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ACOUSTIC REPORT – DA STAGE

PROPOSED BOARDING HOUSE DEVELOPMENT

882A PITTWATER ROAD, DEE WHY NSW

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PROPOSED BOARDING HOUSE DEVELOPMENT
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1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was requested by Atlen Construction Pty Ltd to prepare an acoustical report for the proposed boarding house development at No. 882A Pittwater Road, Dee Why NSW. The report will form part of the Development Application (DA) documentation to be submitted to the Northern Beaches Council.

For the DA proposal, the acoustic adequacy of the proposed design must be assessed in terms of standard planning guidelines issued by the Council in their Local Environment Plan (LEP) and Development Control Plan (DCP).

As per Council's guidelines and other standard planning instruments, Koikas Acoustics has determined the following acoustical components require an assessment at the current DA design stage:

1. **Road traffic** noise assessment associated with Pittwater Road and its impact on future occupants of the development.
2. Noise impact assessment associated with the use of the **common communal areas** of the subject boarding house development, particularly the rooftop BBQ area.
3. **Mechanical plant** noise emission and the resulting impact on the existing acoustic amenity of the local area.
4. **Inter-tenancy sound-insulation requirements** for shared partitions within the building.

This report presents the results and findings of an acoustic assessment for the subject development. Recommended acoustic treatments and noise controls that are detailed in this report are deemed necessary for the development to comply with the nominated noise criteria and other relevant requirements.



2.0 THE PROPOSAL / DEVELOPMENT

The development is proposed to occupy the site at 882A Pittwater Road, Dee Why NSW.

The development location is situated in primarily urban retail and residential area. Prevailing ambient noise conditions on-site and in the local area are generally the result of road traffic noise (from Pittwater Road) and localised commercial noise sources.

The assessment site is surrounded by:

- Residential/retail premises to all directions, and
- Pittwater Road to the west at approximately 4 m from the front property boundary to the nearest traffic lane.

The subject site and surrounding properties are identified on the aerial photograph included in Figure 1.

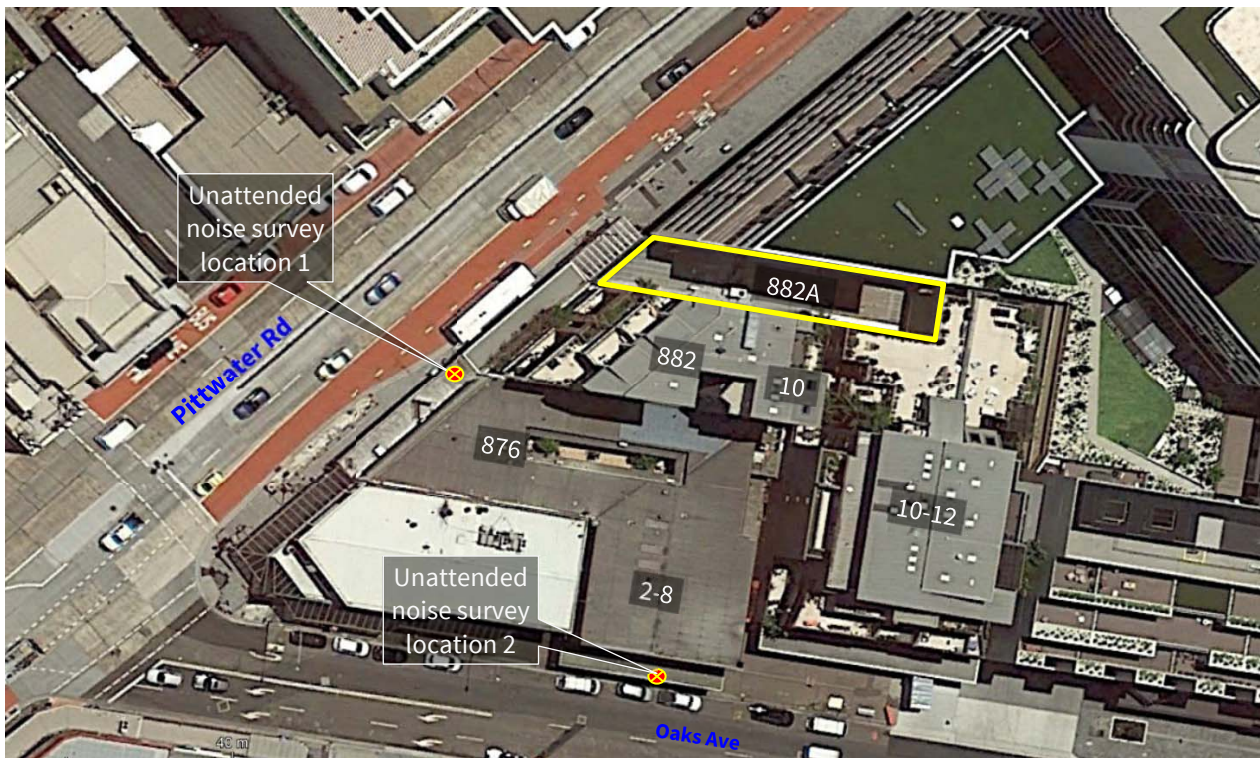


Figure 1. Aerial photo of the subject site and surrounding area (image source – Google Earth)

The proposed development will include nine (9) above-ground floor levels accommodating one (1) ground floor retail, three (3) commercial suites, one (1) managers room/office, twenty (20) boarding rooms, one (1) indoor communal space and one (1) rooftop outdoor BBQ area.

The current building design can be seen in the architectural drawings of the site as prepared by Crawford Architects, detailed in Table 1. All calculations and noise modelled scenarios conducted for this assessment are referenced to these design drawings. Where design changes are made without the prior knowledge of Koikas Acoustics, our assessment results and conclusions published within this report may not be accurate.

Table 1. Architectural drawings used in the assessment				
Drawing Title	Drawing No.	Issue	Date	Project No.
GROUND FLOOR	A100	M	21.03.03	20036
FIRST FLOOR	A101	M	21.03.03	20036
LEVEL 2 FLOOR PLAN	A102	M	21.03.03	20036
LEVEL 3 FLOOR PLAN	A103	M	21.03.03	20036
LEVEL 4 FLOOR PLAN	A104	M	21.03.03	20036
LEVEL 5 FLOOR PLAN	A105	M	21.03.03	20036
LEVEL 6 FLOOR PLAN	A106	M	21.03.09	20036
LEVEL 7 FLOOR PLAN	A107	L	21.03.03	20036
LEVEL 8 FLOOR PLAN	A108	J	21.03.03	20036
ROOF PLAN	A109	J	21.03.03	20036
ELEVATIONS – SHEET 01	A300	M	21.03.04	20036
ELEVATIONS – SHEET 02	A301	H	21.03.04	20036
ELEVATIONS – SHEET 03	A302	B	21.03.04	20036
SECTION AA	A350	L	21.03.03	20036
SECTION BB	A351	M	21.03.03	20036
SECTION CC & DD	A352	E	21.03.03	20036
ELEVATION MATERIAL AND FINISHES	A450	C	21.03.04	20036



3.0 AMBIENT NOISE SURVEY

3.1 SURVEY LOCATIONS

Existing external ambient noise levels were previously measured by installing two sound level meter data loggers on top of the pedestrian awnings:

- fronting Pittwater Road (Location 1) and
- fronting Oaks Avenue (Location 2).

Refer to Figure 1 of the report for noise monitoring locations.

3.2 MEASUREMENT METHODOLOGY & INSTRUMENTATION

- Two Type 1 precision Svantek 977 noise loggers were used for the survey.
- The installed location on the awning meant that the microphone was approximately 4.5-5 metres above the ground footpath level.
- The meters were placed to measure existing background and traffic noise levels that would be common for the façade fronting Pittwater Road and Oaks Avenue.
- The instruments were set-up to measure A-frequency and 'Fast' time-weighted noise levels.
- Noise level data was stored within the logger memory at 15-minute intervals for one-week between Thursday 21st and Friday 27th May 2020.
- Calibration readings were taken before and after each survey with a NATA calibrated and certified Larson Davis CAL200 precision acoustic calibrator. No system drift was observed for this meter.
- BOM (Bureau of Meteorology) weather records for the nearest available weather station indicate that inclement weather conditions did not adversely impact the noise survey.

The summary of noise survey results is presented in Table 2 and 3 below.



Table 2. Summary of noise logger results [dB]				
Location (Refer to Figure 1)	Period, T ¹	Ambient noise level LAeq,T	Rating Background Level LA90,T	Ambient noise level LAeq (Period)
Location 1 Fronting Pittwater Rd	Day	73	61	73
	Evening	71	56	
	Night	68	44	68
Location 2 Fronting Oaks Ave	Day	64	56	64
	Evening	63	51	
	Night	61	46	61
Notes	1. The NSW EPA Industrial Noise Policy refers to the following periods, Day – 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays, Evening – 6 pm to 10 pm Monday to Sunday, Night – 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays.			

Table 3. 1/1 octave band ambient (traffic) noise levels [dB] – LAeq,period [dB]											
Location (Refer to Figure 1)	Period [hhmm-hhmm]	1/1 octave band centre frequency [Hz]									Total
		31.5	63	125	250	500	1000	2000	4000	8000	
Location 1 Fronting Pittwater Rd	0700-2200	39	49	55	59	64	69	67	62	58	73
	2200-0700	33	44	50	54	59	64	62	58	54	68
Location 2 Fronting Oaks Ave	0700-2200	33	43	48	51	54	58	58	56	47	64
	2200-0700	31	39	44	49	52	55	55	53	44	61

The detailed unattended noise survey results are attached as **Appendix A** of this report.

4.0 ROAD TRAFFIC NOISE ASSESSMENT – NOISE MODEL SCENARIO 1

4.1 ROAD TRAFFIC NOISE CRITERIA

As per Clause 102 of the State Environmental Planning Policy (Infrastructure) 2007, hereafter referred to as ISEPP, development for a residential, place of public worship, hospital, educational facility or childcare centre use must be designed to consider the indoor noise amenity of future occupants.

Where the development is for residential use, and the site is adjacent to a classified road that carries an annual daily traffic volume of more than 20,000 vehicles, and that the consent authority considers is likely to be impacted by road noise or vibration, maximum allowable indoor traffic noise levels are defined as:

- LAeq 35 dB in any bedroom in the building between the hours of 10 pm and 7 am.
- LAeq 40 dB elsewhere in the building (excluding a garage, kitchen bathroom or hallway) at any other time.

ISEPP requires that before any application is determined under which this clause applies, consideration must be given to guidelines that are issued by the Director-General. It is the understanding of Koikas Acoustics that the Director-General has issued guidelines relating to the determination of suitable indoor noise levels for development with open windows allowing natural ventilation of indoor areas. The Director-General has recommended under this condition (open windows) that indoor noise levels should not exceed:

- LAeq 45 dB in any bedroom in the building between the hours of 10 pm and 7 am.
- LAeq 50 dB elsewhere in the building (excluding a garage, kitchen bathroom or hallway) at any other time.

The NSW Department of Planning (DoP) supports the design targets of ISEPP and the Director-General guidelines within their road/rail noise guidelines (*Development near rail corridors and busy roads, Interim Guideline 2008*). The DoP guideline further defines the duration under which noise levels are assessed, being LAeq 9 hours (10 pm to 7 am) for bedrooms and LAeq 15 hours (7 am to 10 pm) elsewhere.

A summary of the applied traffic noise planning levels is included in Table 4.



Table 4. Design criteria for internal spaces			
Description	Area	Period	L _{Aeq} (Period) [dB]
Windows and doors closed	Bedrooms	10 pm to 7 am	35
	Bedrooms	7 am to 10 pm	40
	Living areas	At any time	40
Windows & doors open (natural ventilation)	Bedrooms	10 pm to 7 am	45
	Bedrooms	7 am to 10 pm	50
	Living areas	At any time	50
Notes	1.	The assessment period for night time is 9 hours between 10 pm and 7 am.	

4.2 FAÇADE TRAFFIC NOISE LEVELS

Calculating the level of traffic noise that is transmitted through a façade and into a room is dependent upon the external façade noise level, the sound insulation performance of the building façade (inclusive of all building components), and the level of acoustic absorption that is present within the subject room.

As per *AS3671-1989 Acoustics – Road traffic noise intrusion*, the prediction of façade traffic noise levels considers a forecast increase in traffic volumes over a 10-year planning period. In the absence of RMS traffic volume data for the specific road corridor on an annual basis, Koikas Acoustics has adopted a forecast 2% p.a. increase in traffic volumes over a 10-year from the time of preparing this report.

A calibrated Cadna/A noise model (computer software package) was utilised in conjunction with the noise measurements discussed in Section 3.0 of this report to predict external façade traffic noise levels. Refer to noise model **Scenario 1** attached as **Appendix B** of this report.

The predicted maximum external façade traffic noise levels are:

building façade fronting Pittwater Road :	Daytime:	L _{Aeq} , 15 hour	72 dB
	Nighttime:	L _{Aeq} , 9 hour	68 dB

Reduced noise exposure along the southern side and rear of the building will result from the limited field of view of traffic from Pittwater Road and noise shielding from adjacent buildings.

External road traffic noise intrusion calculations are attached as **Appendix C** of this report.

4.3 RECOMMENDED CONSTRUCTION MATERIALS

Indoor noise levels were calculated (details attached as **Appendix C**) to determine the acoustic performance of the proposed building facade. The noise modelling and subsequent analysis conclude the following:

4.3.1 Ceiling/Roof

Table 5. Ceiling/roof recommendations	
Recommended construction	Area to which the recommendation applies
<ul style="list-style-type: none">Concrete roofing with a minimum thickness of 150 mm	All roofing areas.

4.3.2 External Walls

Table 6. External walls recommendations	
Recommended construction	Area to which the recommendation applies
Option 01 (precast concrete wall) <ul style="list-style-type: none">110 mm thick precast concrete wall (minimum density of 1600 kg/m³);A layer of 100 mm thick 14 kg/m³ insulation batts fitted tightly between the 90 mm timber or steel stud framing, andOne layer of 13 mm thick plasterboard for the internal lining.	All external wall areas.
Option 2 (Hebel wall system) <ul style="list-style-type: none">External rendering;75 mm Hebel;Minimum 20 mm air-gap separation;64 mm steel stud framing with insulation batts, andOne layer of 13 mm plasterboard.	
Option 3 (Concrete wall) <ul style="list-style-type: none">concrete external wall systems with a minimum ~150 mm thick (AFS or Dincel wall system)	

4.3.3 Glass Windows and Doors

In-principle design specifications for the glazed door and window systems in the development are provided in **Appendix D** of this report.

In addition to the minimum glass recommendation (**Appendix D**), the installed window/glazed door systems (inclusive of framing and seals) must achieve a minimum acoustic rating of:

- Rw 27 for 4 mm toughened glass;
- Rw 32 for 6.38 mm laminated glass;
- Rw 35~36 for 12.38 mm laminated glass;
- Rw 51 for 6.38 mm laminated glass +
100 mm air gap +
10.38 mm laminated glass;
- and comply with Notes 1 to 4 below.

Koikas Acoustics notes that the recommendations provided in this report are for the minimum required glazing predicted to achieve satisfactory acoustic performance. Design factors such as safety, thermal or energy efficiency are outside the scope of this report and should be assessed accordingly. It is the Client's responsibility to ensure all glazed windows and sliding doors installed on-site to meet all building design requirements.

Notes

1. Window frames should be tightly fitted to the external wall minimising any air gaps. Any air gaps present should be packed with timber and an appropriate acrylic sealant such as Knauf Bindex (or approved equivalent).
2. All open-able windows and glazed door systems should be airtight when closed.
3. Q-lon type seals or the equivalent should be fitted along the perimeter of all glazing systems to minimise air gaps. For sliding glass systems that cannot incorporate Q-lon seals, heavy-duty fin-type seals such as Schlegel SilentFin could be used. If the windows/doors are not designed to be air-tight when closed, the reduced performance of the windows/doors could compromise the acoustic integrity of the building facade.
4. Recommended glass systems have been calculated based on current architectural drawings as established within this report.

High performing glazed window/door systems can be supplied by Eco Aluminium. Mob 0475 770 272.

Web: www.ecoaluminium.com.au. Other reputable suppliers can also be considered.



4.3.4 Timber Entry Doors

The main entry door to the townhouse unit should be a minimum 38-40 mm thick solid-core timber with acoustical perimeter and door bottom seals. Suitable acoustic seals could be Raven type RP10/RP10si door frame/perimeter seals and RP8si door bottom seals, or an approved equivalent from another manufacturer. Any glass inserts in external doors should be a minimum of 10.38 mm laminated glass.

4.3.5 Ventilation (To Be Advised by Mechanical Ventilation Experts)

In the event of high external traffic noise levels, naturally ventilating rooms through the opening of windows and/or doors may not be suitable. This is due to the level of traffic noise being transmitted through the open doors resulting in a breach of the applied noise criterion.

As a general rule, where windows or doors opened sufficiently to provide natural ventilation to a room, the indoor noise level is 10 dB below the outside noise level. Therefore, a window or sliding door to a room may be opened to provide natural ventilation where the outdoor noise level does not exceed 10 dB above the “Windows open” criteria as detailed within this report.

For this development, all habitable rooms fronting Pittwater Road (as noted in **Appendix D** with a star sign “★”) are not suitable for natural ventilation through open windows/doors. Therefore, windows and doors will need to be closed to achieve the acoustic criterion. The design of the ventilation to these rooms is to consider windows and doors being closed.

All other rooms may be naturally ventilated through open windows/doors.

For rooms requiring an alternate source of ventilation other than open windows/doors the following may be considered (subject to review by a ventilation expert):

- Borrowed air from elsewhere in the dwelling/unit
- Incorporating a component of fresh air into a ducted air conditioning system

- Installing a small air supply fan and acoustically treated duct
 - Round or square ceiling mounted ventilation duct fan that incorporating a minimum of 3 metres of sound-absorbing material to the inner surfaces of the ductwork
 - DuctTech Phone: (02) 9674 1577
 - Email: salesnsw@ducttech.com.au



Figure 2. Ceiling mounted ventilation duct fan

- Installing a small air supply fan and acoustically treated duct into a ceiling bulkhead

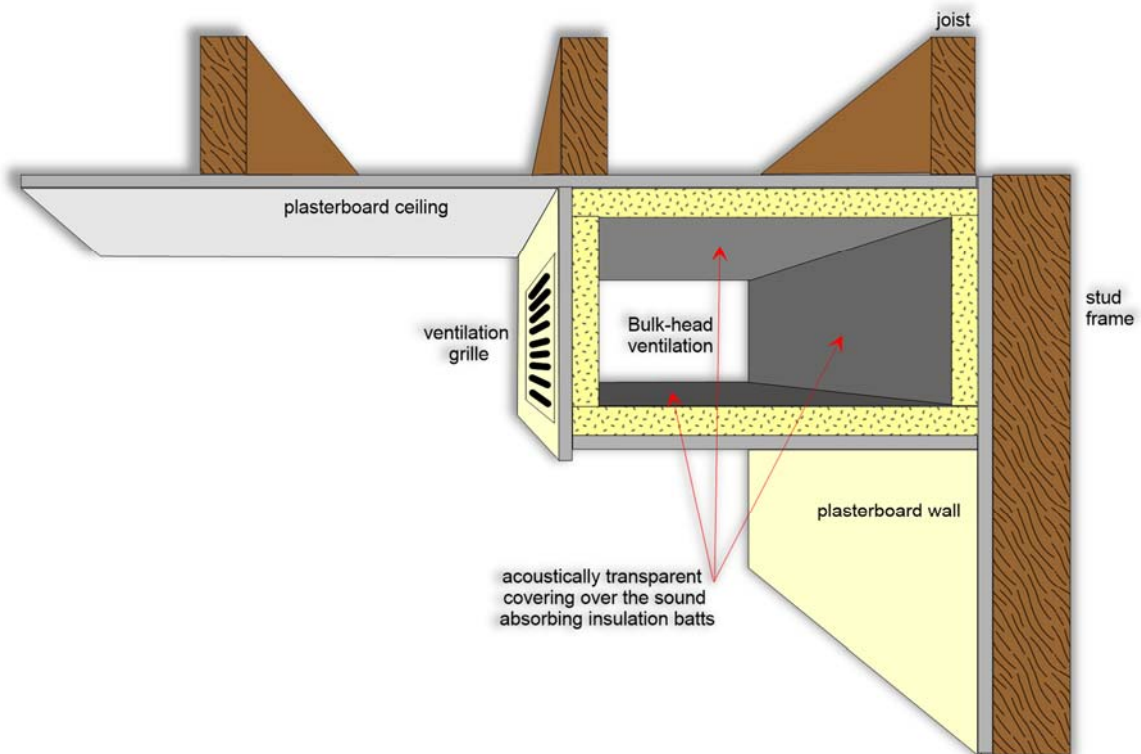


Figure 3. Indicative ventilation system through ceiling bulkhead

- Installing a wall-mounted ventilator such as the Acoustica Aeropac or similar



Figure 4. A wall-mounted ventilator

Any penetrations in the walls or roof to accommodate ventilation system/s should not impact the acoustic integrity of the building façade. An acoustical engineer should review any proposed ventilation solution that proposes a penetration of the building façade.

5.0 BUILDING USE (THE USE OF COMMON COMMUNAL AREA & OUTDOOR BBQ AREAS) – NOISE MODEL SCENARIO 2

5.1 DISCUSSION OF NOISE POLICIES/GUIDELINES AND CRITERIA

Noise emission design targets have been referenced from the NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPfI). The NPfI replaces the former Industrial Noise Policy, also prepared by the EPA.

The NPfI is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the Environment Operations Act 1997, Schedule 1. It is also commonly used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

The guideline applies limits on the short term intrusive nature of a noise or noise-generating development (project intrusive noise level), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (project amenity noise level).

The most stringent of the project intrusive noise level and project amenity noise level is applied as the **project noise trigger level**. The project noise trigger level is the point, above which noise emission from a source or development site would trigger a management response.

To be able to define the more stringent of the intrusive and amenity noise levels, the underlying noise metrics must be the same. As the intrusive noise level is defined in terms of a L_{Aeq} 15 minutes and the amenity noise level is defined in terms of a L_{Aeq} Period, a correction +3 dB correction is applied to the project amenity noise level to equate the L_{Aeq} Period to L_{Aeq} 15 minutes.

Based on the above discussion and unattended noise survey data presented in Section 3.0, the following NPfI planning levels apply for this project relating to boarding house noise (predominately from occupants & guests occupying the outdoor BBQ area):



Table 7. General building use noise criterion levels [dB]								
Period, T (Note 1)	Intrusive		Amenity					Project noise trigger level
	RBL	RBL + 5	Area classification	Recommended amenity noise level	High traffic area	Project amenity noise level ²	+3dB correction	
Location 1 (Fronting Pittwater Road)								
Day	61	66	Urban	60	Yes	58	61	61
Evening	56	61	Urban	50	Yes	56	59	59
Night	44	49	Urban	45	Yes	53	56	49
Night (inaudibility)	44	-	-	-	-	-	-	36~39 ³
Location 2 (Fronting Oak Avenue)								
Day	56	61	Urban	60	No	55	58	58
Evening	51	56	Urban	50	Yes	48	51	51
Night	46	51	Urban	45	Yes	46	49	49
Night (inaudibility)	46	-	-	-	-	-	-	38~41 ³
Notes	<ol style="list-style-type: none"> EPA defines the following periods, Day – 7 am to 6 pm Mon to Sat and 8 am to 6 pm Sun and public holidays, Evening – 6 pm to 10 pm Mon to Sun, Night – 10 pm to 7 am Mon to Sat and 10 pm to 8 am Sun and public holidays. Project noise amenity level = recommended noise amenity level – 5dB, except where specific circumstances are met, such as high traffic. The inaudibility occurs when the noise in question is 5~8 dB lower than the ambient background noise level. 							

The noise criteria (external) adopted concerning the general building use are:

Fronting the main road (Pittwater Road)

- **$L_{Aeq, 15 \text{ min}} \leq 61 \text{ dB}$** during the daytime period;
- **$L_{Aeq, 15 \text{ min}} \leq 59 \text{ dB}$** during the evening period
- **$L_{Aeq, 15 \text{ min}} \leq 49 \text{ dB}$** during the night-time period, and
- **$L_{Aeq, 15 \text{ min}} \leq 36\sim39 \text{ dB}$** for inaudibility (applicable for AC during night-time only).

Rear or shielded areas

- **$L_{Aeq, 15 \text{ min}} \leq 58 \text{ dB}$** during the daytime period;
- **$L_{Aeq, 15 \text{ min}} \leq 51 \text{ dB}$** during the evening period
- **$L_{Aeq, 15 \text{ min}} \leq 49 \text{ dB}$** during the night-time period, and
- **$L_{Aeq, 15 \text{ min}} \leq 38\sim41 \text{ dB}$** for inaudibility (applicable for AC during night-time only).



5.2 ASSOCIATED SOUND LEVELS

The primary focus of the noise emission assessment in this section is attributed to persons talking in the outdoor BBQ areas level 8 at the rear. The number of people occupying the outdoor courtyard areas was based on 50% of the maximum occupancy and the presumption of 25% of the occupants bring an additional 1 guest:

50 % of 34 (maximum of numbers of occupants)	=	12 occupants
50 % of 12 occupants	=	6 guests
Total	=	18 people

Therefore, as a worst-case scenario, this acoustic assessment considers a maximum of 18 people occupying the courtyard areas at any one time.

For the purpose of predicting noise emission, 50% of people are conservatively assumed to be speaking at the same time with normal conversational vocal effort. The sound power level attributed to 'normal' conversational voice is $L_{A_{Weq}}$ 64 dB for one person (i.e. equivalent to $L_{A_{Weq}}$ 74 dB for 9 people talking at the same time).

5.3 RESULTANT NOISE LEVELS FROM THE REAR OUTDOOR BBQ AREA (NOISE MODEL SCENARIO 2) TO SURROUNDING RESIDENTIAL PREMISES

Noise levels resulting from the use of the rear outdoor BBQ area were determined for the proposed boarding house utilising a computer software package called CadnaA.

The calculated maximum noise level from 18 occupants/guests (as determined in Section 5.2 above) was found to be $L_{A_{eq,15mins}}$ 50 dB outside the window on the 7th floor level of the rear boarding room of the subject development and expected to comply with the daytime/evening noise criterion levels.

To achieve compliance at all other hours, the recommendations stated in Section 5.4 of this report are required to be implemented.

The above calculated resultant noise level at the most noise-sensitive receiver location is the absolute maximum considering the worst-case scenario. The actual noise levels are expected to be lower.



The aerial photo superimposed with noise level contours produced by the Cadna/A noise model shows noise impact emanating from the proposed outdoor communal courtyard area. Details of these noise contour maps are attached as **Appendix B** (Scenario 2).

5.4 RECOMMENDATIONS AND BOARDING HOUSE OPERATING RESTRICTIONS

To achieve compliance during all periods, the following is restricted to the proposed boarding house:

Daytime & evening Period (Between 0700 and 2200 hours)

- A maximum of 18 people is permitted to occupy the rooftop BBQ area.
- The bi-fold doors of the indoor communal living room on level 7 (adjacent to the external BBQ area) are to be closed at all times.
- No music is to be played outdoors in the BBQ area.

Night-time Period (Between 2200 and 0700 hours)

- For the benefit of occupants of the subject boarding house rooms, it is recommended that all music cease playing after 10 pm or is played at low levels to minimise noise disturbance to surrounding occupants. House rules should be enforced by the building management.
- No one is to occupy the indoor and outdoor communal areas (including the BBQ area) for recreational purposes.

Furthermore,

- Signage needs to be erected to remind occupants to keep their noise down and to respect the quiet enjoyment of other occupants and surrounding neighbours.
- Signage of the manager's details can also be erected at appropriate locations internally and externally so that the owners/operators can be contacted immediately if the noise rules in the plan of management are not complied with.



6.0 MECHANICAL PLANT NOISE ASSESSMENT

6.1 MECHANICAL PLANT NOISE CRITERIA

Refer to Section 5.1 for the discussion of applicable noise policy/guideline for mechanical plant noise. Similarly, the noise criteria (external) adopted concerning the mechanical plant are:

Fronting the main road (Pittwater Road)

- **$L_{Aeq, 15 \text{ min}} \leq 61 \text{ dB}$** during the daytime period;
- **$L_{Aeq, 15 \text{ min}} \leq 59 \text{ dB}$** during the evening period
- **$L_{Aeq, 15 \text{ min}} \leq 49 \text{ dB}$** during the night-time period, and
- **$L_{Aeq, 15 \text{ min}} \leq 36\sim 39 \text{ dB}$** for inaudibility (applicable for AC during night-time only).

Rear or shielded areas

- **$L_{Aeq, 15 \text{ min}} \leq 58 \text{ dB}$** during the daytime period;
- **$L_{Aeq, 15 \text{ min}} \leq 51 \text{ dB}$** during the evening period
- **$L_{Aeq, 15 \text{ min}} \leq 49 \text{ dB}$** during the night-time period, and
- **$L_{Aeq, 15 \text{ min}} \leq 38\sim 41 \text{ dB}$** for inaudibility (applicable for AC during night-time only).

6.2 NOISE MITIGATION MEASURES

As the mechanical plant selection is yet to be completed at the time of preparing this acoustical report, in-principle recommendations have been included based on previous experience with similar sites.

Noise impact assessment of the outdoor AC units has been included in this acoustic assessment report. The calculated resultant noise levels are illustrated in the CadnaA noise maps attached as **Appendix C** of this report (noise model scenario 3). This noise model scenario was based on 26 residential Outdoor AC Condensing units located on the rooftop mechanical plant noise (model: **Dakin FTXM46QVMA**) with a noise barrier (1 m above the top of the AC units).

The following noise mitigation measure may be required (this may require to be verified once the design details becoming available at a later stage):



Table 8. Recommended noise mitigation measures to mechanical plant

Mechanical Plant	Noise Mitigation Measures
<p>Car Park Exhaust Fan Car Park Supply Fan Fantech AP0564GAB/20</p>	<ul style="list-style-type: none"> • It is assumed that the Fantech AP0564GAB/20 exhaust fan mode is used for both the car park exhaust and supply air fans. The sound power level is not to exceed L_{WAeq} 84 dB. • Ductwork length from the actual exhaust/supply fan to the terminating/inlet grille is not to be less than 5 meters in length. • The terminating/inlet grille must be located at a minimum 5 meters distance to any residential windows or balcony, except in a well-shielded area. • Line the inside ductwork with 50 mm thick rigid grade fibreglass 32 kg/m³ over a minimum length of 5 metres between the terminating/inlet grille end of the ductwork and the extraction/supply fan respectively. • The fans are to be fitted with a CO sensor and likely to operate during peak hours only. • The fans are to be fitted with a VSD (variable speed device) such that the speed can be adjusted where necessary for compliance. This is to be verified at a later stage. • A silencer with an insert loss of not less than 10 dB may be required. This is to be verified at a later stage.
<p>Residential Outdoor AC Condensing Unit Dakin FTXM46QVMA</p>	<ul style="list-style-type: none"> • It is recommended that the Daikin FTXM46QVMA outdoor AC condensing unit is used. The sound power level is not to exceed L_{WAeq} 60 dB. • All AC units to be located on the rooftop level in the designated mechanical plant area. • Footings/supports of outdoor AC units must be vibration isolated to minimise structure-borne vibrations transmitting into floor slabs/walls which will manifest as airborne noise in those adjoining spaces. • A noise barrier of at least 1 m above the top of the AC units will be required around the mechanical plant area on the rooftop level. • All units are to be programmed so that the “night-mode” is activated between 2200 and 0700 hours with a minimum noise reduction of 5 dB.

Before construction, a detailed assessment of mechanical plant noise assessment may be required for the subject development once more details have been confirmed.



7.0 INTER-TENANCY NOISE

7.1 BCA REQUIREMENTS

The Deemed-to-Satisfy provisions applying to this specific development are summarised below:

Table 9. BCA acoustic design requirements			
Partition	Detail	Airborne sound	Impact sound
Floor	Separating SOU's, or an SOU from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or part of a different classification	$R_w + C_{tr} \geq 50$	$L_{n,w} \leq 62$
Wall <i>See notes 1 and 2</i>	Separating SOU's	$R_w + C_{tr} \geq 50$	Not applicable
	Separating a habitable room (other than a kitchen) in one SOU from a bathroom, sanitary compartment, laundry, kitchen in another SOU	$R_w + C_{tr} \geq 50$	Discontinuous construction
	Separating an SOU from a plant room or lift shaft	$R_w \geq 50$	Discontinuous construction
	Separating an SOU from a stairway, public corridor, public lobby or the like, or part of a different classification	$R_w \geq 50$	Not applicable
Door	Located in a wall separating an SOU from a stairway, public corridor, public lobby or the like	$R_w \geq 30$	Not applicable
Services	Duct, soil, waste or water supply pipes located in a wall or floor cavity and serves or passes through more than one SOU (including a stormwater pipe)	$R_w + C_{tr} \geq 40$ (habitable) $R_w + C_{tr} \geq 25$ (other)	Not applicable
Pumps	A flexible coupling must be used at the point of connection between the service's pipes in a building and any circulating or another pump.		
Notes	<ol style="list-style-type: none"> Where a wall is to achieve a sound insulation rating and has a floor above, the wall must continue to either the underside of the floor or to the ceiling which has a comparable sound insulation rating to the wall. Where a wall is to achieve a sound insulation rating and has a roof above, the wall must continue to either the underside of the roof or to the ceiling which has a comparable sound insulation rating to the wall. As defined by the BCA, a 'habitable room' means a room used for normal domestic activities such as bedroom, living room, lounge room, music room, television room, kitchen dining room, study, playroom, family room, home theatre and sunroom. SOU = Sole occupancy unit. 		

All wall systems should be installed following general installation guidelines included in the BCA and as per relevant manufacturer installation guidelines/requirements.

7.2 RECOMMENDED PARTITION WALLS

Table 10 recommends several partition wall systems that are capable of achieving the required acoustic performance.

Table 10. Recommended partition wall systems

Wall type	BCA design standard	Construction
Inter-tenancy wall	Rw + Ctr ≥ 50 Discontinuous	<p><u>Partition wall between sole-occupancy units – Separating a habitable room (other than a kitchen) in one unit from a bathroom, sanitary compartment, laundry or kitchen in an adjoining unit</u></p> <p>[AFS] AFS 162 Logicwall, 20mm cavity, 64mm steel studs with 75mm thick Tontine TSB4 insulation within the stud cavity, 10mm Soundcheck.</p> <p>[Masonry] Two leaves of 110mm clay brick masonry, 50mm cavity between the leaves (where brick ties are used they are to be of the resilient type), 13mm cement render to each side. <i>BCA D.T.S.</i></p> <p>[Concrete] 125mm concrete panel, 20mm cavity, 64mm steel studs, 70mm polyester insulation (9kg/m³) between the studs, 13mm plasterboard fixed to studs. <i>BCA D.T.S.</i></p> <p>[Hebel] 13mm Fyrchek, 75mm Hebel Powerpanel, 35mm cavity, 64mm steel studs with 100mm S6 polyester insulation, 13mm Fyrchek/Aquachek.</p> <p>[Lightweight] 2x64mm steel studs, 20mm cavity, 60mm polyester insulation (11kg/m³) positioned between one row of studs, 2x13mm fire-resistant plasterboard each side.</p>
	Rw + Ctr ≥ 50	<p><u>Partition wall between sole-occupancy units</u></p> <p>[AFS] AFS 162 Logicwall panel, paint or render finish.</p> <p>[AFS] AFS 162 Logicwall panel, 28mm furring channel, Tontine TSB2 insulation within the framing cavity, 13mm plasterboard.</p> <p>[Masonry / Hebel / Lightweight] As above.</p> <p>[Concrete] 200mm concrete panel, 13mm cement render of each face. <i>BCA D.T.S.</i></p>
Common wall	Rw ≥ 50 Discontinuous	<p><u>Partition wall between a sole-occupancy unit and plant room or lift shaft</u></p> <p>As above for inter-tenancy wall partitions that satisfy discontinuous construction</p>
	Rw ≥ 50	<p><u>Partition wall between sole-occupancy unit and stairway, public corridor, public lobby or the like or part of a different classification</u></p> <p>[AFS] AFS 150 Logicwall panel, paint or render finish.</p> <p>[AFS] AFS 162 Logicwall panel, paint or render finish.</p> <p>[Masonry] Single leaf 150mm brick masonry with 13mm cement render on each face.</p> <p>[Concrete] 125mm thick concrete panel.</p> <p>[Hebel] 13mm Gyprock CD, 75mm Hebel Powerpanel, minimum 20mm cavity, 64mm steel framing with 50mm glass wool insulation, 13mm Gyprock CD.</p> <p>[Lightweight] 92mm steel studs, 60mm polyester insulation (11kg/m³) positioned between the studs, 2x13mm fire-resistant plasterboard each side.</p>
Services shaft wall	Rw+Ctr ≥40	<p><u>Services shaft wall to habitable room within the unit</u></p> <p>[Masonry] 110mm brick masonry with 13mm cement render on each face. <i>BCA D.T.S.</i></p> <p>[Concrete] 100mm thick concrete panel. <i>BCA D.T.S.</i></p> <p>[Lightweight] 2x13mm plasterboard, pipe lagging (Soundlag 4525C, Acoustilag 45)</p>
	Rw+Ctr ≥25	<p><u>Services shaft wall to non-habitable room within the unit</u></p> <p>[Lightweight] 2 layers of 13mm plasterboard</p>
Notes:		<ol style="list-style-type: none"> Recommendations within the above table are based on published acoustic data obtained from the manufacturer's website. Laboratory tests of the AFS 162 Logicwall on its own showed non-compliance with the BCA requirement of Rw + Ctr 50. However, an investigation by PKA Consulting concludes that the poor acoustic performance was due to factors not related to the wall system, but rather the test facility. It is expected that the acoustic performance will satisfy the BCA condition. This conclusion is supported by numerous field tests that indicate compliance with the BCA verification methods rating. All installation of proprietary type wall systems must be per the relevant installation guidelines and manuals. <i>BCA D.T.S.</i> = BCA Deemed-to-Satisfy construction. These wall systems are to be installed as per "Construction Deemed-to-Satisfy" notes included within Specification F5.2 of Volume One of the BCA. Where these systems are installed correctly per the BCA they do not require compliance testing to verify acoustic performance.

7.3 RECOMMENDED PARTITION FLOOR/CEILING

The following flooring systems could be considered to achieve the impact noise criteria listed in the Table above summarising the BCA/DCP requirements:

Table 18. Typical acoustical performance achieved with Uniroll underlays that would achieve or exceed the BCA & Council's requirements	
Floor Type	Construction details or underlay type
Carpet	Carpet over carpet underlay over ≥ 150 mm concrete slab will typically achieve $L'nTw \leq 40$
Direct Stick Tiles	9 or 10 mm ceramic tiles over 5 mm adhesive over the underlay (specified below) + ≥ 150 mm concrete slab over 100 mm ceiling cavity and 13 mm plasterboard ceiling will typically achieve $L'nTw \leq 50$
	RFC750 (4.5 mm) RF700 (4- 5- 10 mm)
Under Screed Tiles	9 or 10 mm ceramic tiles over 5 mm glue over 30 mm screed over the underlay RFC750 (4.5mm) or RF700 (5mm) + ≥ 150 mm concrete slab over 100 mm ceiling cavity and 13 mm plasterboard ceiling will typically achieve $L'nTw \leq 50$
Direct Stick or Floating Flooring	19 mm strip timber + adhesive + 15 mm ply + RFC700 (4, 5 or 10 mm) + ≥ 150 mm concrete slab over 100 mm ceiling cavity and 13 mm plasterboard ceiling will typically achieve $L'nTw \leq 50$
	Engineered floating floor + 2 mm foam slip layer + RF700 (4, 5mm) + ≥ 150 mm concrete slab over 100 mm ceiling cavity and 13 mm plasterboard ceiling will typically achieve $L'nTw \leq 50$
Direct Stick Vinyl Flooring	Vinyl flooring over + RF700 (3, 4, 5 or 10 mm) + ≥ 150 mm concrete slab over 100 mm ceiling cavity and 13 mm plasterboard ceiling will typically achieve $L'nTw \leq 55$

Alternative underlays could also be considered.

The above recommendations also apply to balconies/terraces situated above indoor areas of apartments below.

All flooring and acoustic underlays should be installed as per relevant manufacturers installation and design guides.

Hard floor coverings such as tiles must not make contact with any walls or joinery such as kitchen benches, cupboards etc. During the installation of hard floor coverings, temporary spacers of 5 - 10 mm should be used to isolate the floor covering from walls and/or joinery with the resulting gaps filled with a suitable mastic type sealant or off-cut of rubber underlay material. Most acoustic underlay manufacturers include a construction detail in this regard that involves an upturn of the rubber underlay material at the wall/floor junction.

Alternative floor/ceiling systems could be considered provided that the acoustic performance is tested or assessed by a consulting acoustical engineer to be compliant with the sound insulation performance requirements of the BCA.

Verification of installed acoustic performance should be determined following the recommendation of

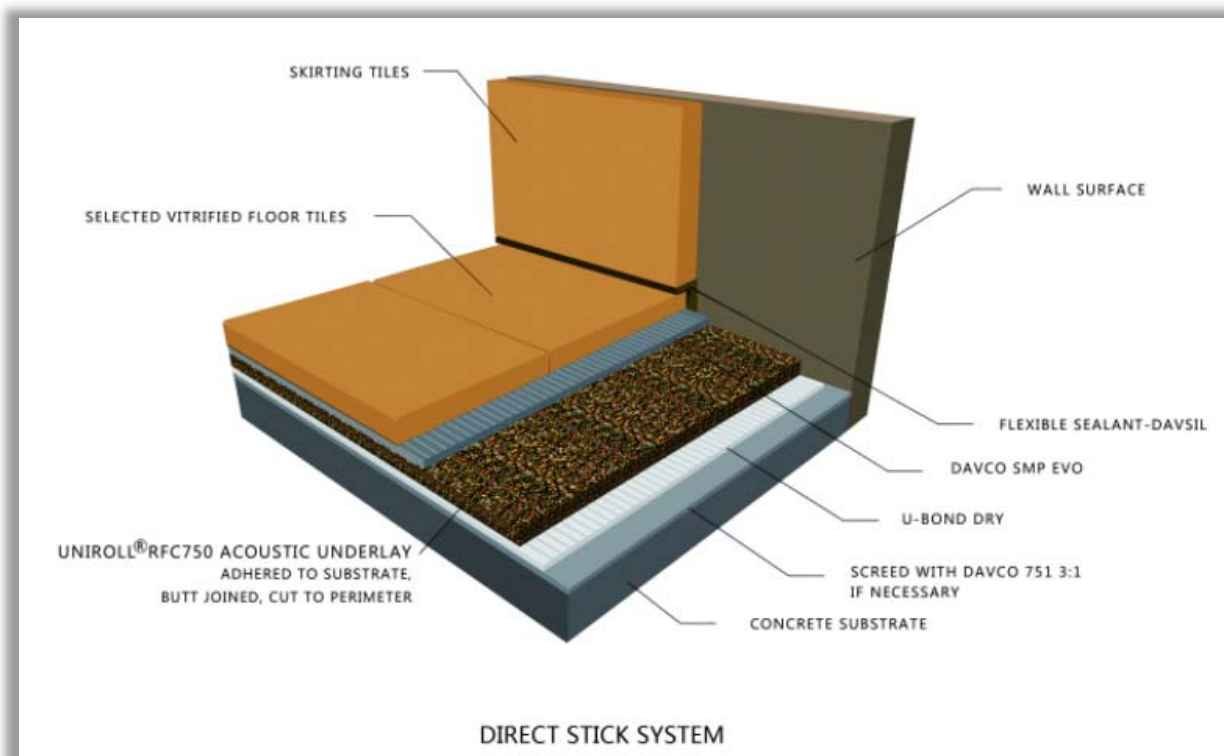


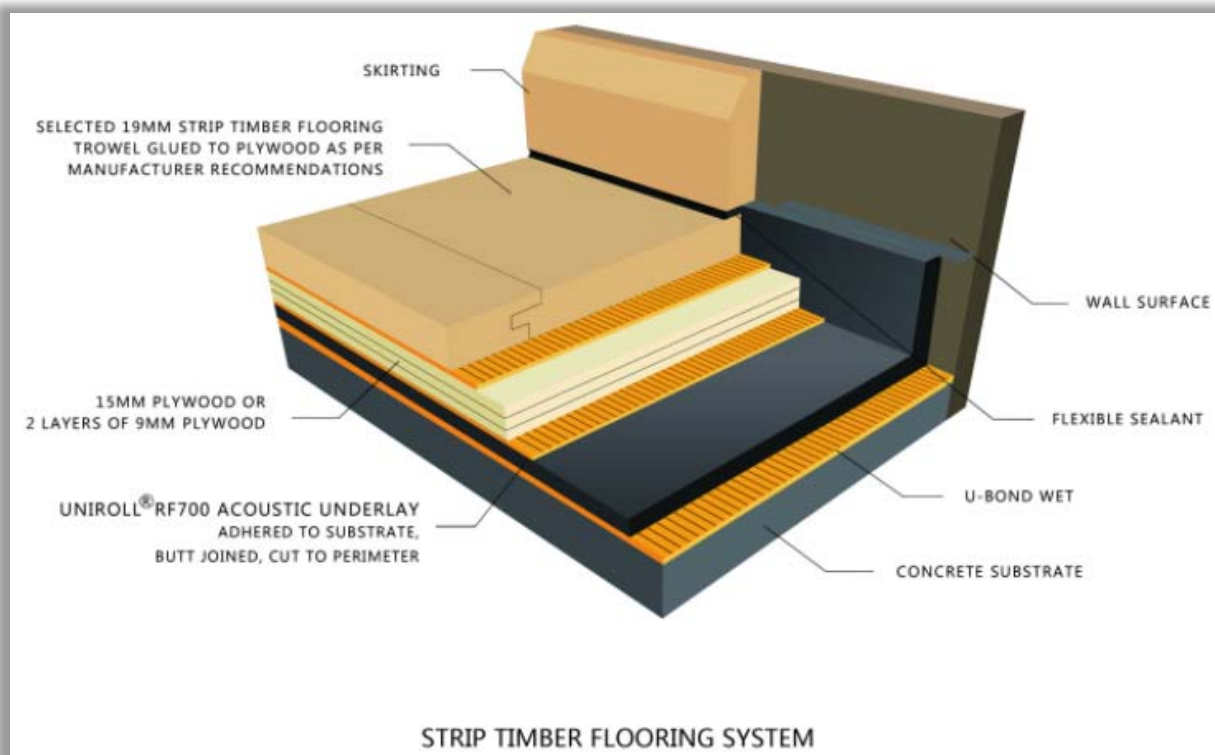
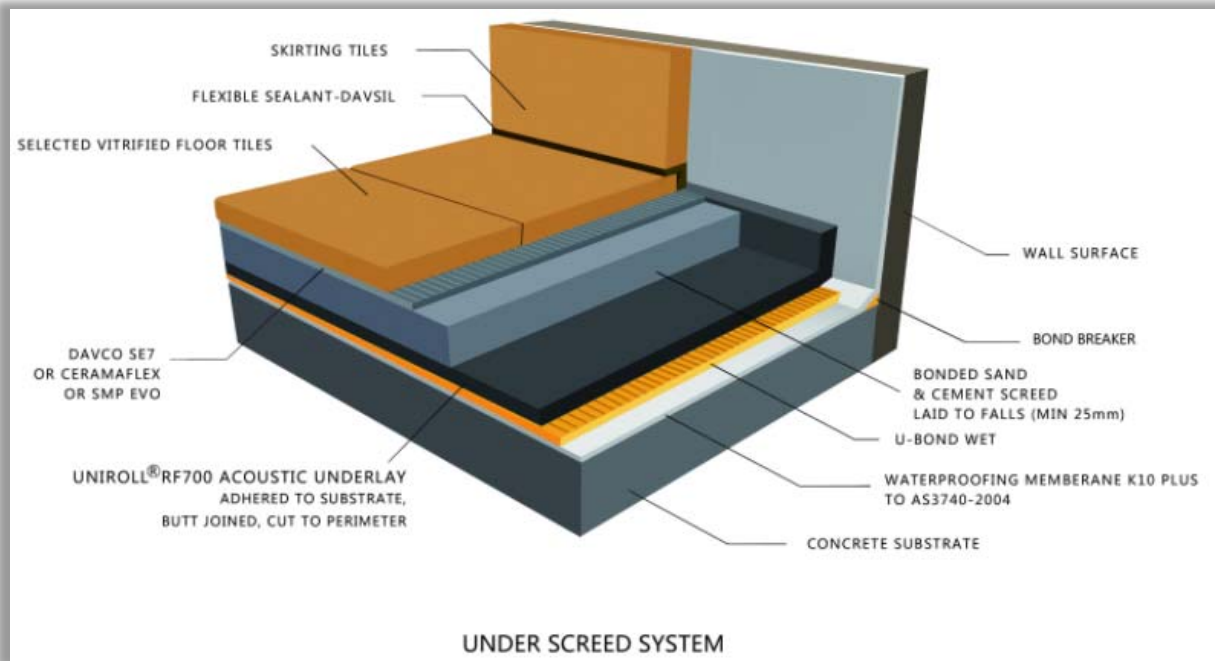
Section 5.5 of this report. Flooring systems tested in a NATA or an equivalent International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) certified laboratory and complying with the requirements of the BCA would not need to be tested in-situ for verification of installed acoustic performance. For flooring systems not tested by a NATA or ILAC MRA certified laboratory, it is recommended that before any flooring is installed, preliminary testing be undertaken at the subject site to ensure that the acoustic impact rating required is achieved. Impact noise test results can vary from site to site as many factors can influence the acoustic impact rating.

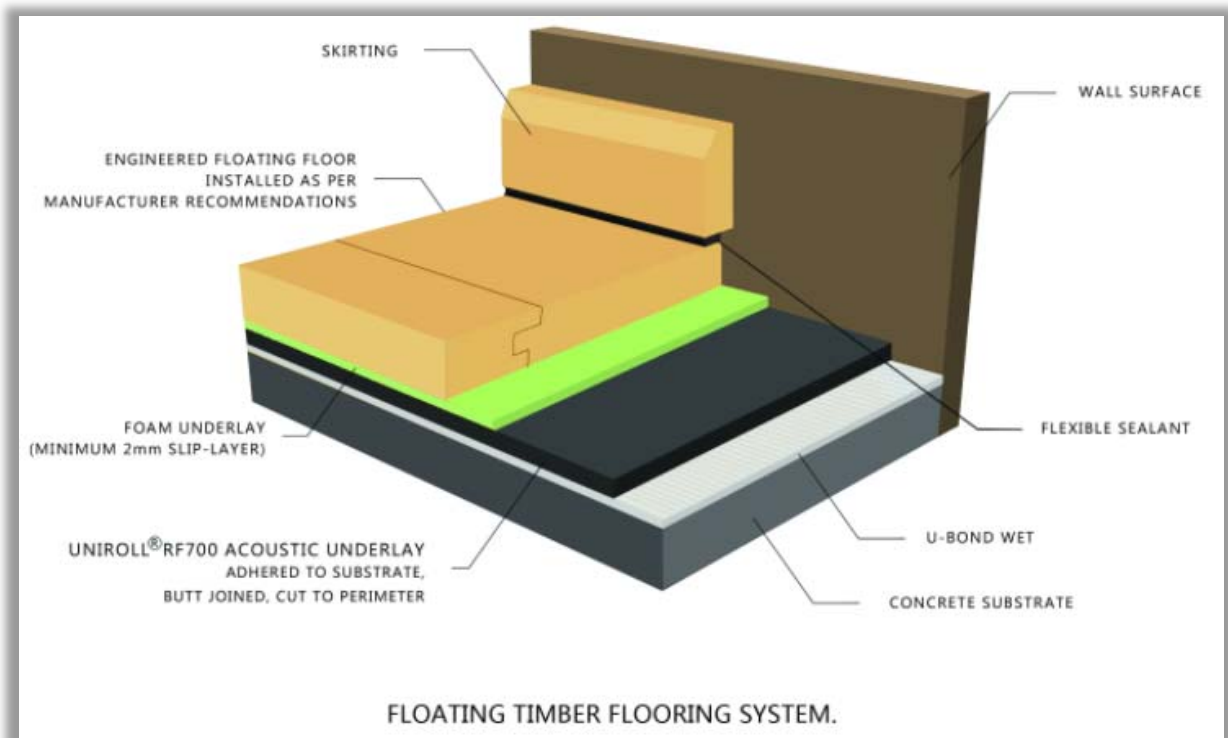
These include:

- the thickness of floor slabs,
- the air gap between the plasterboard ceiling and the concrete slab,
- the sealing between the plasterboard and the walls,
- the thickness and density of the plasterboard ceiling,
- the connections of the suspended ceiling grid to the concrete slab,
- the surface area of the floor,
- flanking paths,
- the wall types, and

the junctions between the slab and the walls.







The above floor systems have been assessed to comply with the BCA airborne and impact sound insulation requirements. **The ‘for construction’ floor systems should be re-assessed at the detailed design stage.**

Verification of installed acoustic performance should also be determined as per the recommendations of Section 7.6 of this report.

7.4 SOIL, WASTE, WATER SUPPLY PIPES

The BCA qualifies the acoustic requirements of services partitions with the following:

- Services must not be chased into concrete or masonry elements,
- An access door or panel must be firmly fixed to overlap the frame or rebate the frame by not less than 10mm and be fitted with proper sealing gasket along all edges and constructed of:
 - Wood, particle board or block board not less than 38mm thick; or
 - Compressed fibre reinforced cement sheeting not less than 9mm thick; or
 - Proprietary access panel as approved by an acoustical engineer.
- A water supply pipe must only be installed in the cavity of discontinuous construction, and in the case of a pipe that serves only one SOU, must not be fixed to the wall leaf on the side adjoining any other SOU and have a clearance not less than 10mm to the other wall leaf.

Where a duct, soil, waste or water supply pipe is located within a wall or ceiling cavity and serves or passes through one or more SOU's, the following separation details may be used to comply with the required acoustic rating:

Table 12. Services in cavity wall or ceiling			
Option	Rating	Documented source	System detail
1	Rw + Ctr 25	CSR Red Book, Koikas Acoustics opinion	2 layers of 10mm plasterboard
2	Rw + Ctr 25	CSR Red Book	Acoustilag 45 and 13mm plasterboard wall/ceiling lining
3	Rw + Ctr 25	CSR Red Book	Unlagged pipes and 13mm Soundchek wall/ceiling lining. Alternatively, 2 layers of 16mm Fychek may be used as wall/ceiling lining
4	Rw + Ctr 40	CSR Red Book	Acoustilag 45 and 13mm Soundchek wall/ceiling lining. Alternatively, 2 layers of 16mm Fychek may be used as wall/ceiling lining
5	Rw + Ctr 40	Pyrotech Soundlag 4525C brochure	Soundlag 4525C and minimum 10mm plasterboard wall/ceiling lining
Notes: 1. The acoustic lagging material may be excluded by using Rehau Raupiano Plus pipe system. 2. All installations are to be per relevant manufacturers' specifications and requirements. 3. Incorporating downlights into ceilings will impact on the acoustic rating of the partition system. Consultation should be made with an acoustic consultant in the event of downlights being proposed in the ceiling. The CSR Red Book provides some guidance on downlights being installed in a services partition system.			

7.5 SOUND ISOLATION OF PUMPS

A flexible coupling must be used at the point of connection between the service's pipes in a building and any circulation or another pump.

7.6 VERIFICATION OF ACOUSTIC PERFORMANCE

It is common for comparable floor/ceiling system designs to achieve varying acoustic insulation and isolation ratings between buildings. This can be due to the quality of workmanship, attention to detail in sealing any penetrations, and the emergence of flanking sound transmission paths within a building. For this reason, one cannot categorically state that any partition will achieve a specific acoustic rating without conducting in-situ testing.

Koikas Acoustics recommends that in-situ testing is conducted on a representative, and fully installed floor/ceiling assembly (for all types of floor coverings – timber, tiles, carpet) to ensure adequate acoustic insulation and isolation is achieved, before installing all floors on all floor levels of the building.

8.0 SUMMARY AND CONCLUSION

Koikas Acoustics Pty Ltd was requested to conduct an acoustic assessment for the proposed boarding house development at No. 882A Pittwater Road, Dee Why. The report will form part of the Development Application (DA) documentation to be submitted to the Northern Beaches Council. The assessment considers potential noise impacts to future occupants of the development, and to surrounding residents such that acceptable acoustic amenity for the area is maintained.

Acoustic planning levels have been referenced from current acoustic planning guidelines such as ISEPP, NSW DoP, EPA, BCA and other relevant standards/policies/guidelines. The included recommendations are based on the architectural drawings of the site as prepared by Crawford Architects, detailed in Table 1.

Our assessment concludes the following concerning the assessed components of noise:

1. External road traffic noise intrusion has been adequately addressed with recommendations on appropriate noise mitigation measures (refer to Section 4.3) of this report.
2. There are sufficient means to attenuate the proposed boarding house operation noise (predominantly people occupying the outdoor BBQ area) to the surrounding premises provided that the recommendations and operating restrictions stated in Section 5.4 of this report are implemented in design and construction.
3. A detailed assessment of mechanical plant and operational noise should be prepared for the subject development before construction. Based on the preliminary assessment conducted in this report, there are sufficient means to attenuate the general mechanical plant noise to the surrounding premises.
4. Acoustic treatment options for the common walls, floors and services partitions included within this report would be adequate for satisfying the sound insulation provisions of the BCA. Refer to Section 7.0 of this report.

Alternate systems and design may be considered to those recommended within this report provided that they are approved by an appropriately qualified acoustical engineer/consultant.

In our professional opinion, there is sufficient scope within the proposed building design for the proposed boarding house development site at 882A Pittwater Road, Dee Why NSW to achieve the applied acoustic planning guidelines.



APPENDIX A

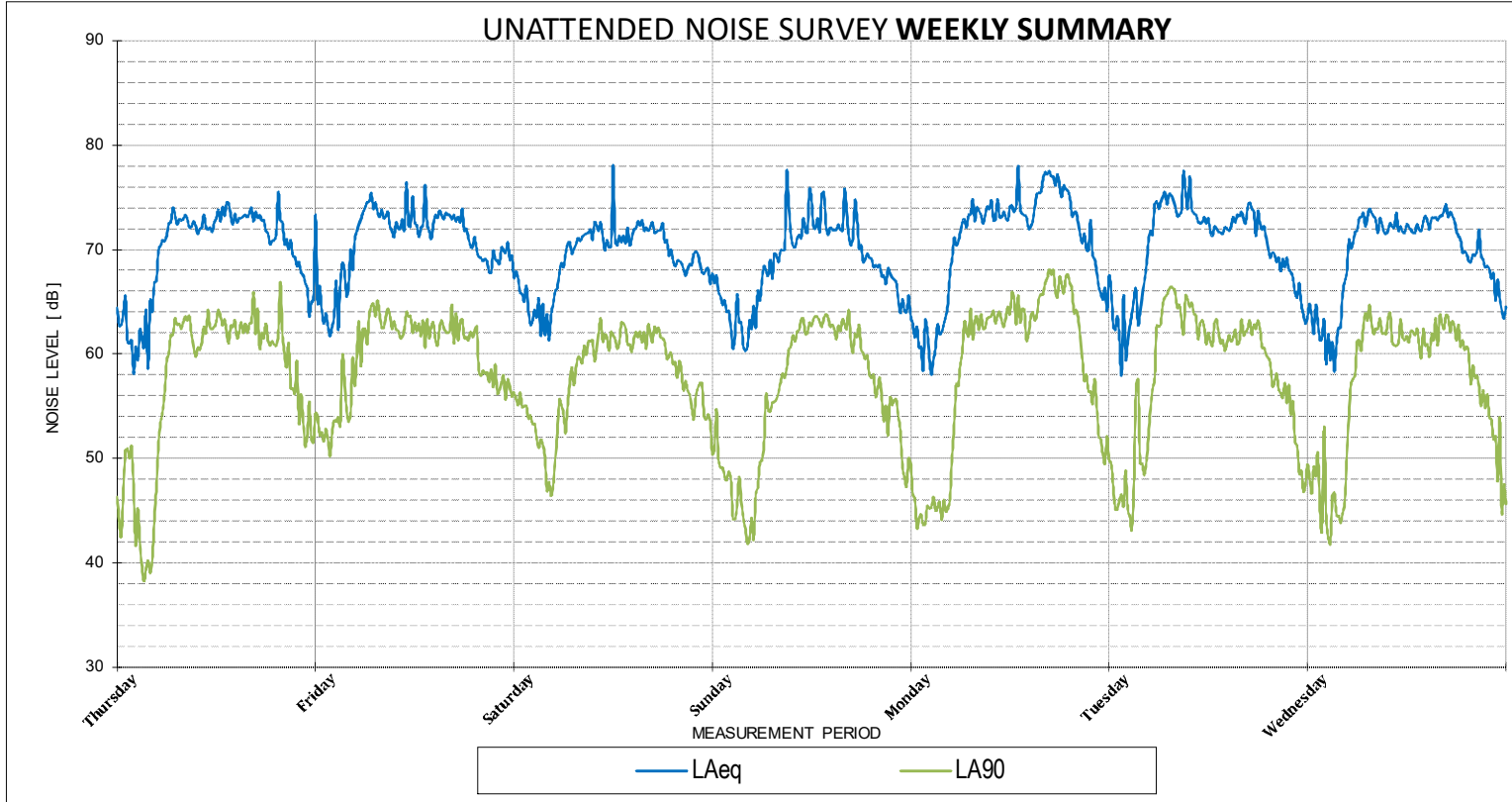
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APPENDIX A

WEEKLY SUMMARY

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

PERIOD: 21st to the 27th May 2020



Sundays and Public Holidays the hours change to 0800

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	LA90 Evening	LA90 Night-time
Day 1	61	57	40
Day 2	61	58	52
Day 3	59	56	49
Day 4	59	54	44
Day 5	62	57	44
Day 6	61	56	45
Day 7	61	56	44
RBL	61	56	44

	LAeq Daytime	LAeq Evening	LAeq Night-time
Day 1	73	71	67
Day 2	73	70	70
Day 3	72	69	67
Day 4	73	69	66
Day 5	75	74	67
Day 6	73	70	69
Day 7	73	70	67
Average	73	71	68

SUMMARY OF TRAFFIC LEVELS

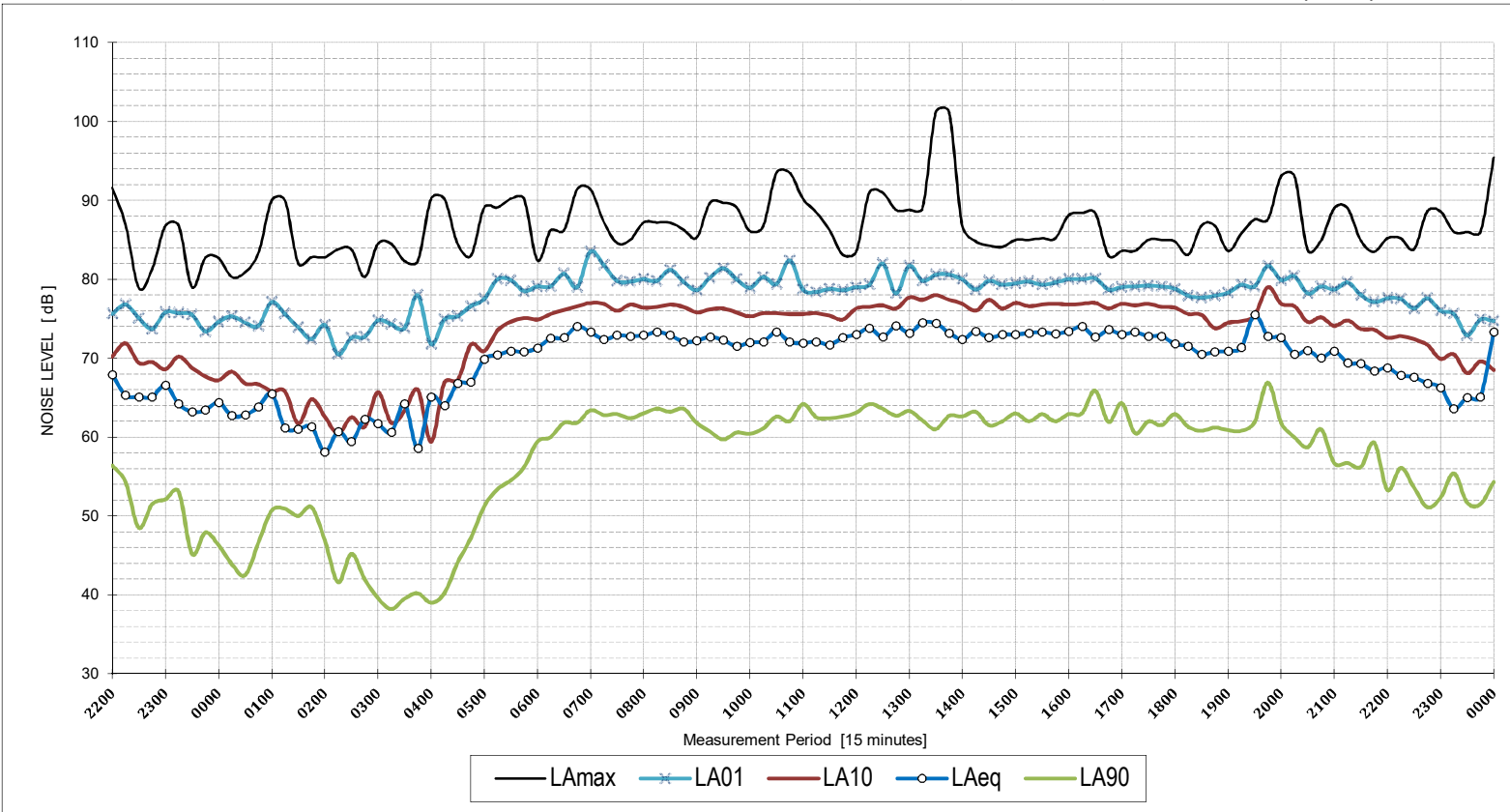
LAeq 15 hrs	0700-2200	73	dB
LAeq 9 hrs	2200-0700	68	dB
Max LAeq 1 hr	0700-2200	74	dB
Max LAeq 1 hr	2200-0700	71	dB

WEEKLY SUMMARY Descriptor	Period Start	Period End	Frequency [Hz]										Total A
			31.5	63	125	250	500	1000	2000	4000	8000		
10% min LA90 Daytime	7:00 AM	6:00 PM	30	40	45	49	53	57	55	50	41	61	
10% min LA90 Evening	6:00 PM	10:00 PM	23	33	39	44	48	52	50	43	33	56	
10% min LA90 Night	10:00 PM	7:00 AM	17	21	32	36	38	39	37	32	26	44	
10% min LA90 Period	7:00 AM	10:00 PM	24	36	41	46	50	54	51	45	35	58	
10% min LA90 Period	10:00 PM	7:00 AM	16	22	31	36	38	39	37	32	26	44	
LAeq 15 hours	7:00 AM	10:00 PM	39	49	55	59	64	69	67	62	58	73	
LAeq 9 hours	10:00 PM	7:00 AM	33	44	50	54	59	64	62	58	54	68	
Max LAeq 1 hour Day	7:00 AM	10:00 PM	39	49	55	59	64	70	68	64	60	74	
Max LAeq 1 hour Night	10:00 PM	7:00 AM	36	46	52	56	62	67	65	62	57	71	

DAY 1

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Thursday, 21 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	61	dB
LA90 Evening	1800-2200	57	dB
LA90 Night-time	2200-0700	40	dB
LAeq Daytime	0700-1800	73	dB
LAeq Evening	1800-2200	71	dB
LAeq Night-time	2200-0700	67	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	73	dB
LAeq 9 hours	2200-0700	67	dB
Max LAeq 1 hour	0700-2200	73	dB
Max LAeq 1 hour	2200-0700	71	dB

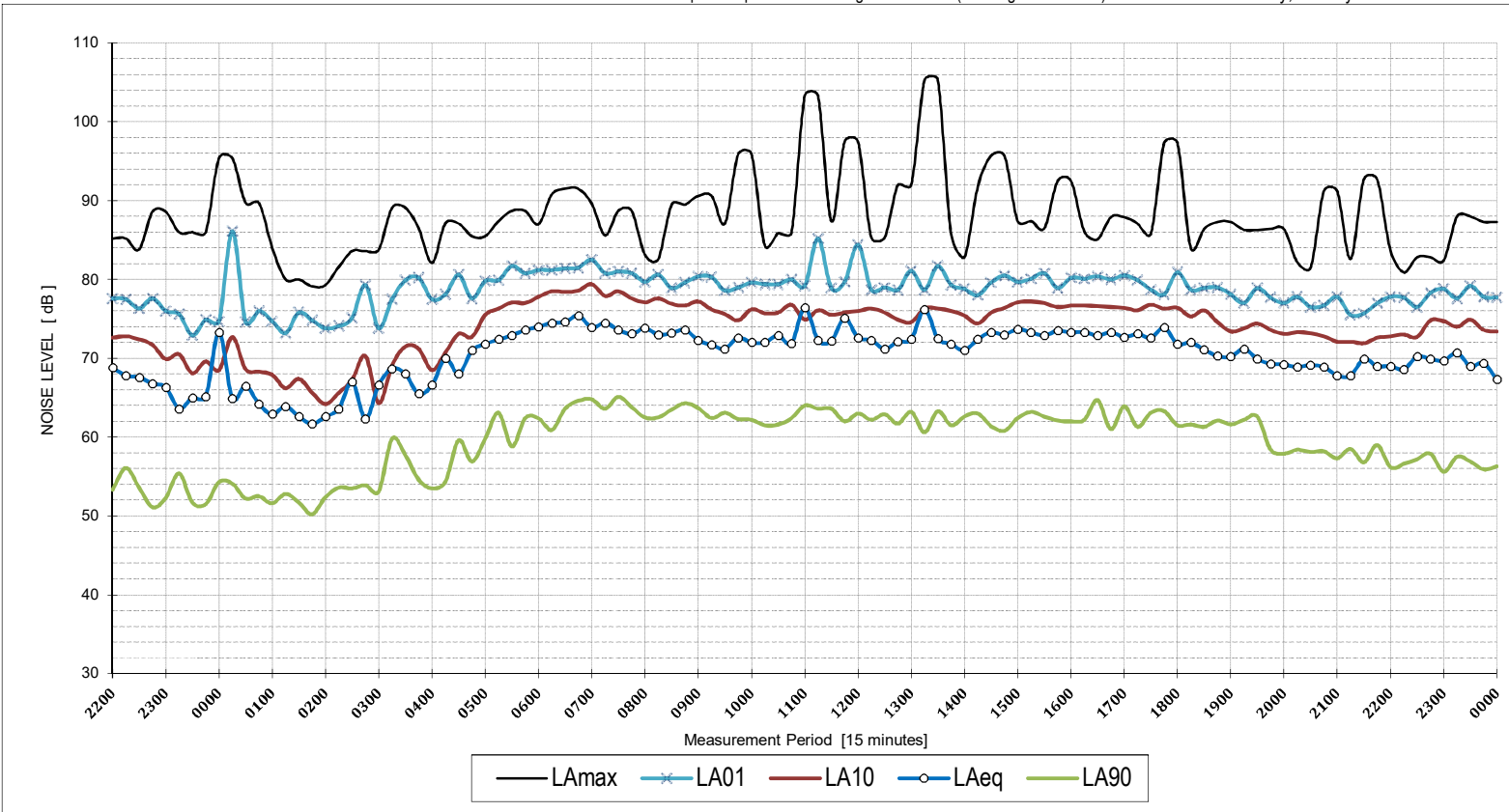
Maximum noise events as defined in the Environmental Noise Management Manual [LAmx - LAeq ≥ 15] 32

Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	30	40	44	49	53	57	55	50	42	61
10% min LA90 Evening	6:00 PM	10:00 PM	23	34	39	44	49	53	51	44	36	57
10% min LA90 Night	10:00 PM	7:00 AM	16	19	29	33	35	34	30	23	17	40
10% min LA90 Period	7:00 AM	10:00 PM	28	38	44	48	52	56	54	49	40	60
10% min LA90 Period	10:00 PM	7:00 AM	17	19	28	33	35	34	30	23	17	40
LAeq 15 hours	7:00 AM	10:00 PM	39	49	55	59	64	69	67	63	59	73
LAeq 9 hours	10:00 PM	7:00 AM	33	45	52	55	60	64	61	56	50	67
Max LAeq 1 hour Day	7:00 AM	10:00 PM	39	50	56	60	65	70	67	63	58	73
Max LAeq 1 hour Night	10:00 PM	7:00 AM	36	48	55	58	63	67	64	59	53	71

DAY 2

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Friday, 22 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	61	dB
LA90 Evening	1800-2200	58	dB
LA90 Night-time	2200-0700	52	dB
LAeq Daytime	0700-1800	73	dB
LAeq Evening	1800-2200	70	dB
LAeq Night-time	2200-0700	70	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	72	dB
LAeq 9 hours	2200-0700	70	dB
Max LAeq 1 hour	0700-2200	74	dB
Max LAeq 1 hour	2200-0700	73	dB

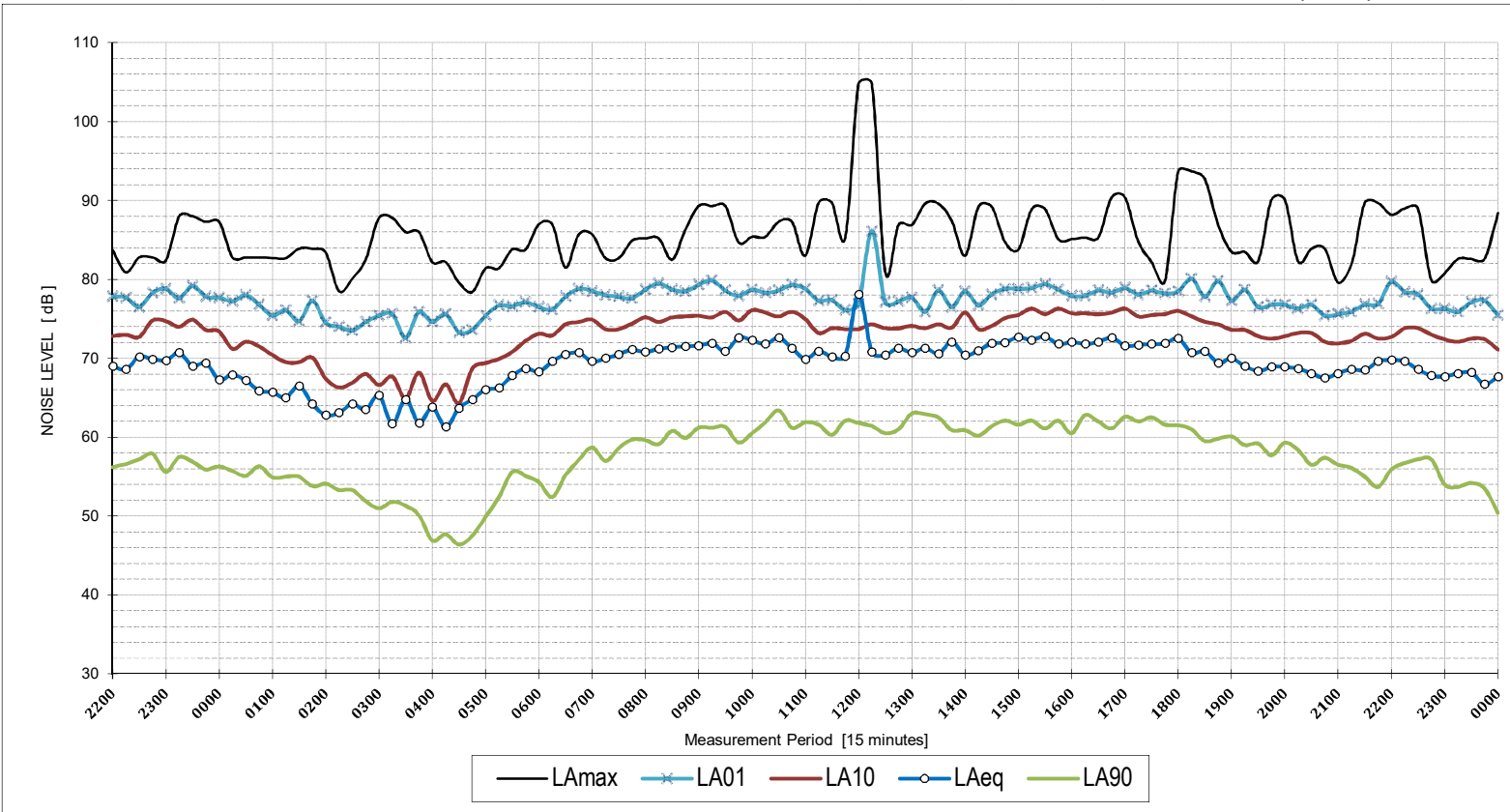
Maximum noise events as defined in the Environmental Noise Management Manual [L _{max} - L _{Aeq} ≥ 15]	33
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	31	40	45	49	54	57	55	50	41	61
10% min LA90 Evening	6:00 PM	10:00 PM	24	36	42	46	50	54	51	44	35	58
10% min LA90 Night	10:00 PM	7:00 AM	19	32	38	41	44	47	45	41	34	52
10% min LA90 Period	7:00 AM	10:00 PM	25	37	43	47	51	55	52	45	36	58
10% min LA90 Period	10:00 PM	7:00 AM	18	31	37	41	44	47	46	42	36	52
LAeq 15 hours	7:00 AM	10:00 PM	39	49	55	59	64	69	66	60	55	72
LAeq 9 hours	10:00 PM	7:00 AM	36	46	51	55	60	65	64	62	58	70
Max LAeq 1 hour Day	7:00 AM	10:00 PM	40	50	56	60	65	71	67	61	55	74
Max LAeq 1 hour Night	10:00 PM	7:00 AM	38	48	53	58	64	69	68	65	61	73

DAY 3

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Saturday, 23 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	59	dB
LA90 Evening	1800-2200	56	dB
LA90 Night-time	2200-0700	49	dB
LAeq Daytime	0700-1800	72	dB
LAeq Evening	1800-2200	69	dB
LAeq Night-time	2200-0700	67	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	71	dB
LAeq 9 hours	2200-0700	67	dB
Max LAeq 1 hour	0700-2200	72	dB
Max LAeq 1 hour	2200-0700	70	dB

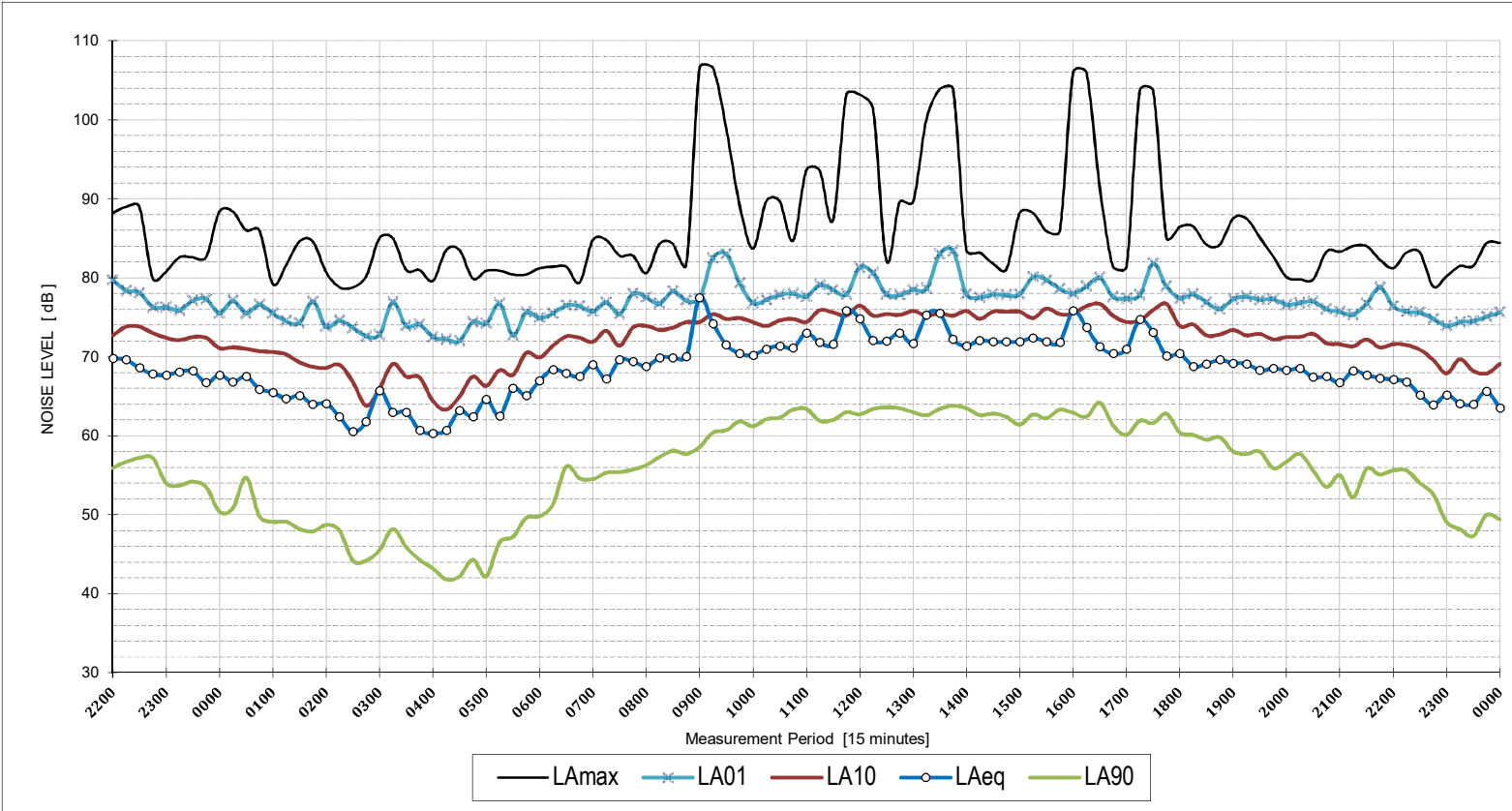
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Descriptor	Period		Frequency [Hz]									
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10% min LA90 Daytime	7:00 AM	6:00 PM	28	38	44	48	52	55	53	47	38	59
10% min LA90 Evening	6:00 PM	10:00 PM	23	33	40	44	48	52	49	42	32	56
10% min LA90 Night	10:00 PM	7:00 AM	18	29	35	39	41	44	42	37	30	49
10% min LA90 Period	7:00 AM	10:00 PM	24	35	41	46	50	54	51	44	34	57
10% min LA90 Period	10:00 PM	7:00 AM	12	24	30	36	40	44	44	40	33	49
LAeq 15 hours	7:00 AM	10:00 PM	37	48	54	58	63	68	65	58	53	71
LAeq 9 hours	10:00 PM	7:00 AM	32	44	49	53	58	64	62	57	53	67
Max LAeq 1 hour Day	7:00 AM	10:00 PM	38	49	55	59	64	69	66	59	54	72
Max LAeq 1 hour Night	7:00 AM	10:00 PM	33	44	49	54	60	66	64	60	56	70

DAY 4

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Sunday, 24 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	59	dB
LA90 Evening	1800-2200	54	dB
LA90 Night-time	2200-0800	44	dB
LAeq Daytime	0800-1800	73	dB
LAeq Evening	1800-2200	69	dB
LAeq Night-time	2200-0800	66	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	72	dB
LAeq 9 hours	2200-0700	66	dB
Max LAeq 1 hour	0700-2200	74	dB
Max LAeq 1 hour	2200-0700	68	dB

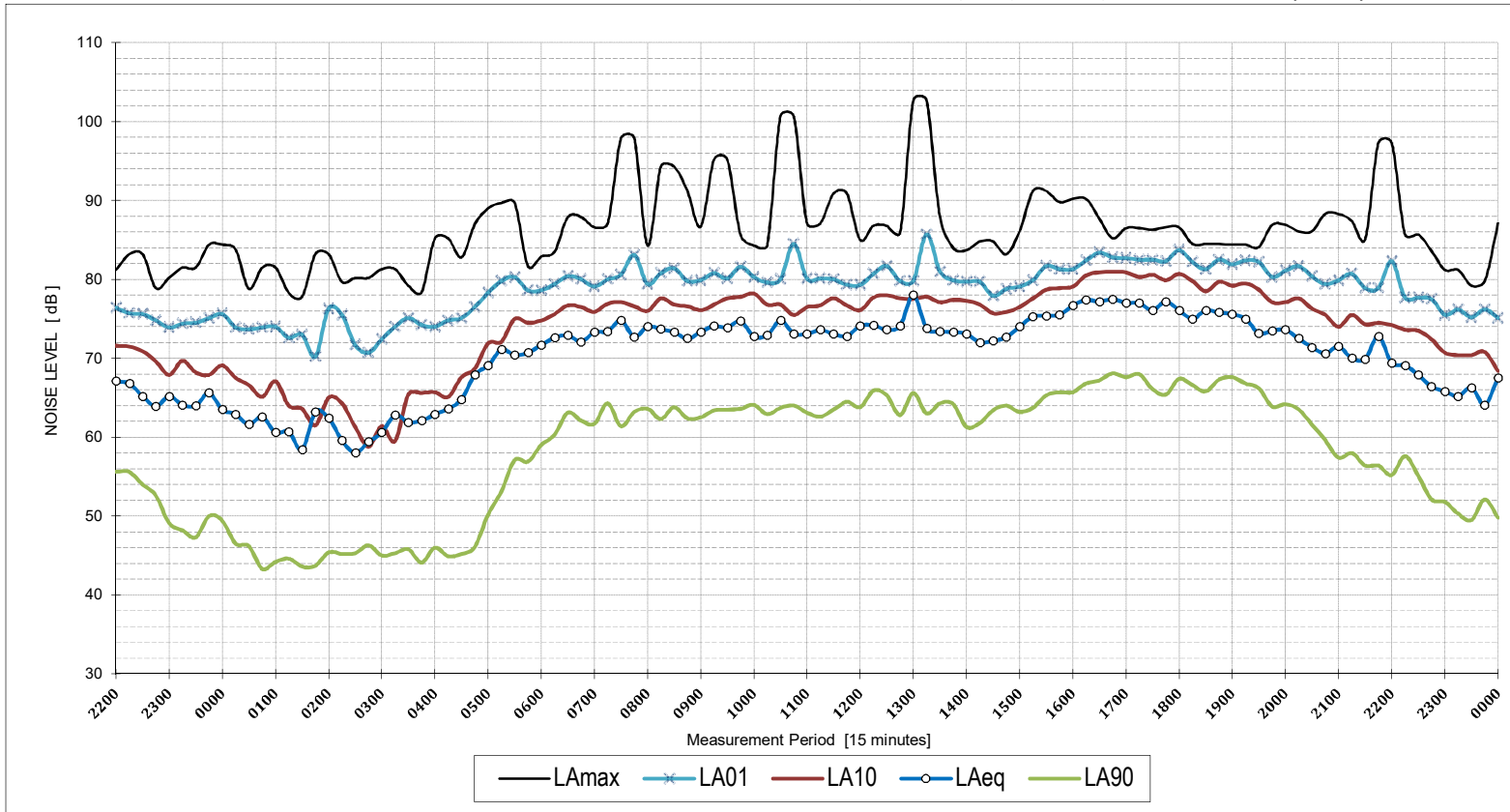
Maximum noise events as defined in the Environmental Noise Management Manual [LAmx - LAeq ≥ 15]	26
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	8:00 AM	6:00 PM	26	36	42	48	51	55	52	46	37	59
10% min LA90 Evening	6:00 PM	10:00 PM	21	32	38	43	47	50	48	40	31	54
10% min LA90 Night	10:00 PM	8:00 AM	17	21	31	35	38	39	37	32	26	44
10% min LA90 Period	7:00 AM	10:00 PM	22	33	39	44	48	52	49	42	33	55
10% min LA90 Period	10:00 PM	7:00 AM	14	21	29	34	37	39	37	31	24	44
LAeq 15 hours	7:00 AM	10:00 PM	38	48	54	58	63	69	65	58	53	72
LAeq 9 hours	10:00 PM	7:00 AM	30	43	48	53	58	63	60	53	46	66
Max LAeq 1 hour Day	7:00 AM	10:00 PM	40	50	55	59	65	71	68	60	54	74
Max LAeq 1 hour Night	10:00 PM	7:00 AM	32	44	50	55	60	65	62	54	47	68

DAY 5

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Monday, 25 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	62	dB
LA90 Evening	1800-2200	57	dB
LA90 Night-time	2200-0700	44	dB
LAeq Daytime	0700-1800	75	dB
LAeq Evening	1800-2200	74	dB
LAeq Night-time	2200-0700	67	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	74	dB
LAeq 9 hours	2200-0700	67	dB
Max LAeq 1 hour	0700-2200	77	dB
Max LAeq 1 hour	2200-0700	71	dB

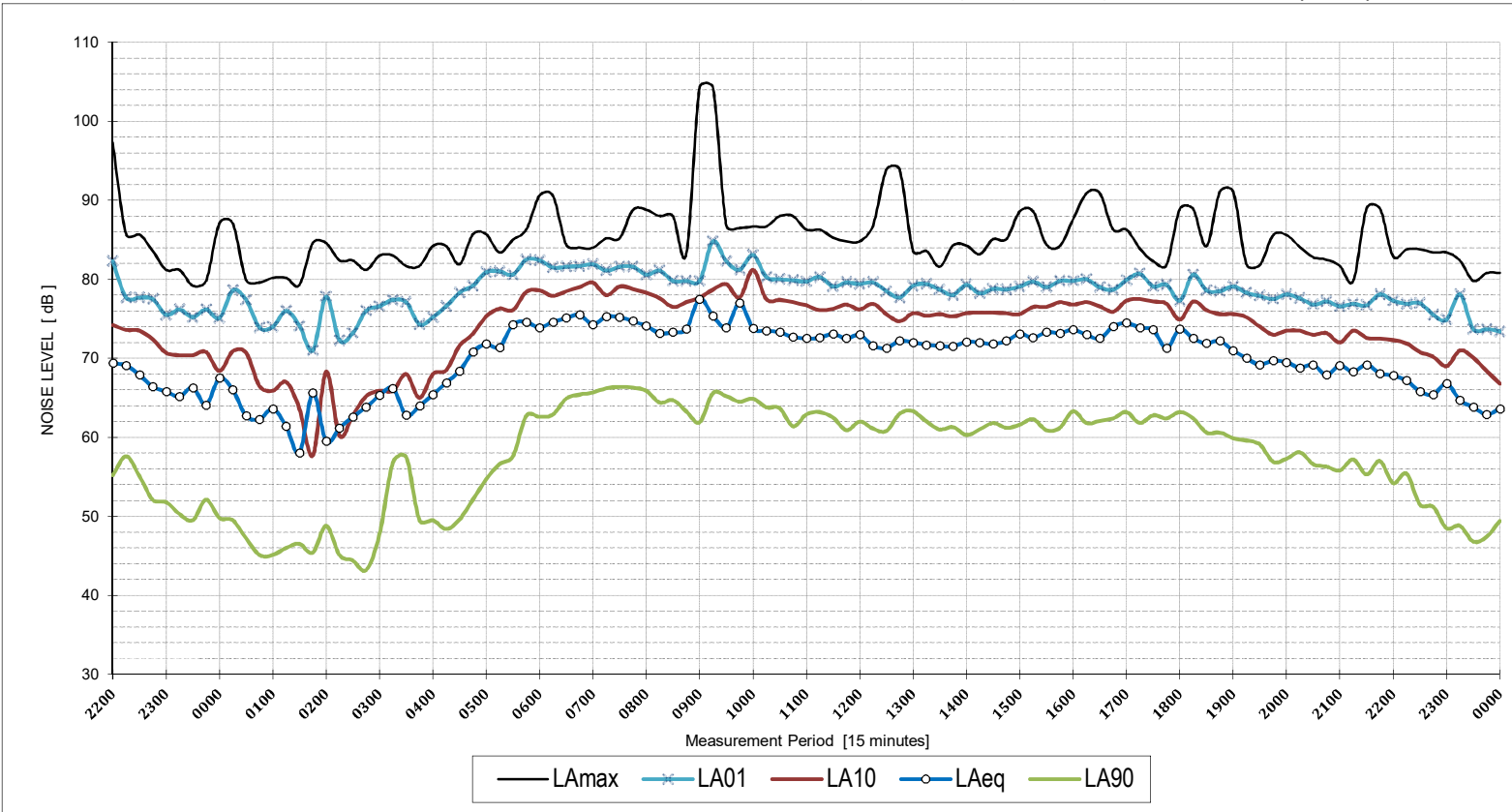
Maximum noise events as defined in the Environmental Noise Management Manual [LAmx - LAeq ≥ 15]	32
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	31	40	45	50	54	58	57	52	45	62
10% min LA90 Evening	6:00 PM	10:00 PM	20	32	38	44	48	52	52	48	41	57
10% min LA90 Night	10:00 PM	7:00 AM	16	21	31	36	38	39	37	32	26	44
10% min LA90 Period	7:00 AM	10:00 PM	30	39	44	49	53	57	56	51	44	61
10% min LA90 Period	10:00 PM	7:00 AM	15	21	31	35	38	39	37	32	26	44
LAeq 15 hours	7:00 AM	10:00 PM	39	49	54	59	64	70	69	67	63	74
LAeq 9 hours	10:00 PM	7:00 AM	33	44	50	54	59	64	61	55	49	67
Max LAeq 1 hour Day	7:00 AM	10:00 PM	39	49	54	59	65	70	72	71	67	77
Max LAeq 1 hour Night	10:00 PM	7:00 AM	37	48	54	58	63	67	65	59	53	71

DAY 6

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Tuesday, 26 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	61	dB
LA90 Evening	1800-2200	56	dB
LA90 Night-time	2200-0700	45	dB
LAeq Daytime	0700-1800	73	dB
LAeq Evening	1800-2200	70	dB
LAeq Night-time	2200-0700	69	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	73	dB
LAeq 9 hours	2200-0700	69	dB
Max LAeq 1 hour	0700-2200	75	dB
Max LAeq 1 hour	2200-0700	74	dB

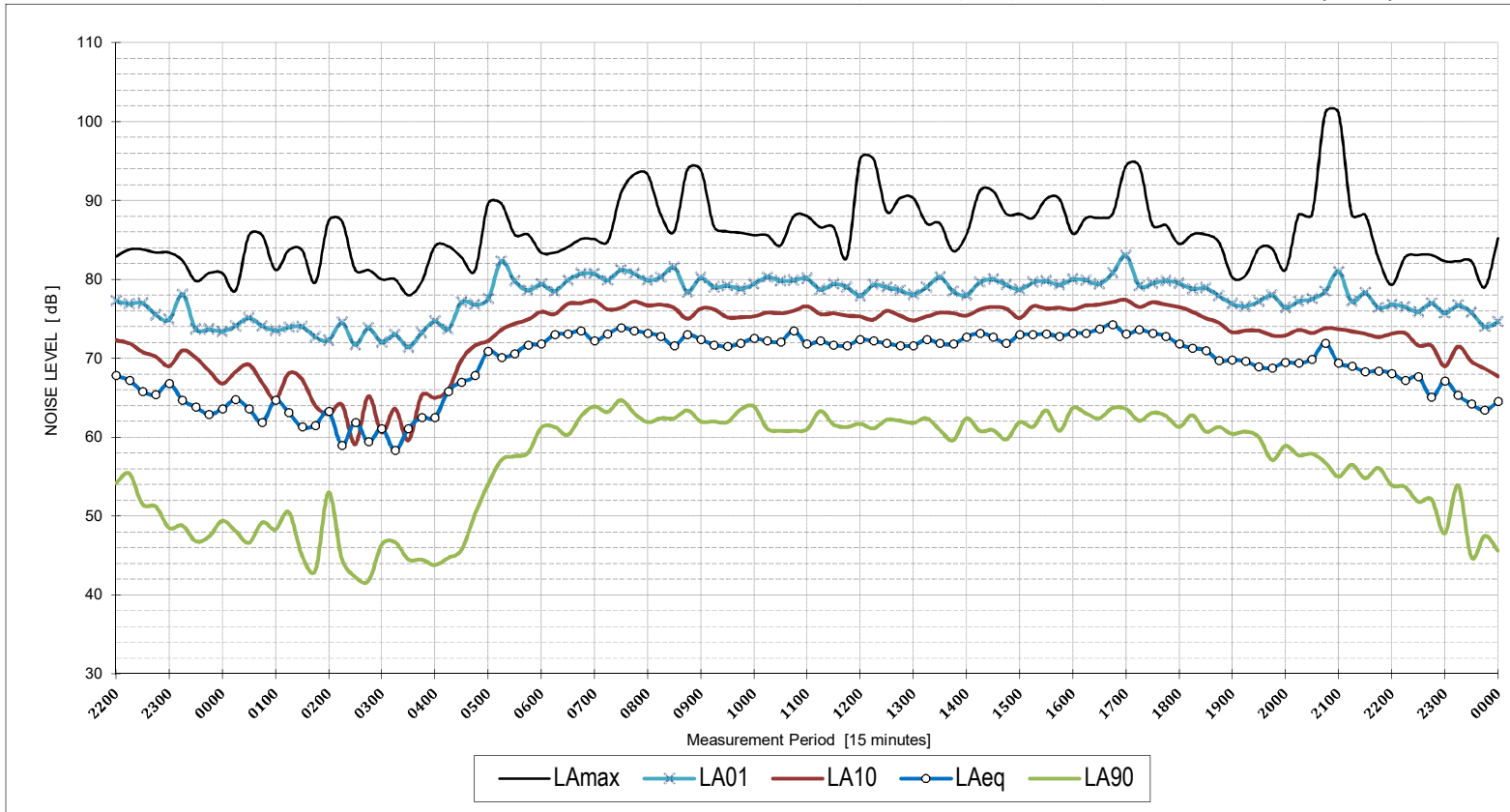
Maximum noise events as defined in the Environmental Noise Management Manual [LAmx - LAeq ≥ 15]	27
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	30	40	45	49	53	57	55	50	41	61
10% min LA90 Evening	6:00 PM	10:00 PM	23	35	40	45	49	52	50	43	33	56
10% min LA90 Night	10:00 PM	7:00 AM	17	21	32	37	39	40	38	34	28	45
10% min LA90 Period	7:00 AM	10:00 PM	24	36	41	46	50	53	51	44	34	57
10% min LA90 Period	10:00 PM	7:00 AM	17	22	32	37	39	40	38	34	28	45
LAeq 15 hours	7:00 AM	10:00 PM	39	49	54	59	64	69	67	63	59	73
LAeq 9 hours	10:00 PM	7:00 AM	33	44	49	54	59	64	64	62	59	69
Max LAeq 1 hour Day	7:00 AM	10:00 PM	40	50	55	59	65	70	69	67	63	75
Max LAeq 1 hour Night	10:00 PM	7:00 AM	38	48	53	57	63	68	69	67	63	74

DAY 7

LOGGER LOCATION: Top of the pedestrian awning at Location 1 (Fronting Pittwater Rd)

DATE: Wednesday, 27 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	61	dB
LA90 Evening	1800-2200	56	dB
LA90 Night-time	2200-0700	44	dB
LAeq Daytime	0700-1800	73	dB
LAeq Evening	1800-2200	70	dB
LAeq Night-time	2200-0700	67	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	72	dB
LAeq 9 hours	2200-0700	67	dB
Max LAeq 1 hour	0700-2200	73	dB
Max LAeq 1 hour	2200-0700	71	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmix - LAeq ≥ 15]

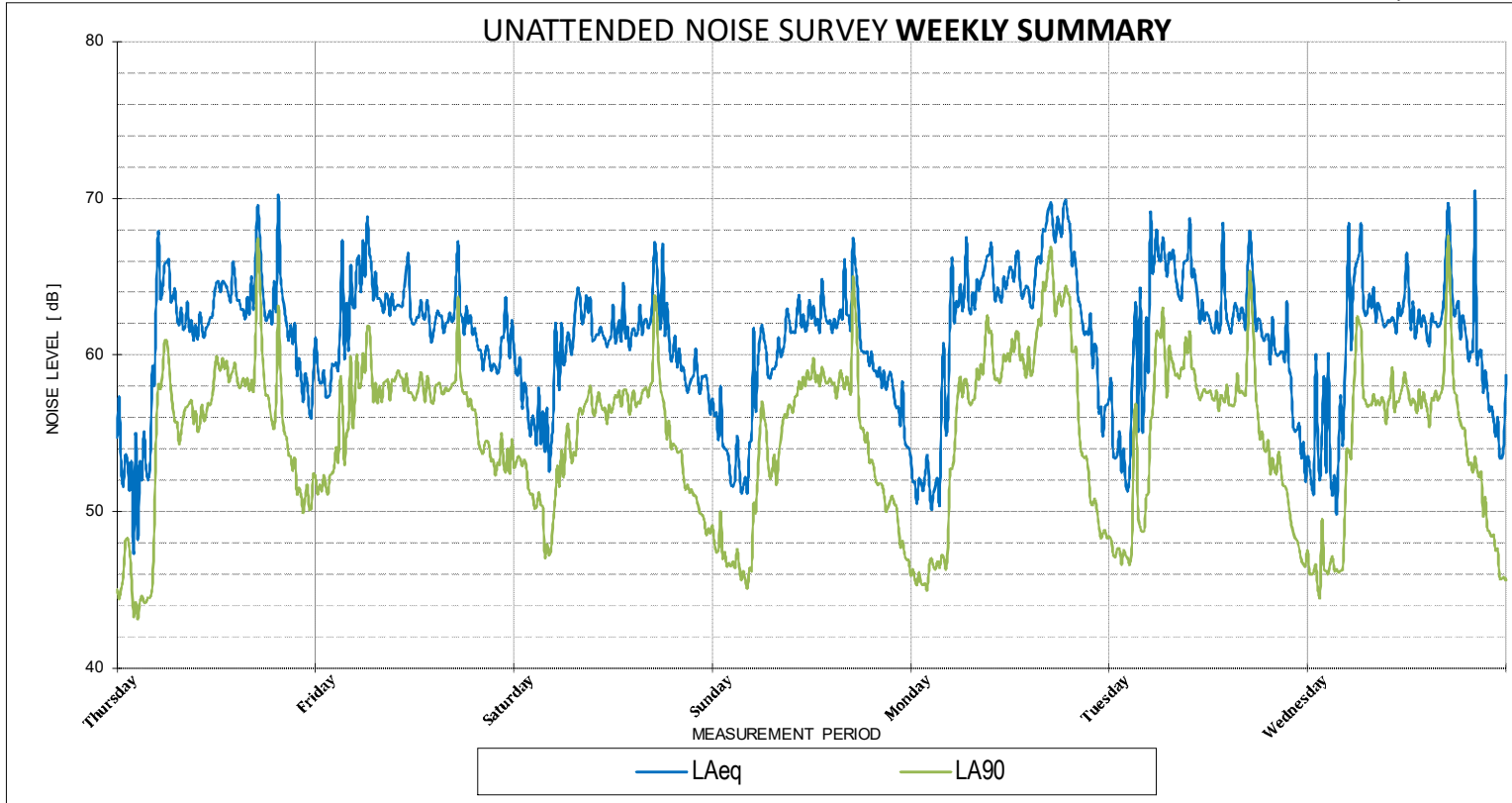
29

Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	30	40	45	49	53	57	55	50	41	61
10% min LA90 Evening	6:00 PM	10:00 PM	22	33	39	44	48	52	49	42	31	56
10% min LA90 Night	10:00 PM	7:00 AM	16	23	32	36	38	39	37	30	21	44
10% min LA90 Period	7:00 AM	10:00 PM	24	35	41	46	50	54	51	45	35	58
10% min LA90 Period	10:00 PM	7:00 AM	16	23	32	36	38	39	37	30	21	44
LAeq 15 hours	7:00 AM	10:00 PM	39	49	56	60	64	69	66	60	55	72
LAeq 9 hours	10:00 PM	7:00 AM	33	45	50	54	60	64	61	56	50	67
Max LAeq 1 hour Day	7:00 AM	10:00 PM	40	50	57	61	65	70	67	61	56	73
Max LAeq 1 hour Night	10:00 PM	7:00 AM	36	48	53	57	63	68	65	59	53	71

WEEKLY SUMMARY

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

PERIOD: 21st to the 27th May 2020



Sundays and Public Holidays the hours change to 0800

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	LA90 Evening	LA90 Night-time
Day 1	56	53	44
Day 2	57	53	51
Day 3	56	51	49
Day 4	56	51	46
Day 5	58	53	45
Day 6	57	51	47
Day 7	56	50	46
RBL	56	51	46

	LAeq Daytime	LAeq Evening	LAeq Night-time
Day 1	64	64	60
Day 2	63	61	63
Day 3	62	61	59
Day 4	63	59	58
Day 5	66	66	60
Day 6	64	61	62
Day 7	63	63	61
Average	64	63	61

SUMMARY OF TRAFFIC LEVELS

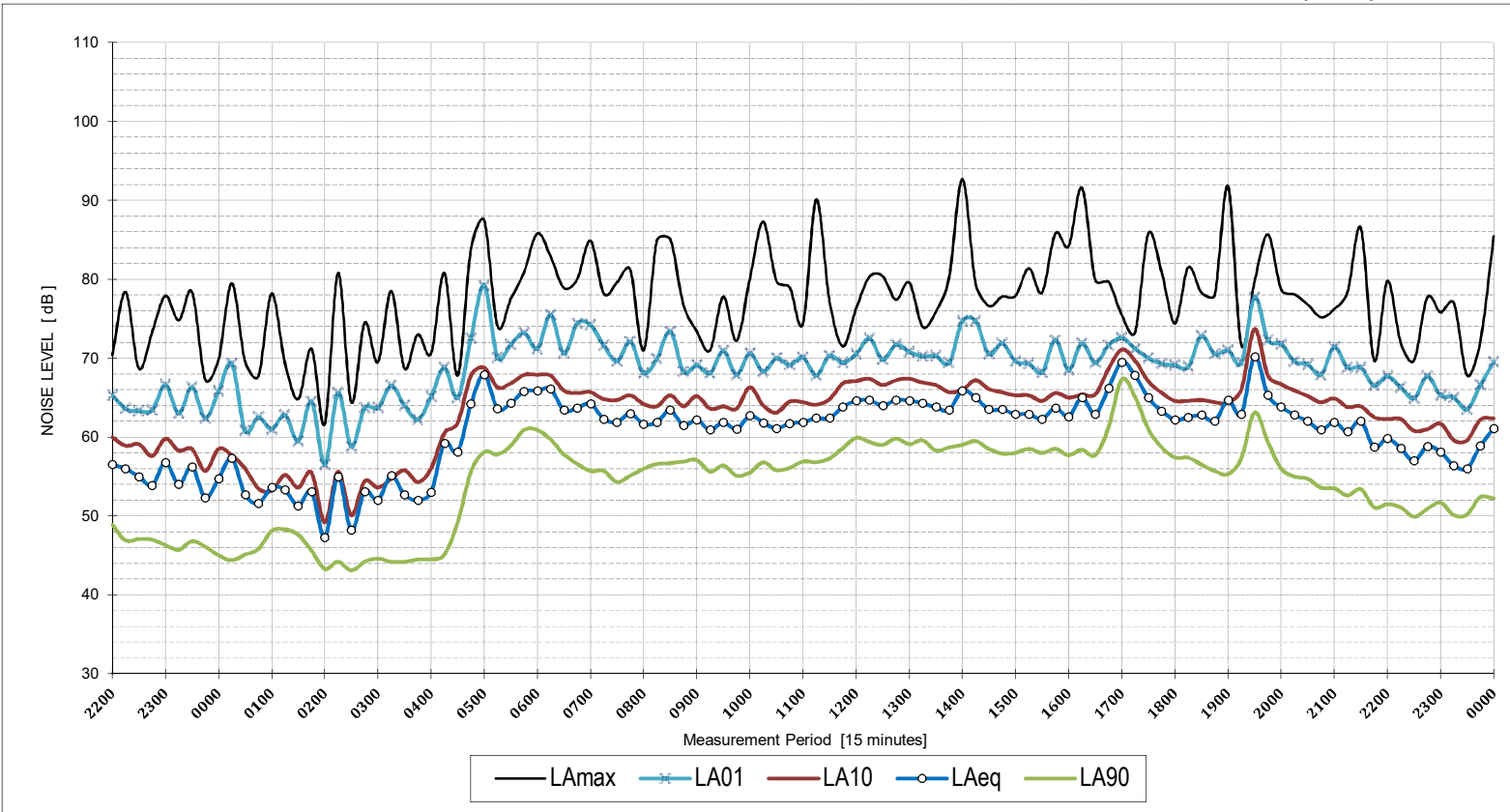
LAeq 15 hrs	0700-2200	64	dB
LAeq 9 hrs	2200-0700	61	dB
Max LAeq 1 hr	0700-2200	66	dB
Max LAeq 1 hr	2200-0700	65	dB

WEEKLY SUMMARY Descriptor	Period Start	Period End	Frequency [Hz]										Total A
			31.5	63	125	250	500	1000	2000	4000	8000		
10% min LA90 Daytime	7:00 AM	6:00 PM	28	36	42	46	49	52	50	45	35	56	
10% min LA90 Evening	6:00 PM	10:00 PM	21	31	39	43	45	47	44	38	27	52	
10% min LA90 Night	10:00 PM	7:00 AM	12	25	36	40	40	40	38	34	24	46	
10% min LA90 Period	7:00 AM	10:00 PM	23	32	40	44	46	49	46	40	30	53	
10% min LA90 Period	10:00 PM	7:00 AM	12	25	36	39	40	40	38	34	23	46	
LAeq 15 hours	7:00 AM	10:00 PM	33	43	48	51	54	58	58	56	47	64	
LAeq 9 hours	10:00 PM	7:00 AM	31	39	44	49	52	55	55	53	44	61	
Max LAeq 1 hour Day	7:00 AM	10:00 PM	34	44	49	52	55	60	61	59	50	66	
Max LAeq 1 hour Night	10:00 PM	7:00 AM	32	43	48	51	55	59	61	59	49	65	

DAY 1

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

DATE: Thursday, 21 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	56	dB
LA90 Evening	1800-2200	53	dB
LA90 Night-time	2200-0700	44	dB
LAeq Daytime	0700-1800	64	dB
LAeq Evening	1800-2200	64	dB
LAeq Night-time	2200-0700	60	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	64	dB
LAeq 9 hours	2200-0700	60	dB
Max LAeq 1 hour	0700-2200	67	dB
Max LAeq 1 hour	2200-0700	65	dB

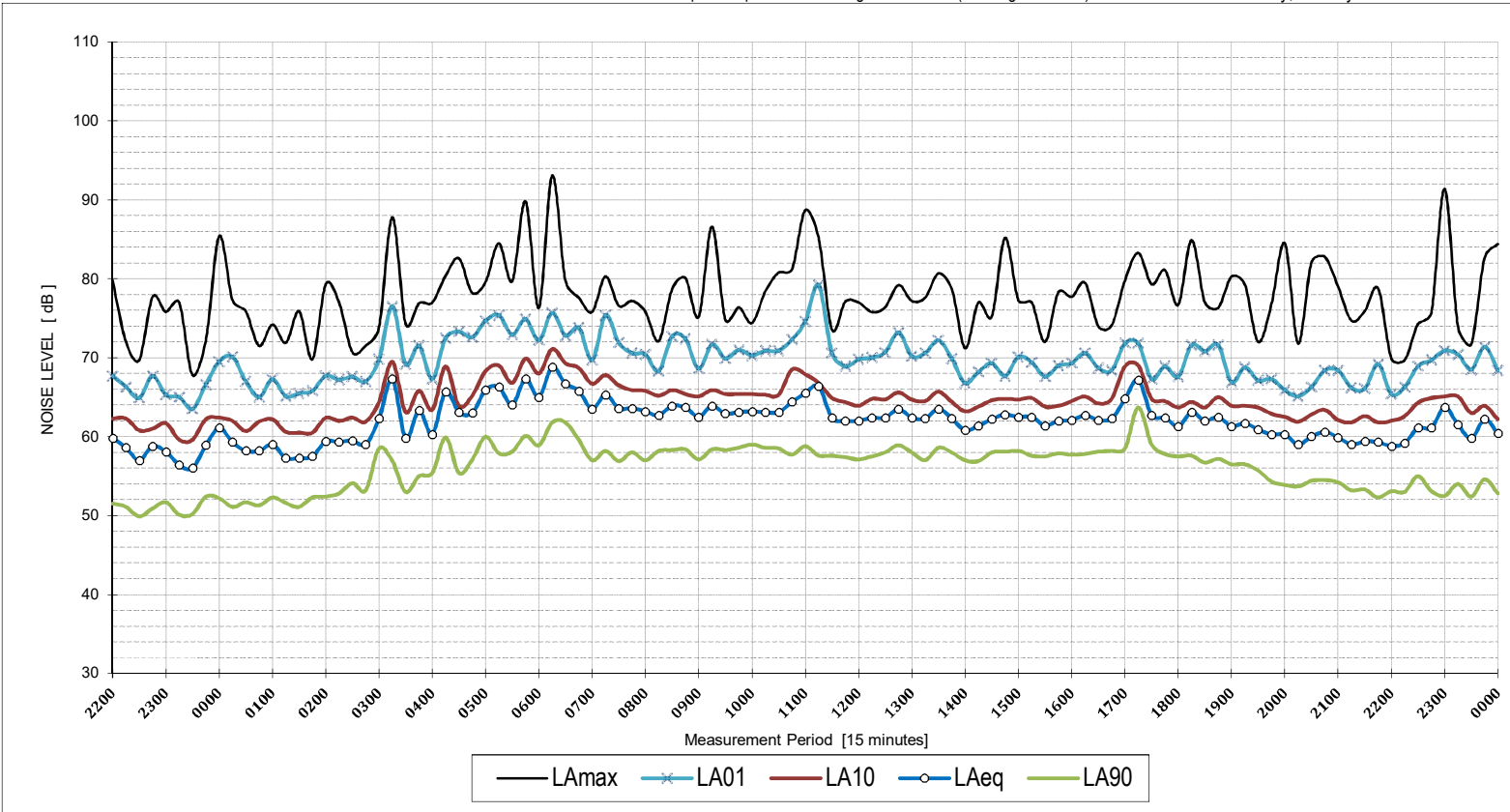
Maximum noise events as defined in the Environmental Noise Management Manual [LAmx - LAeq ≥ 15] 29

Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	27	35	41	46	48	51	50	44	33	56
10% min LA90 Evening	6:00 PM	10:00 PM	22	32	40	44	45	48	47	42	33	53
10% min LA90 Night	10:00 PM	7:00 AM	8	23	35	38	39	37	35	29	18	44
10% min LA90 Period	7:00 AM	10:00 PM	25	34	40	45	47	50	49	43	32	55
10% min LA90 Period	10:00 PM	7:00 AM	8	23	35	38	39	37	35	29	18	44
LAeq 15 hours	7:00 AM	10:00 PM	33	43	48	51	55	58	58	57	48	64
LAeq 9 hours	10:00 PM	7:00 AM	26	39	45	48	51	54	55	54	43	60
Max LAeq 1 hour Day	7:00 AM	10:00 PM	33	43	49	52	55	60	62	60	51	67
Max LAeq 1 hour Night	10:00 PM	7:00 AM	31	43	49	53	55	58	60	59	48	65

DAY 2

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

DATE: Friday, 22 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	57	dB
LA90 Evening	1800-2200	53	dB
LA90 Night-time	2200-0700	51	dB
LAeq Daytime	0700-1800	63	dB
LAeq Evening	1800-2200	61	dB
LAeq Night-time	2200-0700	63	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	63	dB
LAeq 9 hours	2200-0700	63	dB
Max LAeq 1 hour	0700-2200	64	dB
Max LAeq 1 hour	2200-0700	66	dB

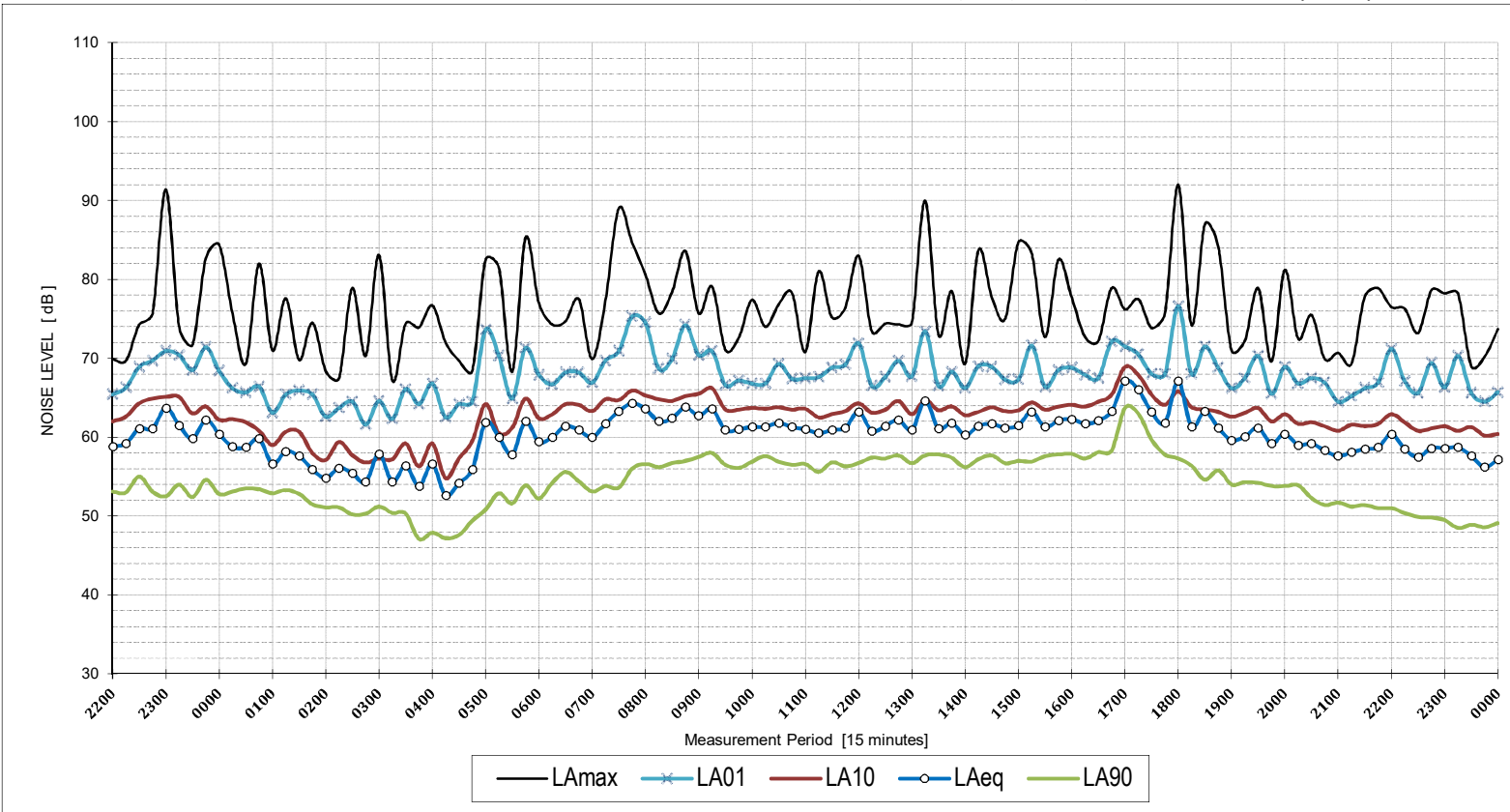
Maximum noise events as defined in the Environmental Noise Management Manual [LAmx - LAeq ≥ 15] 19

Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	28	36	42	46	50	53	51	45	35	57
10% min LA90 Evening	6:00 PM	10:00 PM	23	32	39	44	46	49	47	42	32	53
10% min LA90 Night	10:00 PM	7:00 AM	20	31	38	42	44	45	45	41	33	51
10% min LA90 Period	7:00 AM	10:00 PM	25	33	40	45	47	50	48	43	33	54
10% min LA90 Period	10:00 PM	7:00 AM	19	29	38	41	43	45	45	42	34	51
LAeq 15 hours	7:00 AM	10:00 PM	34	43	48	51	54	58	57	53	44	63
LAeq 9 hours	10:00 PM	7:00 AM	36	43	46	50	54	57	58	55	47	63
Max LAeq 1 hour Day	7:00 AM	10:00 PM	35	45	49	52	56	60	58	54	45	64
Max LAeq 1 hour Night	10:00 PM	7:00 AM	35	43	47	52	56	60	61	60	50	66

DAY 3

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

DATE: Saturday, 23 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	56	dB
LA90 Evening	1800-2200	51	dB
LA90 Night-time	2200-0700	49	dB
LAeq Daytime	0700-1800	62	dB
LAeq Evening	1800-2200	61	dB
LAeq Night-time	2200-0700	59	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	59	dB
Max LAeq 1 hour	0700-2200	64	dB
Max LAeq 1 hour	2200-0700	61	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LA_{max} - LA_{eq} ≥ 15]

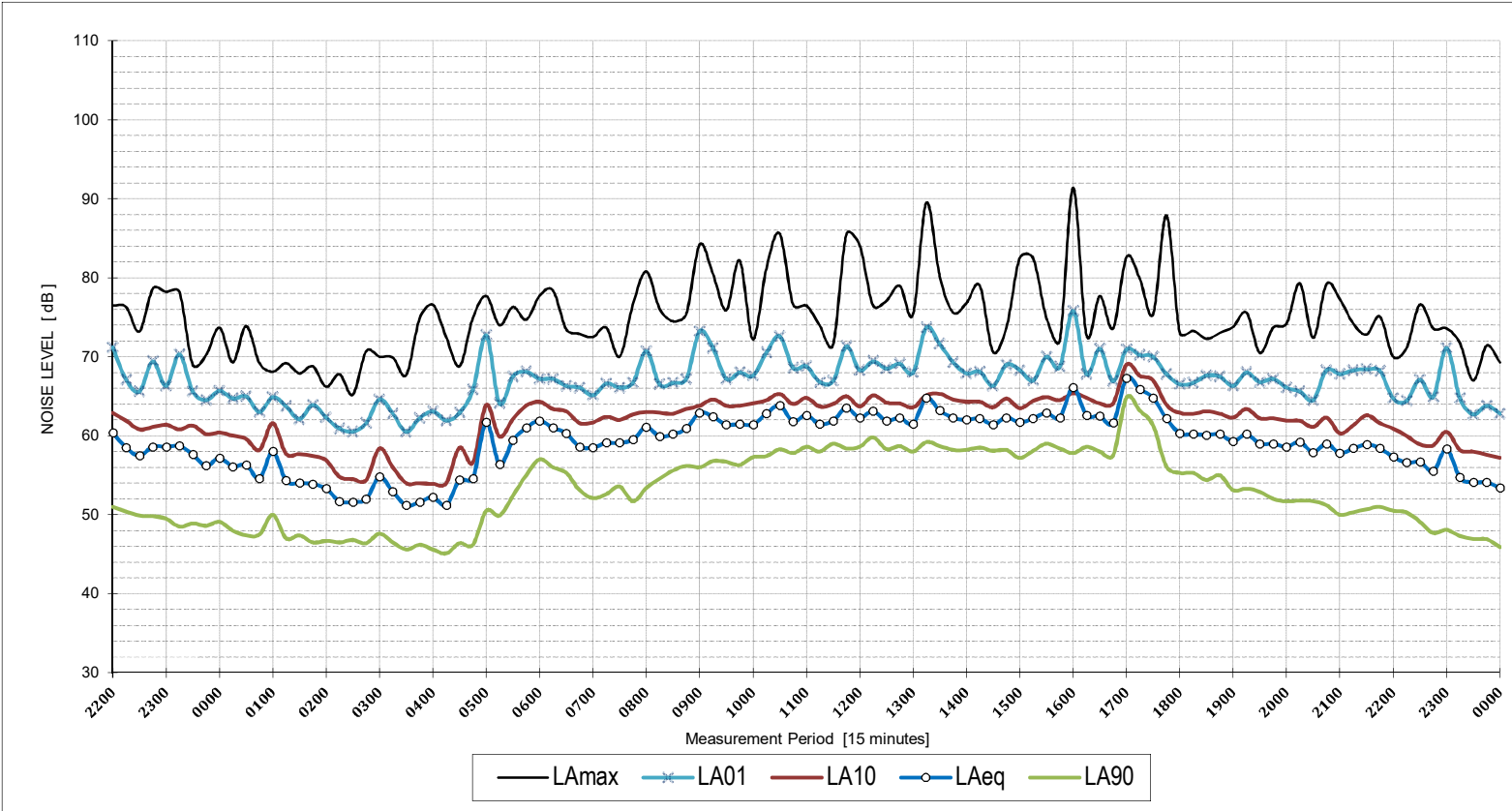
20

Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	27	35	41	46	49	52	50	44	34	56
10% min LA90 Evening	6:00 PM	10:00 PM	21	31	39	43	45	47	44	38	27	51
10% min LA90 Night	10:00 PM	7:00 AM	17	30	37	41	42	43	41	38	29	49
10% min LA90 Period	7:00 AM	10:00 PM	23	32	39	43	46	49	46	40	30	53
10% min LA90 Period	10:00 PM	7:00 AM	16	26	35	39	41	43	43	39	31	49
LAeq 15 hours	7:00 AM	10:00 PM	33	43	48	51	54	58	56	52	42	62
LAeq 9 hours	10:00 PM	7:00 AM	30	39	43	47	51	54	53	51	42	59
Max LAeq 1 hour Day	7:00 AM	10:00 PM	33	43	48	52	55	59	58	54	43	64
Max LAeq 1 hour Night	7:00 AM	10:00 PM	31	40	44	48	52	57	56	54	45	61

DAY 4

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

DATE: Sunday, 24 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	56	dB
LA90 Evening	1800-2200	51	dB
LA90 Night-time	2200-0800	46	dB
LAeq Daytime	0800-1800	63	dB
LAeq Evening	1800-2200	59	dB
LAeq Night-time	2200-0800	58	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	57	dB
Max LAeq 1 hour	0700-2200	64	dB
Max LAeq 1 hour	2200-0700	60	dB

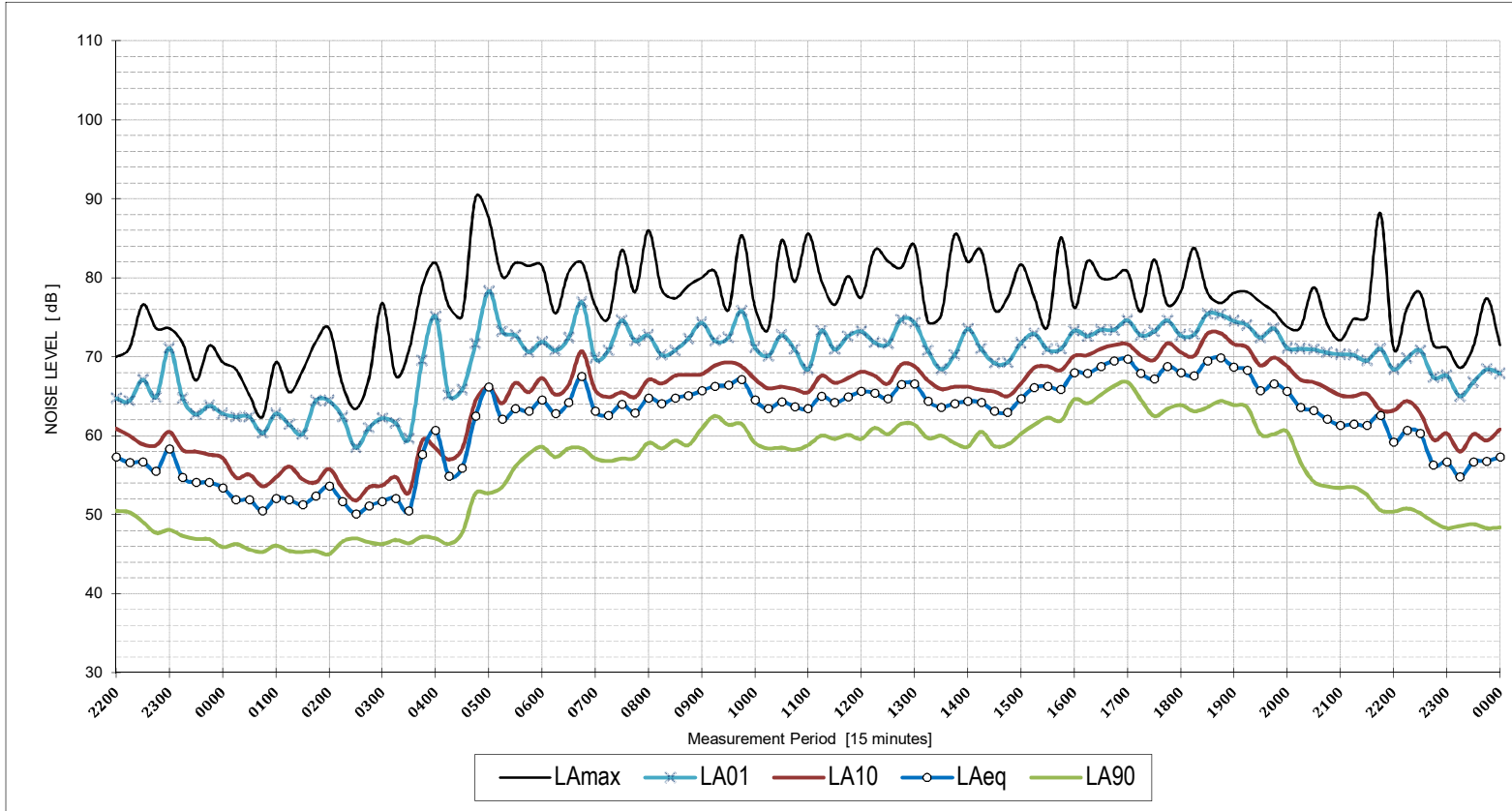
Maximum noise events as defined in the Environmental Noise Management Manual [LA _{max} - LA _{eq} ≥ 15]	22
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	8:00 AM	6:00 PM	26	34	41	46	49	51	50	45	35	56
10% min LA90 Evening	6:00 PM	10:00 PM	19	30	39	42	44	45	43	38	27	51
10% min LA90 Night	10:00 PM	8:00 AM	12	24	36	39	40	40	38	34	25	46
10% min LA90 Period	7:00 AM	10:00 PM	20	31	39	43	45	47	45	39	29	52
10% min LA90 Period	10:00 PM	7:00 AM	12	24	36	39	40	40	38	34	24	46
LAeq 15 hours	7:00 AM	10:00 PM	33	43	48	51	54	57	56	53	43	62
LAeq 9 hours	10:00 PM	7:00 AM	27	36	42	46	49	52	52	50	39	57
Max LAeq 1 hour Day	7:00 AM	10:00 PM	35	44	49	52	55	59	58	55	45	64
Max LAeq 1 hour Night	10:00 PM	7:00 AM	28	37	42	46	49	54	55	54	42	60

DAY 5

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

DATE: Monday, 25 May 2020



AMBIENT NOISE METRICS

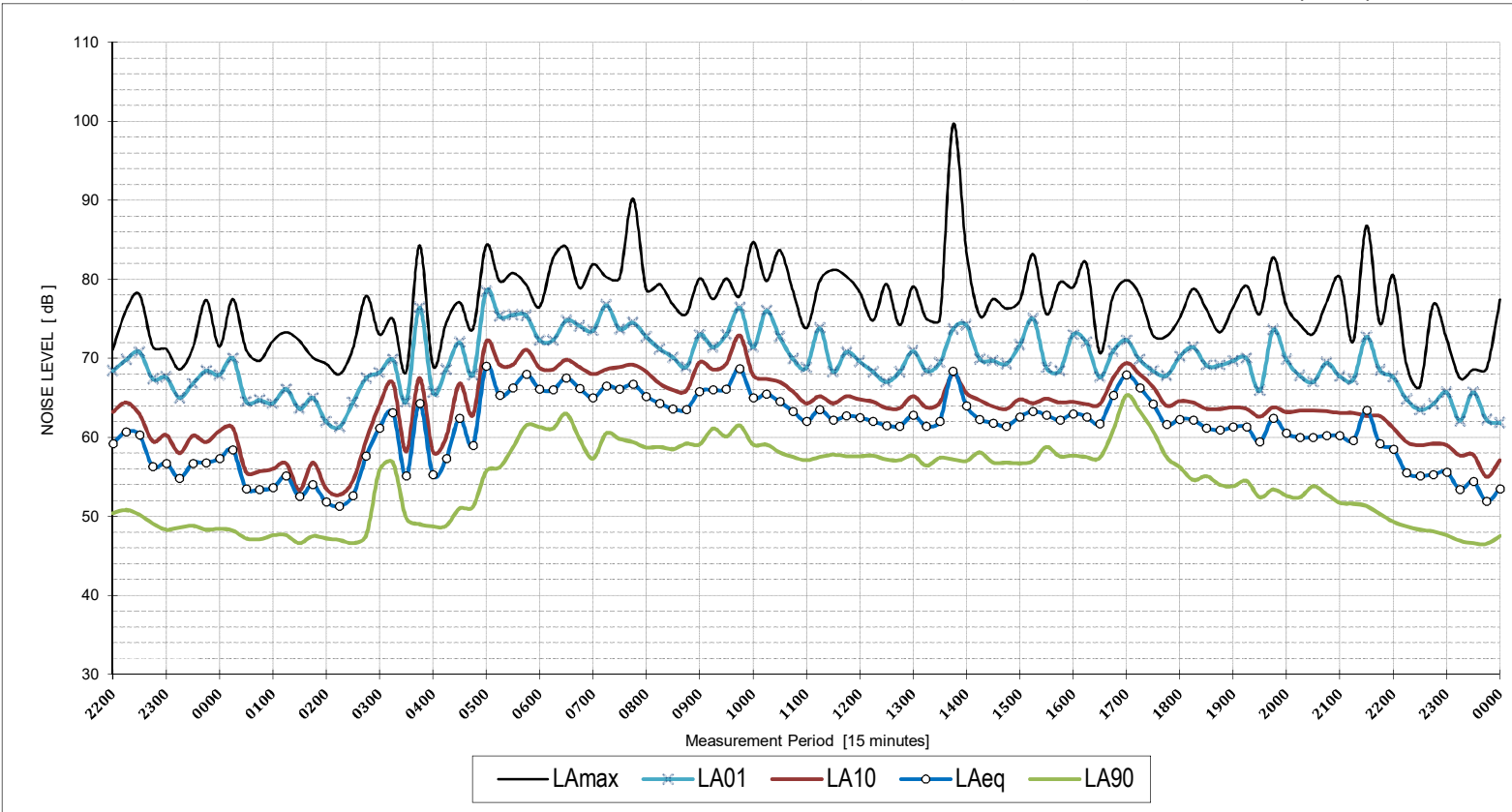
Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	58	dB
LA90 Evening	1800-2200	53	dB
LA90 Night-time	2200-0700	45	dB
LAeq Daytime	0700-1800	66	dB
LAeq Evening	1800-2200	66	dB
LAeq Night-time	2200-0700	60	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	66	dB
LAeq 9 hours	2200-0700	60	dB
Max LAeq 1 hour	0700-2200	69	dB
Max LAeq 1 hour	2200-0700	64	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	26
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	28	36	42	47	50	53	53	49	39	58
10% min LA90 Evening	6:00 PM	10:00 PM	20	30	39	43	45	47	47	44	34	53
10% min LA90 Night	10:00 PM	7:00 AM	11	24	35	39	40	39	36	32	22	45
10% min LA90 Period	7:00 AM	10:00 PM	26	35	42	46	48	52	51	46	35	56
10% min LA90 Period	10:00 PM	7:00 AM	10	24	36	39	40	39	36	32	22	45
LAeq 15 hours	7:00 AM	10:00 PM	34	43	49	52	55	60	61	60	52	66
LAeq 9 hours	10:00 PM	7:00 AM	28	38	45	49	52	54	54	51	42	60
Max LAeq 1 hour Day	7:00 AM	10:00 PM	33	44	50	52	56	62	64	63	56	69
Max LAeq 1 hour Night	10:00 PM	7:00 AM	31	42	48	51	55	58	58	56	46	64



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	57	dB
LA90 Evening	1800-2200	51	dB
LA90 Night-time	2200-0700	47	dB
LAeq Daytime	0700-1800	64	dB
LAeq Evening	1800-2200	61	dB
LAeq Night-time	2200-0700	62	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	64	dB
LAeq 9 hours	2200-0700	62	dB
Max LAeq 1 hour	0700-2200	66	dB
Max LAeq 1 hour	2200-0700	67	dB

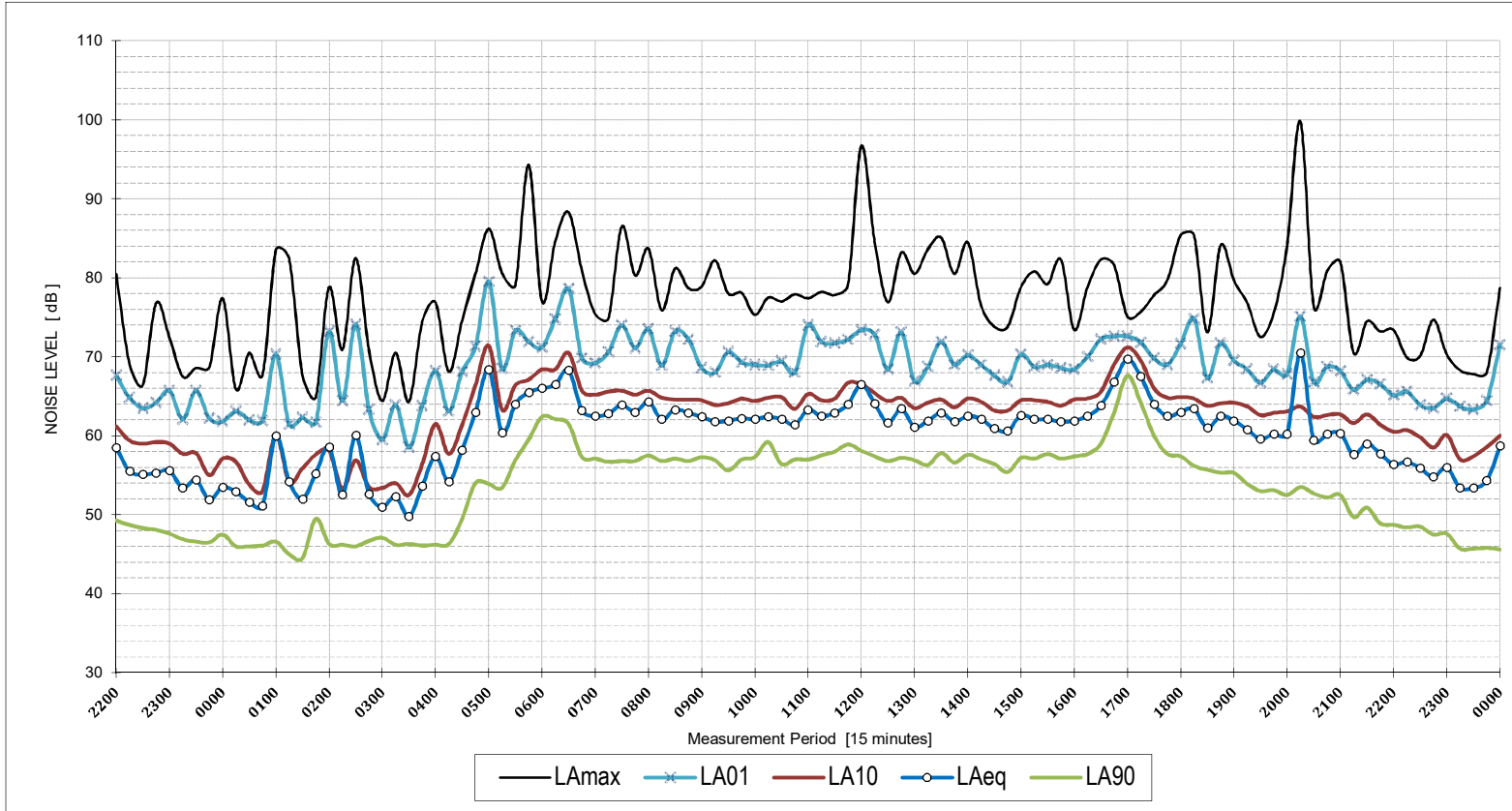
Maximum noise events as defined in the Environmental Noise Management Manual [L _{max} - L _{Aeq} ≥ 15]	20
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Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	28	36	42	46	49	52	51	46	36	57
10% min LA90 Evening	6:00 PM	10:00 PM	21	31	39	44	45	46	44	38	27	51
10% min LA90 Night	10:00 PM	7:00 AM	11	25	36	40	41	41	39	34	24	47
10% min LA90 Period	7:00 AM	10:00 PM	22	32	40	44	46	48	45	40	28	53
10% min LA90 Period	10:00 PM	7:00 AM	11	25	37	41	41	41	38	34	23	47
LAeq 15 hours	7:00 AM	10:00 PM	33	43	49	52	55	58	58	56	47	64
LAeq 9 hours	10:00 PM	7:00 AM	27	39	44	49	52	56	57	55	47	62
Max LAeq 1 hour Day	7:00 AM	10:00 PM	35	44	49	52	56	60	61	59	50	66
Max LAeq 1 hour Night	10:00 PM	7:00 AM	31	42	47	51	55	60	62	61	52	67

DAY 7

LOGGER LOCATION: Top of the pedestrian awning at Location 2 (Fronting Oaks Ave)

DATE: Wednesday, 27 May 2020



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	56	dB
LA90 Evening	1800-2200	50	dB
LA90 Night-time	2200-0700	46	dB
LAeq Daytime	0700-1800	63	dB
LAeq Evening	1800-2200	63	dB
LAeq Night-time	2200-0700	61	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	63	dB
LAeq 9 hours	2200-0700	61	dB
Max LAeq 1 hour	0700-2200	66	dB
Max LAeq 1 hour	2200-0700	65	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmix - LAeq ≥ 15] 26

Descriptor	Period		Frequency [Hz]									
	Start	End	31.5	63	125	250	500	1000	2000	4000	8000	Total A
10% min LA90 Daytime	7:00 AM	6:00 PM	28	36	42	46	49	52	50	45	34	56
10% min LA90 Evening	6:00 PM	10:00 PM	19	30	39	43	44	45	43	37	25	50
10% min LA90 Night	10:00 PM	7:00 AM	14	25	36	40	40	39	37	31	19	46
10% min LA90 Period	7:00 AM	10:00 PM	22	32	40	44	46	48	46	40	30	53
10% min LA90 Period	10:00 PM	7:00 AM	13	25	36	40	40	39	37	31	19	46
LAeq 15 hours	7:00 AM	10:00 PM	33	43	49	52	55	58	57	55	45	63
LAeq 9 hours	10:00 PM	7:00 AM	27	39	45	49	52	54	56	54	42	61
Max LAeq 1 hour Day	7:00 AM	10:00 PM	33	44	50	54	56	59	60	58	47	66
Max LAeq 1 hour Night	10:00 PM	7:00 AM	31	42	48	51	55	58	61	60	47	65

APPENDIX B

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APPENDIX B

**** SCENARIO 1**
TRAFFIC NOISE MODEL
(GROUND FLOOR LEVEL)**

NOISE SOURCES

~ Road traffic along Pittwater Rd and Oaks Ave.

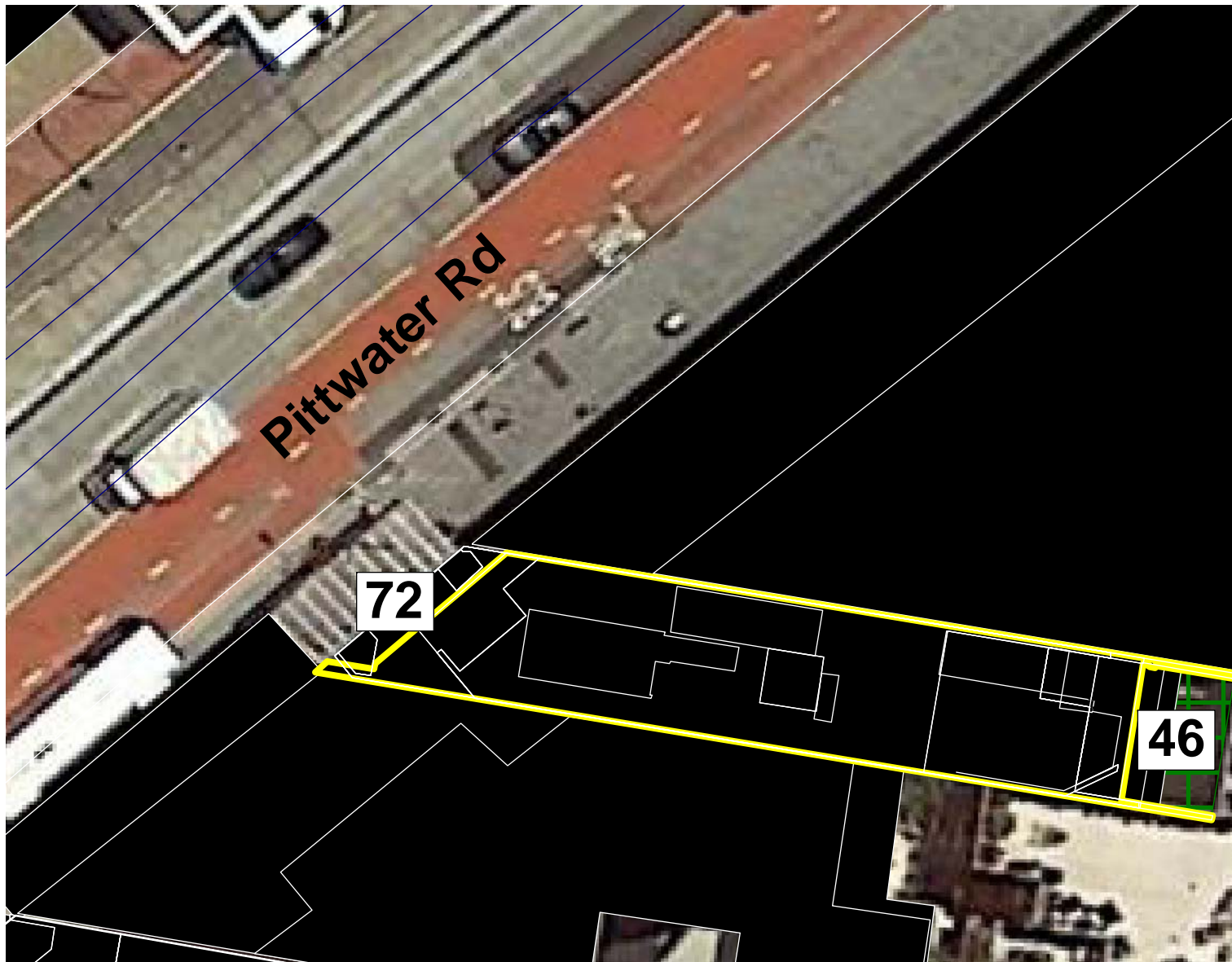
Note:








- LAeq,15hours noise levels shown are at 1.5 m above the ground floor level of the subject development.













- The maximum reading at the proposed development (lobby) on ground floor level is LAeq,15hrs 72 dB.

- Night-time noise levels (LAeq,9hrs) are approximately 4~5 dB lower.

PRINT DATE: 17/03/21



-  Line Source
-  Building
-  Barrier
-  3D-Reflector
-  Foliage
-  Contour Line
-  Receiver

-  > -99.0 dB
-  > 50.0 dB
-  > 55.0 dB
-  > 60.0 dB
-  > 65.0 dB
-  > 70.0 dB
-  > 75.0 dB
-  > 80.0 dB
-  > 85.0 dB
-  > 90.0 dB
-  > 95.0 dB
-  > 100.0 dB

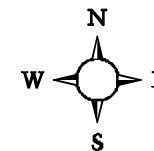
SCENARIO 1: TRAFFIC NOISE MODEL (GROUND FLOOR)

JOB NUMBER: 4617

SITE LOCATION: 882A Pittwater Rd, Dee Why NSW

ASSESSED TO: NSW DoP / ISEPP

LIMITING CRITERIA: 35-40 dB(A) - INTERNAL



**** SCENARIO 1**
TRAFFIC NOISE MODEL
(LEVEL 2)**

NOISE SOURCES

~ Road traffic along Pittwater Rd and Oaks Ave.

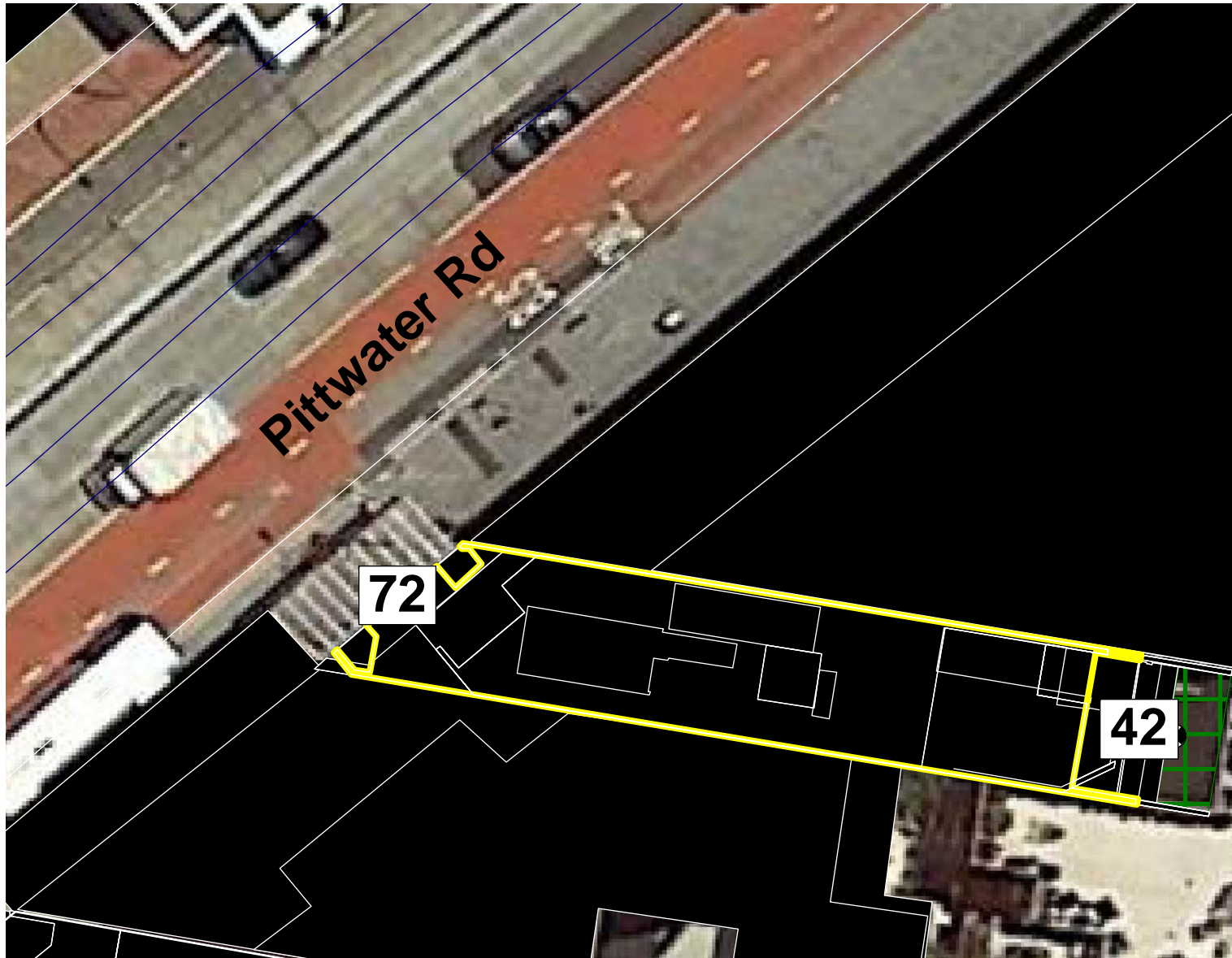
Note:

- LAeq,15hrs noise levels shown are at 1.5 m above the 2nd floor level of the subject development.

- The maximum reading at the proposed development on the 2nd floor level is LAeq,15hrs 72 dB.

- Night-time noise levels (LAeq,9hrs) are approximately 4~5 dB lower.

PRINT DATE: 17/03/21



- Line Source
- Building
- Barrier
- 3D-Reflector
- Foliage
- Contour Line
- Receiver

- > -99.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB
- > 90.0 dB
- > 95.0 dB
- > 100.0 dB

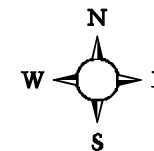
SCENARIO 1: TRAFFIC NOISE MODEL (LEVEL 2)

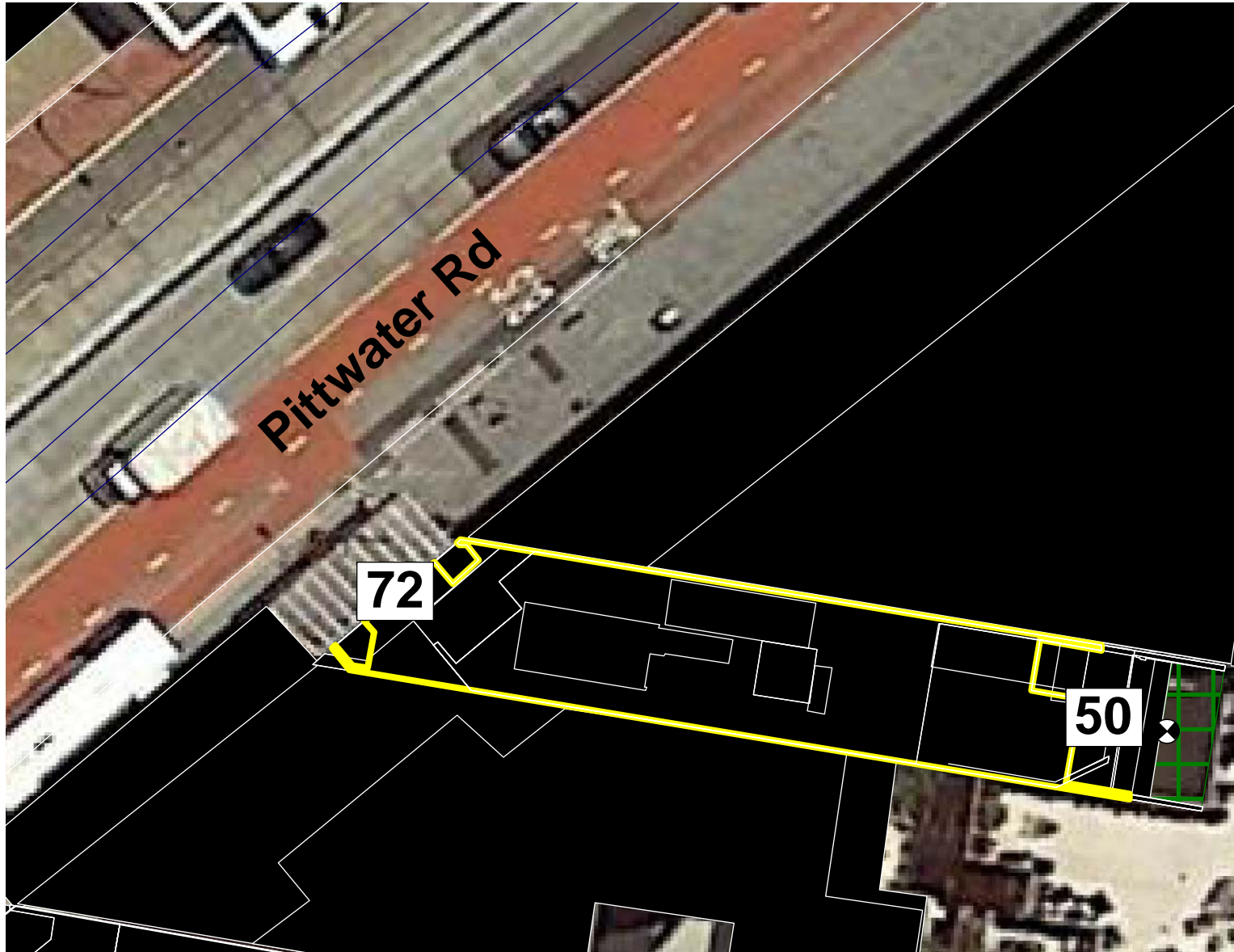
JOB NUMBER: 4617

SITE LOCATION: 882A Pittwater Rd, Dee Why NSW

ASSESSED TO: NSW DoP / ISEPP

LIMITING CRITERIA: 35-40 dB(A) - INTERNAL





**** SCENARIO 1**
TRAFFIC NOISE MODEL
(LEVEL 4)**

NOISE SOURCES

~ Road traffic along Pittwater Rd and Oaks Ave.

Note:

- LAeq,15hrs noise levels shown are at 1.5 m above the 4th floor level of the subject development.
- The maximum reading at the proposed development on the 4th floor level is LAeq,15hrs 72 dB.
- Night-time noise levels (LAeq,9hrs) are approximately 4~5 dB lower.

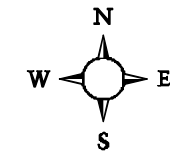
PRINT DATE: 18/03/21

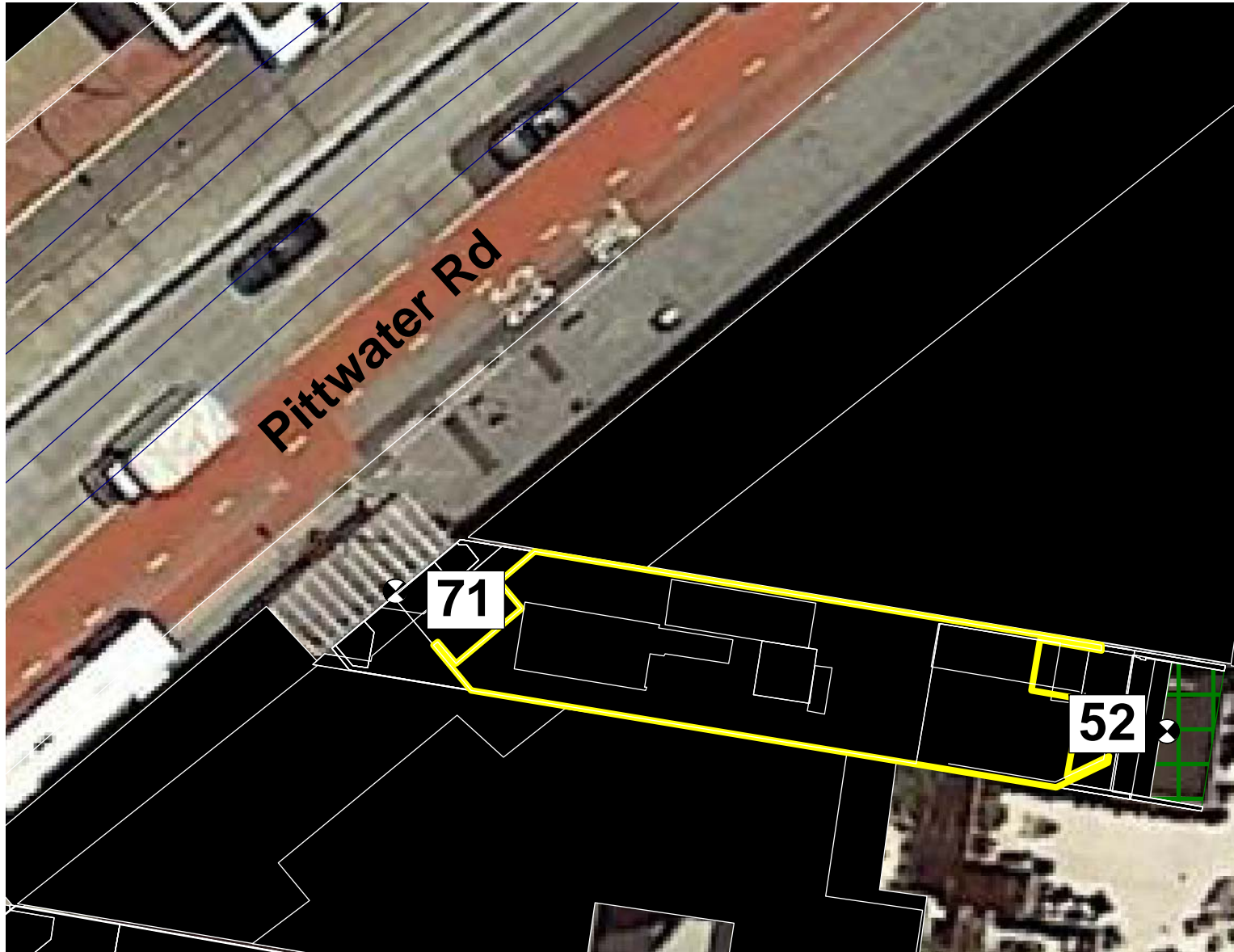
- Line Source
- Building
- Barrier
- 3D-Reflector
- Foliage
- Contour Line
- Receiver

- > -99.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB
- > 90.0 dB
- > 95.0 dB
- > 100.0 dB

SCENARIO 1: TRAFFIC NOISE MODEL (LEVEL 4)

JOB NUMBER: 4617
SITE LOCATION: 882A Pittwater Rd, Dee Why NSW
ASSESSED TO: NSW DoP / ISEPP
LIMITING CRITERIA: 35-40 dB(A) - INTERNAL





**** SCENARIO 1**
TRAFFIC NOISE MODEL
(LEVEL 6)**

NOISE SOURCES

~ Road traffic along Pittwater Rd and Oaks Ave.








Note:













- LAeq,15hrs noise levels shown are at 1.5 m above the 6th floor level of the subject development.

- The maximum reading at the proposed development on the 6th floor level is LAeq,15hrs 72 dB.

- Night-time noise levels (LAeq,9hrs) are approximately 4~5 dB lower.

PRINT DATE: 18/03/21

-  Line Source
-  Building
-  Barrier
-  3D-Reflector
-  Foliage
-  Contour Line
-  Receiver

-  > -99.0 dB
-  > 50.0 dB
-  > 55.0 dB
-  > 60.0 dB
-  > 65.0 dB
-  > 70.0 dB
-  > 75.0 dB
-  > 80.0 dB
-  > 85.0 dB
-  > 90.0 dB
-  > 95.0 dB
-  > 100.0 dB

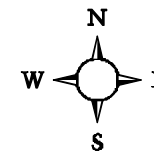
SCENARIO 1: TRAFFIC NOISE MODEL (LEVEL 6)

JOB NUMBER: 4617

SITE LOCATION: 882A Pittwater Rd, Dee Why NSW

ASSESSED TO: NSW DoP / ISEPP

LIMITING CRITERIA: 35-40 dB(A) - INTERNAL



**** SCENARIO 1**
TRAFFIC NOISE MODEL
(LEVEL 8)**

NOISE SOURCES

~ Road traffic along Pittwater Rd and Oaks Ave.

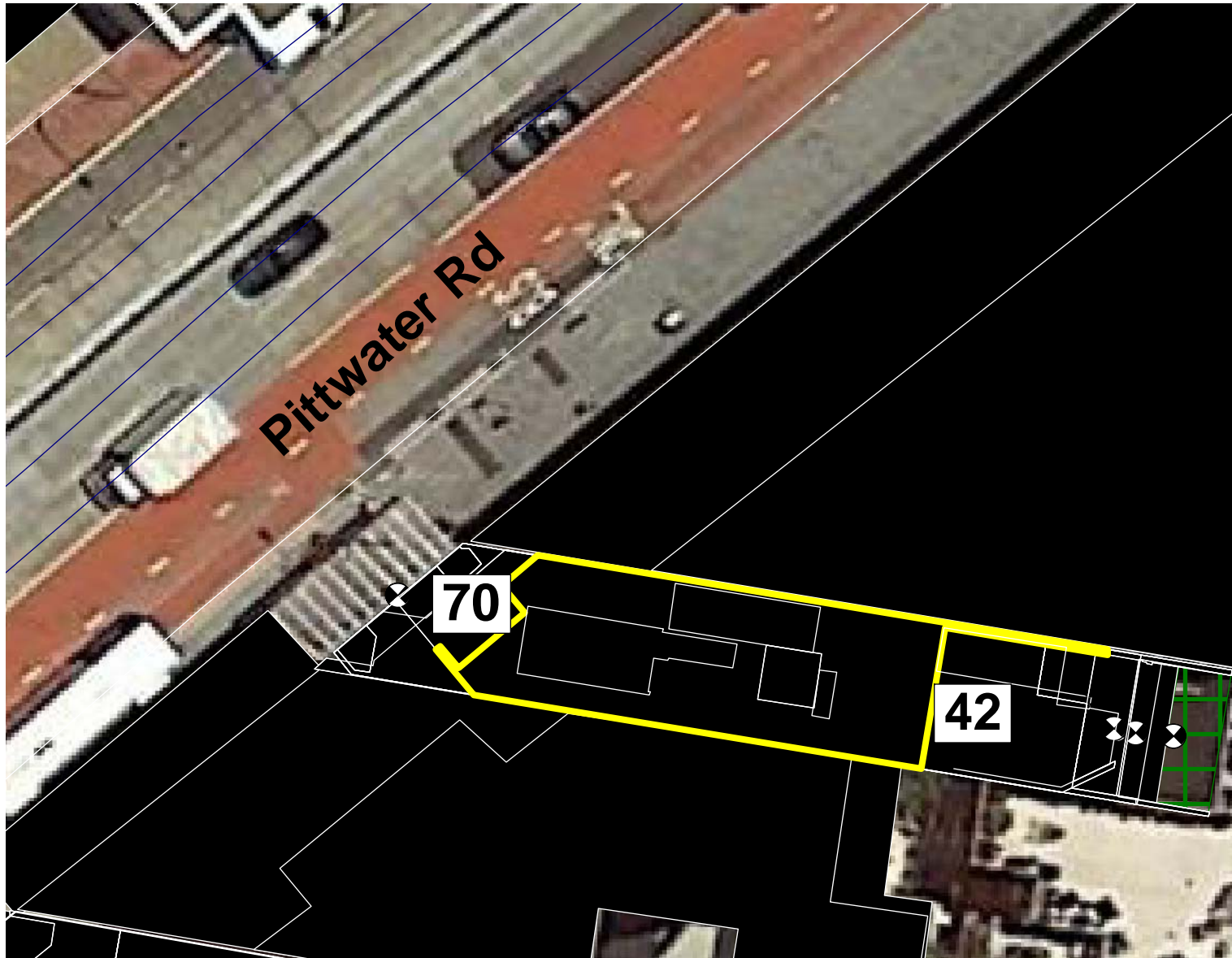
Note:

- LAeq,15hrs noise levels shown are at 1.5 m above the 8th floor level of the subject development.

- The maximum reading at the proposed development on the 8th floor level is LAeq,15hrs 72 dB.

- Night-time noise levels (LAeq,9hrs) are approximately 4~5 dB lower.

PRINT DATE: 18/03/21



- Line Source
- Building
- Barrier
- 3D-Reflector
- Foliage
- Contour Line
- Receiver

- > -99.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB
- > 90.0 dB
- > 95.0 dB
- > 100.0 dB

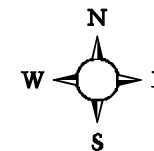
SCENARIO 1: TRAFFIC NOISE MODEL (LEVEL 8)

JOB NUMBER: 4617

SITE LOCATION: 882A Pittwater Rd, Dee Why NSW

ASSESSED TO: NSW DoP / ISEPP

LIMITING CRITERIA: 35-40 dB(A) - INTERNAL



**** SCENARIO 2****
BBQ AREA NOISE MODEL
(LEVEL 7 or 8 or TOP LEVEL)

NOISE SOURCES

~ Road traffic along Pittwater Rd and Oaks Ave.

Note:

- LAeq,15mins noise levels shown are at 1.5 m above the most noise affected floor level of the subject development (level 7 or 8) or surrounding buildings.

- The maximum reading at the most noise-affected location is LAeq,15mins 50 dB.

PRINT DATE: 18/03/21



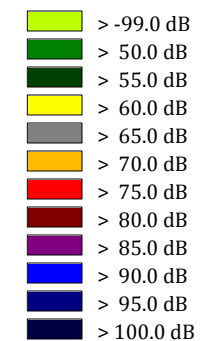
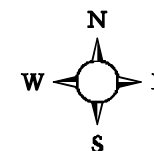
SCENARIO 2: BBQ AREA NOISE MODEL (LEVEL 7, 8 or top floor level)

JOB NUMBER: 4617

SITE LOCATION: 882A Pittwater Rd, Dee Why NSW

ASSESSED TO: NSW DoP / ISEPP

LIMITING CRITERIA: LAeq 51 dB - EXTERNAL for evening period





**** SCENARIO 3**
AC NOISE MODEL
(LEVEL 8 or TOP LEVEL)**

NOISE SOURCES

~ 26 AC units

Note:

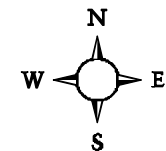
- LAeq,15mins noise levels shown are at 1.5 m above the most noise affected floor level of the subject development (level 8) or surrounding buildings.

- The maximum reading at the most noise-affected location is LAeq,15mins 38 dB.

PRINT DATE: 19/03/21

- + Point Source
- Building
- Barrier
- 3D-Reflector
- Foliage
- Contour Line
- + Receiver

- > -99.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB
- > 90.0 dB
- > 95.0 dB
- > 100.0 dB



SCENARIO 3: AC NOISE MODEL (LEVEL 8 or top floor level)

JOB NUMBER: 4617

SITE LOCATION: 882A Pittwater Rd, Dee Why NSW

ASSESSED TO: NSW DoP / ISEPP

LIMITING CRITERIA: LAeq,15mins 36-41 dB - EXTERNAL for night-time period

APPENDIX C

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APPENDIX C

TRAFFIC NOISE INTRUSION CALCULATIONS - BOARDING ROOMS ON LEVEL 2 (FRONTING MAIN ROAD)

Job 4617
 Client Atlen Construction Pty Ltd
 Site 882A Pittwater Road, Dee Why NSW
 Room Boarding rooms on level 2 fronting Pittwater Road

ROOM DATA

H 2.7 m D 5 m
 W 3 m V 40.5 m³

		63	125	250	500	1k	2k	4k	8k	Area
<i>Bedroom, timber floor, furnished (RT60, sec)</i>		0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.38
WESTERN FAÇADES - NOISE LEVEL, LAeq, 9hrs [dB]		<u>44</u>	<u>50</u>	<u>54</u>	<u>59</u>	<u>64</u>	<u>62</u>	<u>58</u>	<u>54</u>	<u>68</u>
STL 1	110 mm precast concrete + 90 mm timber studs with insulation + 13 mm PB	29	32	47	47	50	47	50	52	1.1
STL 2	6.38 mm laminated + 100 mm air-gap + 10.38 mm laminated	29	35	41	49	52	51	58	63	4.3
STL 3										
STL 4										
	Noise through Component 1	10	13	1	6	7	9	2	-5	17
	Noise through Component 2	16	16	13	10	11	11	-1	-10	22
	Noise through Component 3	0	0	0	0	0	0	0	0	0
	Noise through Component 4	0	0	0	0	0	0	0	0	0
	NOISE THROUGH FAÇADE 1	17	18	14	12	13	13	6	4	23
		<u>0</u>								
STL 1										
STL 2										
STL 3										
STL 4										
	Noise through Component 1	0	0	0	0	0	0	0	0	0
	Noise through Component 2	0	0	0	0	0	0	0	0	0
	Noise through Component 3	0	0	0	0	0	0	0	0	0
	Noise through Component 4	0	0	0	0	0	0	0	0	0
	NOISE THROUGH FAÇADE 2	0	0	0	0	0	0	0	0	0
		<u>0</u>								
STL 1										
STL 2										
STL 3										
STL 4										
	Noise through Component 1	0	0	0	0	0	0	0	0	0
	Noise through Component 2	0	0	0	0	0	0	0	0	0
	Noise through Component 3	0	0	0	0	0	0	0	0	0
	Noise through Component 4	0	0	0	0	0	0	0	0	0
	NOISE THROUGH FAÇADE 3	0	0	0	0	0	0	0	0	0
EXTERNAL FAÇADE 4 - NOISE LEVEL, LAeq, Period [dB]		<u>0</u>								
STL 1										
STL 2										
STL 3										
STL 4										
	Noise through Component 1	0	0	0	0	0	0	0	0	0
	Noise through Component 2	0	0	0	0	0	0	0	0	0
	Noise through Component 3	0	0	0	0	0	0	0	0	0
	Noise through Component 4	0	0	0	0	0	0	0	0	0
	NOISE THROUGH FAÇADE 4	0	0	0	0	0	0	0	0	0
SUMMARY OF RESULTS		Noise Transmission Through Each Façade LAeq,Period [dB]								
	<u>Frequency</u>	<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1k</u>	<u>2k</u>	<u>4k</u>	<u>8k</u>	<u>Tot</u>
	Façade 1	17	18	14	12	13	13	6	4	23
	Façade 2	0	0	0	0	0	0	0	0	0
	Façade 3	0	0	0	0	0	0	0	0	0
	Façade 4	0	0	0	0	0	0	0	0	0
	CALCULATED INDOOR TRAFFIC NOISE LEVEL, LAeq, Period [dB]	18	18	15	13	14	14	9	7	24

APPENDIX D

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APPENDIX D

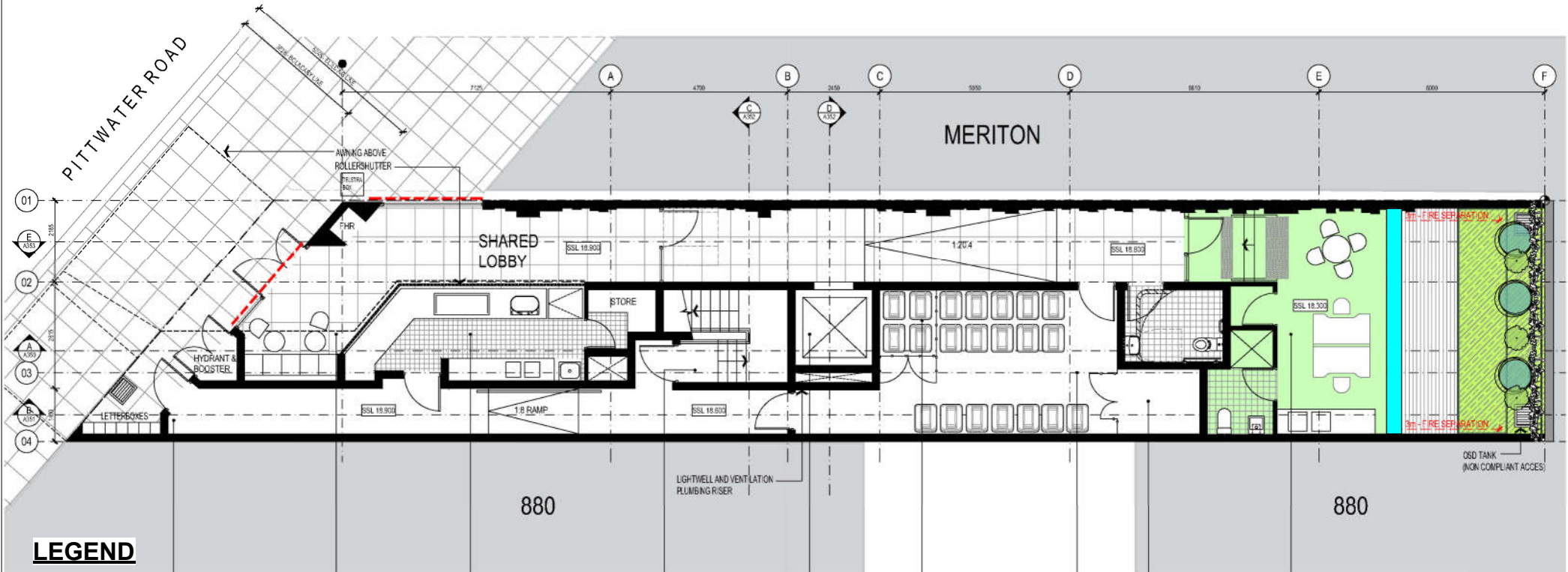
GROUND FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- - - DRENCHERS
- UNIT 01
- UNIT NUMBER
- 28.0 SQM --- TOTAL AREA
- 20.0 SQM --- TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

-
- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing
OR
12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- ★ Mechanical Ventilation System is Required

FIRE EGRESS STAIR

FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT

MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

CAGED COMMERCIAL REFUSE & RECYCLE

BINS

BULKY GOODS
8 SQM

COMMERCIAL 01
27.2 SQM

PROJECT
ARH DEE WHY

882A PITTWATER ROAD, DEE WHY NSW 2099

TITLE
GROUND FLOOR



SCALE
1:50 @ A1

PROJECT NUMBER
20036

DRAWING NUMBER
A100

ISSUE
M

crawford
architects

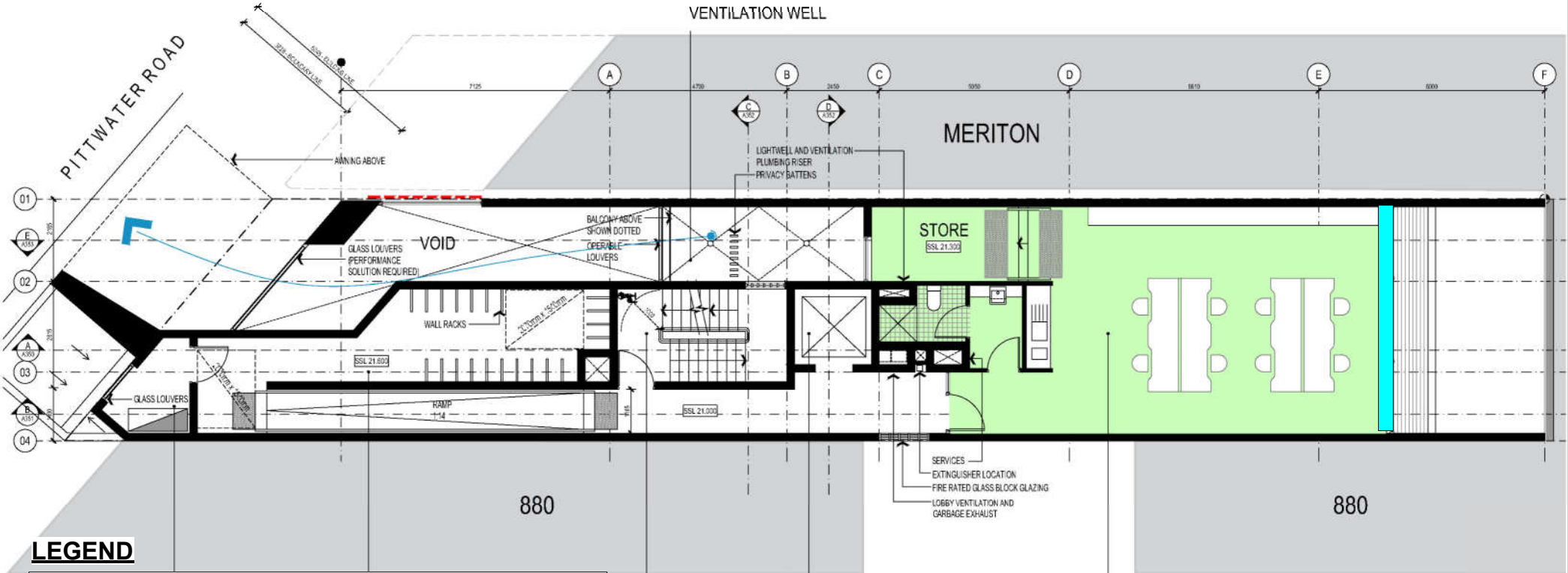
1st FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- DRENCHERS
- UNIT 01**
- UNIT NUMBER
- 28.0 SQM TOTAL AREA
- 20.0 SQM TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing
- OR**
- 12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- Mechanical Ventilation System is Required

FIRE EGRESS
FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT
MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

COMMERCIAL 02
75.6 SQM

PROJECT
ARH DEE WHY

882A PITTWATER ROAD, DEE WHY NSW 2099

TITLE
FIRST FLOOR



SCALE
1:50 @ A1

APPROVED
DRAWN
CHECKED
DATE
STATUS

PROJECT NUMBER
20036

DRAWING NUMBER
A101

ISSUE
M **crawford**
architects

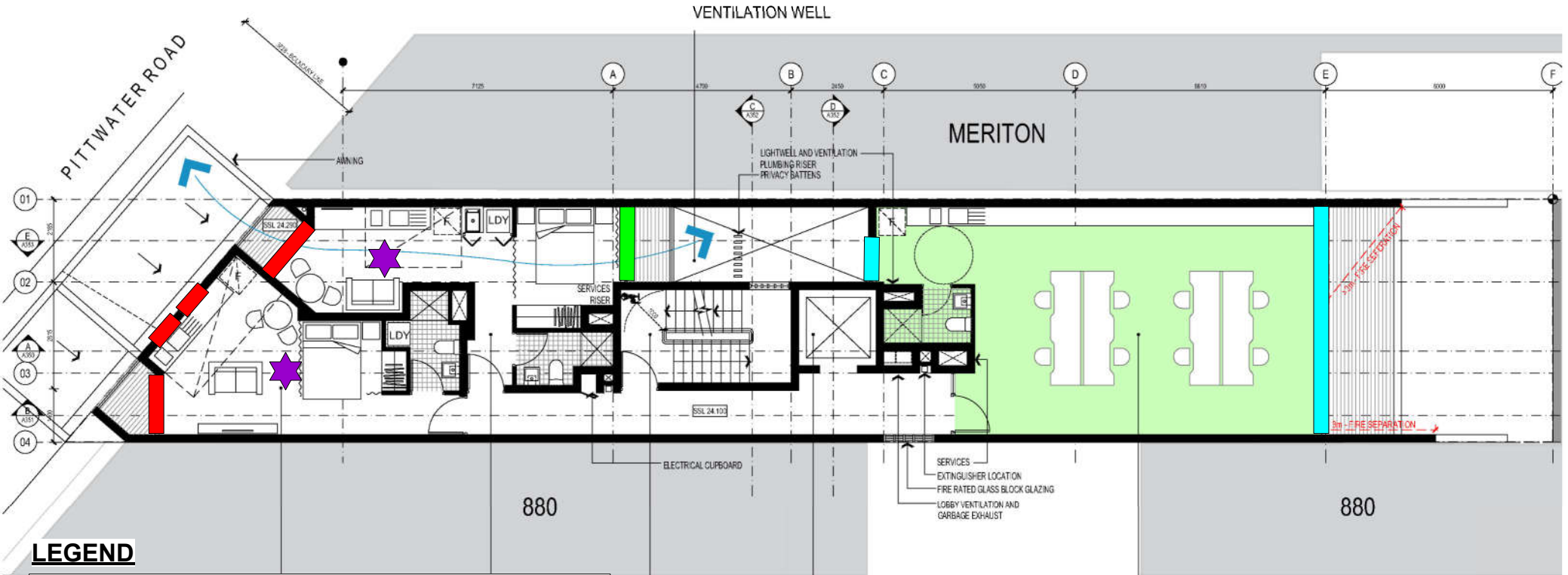
2nd FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- DRENCHERS
- UNIT 01**
 - UNIT NUMBER
 - 28.0 SQM TOTAL AREA
 - 20.0 SQM TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing
 - 12.38 mm laminated glazing
 - 10.38 mm laminated glazing
 - 6.38 mm laminated glazing
 - 4 mm (non-colour coded)
 - Mechanical Ventilation System is Required
- OR**
- 12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing

FIRE EGRESS

FIRE ISOLATED STAIR DISCHARGE AT STREET

LIFT

MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

COMMERCIAL 03

63.7 SQM

PROJECT
ARH DEE WHY

882A PITTSWATER ROAD, DEE WHY NSW 2099

TITLE
LEVEL 2 FLOOR PLAN



SCALE
1:50 @ A1

APPROVED
DRAWN
CHECKED
DATE
STATUS

MT
PJG
NOV 2023
DA

PROJECT NUMBER
DRAWING NUMBER
20036

A102

ISSUE
M **crawford**
architects

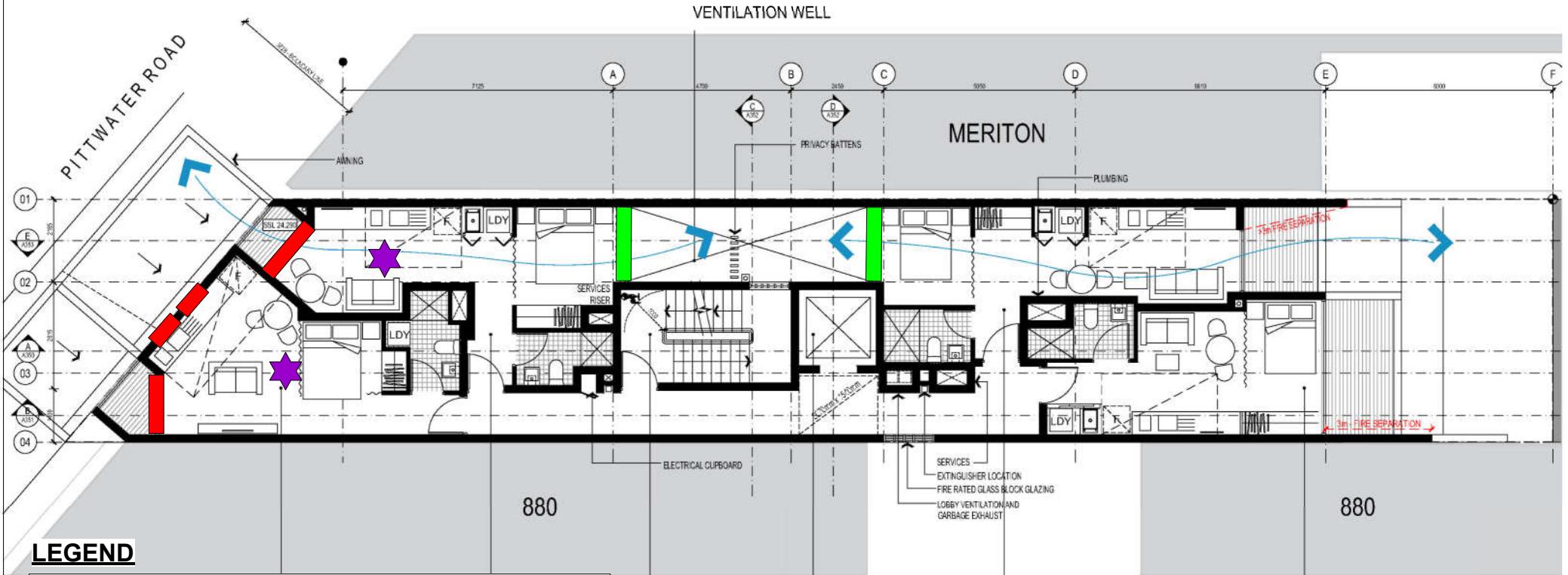
3rd FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- - - DRENCHERS
- UNIT 01
- UNIT NUMBER
- 28.0 SQM --- TOTAL AREA
- 20.0 SQM --- TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing **OR** 12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- Mechanical Ventilation System is Required

FIRE EGRESS

FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT

MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

L3.03

29.0 SQM
21.3 SQM
CROSS VENTILATION
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

L3.04

24.7 SQM
16.2 SQM
SINGLE ASPECT
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

PROJECT
ARH DEE WHY

882A PITTWATER ROAD, DEE WHY NSW 2099

TITLE
LEVEL 3 FLOOR PLAN



SCALE
1:50 @ A1
APPROVED
DRAWN
CHECKED
DATE
STATUS
NOV 2023
DA

PROJECT NUMBER
20036

DRAWING NUMBER
A103

ISSUE
M **crawford**
architects

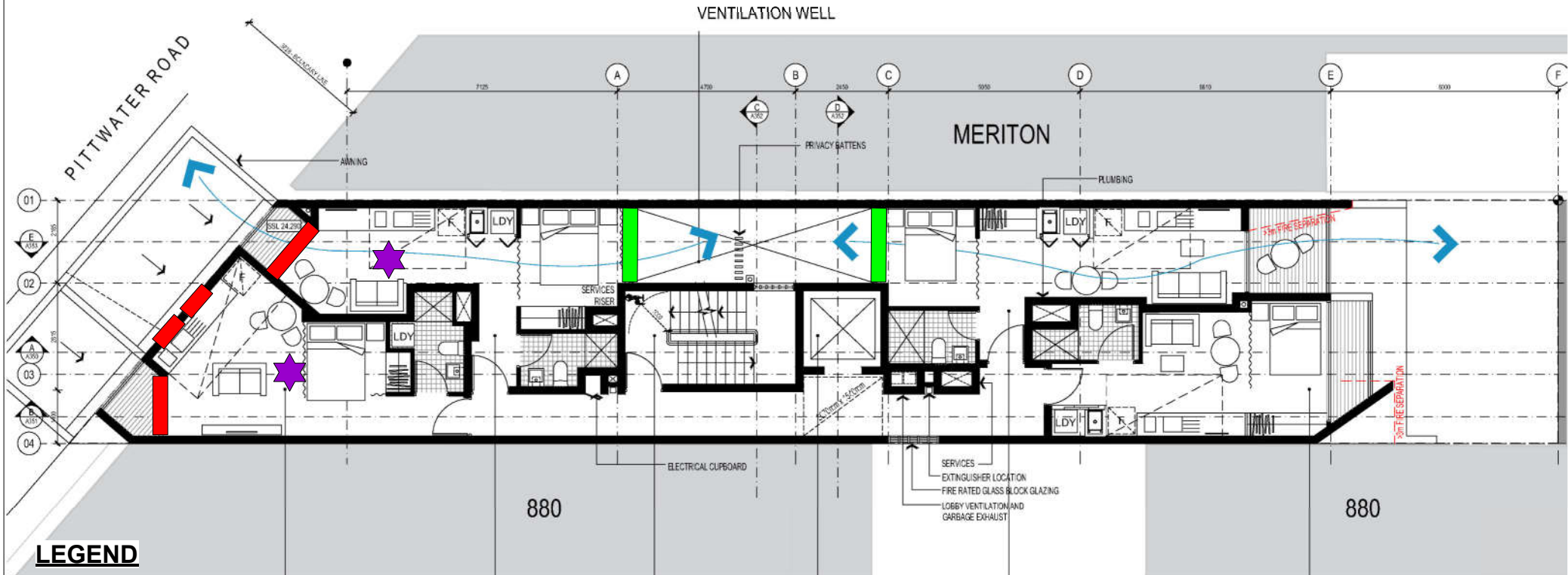
4th FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- DRENCHERS
- UNIT 01**
- UNIT NUMBER
- 28.0 SQM TOTAL AREA
- 20.0 SQM TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing
- OR**
- 12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- Mechanical Ventilation System is Required

FIRE EGRESS

FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT

MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

L4.03

29.0 SQM
21.3 SQM
CROSS VENTILATION
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

L4.04

24.7 SQM
16.0 SQM
SINGLE ASPECT
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

PROJECT
ARH DEE WHY

882A PITTWATER ROAD, DEE WHY NSW 2099

TITLE
LEVEL 4 FLOOR PLAN



SCALE
1:50 @ A1
APPROVED
DRAWN
CHECKED
DATE
STATUS
DA

PROJECT NUMBER
20036

DRAWING NUMBER
A104

ISSUE
M

crawford
architects

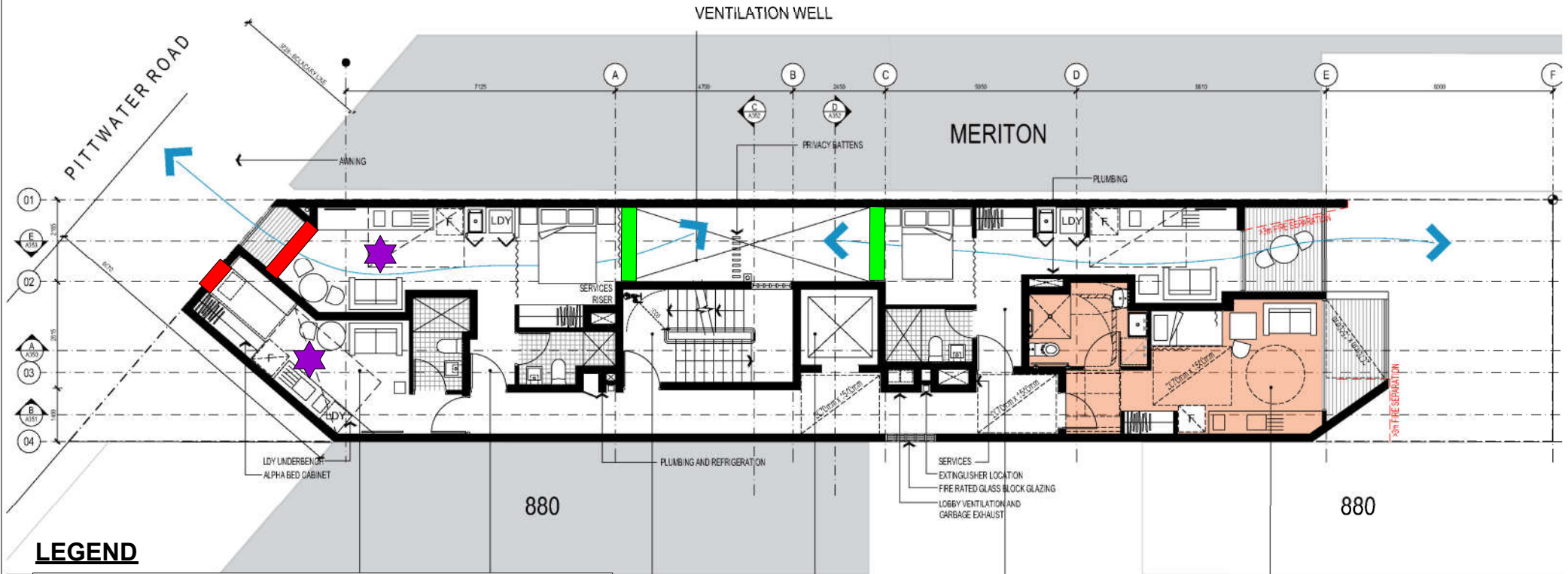
5th FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- DRENCHERS
- UNIT 01**
- UNIT NUMBER
- 28.0 SQM TOTAL AREA
- 20.0 SQM TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing **OR** 12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- Mechanical Ventilation System is Required

FIRE EGRESS

FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT

MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

L5.02

27.3 SQM
19.6 SQM

CROSS VENTILATION
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

L5.03 ACCESSIBLE

25.7 SQM
13.8 SQM

ACCESSIBLE
COMPLIANT INTERNAL CIRCULATION
SINGLE ASPECT
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

PROJECT
ARH DEE WHY

882A PITTSWATER ROAD, DEE WHY NSW 2099

TITLE
LEVEL 5 FLOOR PLAN



SCALE
1:50 @ A1

PROJECT NUMBER
20036

DRAWING NUMBER
A105

ISSUE
M **crawford**
architects

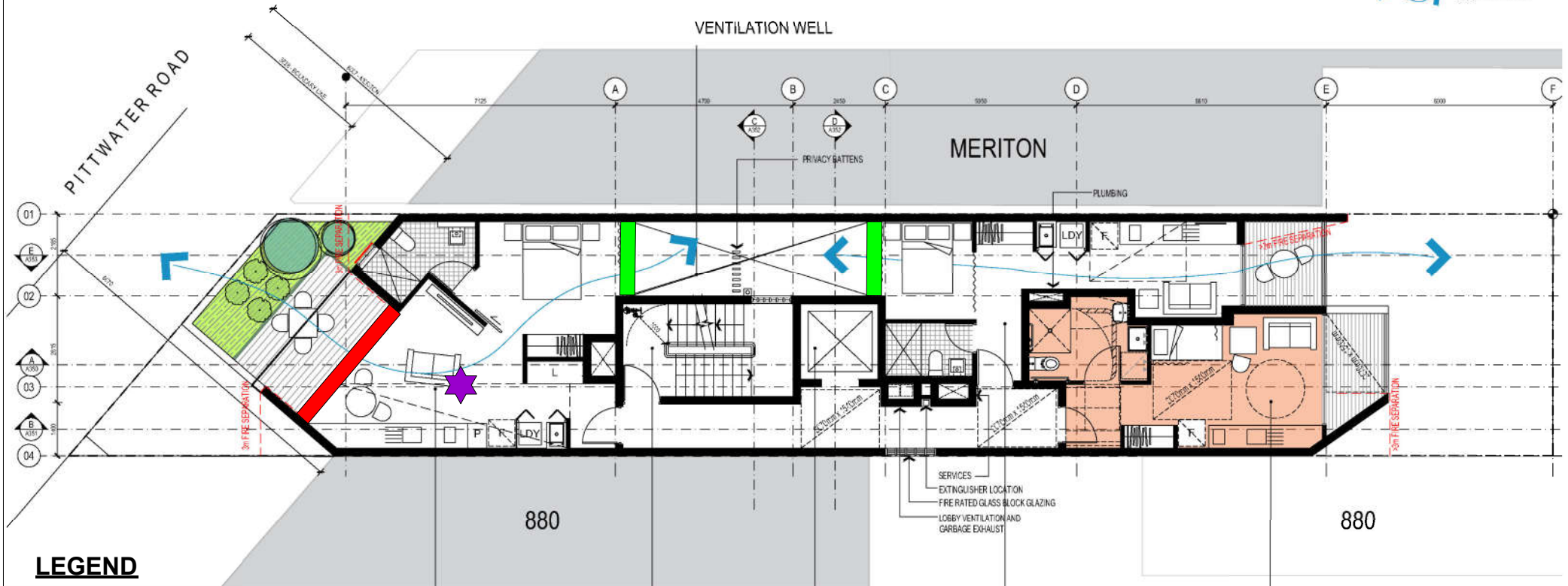
6th & 7th FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- DRENCHERS
- UNIT 01**
- UNIT NUMBER
- 28.0 SQM TOTAL AREA
- 20.0 SQM TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing
- OR**
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- Mechanical Ventilation System is Required

FIRE EGRESS

FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT

MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

L6.02
27.3 SQM
19.6 SQM

CROSS VENTILATION
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

L6.03 ACCESSIBLE
25.7 SQM
13.8 SQM

ACCESSIBLE
COMPLIANT INTERNAL CIRCULATION
SINGLE ASPECT
INTERNAL KITCHENETTE
INTERNAL LAUNDRY
INTERNAL BATHROOM
LARGE BALCONY

PROJECT
ARH DEE WHY

882A PITTSWATER ROAD, DEE WHY NSW 2099

TITLE
LEVEL 6 FLOOR PLAN



SCALE
1:50 @ A1
APPROVED
DRAWN
CHECKED
DATE
STATUS
NOV 2023
DA

PROJECT NUMBER
20036

DRAWING NUMBER
A106

ISSUE
M **crawford architects**

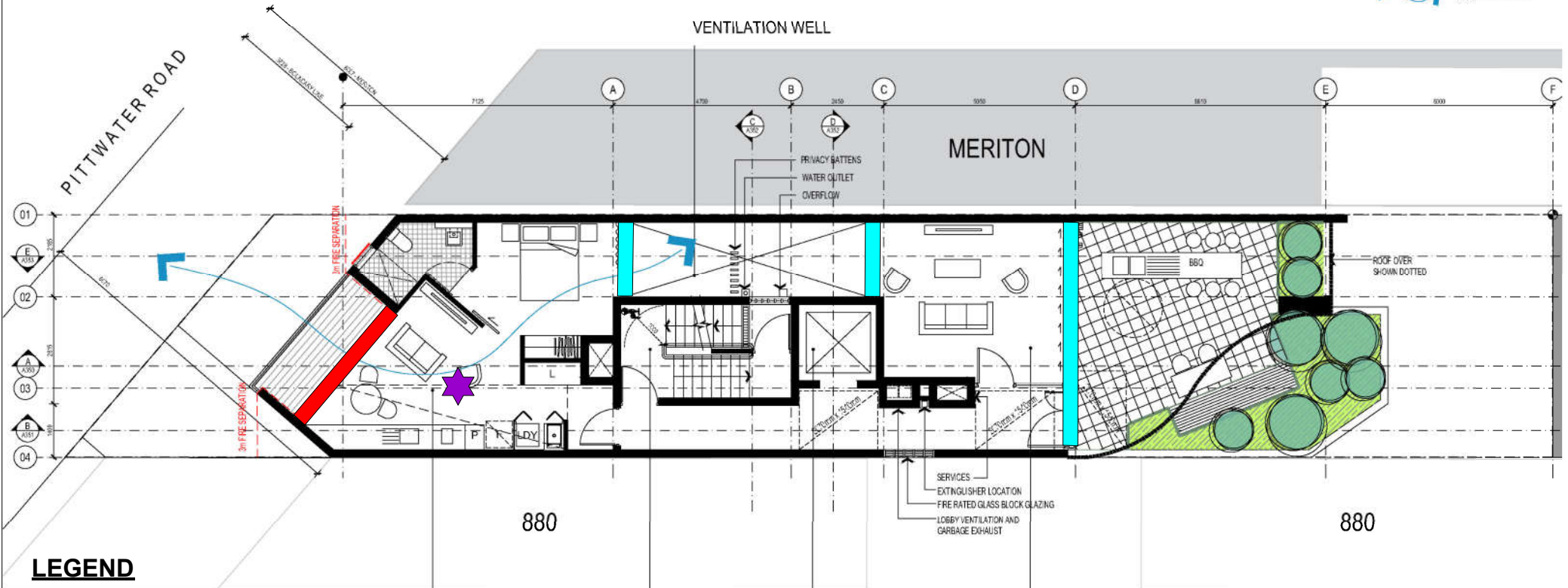
8th FLOOR LEVEL

NOTES

ALL LOADBEARING WALLS AND BOUNDING CONSTRUCTION TO BE 120/120/120

LEGEND

- BOUNDARY
- DRENCHERS
- UNIT 01**
- UNIT NUMBER
- 28.0 SQM TOTAL AREA
- 20.0 SQM TOTAL AREA EXCLUDING KITCHEN & TOILETS
- ACCESSIBLE UNIT
- COMMERCIAL SPACE
- CROSS-VENTILATION



LEGEND

- 6.38 mm laminated glazing + 100 mm air-gap + 10.38 mm laminated glazing
- OR**
- 12.76 mm laminated glazing + 24 mm air-gap + 10.76 mm laminated glazing
- 12.38 mm laminated glazing
- 10.38 mm laminated glazing
- 6.38 mm laminated glazing
- 4 mm (non-colour coded)
- Mechanical Ventilation System is Required

FIRE EGRESS
FIRE ISOLATED STAIR
DISCHARGE AT STREET

LIFT
MINIMUM FRL 90/90/90
AS1428 COMPLIANT
STRETCHER COMPLIANT
EMERGENCY LIFT

COMMUNAL SPACE
20 SQM