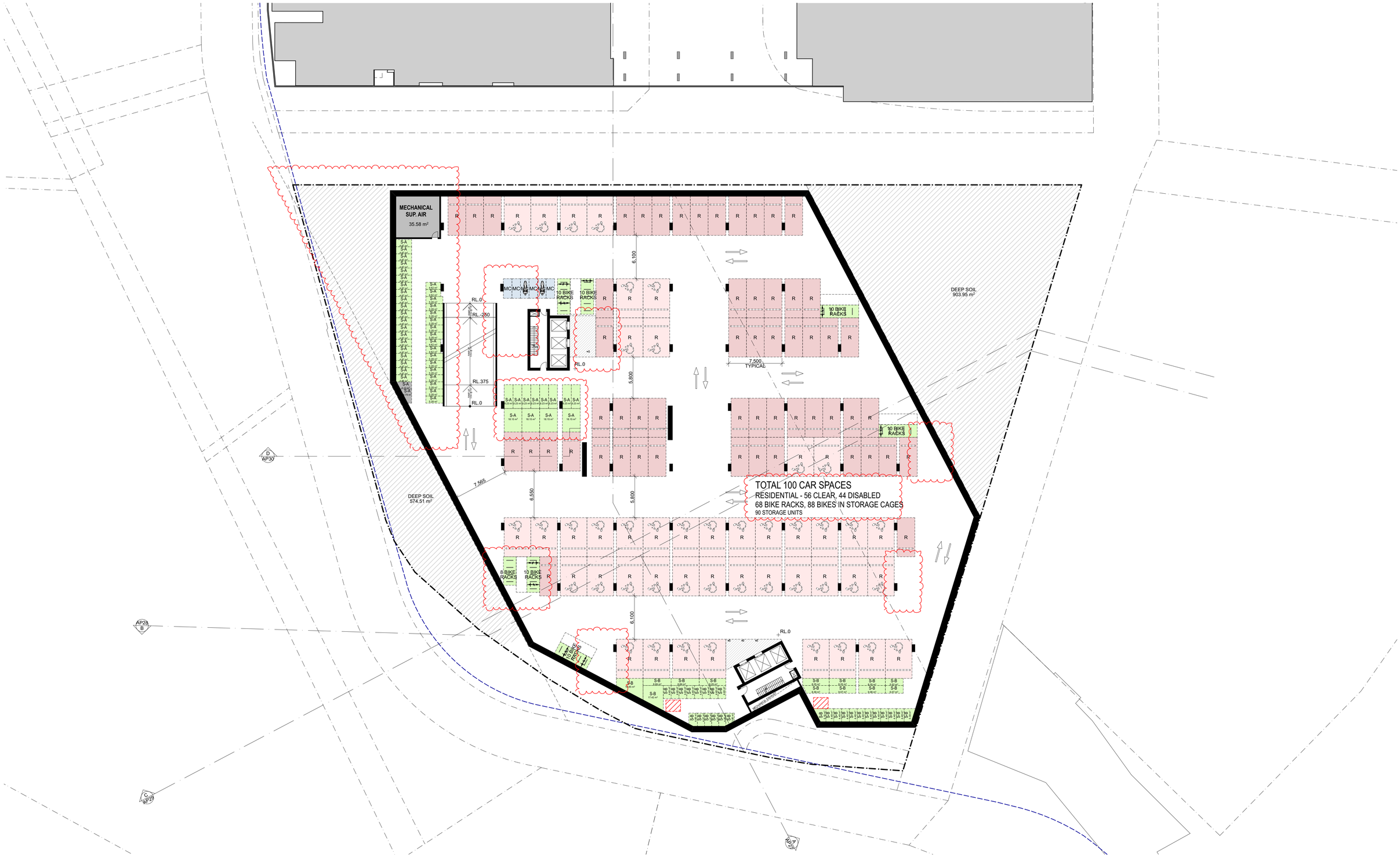
mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Basement 3

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP05	issue	D



Basement 2
1:250

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north point:

N

key plan:

notes:

amendments:

Revision	Description	By	Date
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

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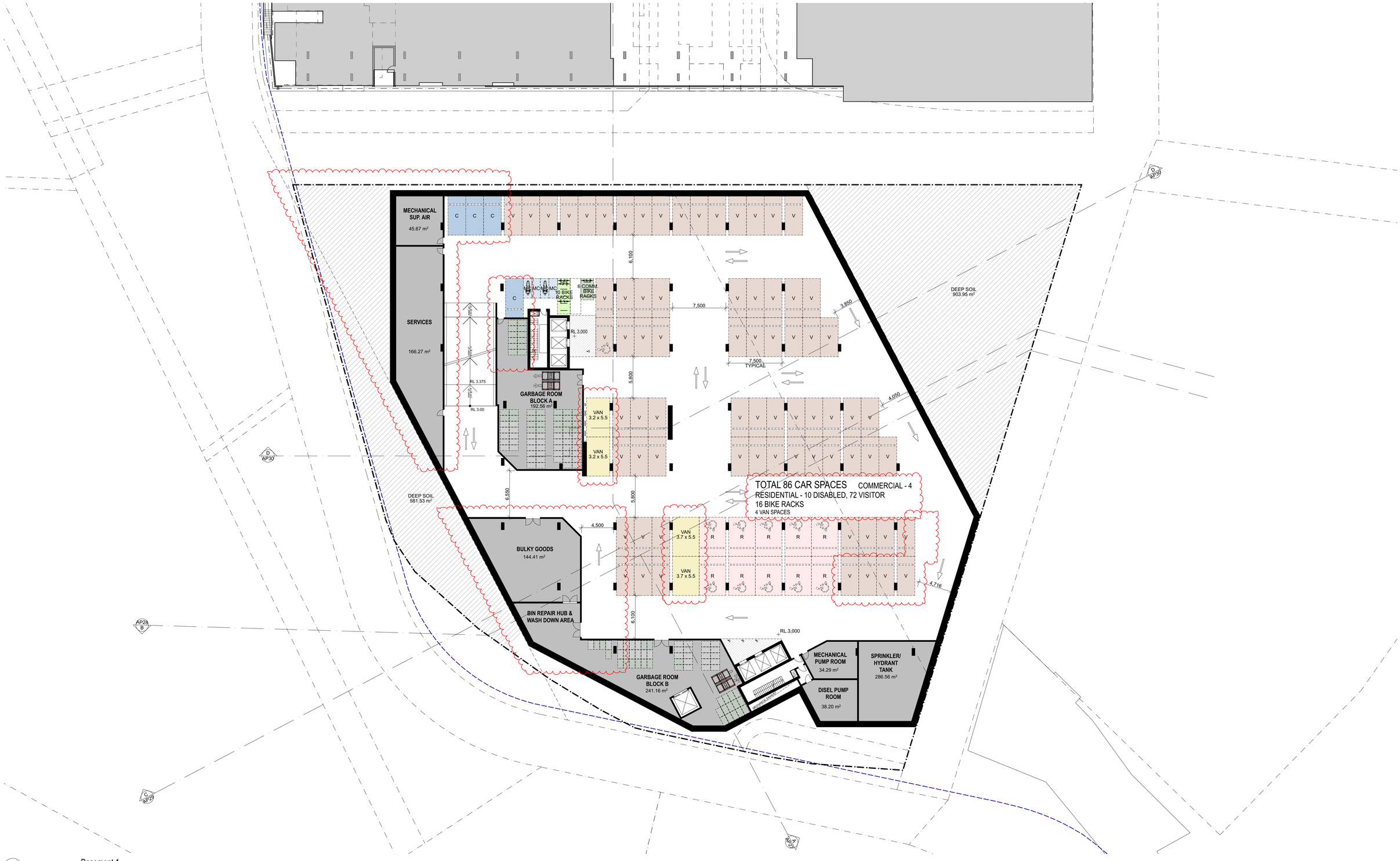
project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Basement 2

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP06	issue	D



Basement 1
1:250

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north point:

N

key plan:

notes:

amendments:

Revision	Description	By	Date
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

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project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Basement 1

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP07	issue	D

Ground.
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

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mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Ground Floor

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP08	issue	D

Level 1
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mpa
mosca pserras architects

project: MIXED USE DEVELOPMENT
location: 11-17 Columbia Lane, HOMEBUSH
client: Columbia Lane Development Pty. Ltd

drawing title: Level 1

scale: 1:250 @ A1
project architect: SP / GK
drawn: SB / MA
job no.: 14028
drawing no.: AP09
issue: D

Level 2-6
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mpa
mosca pserras architects

project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Level 2-6

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP10	issue	D

Level 7
1:250

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north point:

N

key plan:

notes:

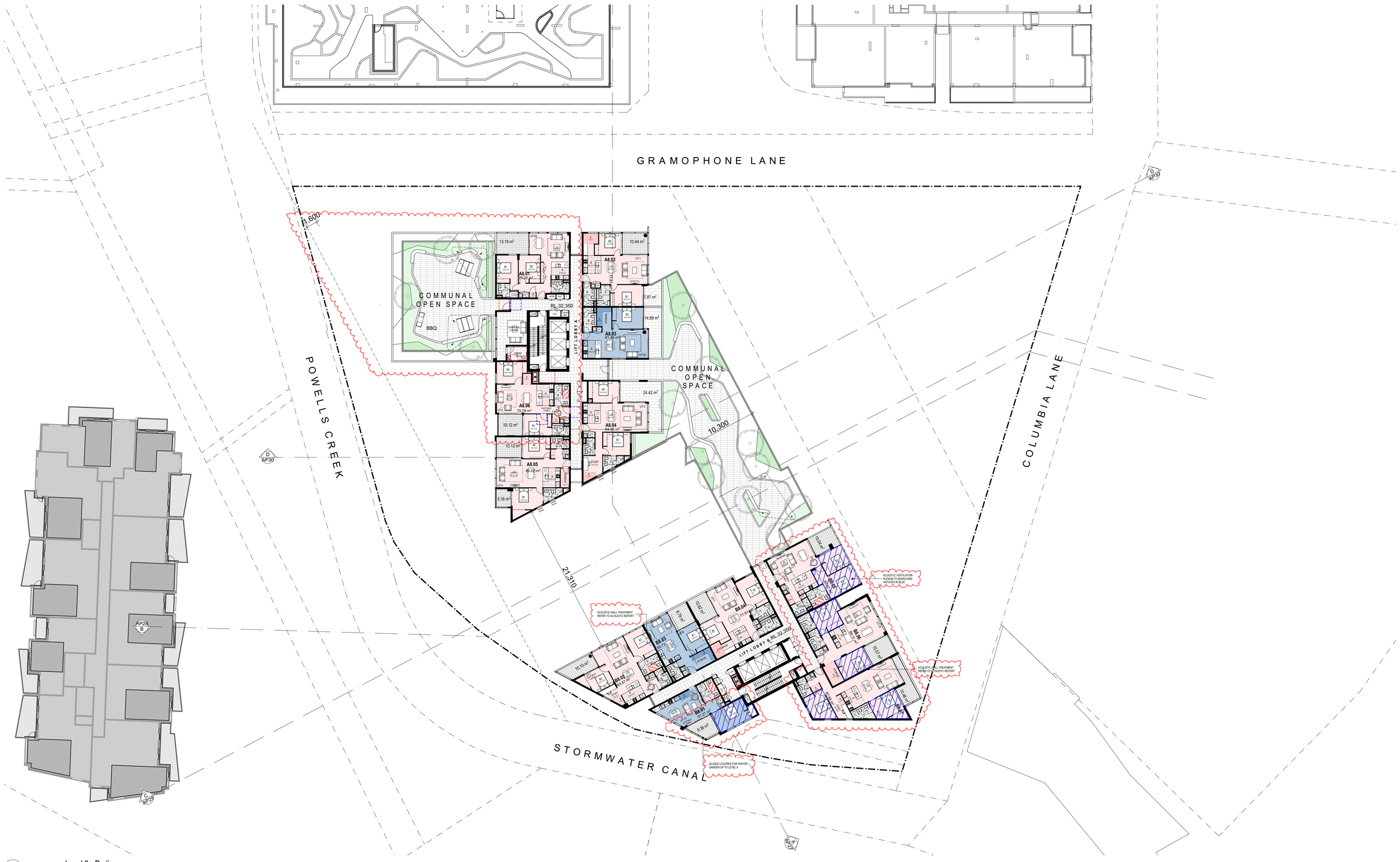
- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Level 7
scale	1:250 @ A1
project architect	SP / GK
drawn	SB / MA
job no.	14028
drawing no.	AP11
issue	D



Level 8 - Podium
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Level 8

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP12	issue	D

Levels 9-12
1:250

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north point:

N

key plan:

notes:

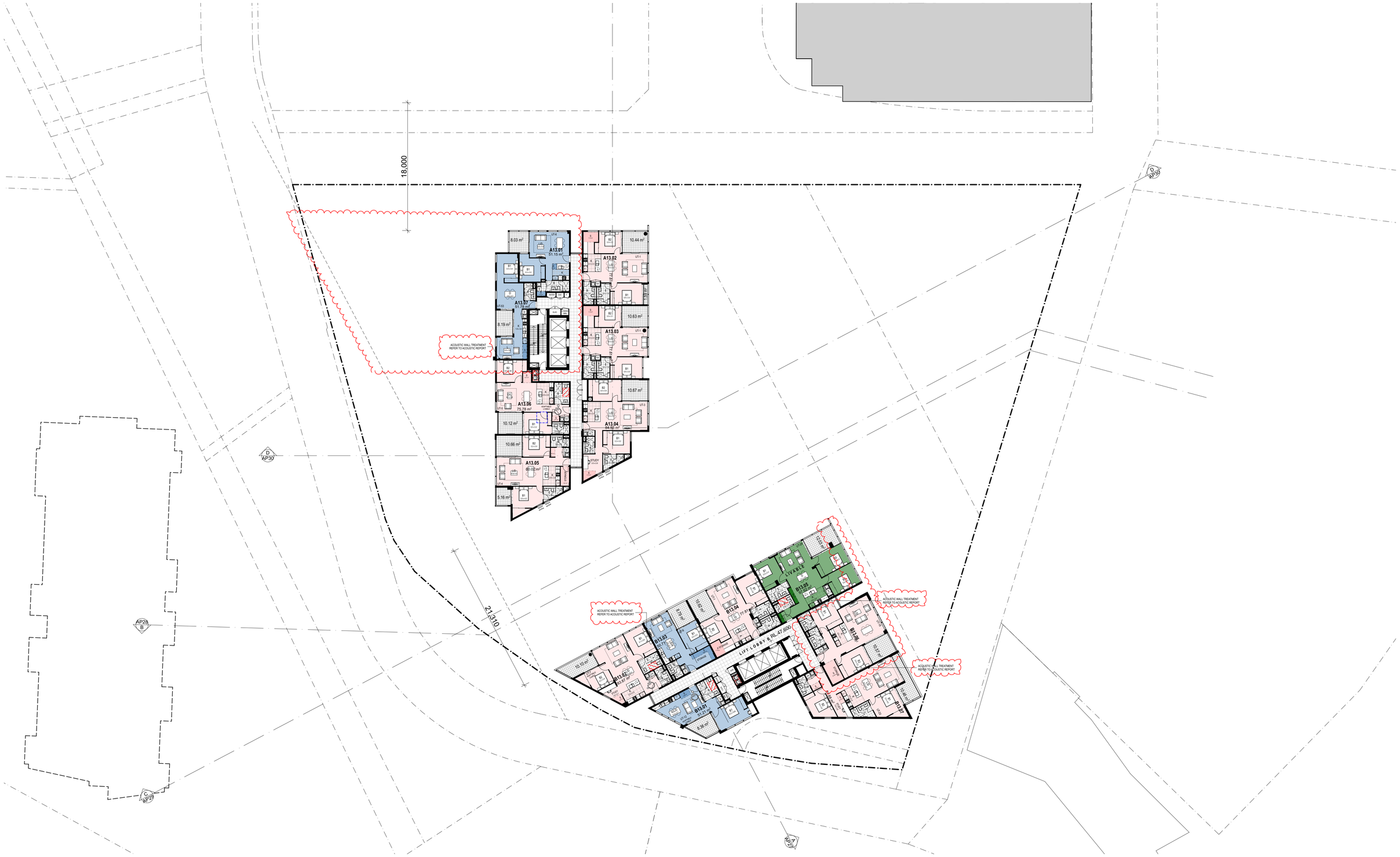
- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project	MIXED USE DEVELOPMENT		
location	11-17 Columbia Lane, HOMEBUSH		
client	Columbia Lane Development Pty. Ltd		
drawing title	Level 9-12		
scale 1:250 @ A1	project architect SP / GK	drawn SB / MA	
job no. 14028	drawing no. AP13	issue D	



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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Level 13

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP14	issue	D

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Level 14-16
scale	1:250 @ A1
job no.	14028
project architect	SP / GK
drawing no.	AP15
drawn	SB / MA
issue	D

Level 17
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Level 17

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP16	issue	D

Levels 18 - 21
1:250

e reception@moscapserras.com.au
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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Level 18-21

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP17	issue	D

Level 22
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

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project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Levels 22

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP18	issue	D

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

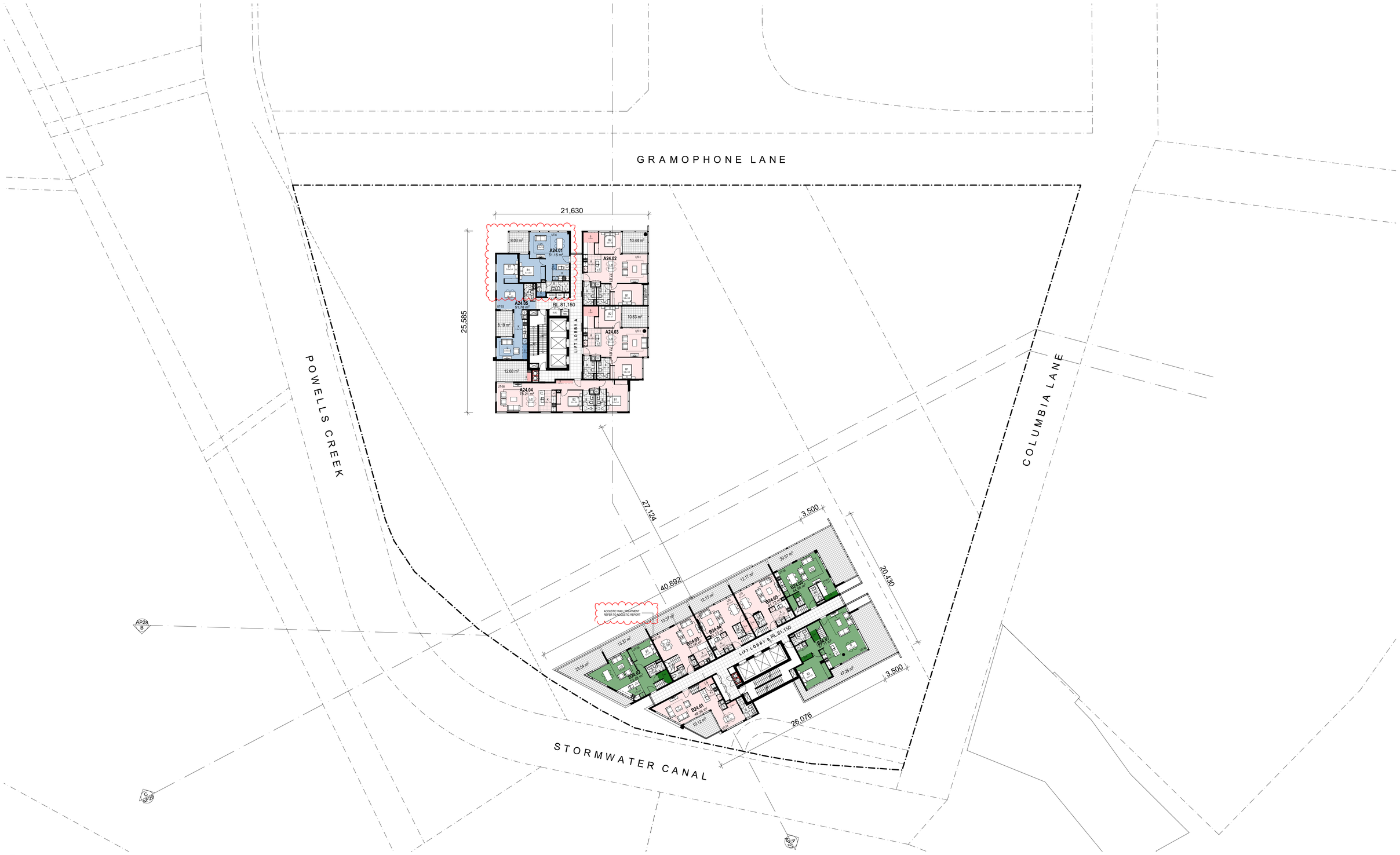
amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Level 23

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP19	issue	D



Level 24
1:250

e reception@moscapserras.com.au
w www.moscapserras.com.au

north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mosca pserras architects

project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Level 24

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP20	issue	D

GRAMOPHONE LANE

POWELLS CREEK

COLUMBIA LANE

STORMWATER CANAL

BUILDING A
ROOF
RL 84.200

SOLAR PANELS
260.50 m²

LIFT OVERRUN

37.237

17.020

23.873

RL 84.200

LIFT OVERRUN

AP28 B

C AP28

AP28 A

Level 25
1:250

e reception@moscapserras.com.au
w www.moscapserras.com.au

north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	06.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

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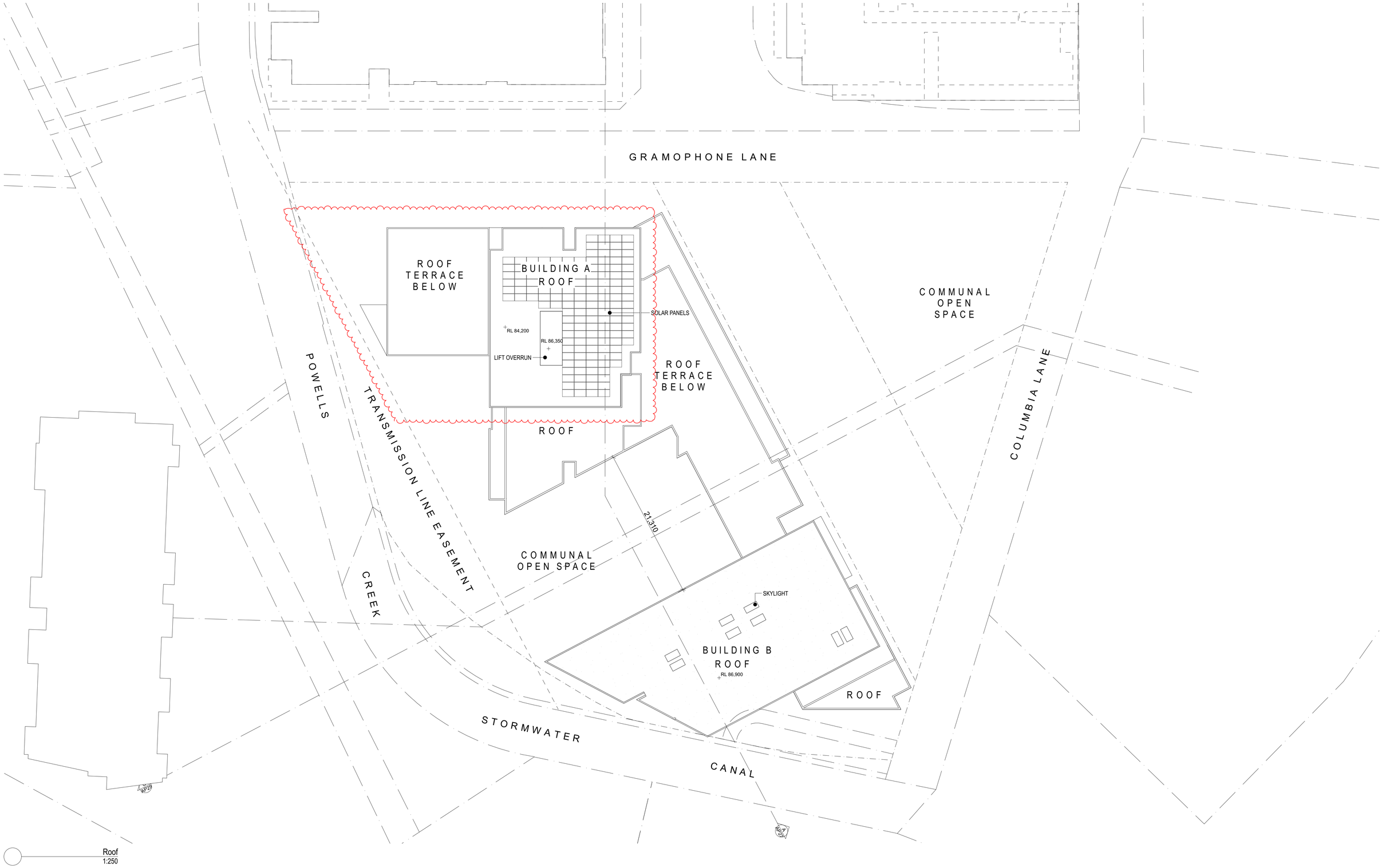
project MIXED USE DEVELOPMENT
location 11-17 Columbia Lane, HOMEBUSH
client Columbia Lane Development Pty. Ltd

drawing title Level 25

scale 1:250 @ A1 | project architect SP / GK | drawn SB / MA
job no. 14028 | drawing no. AP21 | issue D



Roof
1:250

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north point:

N

key plan:

notes:

- 1 BED UNITS
- 2 BED UNITS
- 3 BED UNITS
- LIVE WORK UNITS

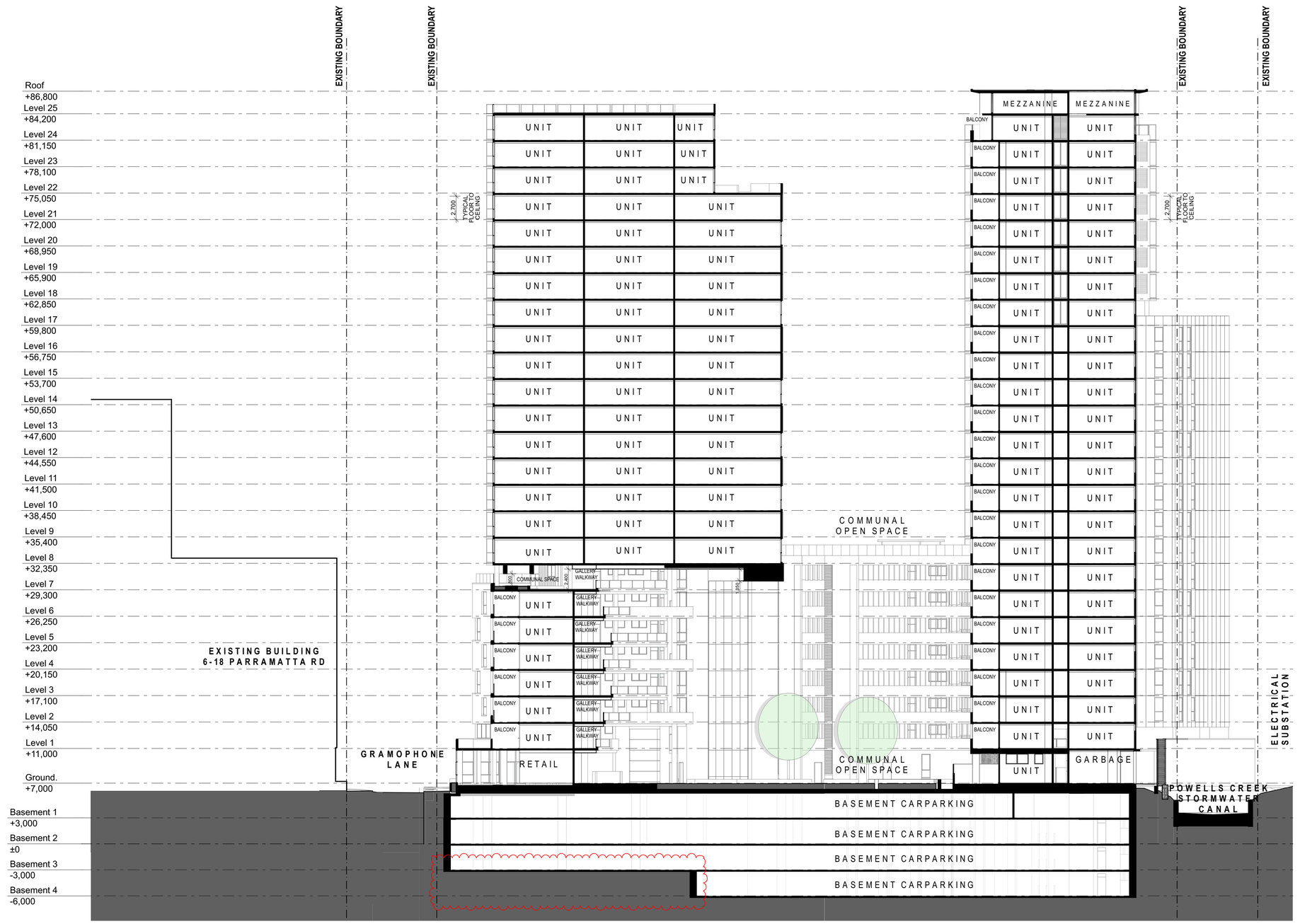
amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	06.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mpa
mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Roof Plan

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP22	issue	D



Section A1
1:250

e reception@moscapserras.com.au
w www.moscapserras.com.au

north point:

N

key plan:

notes:

amendments:

Revision	Description	By	Date
A	DA SUBMISSION	SB	08.08.19
B	Adjustments for Council's R.F.I and D.R.P comments	MA	22.11.19
C	Revised scheme - Consultant issue	MA, SB	08.07.20
D	Council RFI Response	MA, SB	15.07.20

mpa mosca pserras architects

project	MIXED USE DEVELOPMENT
location	11-17 Columbia Lane, HOMEBUSH
client	Columbia Lane Development Pty. Ltd
drawing title	Section A

scale	1:250 @ A1	project architect	SP / GK	drawn	SB / MA
job no.	14028	drawing no.	AP27	issue	D