koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

Commercial 1 (Unit 27)
637-645 Forest Road
Bexley NSW 2207

+612 9587 9702
office@koikasacoustics.com
www.koikasacoustics.com

DELIVERING SOUND ADVICE

ABN: 12 058 524 771

ACOUSTICAL REPORT

PROPOSED CO-LIVING DEVELOPMENT

19-21 BANKS STREET, PADSTOW NSW

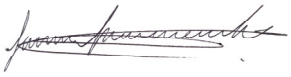
Date: 10 April 2025

File Reference: 6565R20250317hw19-21BanksStreetPadstow_DA.docx

DOCUMENT CONTROL

Project title	Acoustical Report Propose Co-living Development 19-21 Banks Street, Padstow NSW
Project number	6565
Document reference	6565R20250317hw19-21BanksStreetPadstow_DA.docx
Document path	G:\Shared drives\KA Acoustics 2025\REPORT\Building General\6565 (hw) 19-21 Banks Street, Padstow\6565R20250317hw19-21BanksStreetPadstow_DA.docx

Date	**Author**	**Review**	**Notes**
10/04/2025	HW	JT	Report available for issue

Approved by	James Tsevrementzis Managing Consultant (Acoustics)  Member of the Australian Acoustical Society - MAAS
Client	HL Australia Investments Pty Ltd Attention: Jacky He Email: jacky.he@wealthlandgroup.com.au C/o CD Architect Attention: Real Yau Email: real@cdarchitects.com.au

ACOUSTICAL REPORT

PROPOSED CO-LIVING DEVELOPMENT

19-21 BANKS STREET, PADSTOW NSW

CONTENTS

TABLE OF APPENDICES

1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was commissioned by CD Architect to conduct a noise impact assessment of the proposed development at 19-21 Banks Street, Padstow seeking approval for the construction of:

- A new 4-storey boarding house with 56 units
- A new basement parking level

For this DA, the acoustical adequacy of the proposed design must be assessed in terms of standard planning guidelines issued by the Canterbury-Bankstown Council in their Local Environment Plan (LEP), Development Control Plan (DCP), and other standard planning guidelines related to common sources of noise.

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

- Operational Noise emission from the proposed development to neighbouring dwellings
- Mechanical plant noise emission from the proposed development to neighbouring dwellings.
- Inter-tenancy sound-insulation requirements for shared partitions within the building.

This report presents the results and findings of an acoustical assessment for the subject proposal. In-principle acoustic treatments and noise control measures detailed within this report are deemed necessary for the development to comply with the nominated acoustical planning levels/project noise objectives.

2.0 THE PROPOSED DEVELOPMENT

The development is proposed to occupy the site at 19-21 Banks Street, Padstow.

This location is situated in a primarily suburban residential area classified as R4 'High-Density Residential' as per relevant land zoning maps included in the Canterbury-Bankstown Council Local Environment Plan 2023. Surrounding properties are also predominantly residential in classification, also located within R4 'High-Desity Residential' Zoning.

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

Figure 1. Aerial photo of the subject site and surrounding area – Image from SixMaps

Prevailing ambient noise conditions on-site and in the local area are generally the result of typical environmental noise such as distant traffic and localised domestic noise sources.

This acoustic report and any associated recommendations are based solely on the architectural design and drawings prepared by CD Architects (their Project No. J24638D, dated March 2025). Any changes to the design may impact the findings of this report and associated noise control recommendations.

As per the architectural drawings, the proposed development will include:

- 56 residential boarding rooms with (4) four above ground floor levels
- Associated basement parking

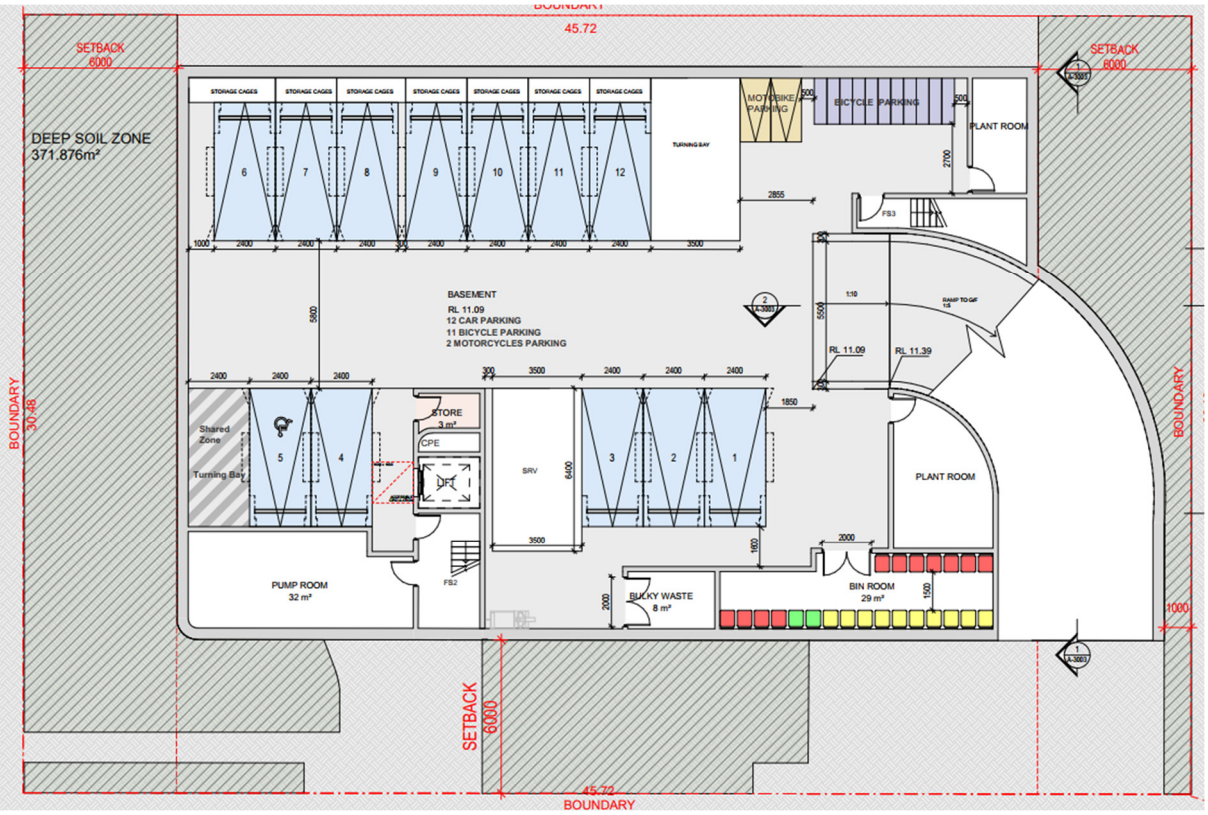


Figure 2. Basement floor plan as per architectural drawings

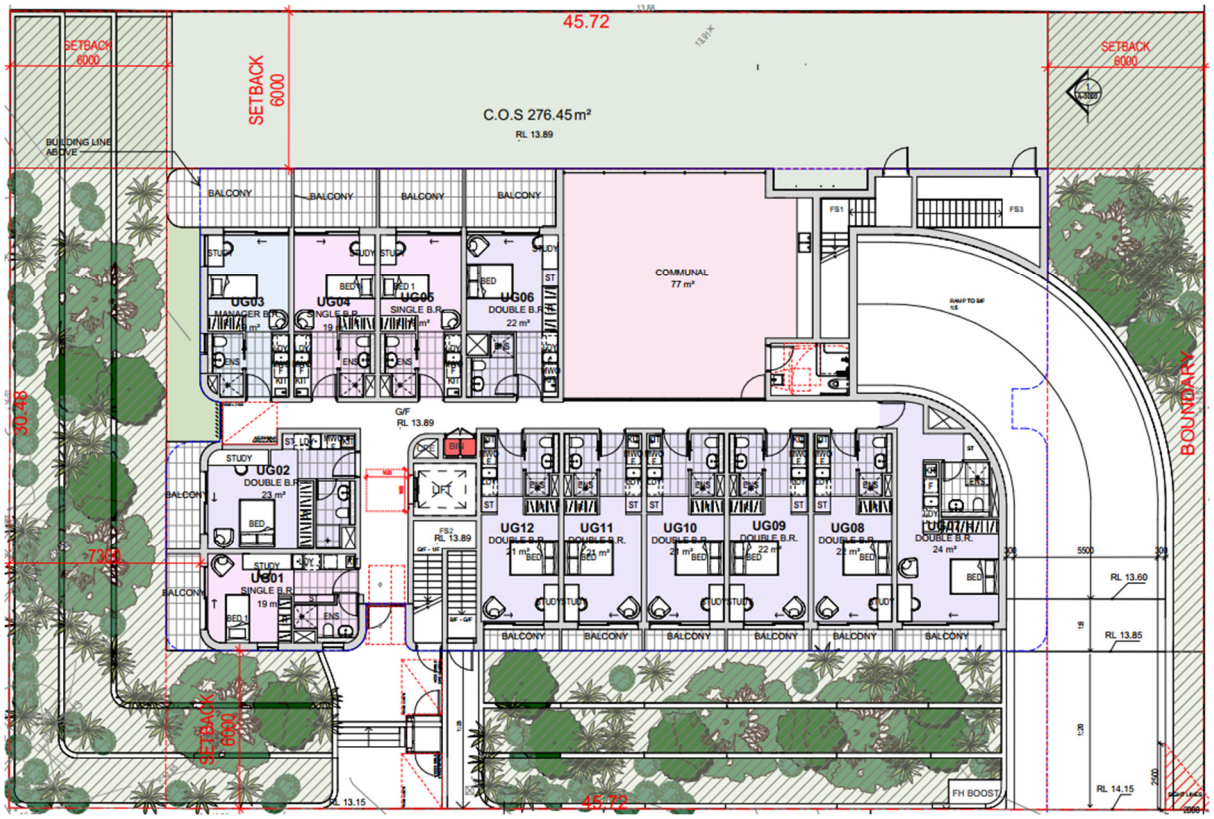


Figure 3. Ground floor plan as per architectural drawings

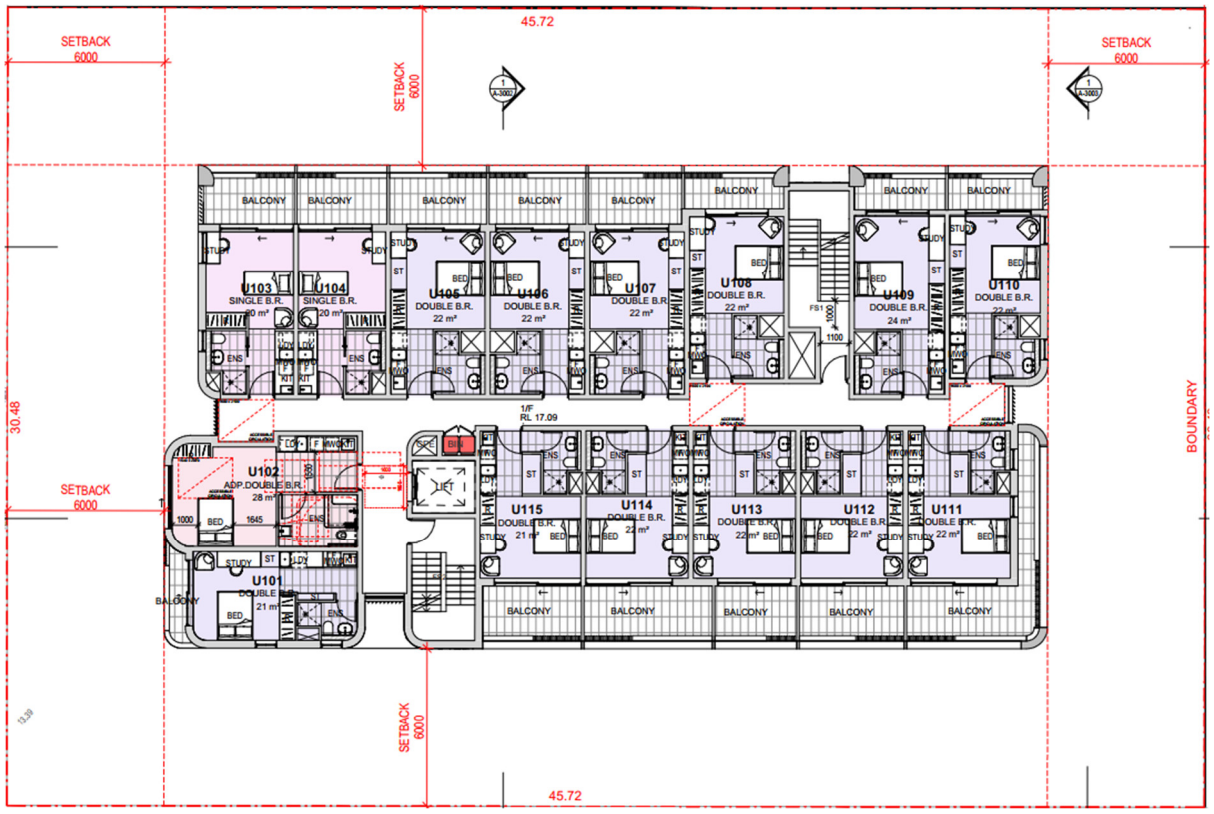


Figure 4. First-floor plan as per architectural drawings

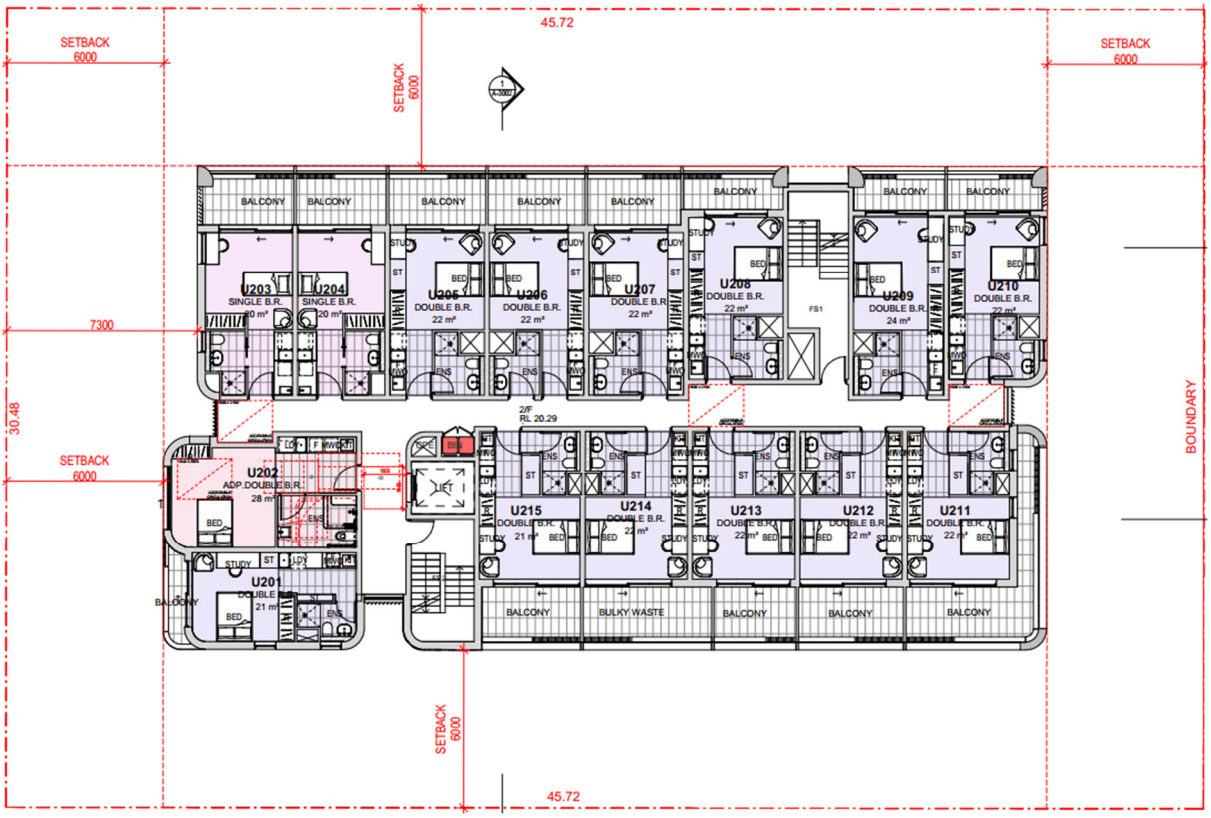


Figure 5. Second-floor plan as per architectural drawings

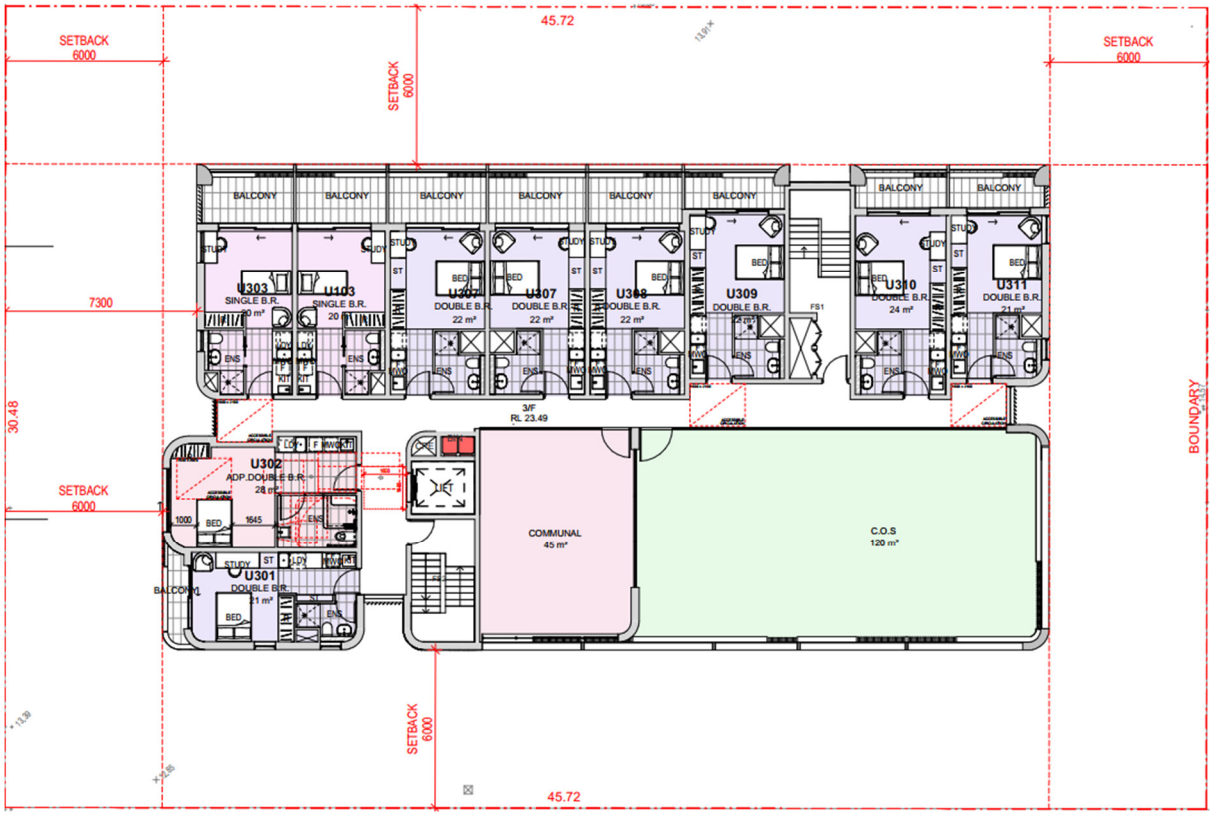


Figure 6. Third-floor plan as per architectural drawings

3.0 NOISE SURVEYS

3.1 ATTENDED ENVIRONMENTAL NOISE MONITORING

Ambient and ambient background noise levels are generally taken to determine the noise profile of the subject area. As such, attended noise surveys were conducted for representative periods related to the subject development.

Noise level measurements were taken with a NATA-calibrated Type 1 NTi XL2 sound level meter. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response.

Sound level measurements were taken for durations deemed sufficient to represent the underlying ambient and background noise environment without the influence of extraneous noise or noise from the subject's development.

Noise surveys were conducted in areas surrounding the proposed development such that the ambient noise levels could be quantified (See Figure 7):

- 19 Banks Street, Padstow Site Location 1 – Svantek 977
- 19 Banks Street, Padstow Site Location 2 – NSRT Noise Sentry
- 21 Banks Street, Padstow Site Location 3 – Attended Measurement

At Location 1 the sound level meter microphone was placed 1.5 metres above the natural ground in 'free-field' conditions, ie. ≥ 3.5 metres from any reflective façade. At Location 2 the sound level meter microphone was placed 2.5 metres above the natural ground in 'free-field' conditions, ie. ≥ 3.5 metres from any reflective façade. At Location 3 the sound level meter microphone was placed 4.5 metres above the natural ground in 'free-field' conditions, ie. ≥ 3.5 metres from any reflective façade.

A summary of the noise survey results is provided in Table 1.

Table 1. Summary of measured environmental noise levels [dB]

Location	Date	Measurement period	EPA assessment period	L_{A90}	L_{Aeq}
Site 1	03.03.2025	16.42 pm to 17.12 pm	Daytime	45	51
Site 3	03.03.2025	16.42 pm to 17.12 pm	Daytime	48	55

3.2 UNATTENDED AMBIENT NOISE SURVEY

Two unattended noise logging surveys were conducted at 21 Banks Street between 3 March 2025 and 11 March 2025. The measurement microphones were set at a height of 1.5 metres (location 1) and 2.5 metres (location 2) above the ground and were clear of any sound-reflective surfaces (excl. the ground) by at least 3.5 metres. This satisfies the requirements for a free-field measurement under AS1055-2018 and Fact Sheet B of the NSW EPA Noise Policy for Industry.

Figure 7. Noise logging location – Image from SixMaps

A Type 1 Svantek 977 noise logger and a Type 1 NSRT Noise Sentry were used for this noise survey. The instruments were set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were saved on the quarter-hour within the logger memory.

A NATA-calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meters before and after the noise survey. No system drift was observed for this sound level meter.

A review of the weather records from the Bureau of Meteorology shows that adverse weather conditions did not influence the noise environment during the measurement period. Observable short-duration extraneous noise events were removed from the survey data.

A summary of the noise survey data is presented below.

Table 2. Summary of noise logger results [dB]

Location	Period, T [1]	Ambient noise level L_{Aeq}	Rating background level L_{A90}	Traffic noise level[2] $L_{Aeq, Period}$
Monitoring Location 1 (rear yard)	Day	48	40	48
	Evening	48	40	
	Night	46	36	46
Monitoring Location 2 (front yard)	Day	62	45	62
	Evening	62	45	
	Night	57	41	57

Notes

1. The **NSW EPA Noise Policy for Industry (NPfI)** refers to:
   Daytime: 7 am – 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays.
   Evening: 6 pm – 10 pm Monday to Sunday
   Night: 10 pm - 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays.
2. The **EPA/RMS/NSW DoP** refers to:
   Daytime: 7 am – 10 pm seven days per week.
   Night: 10 pm - 7 am seven days per week

Daily logger graphs are attached in **Appendix B**.

4.0 ACOUSTIC REQUIREMENTS

4.1 CANTERBURY-BANKSTOWN DCP

Canterbury-Bankstown council has stated in their DCP controls which development must abide by. Whilst no specific reference has been made to acoustics in the DCP regarding boarding houses and co-living developments, Objective O3 states that amenity is to not adversely affect surrounding dwellings in terms of visual bulk, access to sunlight and privacy. Koikas Acoustics has taken this to also include acoustic privacy and amenity as well.

The relevant objectives and controls have been extracted from the DCP and reproduced below:

Objectives

O3 *To ensure the building form and building design of boarding houses do not adversely impact on the amenity of neighbouring sites in terms of visual bulk, access to sunlight, and privacy,*

Development Controls

9.34 *The siting of a plant room, lift motor, mechanical ventilation stack, exhaust stack, and the like must:*

- *Integrate with the architectural features of the building to which it is attached; Or*
- *Be sufficiently screened when viewed from the street and neighbouring sites.*

4.2 EPA NOISE POLICY FOR INDUSTRY

Noise emission design targets have been referenced from the *NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI)*.

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 used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

For residential receivers, 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 (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same.

As the intrusive noise level is defined in terms of an $L_{Aeq,\ 15\ minutes}$ and the amenity noise level is defined in terms of an $L_{Aeq,\ Period}$, a +3 dB correction is applied to the project amenity noise level to equate the $L_{Aeq,\ Period}$ to $L_{Aeq,\ 15\ minutes}$.

Non-residential receivers are assessed to project amenity noise levels relevant to the applicable receiver category (commercial).

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered.

The policy is designed in such a way that the assessing authority would consider the project noise trigger levels, reasonable and feasible mitigation measures, and any residual noise impacts when deciding on acceptable noise outcomes.

The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs.

Table 4. NPfI planning levels – $L_{Aeq,\ 15\ minutes}$ [dB] – Monitoring Location 1

Period,T (Note 1)	Intrusive		Amenity					Project noise trigger level
	RBL	RBL + 5	Area classification	Recommended amenity noise level	High traffic area	[2]Project amenity noise level	+3dB correction	
Day	40	45	Suburban	50	No	45	48	45
Evening	40	45	Suburban	45	No	40	43	43
Night	36	41	Suburban	40	No	35	38	38

Notes:

1. **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.
2. Project noise amenity level = recommended noise amenity level – 5 dB, except where specific circumstances are met, such as high traffic.

Table 5. NPfI planning levels – $L_{Aeq,\ 15\ minutes}$ [dB] – Monitoring Location 2								
Period,T (Note 1)	**Intrusive**		**Amenity**					
	RBL	**RBL + 5**	**Area classification**	**Recommended amenity noise level**	**High traffic area**	**[2]Project amenity noise level**	**+3dB correction**	**Project noise trigger level**
Day	45	50	Suburban	50	No	45	48	48
Evening	45	50	Suburban	45	No	40	43	43
Night	41	46	Suburban	40	No	35	38	38
Notes: 1. 2.	**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 – 5 dB, except where specific circumstances are met, such as high traffic.							

4.3 OFFENSIVE NOISE (POEO ACT 1997 DEFINITION)

In the definitions of the *Protection of the Environment Operations Act 1997*, 'offensive noise' means noise:

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.

4.4 INTER-TENANCY PARTITIONS: BCA 2022 VOL. 1

The Building Code of Australia (BCA) is included as Volume 1 and Volume 2 of the National Construction Code (NCC) and presents the minimum performance requirements for the safety, health, amenity, accessibility and sustainability of certain buildings. It primarily applies to new buildings but may also apply to new building work. The code is periodically updated with version 2022 being current as of the preparation of this report. Hereafter, the BCA will be referred to as the BCA 2022.

The BCA 2022 sound insulation objectives for Class 2, 3, and/or 9c buildings are provided to safeguard occupants from illness or loss of amenities due to excessive sound transfer throughout certain areas of the building. Residential apartments are classified as Class 2 buildings, and thus are

covered under BCA 2022 Volume 1.

The sound insulation requirements of the BCA 2022 may be satisfied through either a Performance Solution or Deemed to Satisfy Solution.

Table 6. BCA 2022 Assessment Methods	
Performance Solution	**Deemed to Satisfy Solution**
• Evidence of suitability (laboratory test) [1] • Verification Methods (field test) [2] • Expert Judgement • Comparison with Deemed to Satisfy Provisions	• Evidence of Suitability (laboratory test) [1] • Expert Judgement • Compliance with an acceptable form of construction (Specification 28)
Notes: 1. Accredited Testing Laboratory as defined in the BCA 2022 Schedule 1 2. Verification Methods – BCA 2022 Parts F7V1 to F7V4	

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

Table 7. BCA 2022 acoustic design requirements			
Partition	**Detail**	**Airborne sound**	**Impact sound**
Floor	Separating SOUs, or an SOU from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or different classification	$R_w + C_{tr} \geq 50$	$L_{n,w} \leq 62$
Walls Notes 1 & 2	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, or kitchen in another SOU	$R_w + C_{tr} \geq 50$	Discontinuous
	Separating an SOU from a plant room or lift shaft	$R_w \geq 50$	Discontinuous
	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 pass 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: 1. 2. 3.	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. A 'habitable room' means a room used for normal domestic activities such as a bedroom, living room, lounge room, music room, television room, kitchen dining room, study, playroom, family room, home theatre and sunroom.		

5.0 INTER-TENANCY PARTITIONS

The following recommendations are deemed suitable to meet the BCA 2022 minimum acoustical requirements. Several options are provided that discuss a range of standard constructions.

All partition systems should be installed as per the general installation guidelines included in the BCA 2022 and as per relevant manufacturer installation guidelines/requirements.

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

5.1 RECOMMENDED PARTITION WALLS

The following partition wall systems are capable of achieving the required acoustical performance.

Table 8. Recommended partition wall systems		
Wall type	**BCA 2022 design standard**	**Construction**
Inter-tenancy wall	Rw + Ctr ≥ 50 Discontinuous	*The 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* **[Hebel]** 13 mm Fyrchek, 75 mm Hebel Powerpanel, 35 mm cavity, 64 mm steel studs with 100 mm S6 polyester insulation, 13 mm Fyrchek/Aquachek.
	Rw + Ctr ≥ 50	*The partition wall between sole-occupancy units* **[Hebel]** As above.
Common wall	Rw ≥ 50 Discontinuous	*The partition wall between the sole-occupancy unit and plant room or lift shaft* As above for inter-tenancy wall partitions that satisfy discontinuous construction
	Rw ≥ 50	*The partition wall between a sole-occupancy unit and stairway, public corridor, public lobby or the like or part of a different classification* **[Hebel]** 13 mm Gyprock CD, 75 mm Hebel Powerpanel, minimum 20 mm cavity, 64 mm steel framing with 50 mm glass wool insulation, 13 mm Gyprock CD.
Services shaft wall	Rw+Ctr ≥40	*Services shaft wall to habitable room within the unit* **[Masonry]** 110 mm brick masonry with 13 mm cement render on each face. *BCA 2022 D.T.S.* **[Concrete]** 100 mm thick concrete panel. *BCA 2022 D.T.S.* **[Lightweight]** 2x13 mm plasterboard, pipe lagging (Soundlag 4525C, Acoustilag 45)
	Rw+Ctr ≥25	*Services shaft wall to non-habitable room within the unit* **[Lightweight]** 2 layers of 13 mm plasterboard
Notes: 1. 2. 3. 4.	Recommendations within the above table are based on published acoustic data obtained from the manufacturer. Laboratory tests of the AFS 162 Logicwall on its own showed non-compliance with the BCA 2022 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 2022 condition. This conclusion is supported by numerous field tests that indicate compliance with the BCA 2022 verification methods rating. All installation of proprietary-type wall systems must be as per the relevant installation guidelines and manuals. *BCA 2022 D.T.S.* = BCA 2022 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 2022. Where these systems are installed correctly as per the BCA 2022 they do not require compliance testing to verify acoustic performance.	

5.2 RECOMMENDED PARTITION FLOOR/CEILING

The following floor/ceiling assemblies are recommended to achieve the BCA 2022 minimum acoustic rating requirements.

Table 9. Typical acoustical performance achieved (Uniroll underlays presented as an example)

Floor-type	Construction details or underlay type
Carpet $L'_{nTw} \leq 40$	• Carpet • Carpet underlay • ≥ 150 mm concrete slab
Direct-stick tiles $L'_{nTw} \leq 50$	• 9 or 10 mm ceramic tiles • 5 mm adhesive glue • underlay RFC750 (3, 4.5 mm) RF700 (3, 4, 5, 10 mm) • 200 mm thick concrete slab • 100 mm ceiling cavity • 13 mm plasterboard ceiling
Tiles over screed $L'_{nTw} \leq 50$	• 9 or 10 mm ceramic tiles • 5 mm adhesive glue • 30 mm screed • Underlay RFC750 (3, 4.5 mm) RF700 (3, 4, 5, 10 mm) • 200 mm concrete slab • 100 mm ceiling cavity • 13 mm plasterboard ceiling
Direct-stick timber $L'_{nTw} \leq 50$	• 19 mm strip timber nailed into 15 mm CD plywood • 5 mm Ubond Wet adhesive • 15 mm CD plywood • RF700 (3, 4, 5, 10 mm) • 200 mm concrete slab • 100 mm ceiling cavity • 13 mm plasterboard ceiling
Floating floor $L'_{nTw} \leq 50$	• Floating floor • 2 mm foam slip layer • RF700 (3, 4, 5, 10 mm) • 200 mm concrete slab • 100 mm ceiling cavity • 13 mm plasterboard ceiling
Direct-stick vinyl $L'_{nTw} \leq 55$	• Vinyl flooring • RF700 (3, 4, 5 or 10 mm) • 200 mm concrete slab • 100 mm ceiling cavity • 13 mm plasterboard ceiling
Notes: 1.	Alternate underlay suppliers may be considered

5.2.1 Additional recommendations/information

- Acoustic underlays may not be required on the ground floor level and/or in apartments that are not located above the apartments below.
- The above recommendations will apply to balconies/terraces situated above the indoor areas of **the** apartments below.
- All flooring and acoustic underlays should be installed as per the relevant manufacturers' installation and design guides.
- Acoustic underlays installed below screeded floors must ensure that the joints of the underlay mats are appropriately sealed such that the screed cannot contact the concrete slab. Koikas Acoustics recommends either:
    - Butt-joining the underlay mats and filling in the gaps at the joints with Novatex Acoustapatch, OR
    - Overlap the underlay mats by a minimum of 50 mm at the joints and tape them down with approved tape.
- 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 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.

  The following diagrams show detailed installation requirements of different flooring systems in conjunction with underlays.

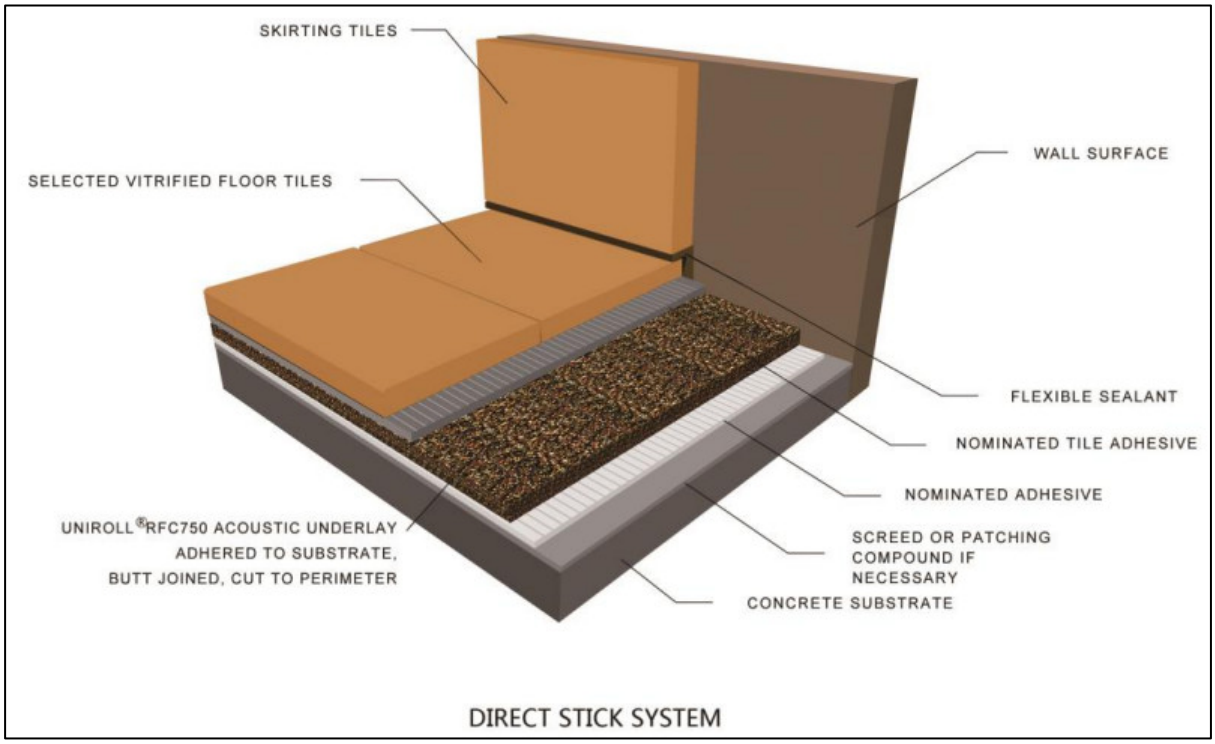


Figure 8. Indicative isolation of hard floor covering details

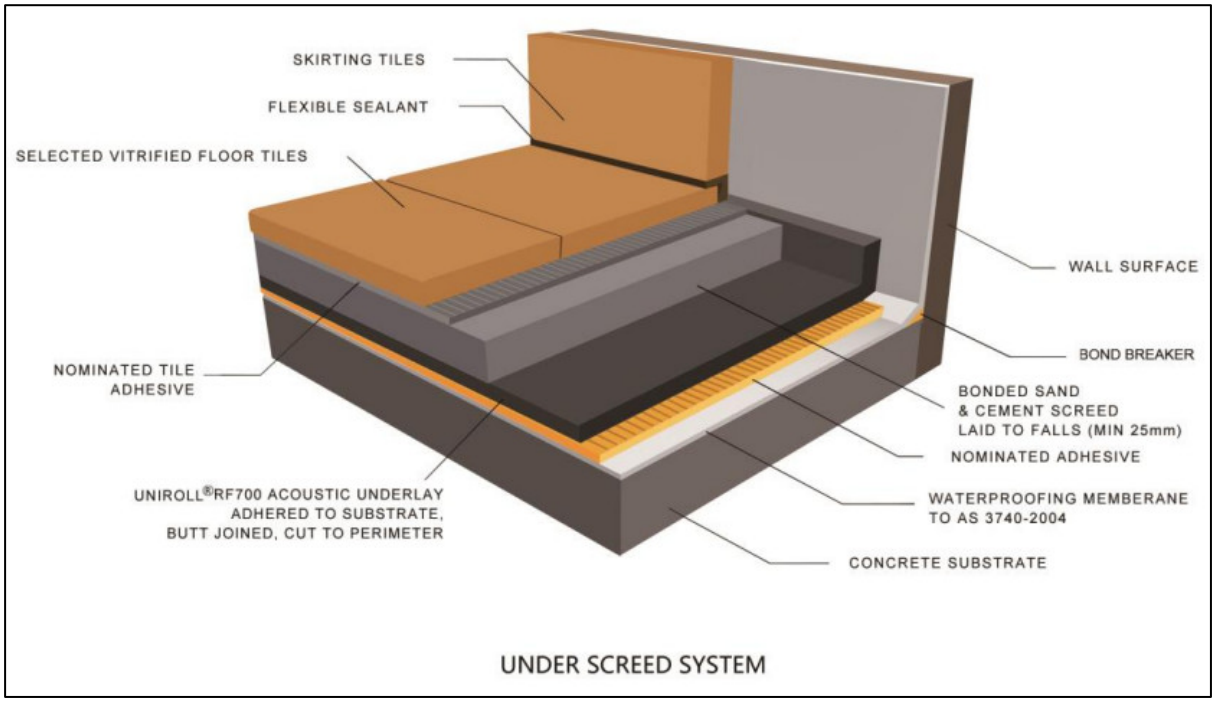


Figure 9. Indicative isolation of hard floor covering details

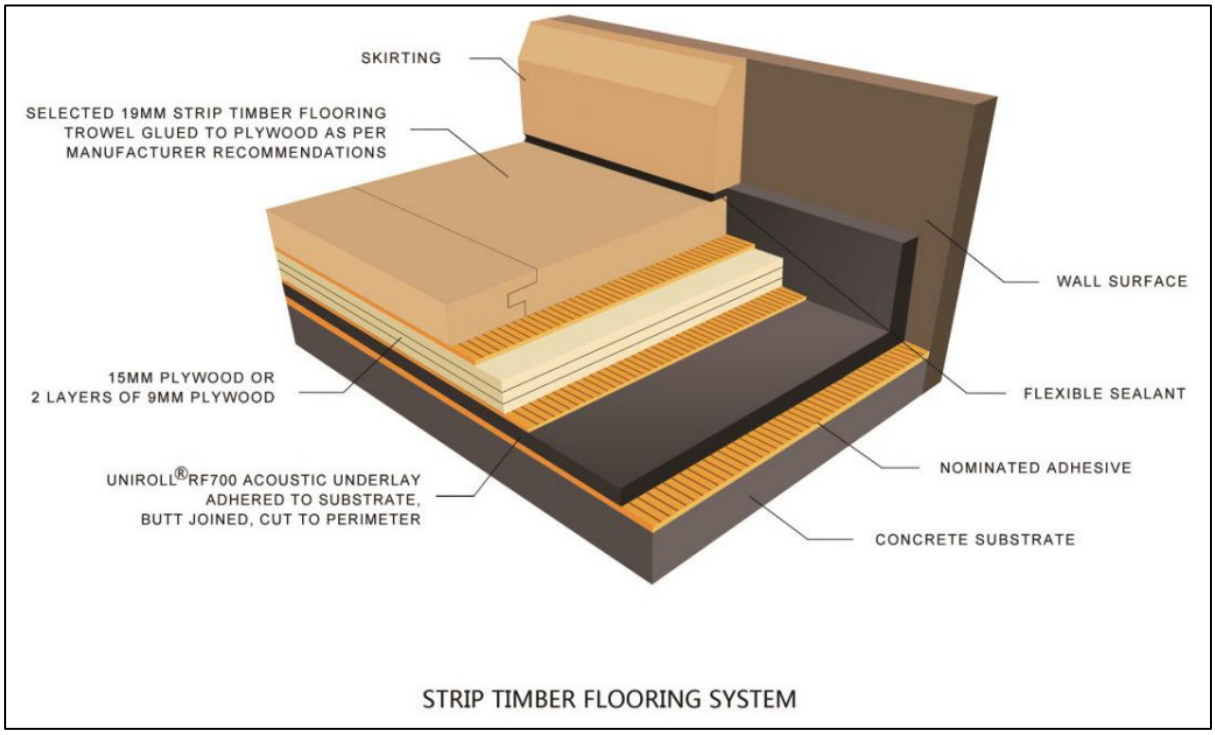


Figure 10. Indicative isolation of hard floor covering details

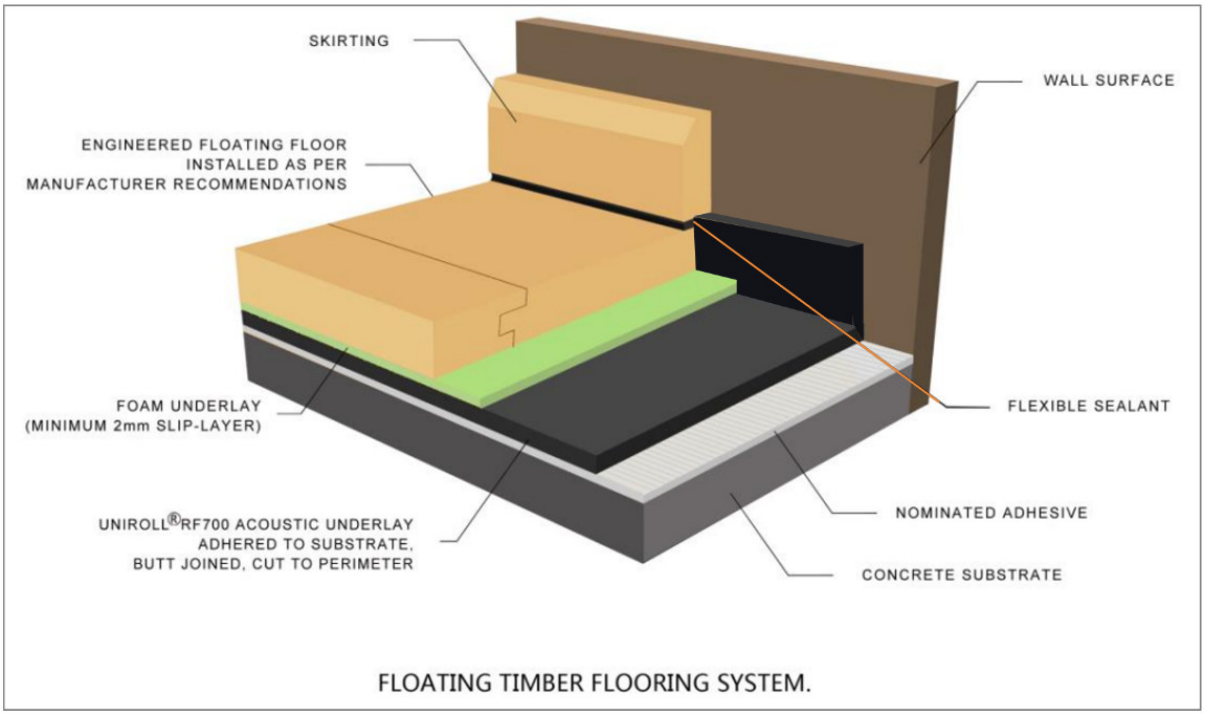


Figure 11. Indicative isolation of hard floor covering details

5.2.2 NATA-certified ceiling/floor systems

Preliminary testing and final OC testing are not required on floor installations that have been tested in a NATA or an equivalent International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) certified laboratory and found to comply with the acoustical performance

requirements of the BCA 2022. The installation would need to match exactly the system installed for the laboratory test, inclusive of adhesives, floor surfaces, underlays etc. Generally, the installation of a suspended ceiling will improve the acoustical impact rating.

Certification of any construction system based on the laboratory acoustic test data, with no on-site testing, can only be considered in the event of extensive field inspections during the construction and fit-out.

5.2.3 Verification of acoustical performance

The recommendations for partition construction details included in this report are not a certification of acoustical compliance. The recommendations are based on our professional opinion of acoustic performance ratings. Several variables (listed below) can exist between development sites that make it impossible to confirm acoustical compliance without conducting in-situ tests.

- The type of flooring installed
- The surface area of the floor
- The geometry of the room
- The thickness and density of the flooring
- Bridging/isolation between the tiles and the skirting boards
- Bridging/isolation between the tiles/screed and the walls
- The damping, thickness and density of the underlay
- The thickness and density of the concrete slab
- Whether the concrete slab is pre or post-tensioned
- The junction between the concrete slab with the walls
- The location of beams, columns and shear walls
- Flanking paths between the concrete slab and the wall types
- The separation between the plasterboard ceiling and the concrete slab
- The connections utilised between the suspended ceiling grid to the concrete slab
- The insulation installed or not installed in the cavity
- The thickness and density of the plasterboard ceiling
- The sealing between the plasterboard ceiling to the walls in the unit below
- The degree of sealing between the plasterboard ceiling and the down-lights
- The use of curtain wall systems

Koikas Acoustics recommends that in-situ testing be conducted on representative and fully

installed partition assemblies to ensure adequate acoustic insulation and isolation are achieved before installation throughout the development.

5.3 SOIL, WASTE, AND WATER SUPPLY PIPES

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 SOUs, the following separation details may be used to comply with the required acoustic rating:

Table 10. Services in cavity wall or ceiling

Option	Rating	Documented source	System detail
1	Rw + Ctr 25	CSR Red Book, KA opinion	2 layers of 10 mm plasterboard
2	Rw + Ctr 25	CSR Red Book	Acoustilag 45 and 13 mm plasterboard wall/ceiling lining
3	Rw + Ctr 25	CSR Red Book	Unlagged pipes and 13 mm Soundchek OR 2 layers of 16 mm Fychek
4	Rw + Ctr 40	CSR Red Book	Acoustilag 45 and 13 mm Soundchek OR Acoustilag 45 and 2 layers of 16 mm Fychek
5	Rw + Ctr 40	Pyrotech Soundlag 4525C brochure	Soundlag 4525C and minimum 10 mm plasterboard wall/ceiling lining
Notes: 1. 2. 3.	The acoustic lagging material may be excluded by using the Rehau Raupiano Plus pipe system. All installations are to be as per the relevant manufacturers' specifications and requirements. Incorporating downlights into ceilings will impact 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.		

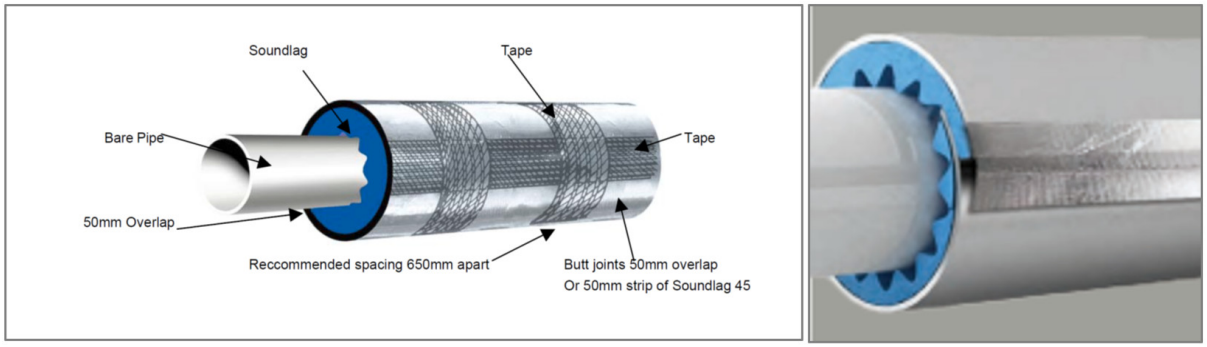


Figure 12. Acoustic lagging details (image from Pyrotech)

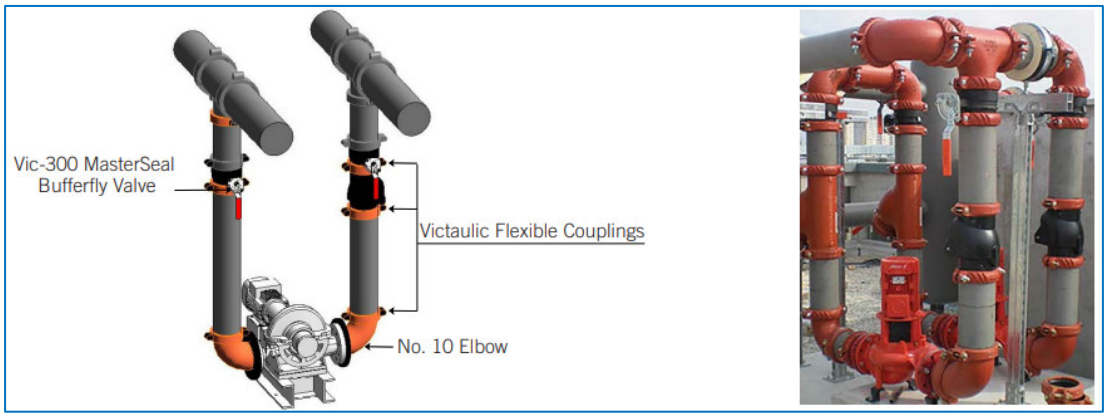
5.3.1 Additional BCA 2022 requirements

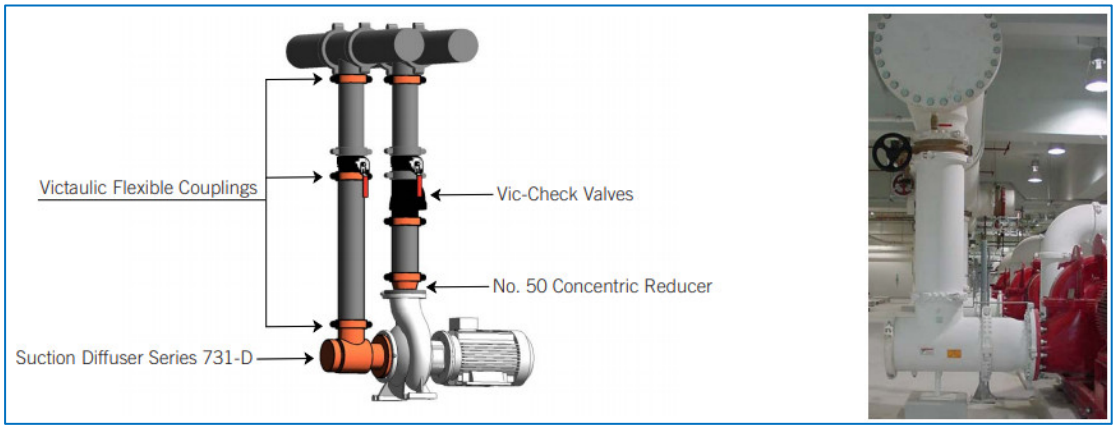
The BCA 2022 further qualifies the acoustic requirements of services partitions with the following:

- 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 10 mm and be fitted with a proper sealing gasket along all edges and constructed of:
- Wood, particle board or block board not less than 38 mm thick; or
- Compressed fibre-reinforced cement sheeting not less than 9 mm thick; or
- Other suitable materials with a mass per unit area not less than 24 kg/m^2.
- 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 10 mm to the other wall leaf.

5.4 SOUND ISOLATION OF PUMPS

HVAC and plumbing noise may originate from large components (chillers, boilers, cooling towers, pumps, air handlers) or any of the smaller components (fans, valves, terminal units, diffusers or grilles). Pumps often give rise to structure-borne noise. This is usually the result of inadequate isolation of the pump or the attached piping. Flexible couplings must be used at the point of connection between the service's pipes in a building and any circulation or another pump. Examples are provided below:





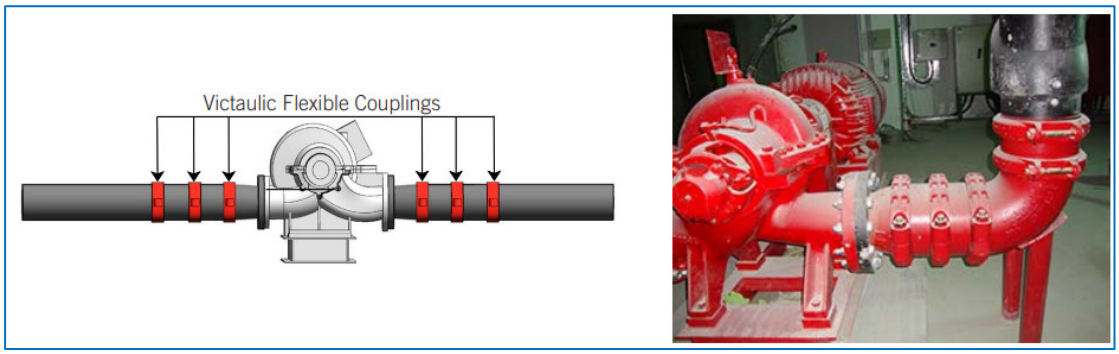
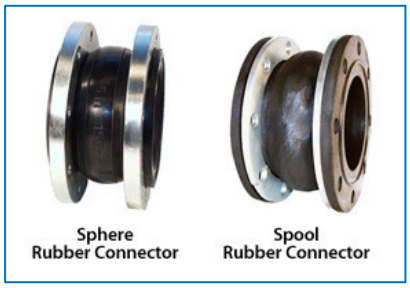


Photo by Victaulic



Photos by Empowering Pumps & Equipment

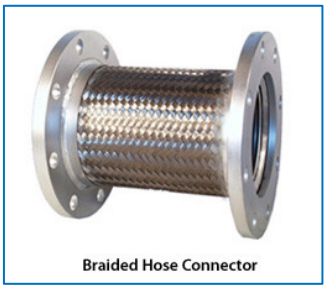


Photo by Plumbers Mate Ltd

Figure 13. Indicative flexible coupling (Image from IADG)

5.5 UNIT ENTRY DOORS

Where an entry door is incorporated into a wall that separates a tenancy from a common area such as a Lobby/Foyer, that door must achieve an acoustic rating of no less than R_w 30. Install a solid core timber door no less than 35 mm thick with Raven RP10 Si (perimeter) and RP99 Si (door bottom) acoustic seals or an approved equivalent.

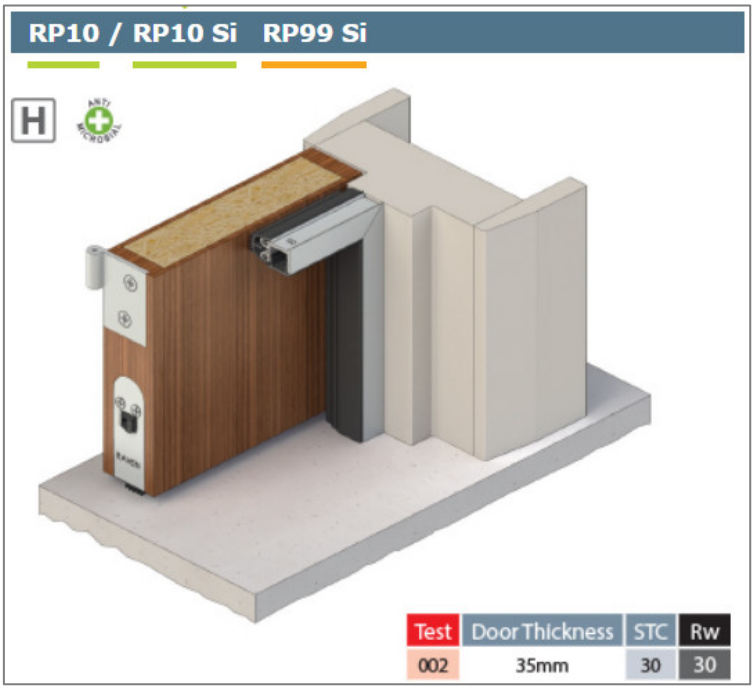


Figure 14. Indicative door and sealing arrangement (Raven)

6.0 OPERATIONAL NOISE ASSESSMENT

Mechanical plant and equipment on this project could include ventilation units for basement levels and garbage rooms, etc. Koikas Acoustics has been advised there will be no air conditioning units.

Section 4.2 of this report establishes the project noise limits for mechanical plant and equipment.

The design of the mechanical systems is not typically completed at the DA stage and thus Koikas Acoustics have completed an indicative assessment of equipment generally found within this type of development.

6.1 ASSESSMENT SCENARIOS

The following design scenarios are assessed with the mentioned assumptions.

Table 11. Design scenarios and assumptions

Scenario	Description	Design assumptions
1	All plant & equipment – daytime hours	• 1 x carpark exhaust fan • 1 x carpark supply fan • 12 x light-vehicles traversing • 12 x vehicle doors opening/closing • 12 x vehicle engine ignition sequences • 1 x opening/closing of carpark entry roller door • Breakout noise from 15 people using the indoor ground floor communal area • Breakout noise from 9 people using the indoor third-floor communal area • Breakout noise from 24 (50% of people talking) people using the third-floor outdoor communal area • Breakout noise from 22 (50% of people talking) people using the outdoor ground floor communal area
2	All plant & equipment – evening hours	• 1 x carpark exhaust fan • 1 x carpark supply fan • 12 x light-vehicles traversing • 12 x vehicle doors opening/closing • 12 x vehicle engine ignition sequences • 1 x opening/closing of carpark entry roller door • Breakout noise from 15 people using the indoor ground floor communal area • Breakout noise from 9 people using the indoor third-floor communal area • Breakout noise from 24 (50% of people talking) people using the third-floor outdoor communal area
3	Reduced plant & equipment - night hours	• 1 x carpark exhaust fan • 1 x carpark supply fan • 6 x light-vehicles traversing • 6 x vehicle doors opening/closing • 6 x vehicle engine ignition sequences • 1 x opening/closing of carpark entry roller door

6.2 EQUIPMENT AND ASSOCIATED SOUND LEVELS

Mechanical service plans are generally not ready at the DA stage. Koikas Acoustics have therefore undertaken an indicative assessment using plant and equipment generally found within this type of development.

Table 12. Summary of associated sound levels

Item	Model	Descriptor	Noise level [dBA]	Location
Carpark supply fan	AP0564LP9/17	L_{weq}	58	Outlet to Rooftop
Carpark exhaust fan	AP1004GA6/12	L_{weq}	73	Outlet to Rooftop
Roller Door opening/closing	-	$L_{weq,15mins}$	68	Ground Floor
Car traversing	-	L_{weq}	78	At grade/carpark
Car Door (corrected for 1 every 15 mins)	-	$L_{weq,15mins}$	55	Carpark
Car Engine (corrected for 1 every 15 mins)	-	$L_{weq,15mins}$	53	Carpark
A person talking with a normal vocal effort	-	L_{weq}	68	Outdoor common areas

6.3 CALCULATED RECEIVER LEVELS

Mechanical plant noise levels have been predicted for nearby residential receivers by way of preparing an acoustic model and conducting point-to-point calculations based on standard sound propagation algorithms. All calculations consider the equipment as selected in the mechanical services plans, the associated sound levels and corresponding attenuators.

Reference should also be made to additional noise control recommendations included within Section 6.4 of this report, which also govern the calculated receiver noise levels.

Due to the size of the development, several potentially affected receiver locations must be assessed in terms of their respective noise exposure from the mechanical plant & equipment associated with the development. The most noise-sensitive receiver locations are summarised below and are shown in Figure 15.

Table 13. Assessment locations		
ID	**Receiver type and address**	**Assessment location**
R1	Residential / 23 Banks Street, Padstow	Ground floor – nearest boundary
R2	Residential / 23 Banks Street, Padstow	First-floor – nearest window
R3	Residential / 25 Banks Street, Padstow	Ground floor – nearest boundary
R4	Residential / 40 Banks Street, Padstow	Ground floor – nearest boundary
R5	Residential / 36 Banks Street, Padstow	Ground floor – nearest boundary
R6	Residential / 34 Banks Street, Padstow	Ground floor – nearest boundary
R7	Residential / 1 Stephanie Street, Padstow	Ground floor – nearest boundary
R8	Residential / 15 Banks Street, Padstow	Ground floor – nearest boundary
R9	Residential / 8 Nigel Place, Padstow	Ground floor – nearest boundary
R10	Residential / 7 Nigel Place, Padstow	Ground floor – nearest boundary
R11	Residential / 6 Nigel Place, Padstow	Ground floor – nearest boundary
R12	Residential / 5 Nigel Place, Padstow	Ground floor – nearest boundary
R13	Residential / 4 Nigel Place, Padstow	Ground floor – nearest boundary
R14	Residential / 3 Nigel Place, Padstow	First-floor – nearest window
R15	Residential / 2 Nigel Place, Padstow	Ground floor – nearest boundary
R16	Residential / 1 Nigel Place, Padstow	Ground floor – nearest boundary
R17	Residential / Unit 2/68 Davies Road, Padstow	First-floor – nearest window

Figure 15. Receiver locations and Identifications

Predicted operational and mechanical plant and equipment noise levels are as follows:

Table 14. Calculated receiver noise levels [dB]

Receiver location	Day (Scenario 1)	Evening (Scenario 2)	Night (Scenario 3)
Residential receivers – front			
Project noise criteria	**48**	**43**	**38**
R2:	47	35	24
R3:	32	32	14
R4:	33	29	16
R5:	35	30	19
R6:	36	31	21
R7:	33	32	20
R8:	36	36	21
Residential receivers – rear			
Project noise criteria	**45**	**43**	**38**
R1:	46[1]	35	30
R9:	40	40	24
R10:	36	36	26
R11:	34	34	21
R12:	34	34	21
R13:	35	35	22
R14:	40	39	26
R15:	42	42	23
R16:	42	41	37
R17:	39	37	28

Notes:

1. A 1-2 dB exceedance is considered negligible in accordance with the EPA's Noise Policy for Industry.

Operational and mechanical plant noise levels have been assessed to comply with the limiting NPfI criteria, pending the inclusion of noise control measures as detailed in the following section of this report.

6.4 RECOMMENDATIONS

- A preliminary mechanical plant noise assessment has been conducted. A detailed assessment of mechanical plant noise must be completed before construction once the details and locations of the mechanical plant have been confirmed.
- For all mechanical plant resting on the roof concrete slab, it is recommended that four Embelton NR1 rubber mounts or equivalent are installed.
- All boundary fences should be constructed at a minimum of 1.8 metres in height and should be constructed of:
    - Double-lapped and capped timber
    - 9 mm fibre cement sheeting fixed to a suitable framing structure
    - Masonry (70 mm thick or above)
    - Transparent materials such as 10.38 mm laminated glass or 15 mm thick Perspex panels
    - Proprietary noise wall solutions such as SlimWall by Modular Walls or similar

  It is to be noted that gaps between the panels and the posts or the ground will significantly reduce the effectiveness of the noise barrier and may lead to non-compliant noise levels at the adjoining premises. Therefore, all gaps should be minimised.
- A proposed solid awning should be installed in the outdoor ground floor communal area to the extent indicated in Figure 16.
- Outdoor Ground Floor communal area:
    - A maximum capacity of 22 people applies to the area during hours 7:00 am to 6:00 pm.
    - This area should not be in use between the hours 6:00 pm to 7:00 am.
- Outdoor Third-floor communal area:
    - A maximum capacity of 24 people applies to this area from hours 7:00 am to 10:00 pm.
    - This area should not be used between the hours 10:00 pm to 7:00 am.
- Indoor communal areas:
    - All doors and windows should remain closed except for when entering or exiting the area.
    - All glazing thickness should be a minimum of 6.38 mm laminate.
    - These areas should not be used between the hours of 10:00 pm to 7:00 am.

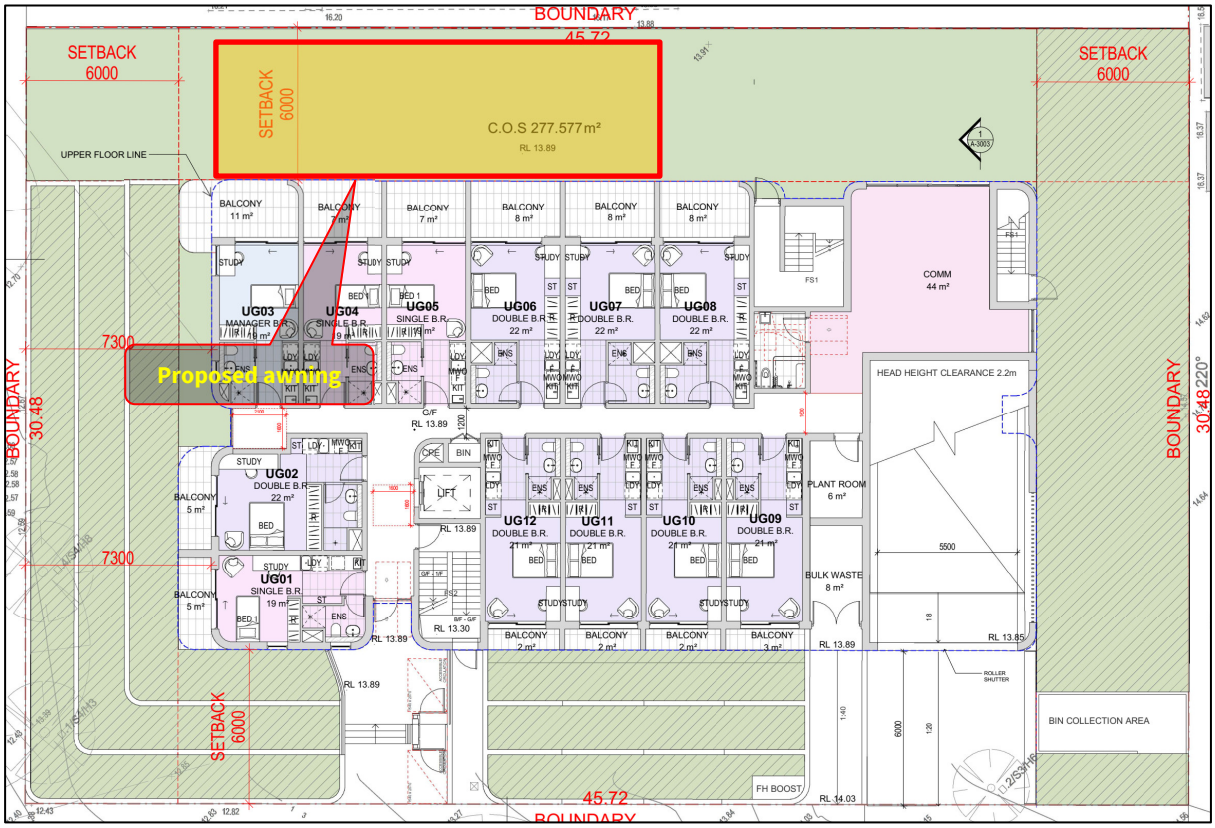


Figure 16. Proposed awning cover – image source from architectural drawings

7.0 CONCLUSION

Koikas Acoustics was requested to conduct an acoustical assessment and prepare a report for the proposal of a (4) four-storey co-living development. The acoustical report is to accompany a development application to be submitted to Canterbury Bankstown Council.

The assessment considers potential noise impacts on future occupants of the development, and surrounding residents such that acceptable acoustic amenity is maintained.

Acoustic planning levels have been referenced from current EPA, and BCA 2022 acoustic planning guidelines and requirements.

The included recommendations are based on designs prepared by CD Architects.

The conclusions reached in this acoustical report should assist Council in making their determination of the proposal. A further detailed acoustical report may be required for the CC submission should the building design be amended, or as required by Council.

Of the assessed components of noise, the following conclusions have been reached:

- Based on the indicative assessment, the operational and mechanical plant noise were found to be within the adopted noise criteria, provided the recommendations in section 6.4 are implemented. A detailed assessment of mechanical plant noise should be prepared for the subject development before construction.
- Acoustical treatments for common floors and service partitions included within this report would be adequate for satisfying the sound insulation provisions of the BCA 2022 or Council's requirements.

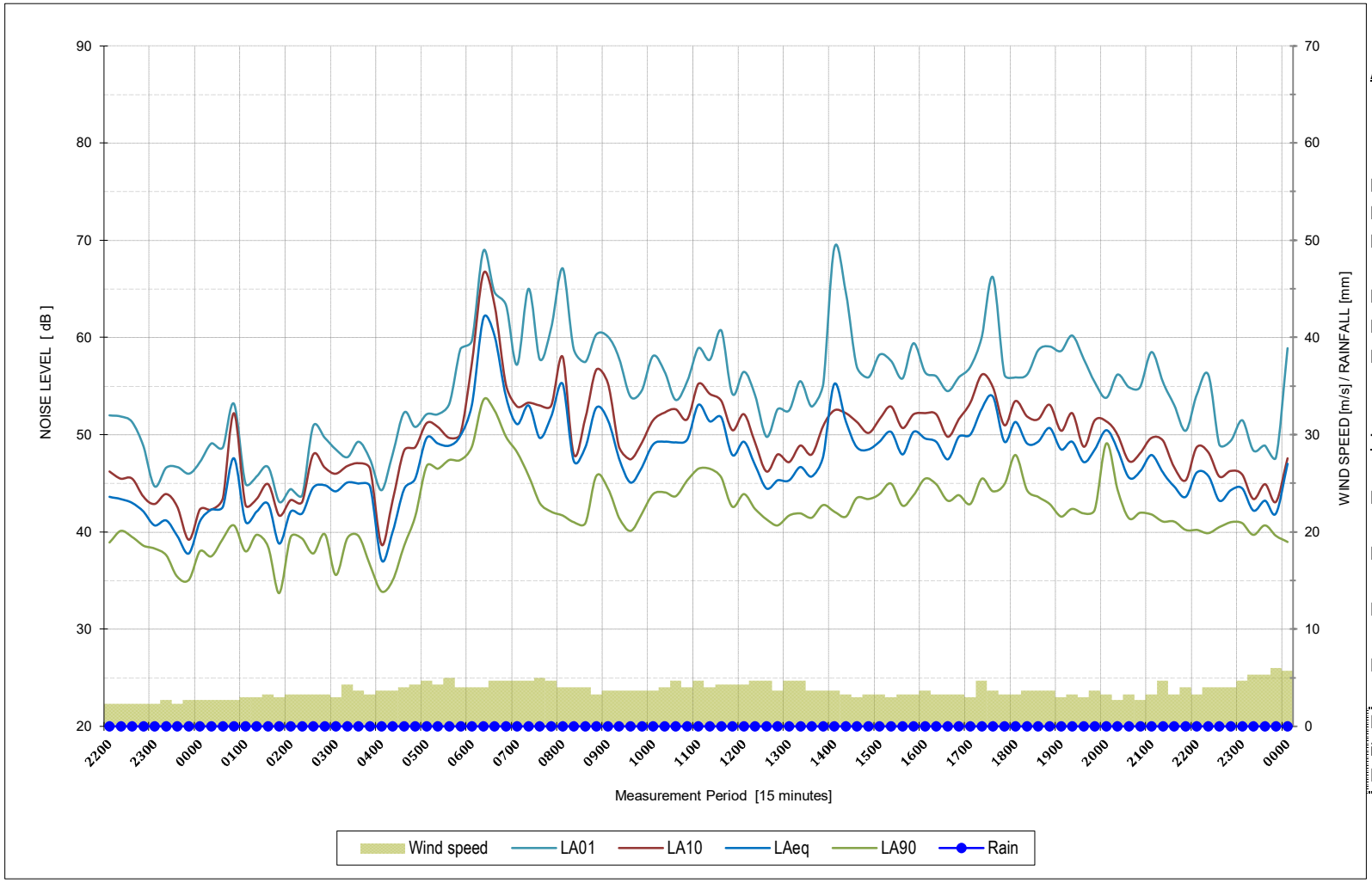
In our professional opinion, there is sufficient scope within the proposed building design to achieve the applied acoustic planning guidelines.

APPENDIX A

APPENDIX A

APPENDIX A

DAY 1 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Tuesday, 4 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	41	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	2200-0700	35	dB
LAeq Daytime	0700-1800	50	dB
LAeq Evening	1800-2200	48	dB
LAeq Night-time	2200-0700	50	dB

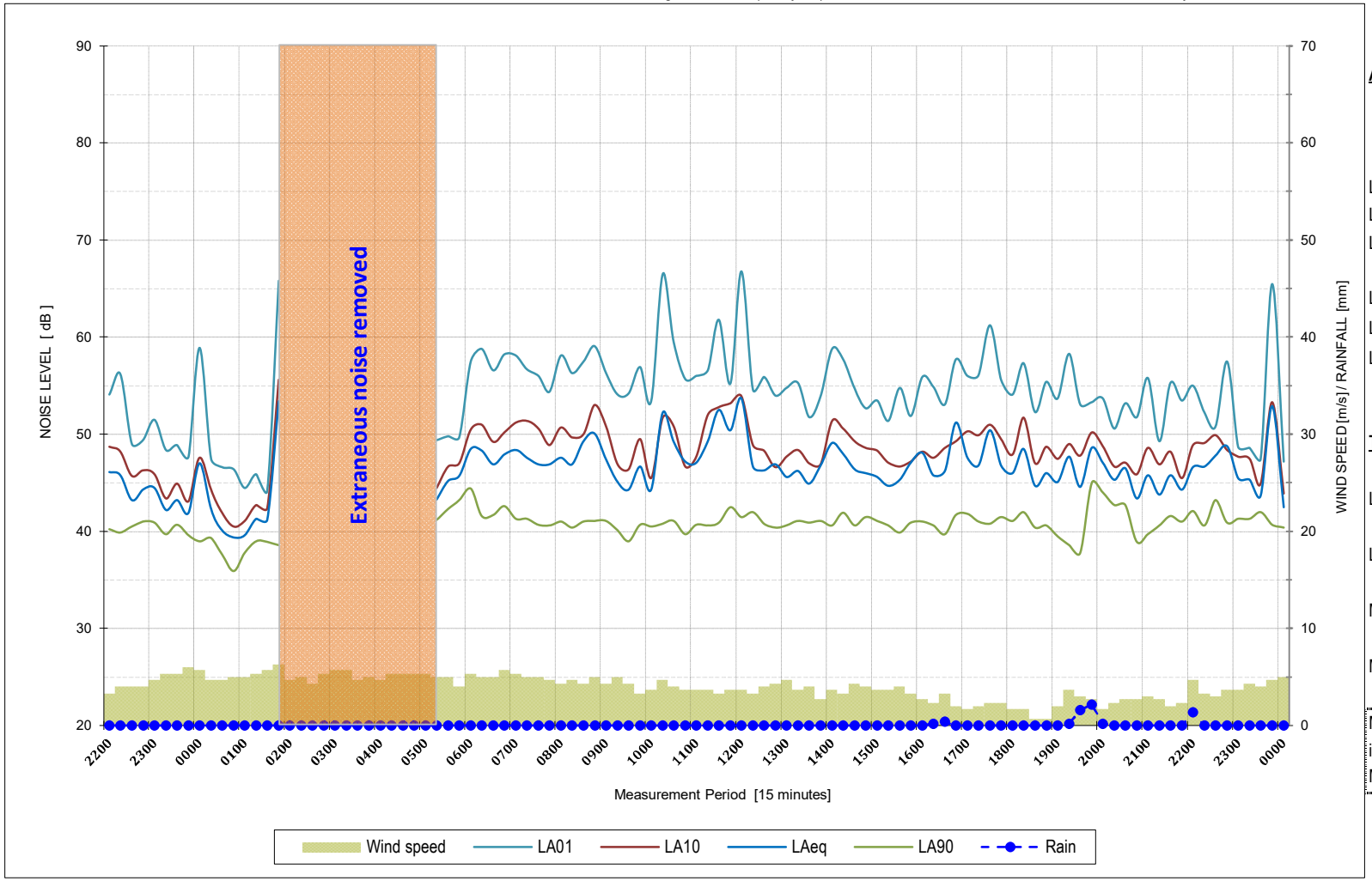
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	50	dB
LAeq 9 hours	2200-0700	50	dB
Max LAeq 1 hour	0700-2200	52	dB
Max LAeq 1 hour	2200-0700	50	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	10

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 2 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Wednesday, 5 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	40	dB
LA90 Evening	1800-2200	39	dB
LA90 Night-time	2200-0700	38	dB
LAeq Daytime	0700-1800	48	dB
LAeq Evening	1800-2200	46	dB
LAeq Night-time	2200-0700	46	dB

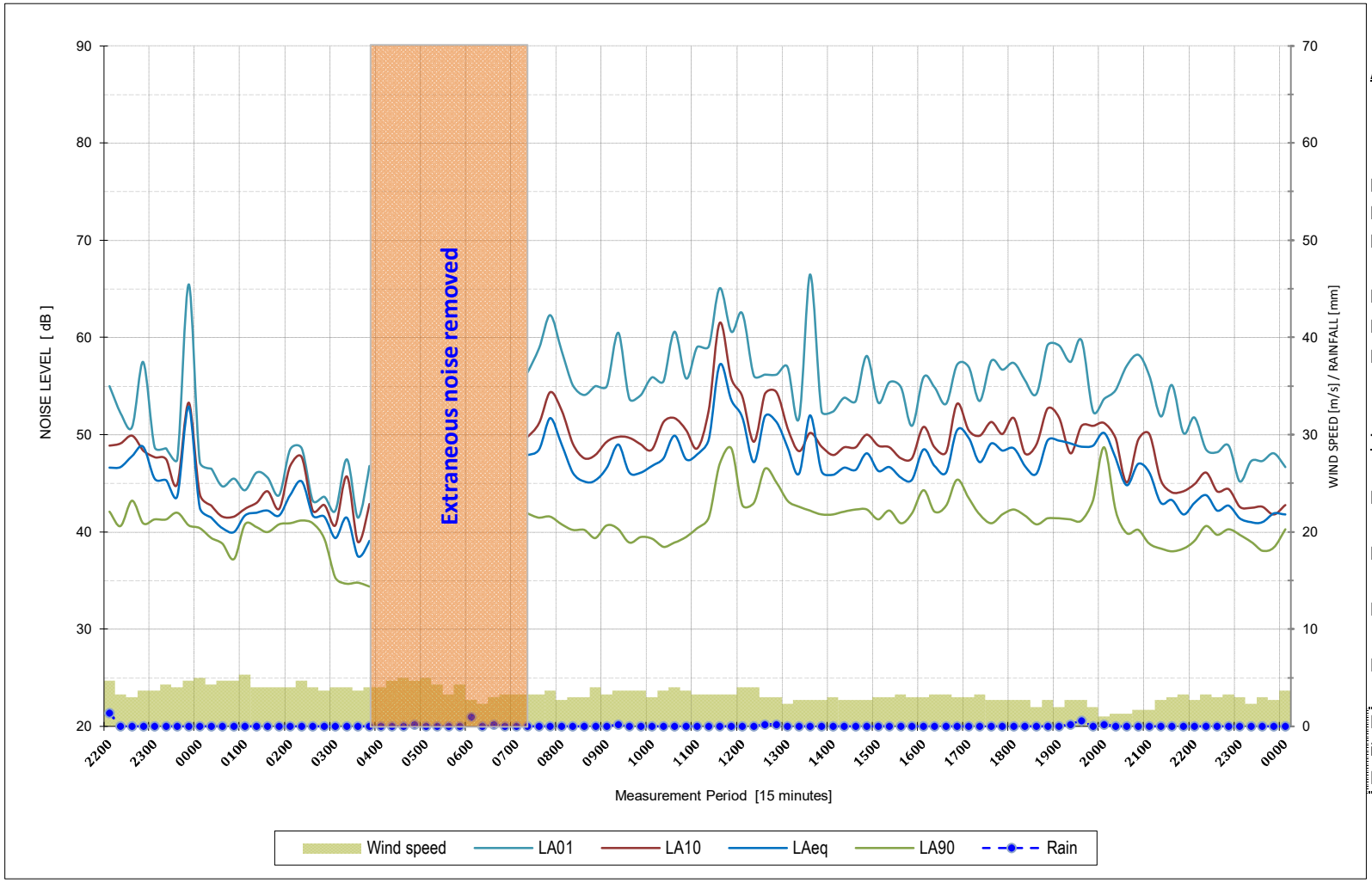
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	48	dB
LAeq 9 hours	2200-0700	46	dB
Max LAeq 1 hour	0700-2200	50	dB
Max LAeq 1 hour	2200-0700	48	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	10

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 3 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Thursday, 6 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	39	dB
LA90 Evening	1800-2200	38	dB
LA90 Night-time	2200-0700	35	dB
LAeq Daytime	0700-1800	49	dB
LAeq Evening	1800-2200	48	dB
LAeq Night-time	2200-0700	45	dB

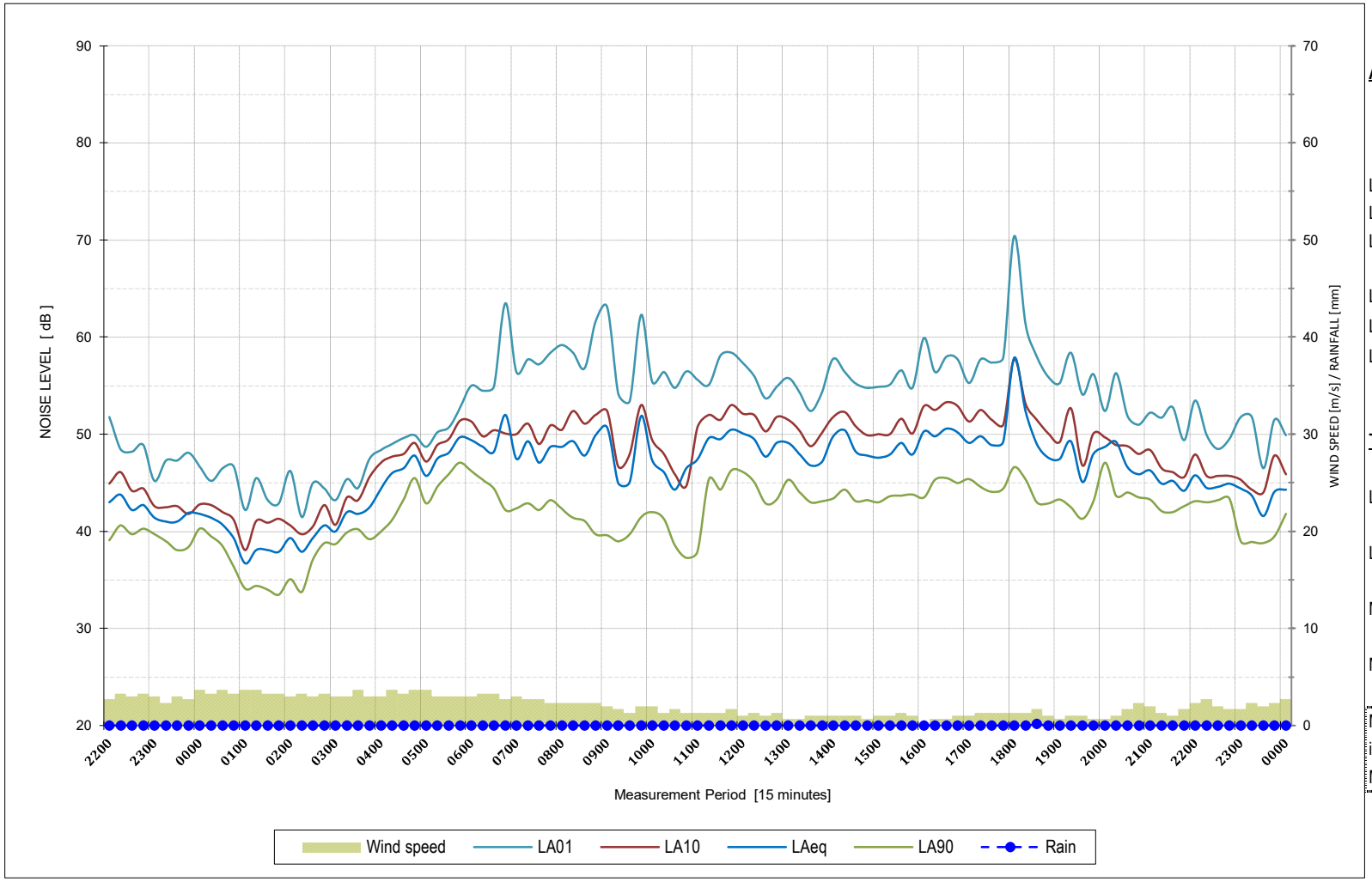
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	49	dB
LAeq 9 hours	2200-0700	45	dB
Max LAeq 1 hour	0700-2200	50	dB
Max LAeq 1 hour	2200-0700	48	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	5

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 4 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Friday, 7 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	40	dB
LA90 Evening	1800-2200	42	dB
LA90 Night-time	2200-0700	34	dB
LAeq Daytime	0700-1800	49	dB
LAeq Evening	1800-2200	50	dB
LAeq Night-time	2200-0700	45	dB

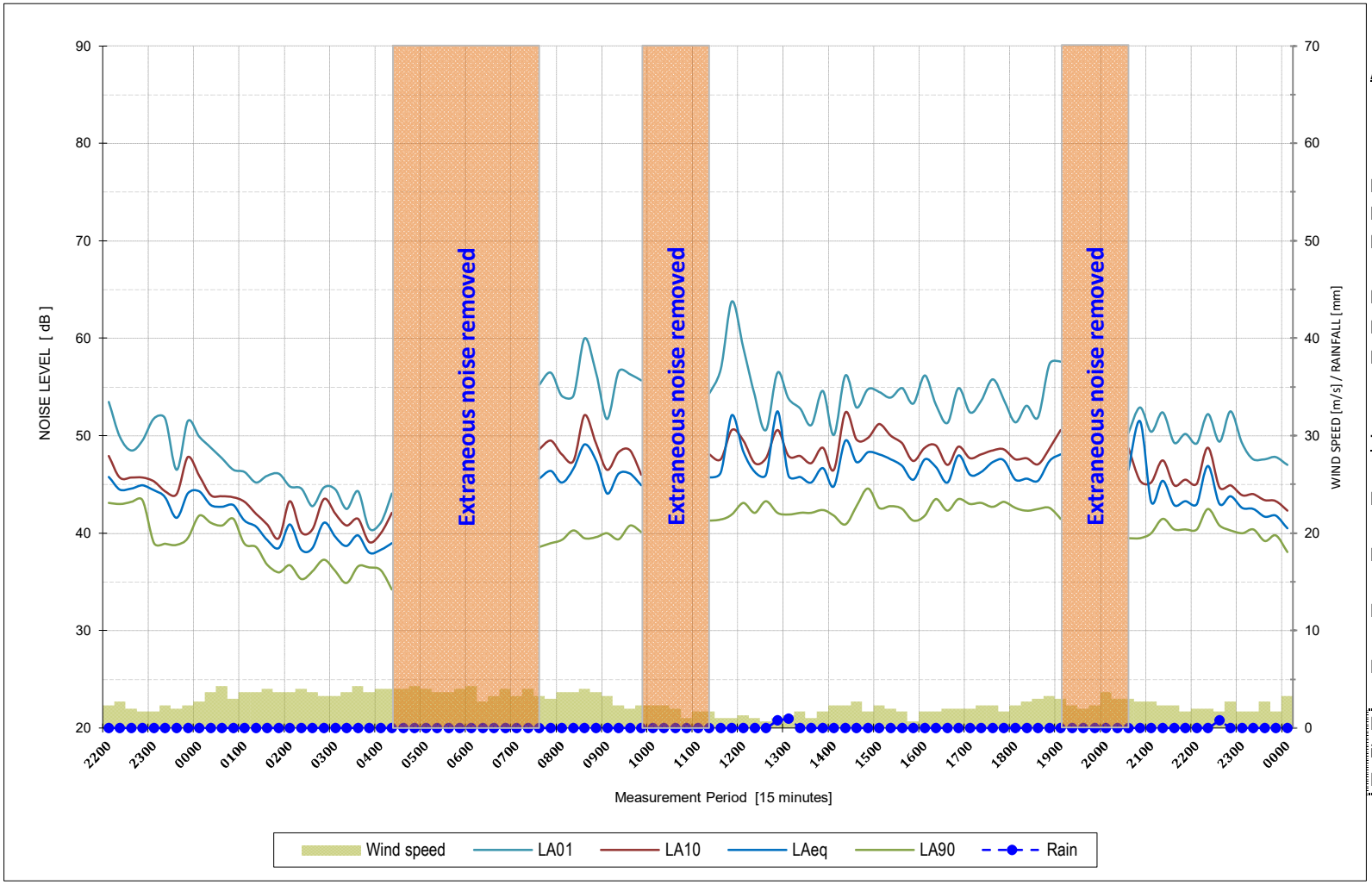
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	49	dB
LAeq 9 hours	2200-0700	45	dB
Max LAeq 1 hour	0700-2200	50	dB
Max LAeq 1 hour	2200-0700	49	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	6

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 5 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Saturday, 8 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	39	dB
LA90 Evening	1800-2200	40	dB
LA90 Night-time	2200-0700	36	dB
LAeq Daytime	0700-1800	47	dB
LAeq Evening	1800-2200	47	dB
LAeq Night-time	2200-0700	42	dB

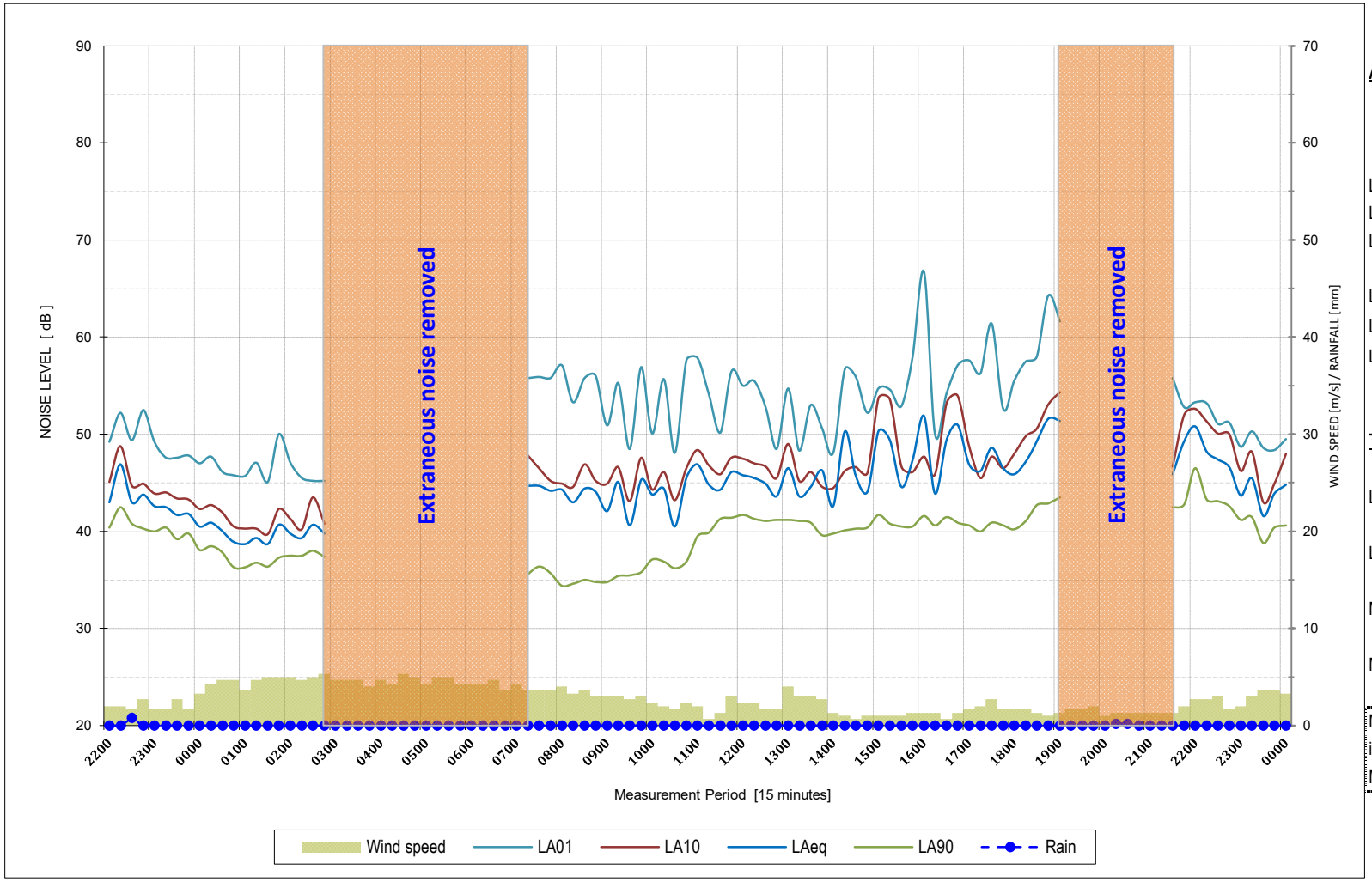
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	47	dB
LAeq 9 hours	2200-0700	42	dB
Max LAeq 1 hour	0700-2200	49	dB
Max LAeq 1 hour	2200-0700	44	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	5

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 6 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Sunday, 9 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	35	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	2200-0800	36	dB
LAeq Daytime	0800-1800	46	dB
LAeq Evening	1800-2200	49	dB
LAeq Night-time	2200-0800	42	dB

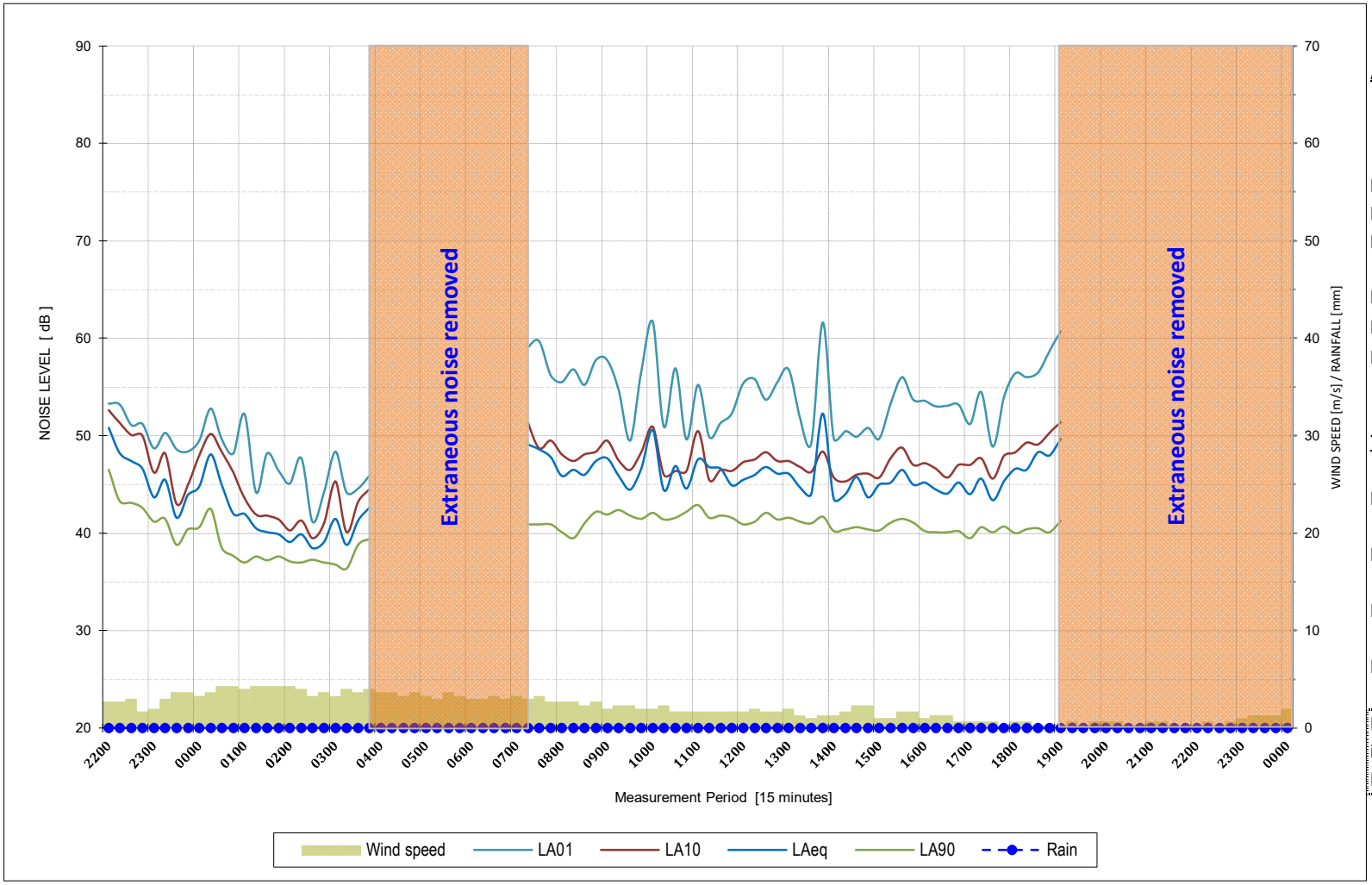
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	47	dB
LAeq 9 hours	2200-0700	42	dB
Max LAeq 1 hour	0700-2200	49	dB
Max LAeq 1 hour	2200-0700	44	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	3

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 7 **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **DATE:** Monday, 10 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	40	dB
LA90 Evening	1800-2200	40	dB
LA90 Night-time	2200-0700	37	dB
LAeq Daytime	0700-1800	46	dB
LAeq Evening	1800-2200	48	dB
LAeq Night-time	2200-0700	44	dB

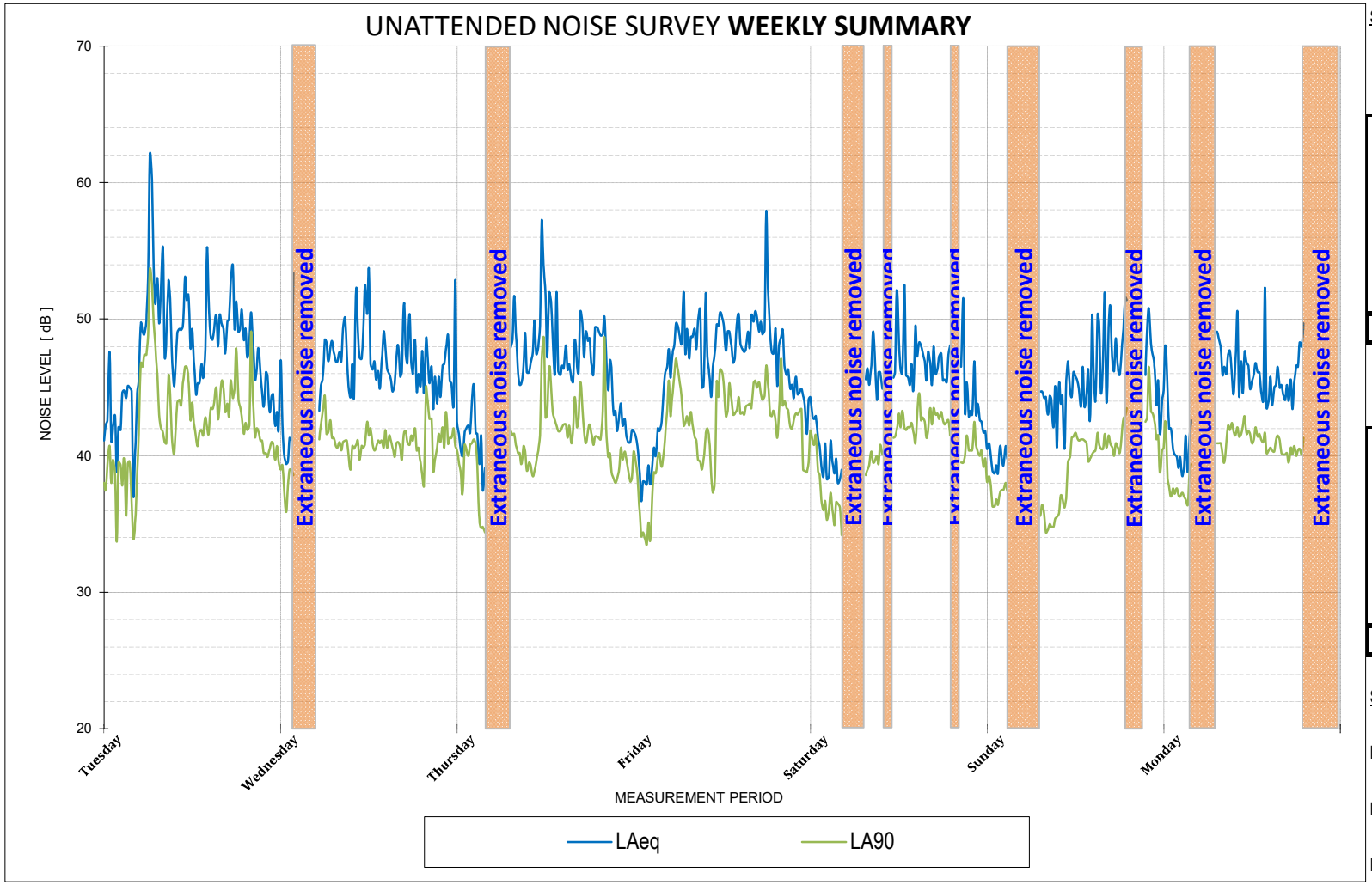
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	47	dB
LAeq 9 hours	2200-0700	44	dB
Max LAeq 1 hour	0700-2200	48	dB
Max LAeq 1 hour	2200-0700	46	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	8

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

WEEKLY SUMMARY **LOGGER LOCATION:** Monitoring Location 1 (rear yard) **PERIOD:** 4 to 10 March 2025



Sundays and Public Holidays the hours change to 0800

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	*LA90* Evening	*LA90* Night-time
Day 1	41	41	35
Day 2	40	39	38
Day 3	39	38	35
Day 4	40	42	34
Day 5	39	40	36
Day 6	35	41	36
Day 7	40	40	37
RBL	**40**	**40**	**36**

	LAeq Daytime	*LAeq* Evening	*LAeq* Night-time
Day 1	50	48	50
Day 2	48	46	46
Day 3	49	48	45
Day 4	49	50	45
Day 5	47	47	42
Day 6	46	49	42
Day 7	46	48	44
Average	**48**	**48**	**46**

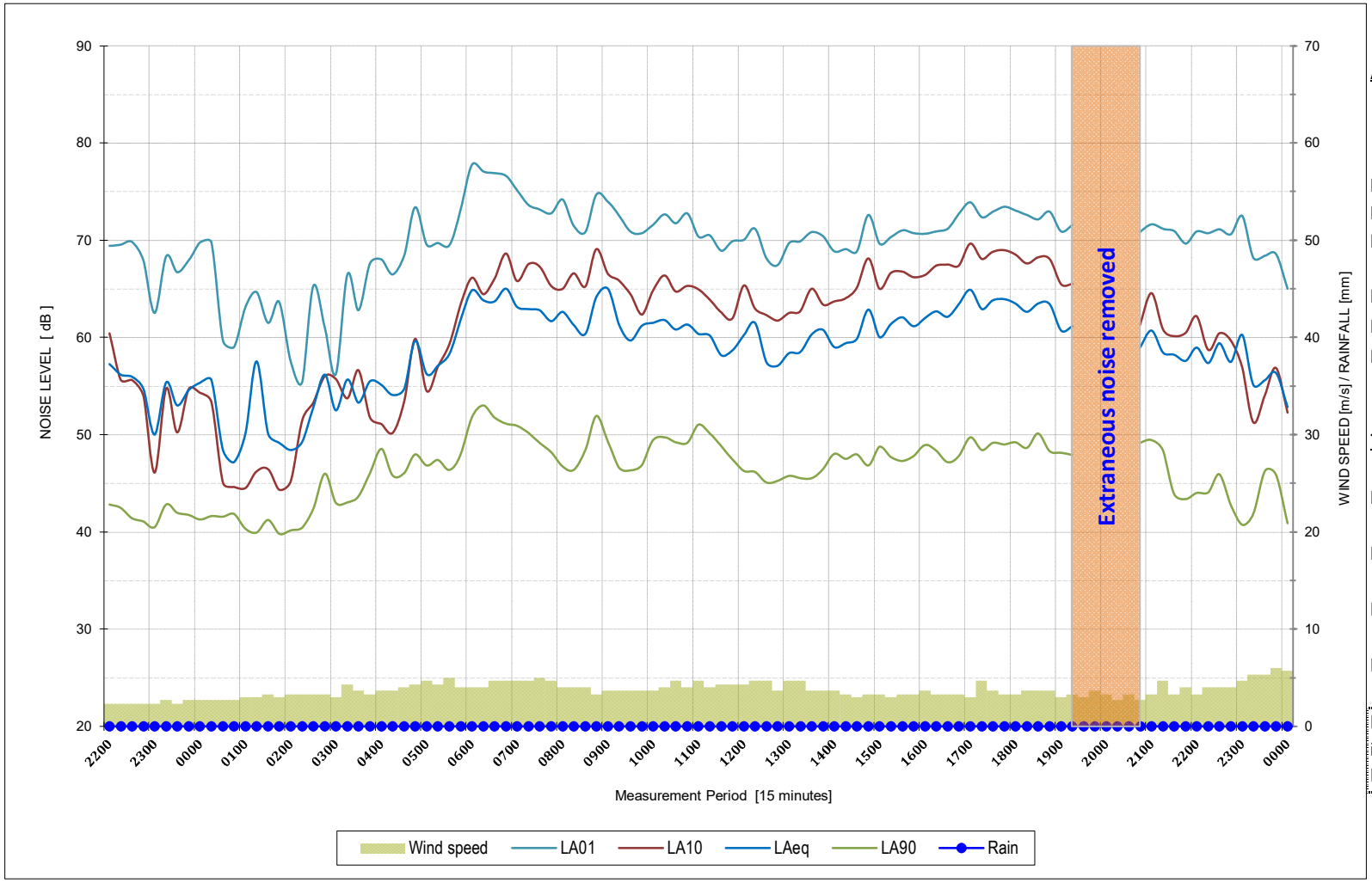
SUMMARY OF TRAFFIC LEVELS

LAeq 15 hrs	0700-2200	48	dB
LAeq 9 hrs	2200-0700	46	dB
Max LAeq 1 hr	0700-2200	50	dB
Max LAeq 1 hr	2200-0700	48	dB

Maximum noise events as defined in the Environmental Noise Management Manual 7 day average - [LAmax - LAeq ≥ 15]	7

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 1 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Tuesday, 4 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	46	dB
LA90 Evening	1800-2200	44	dB
LA90 Night-time	2200-0700	40	dB
LAeq Daytime	0700-1800	62	dB
LAeq Evening	1800-2200	61	dB
LAeq Night-time	2200-0700	58	dB

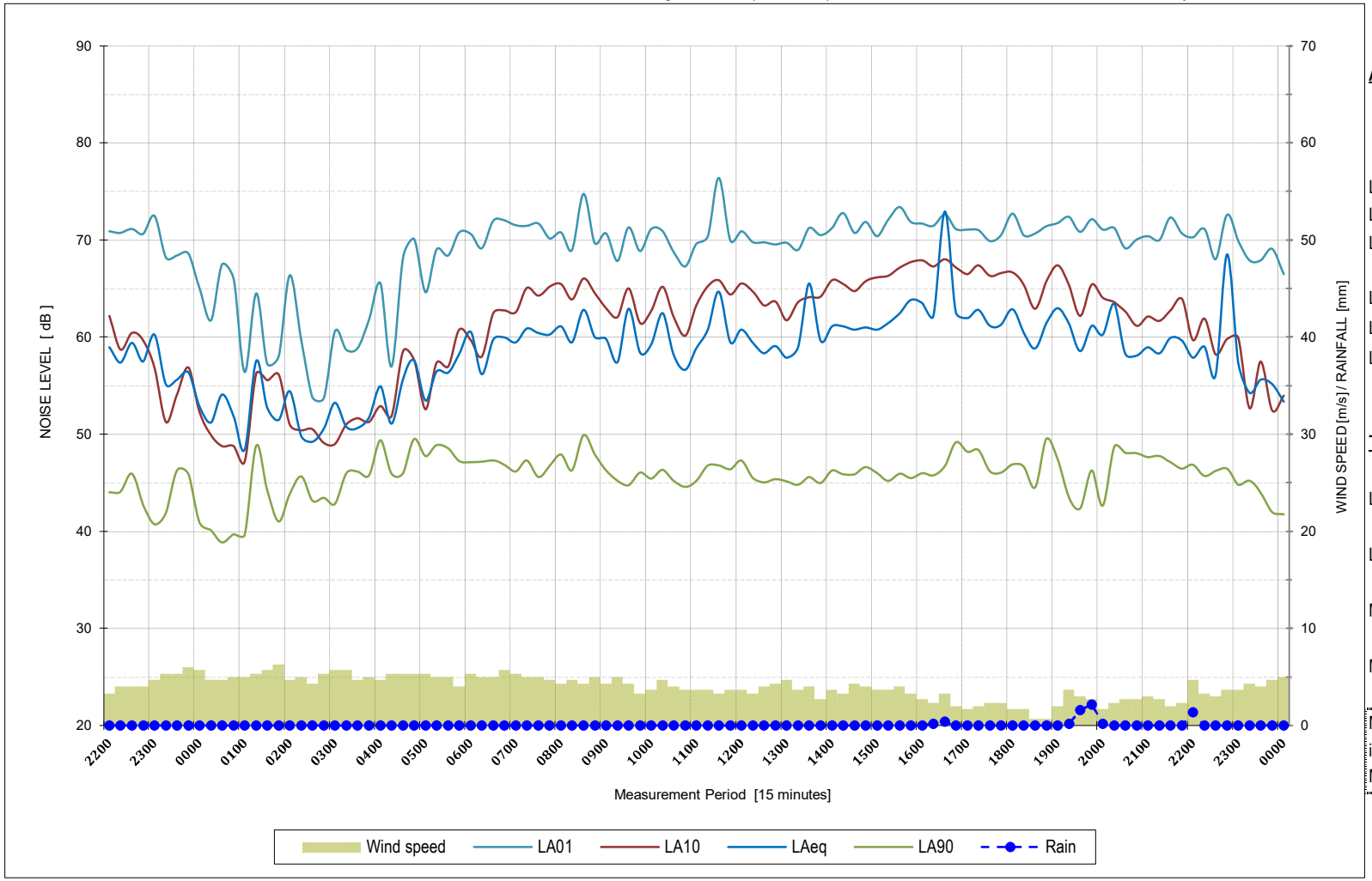
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	58	dB
Max LAeq 1 hour	0700-2200	63	dB
Max LAeq 1 hour	2200-0700	61	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	35

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 2 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Wednesday, 5 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	43	dB
LA90 Night-time	2200-0700	40	dB
LAeq Daytime	0700-1800	62	dB
LAeq Evening	1800-2200	61	dB
LAeq Night-time	2200-0700	56	dB

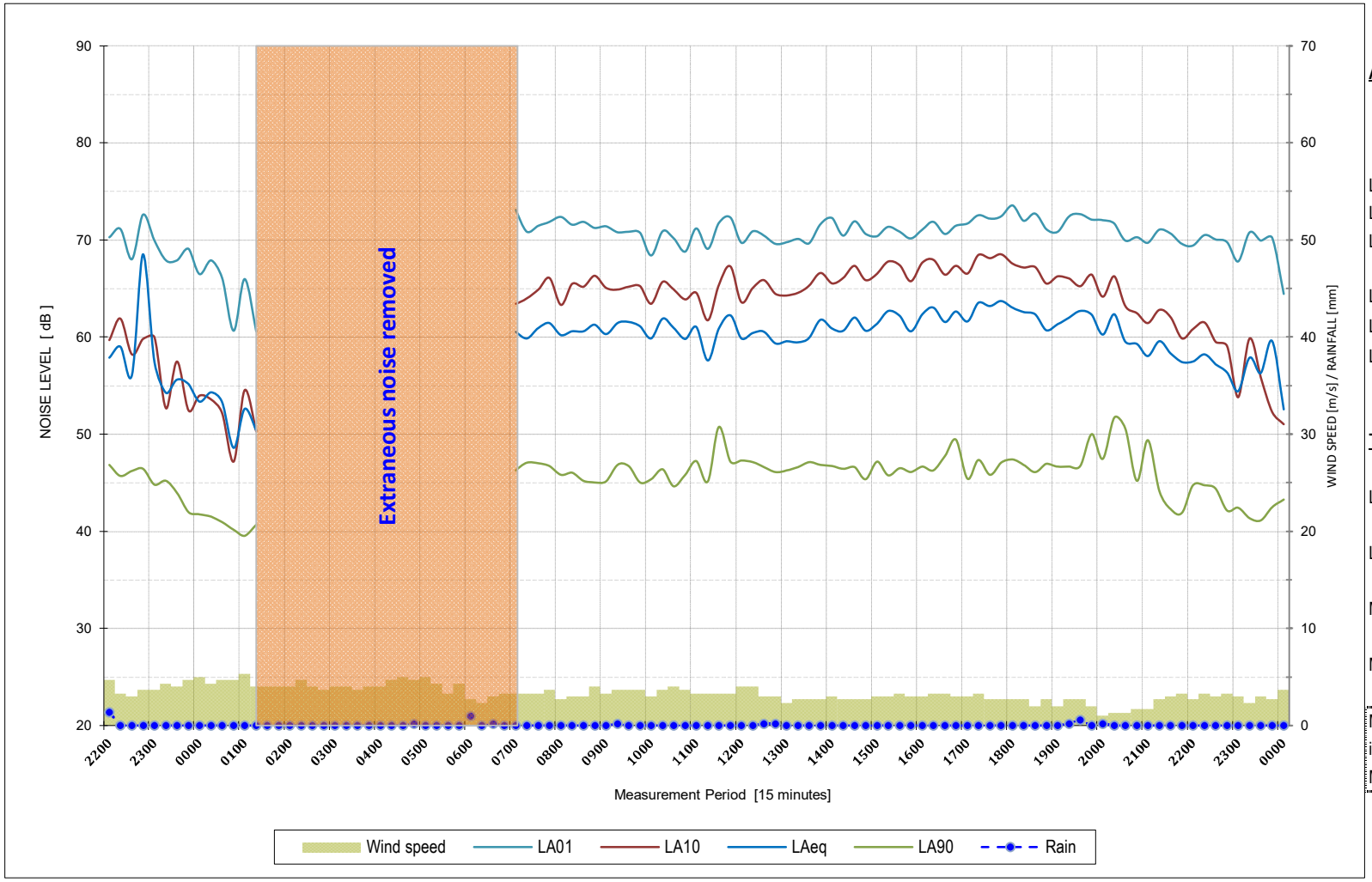
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	56	dB
Max LAeq 1 hour	0700-2200	63	dB
Max LAeq 1 hour	2200-0700	58	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	35

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 3 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Thursday, 6 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	43	dB
LA90 Night-time	2200-0700	40	dB
LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	61	dB
LAeq Night-time	2200-0700	59	dB

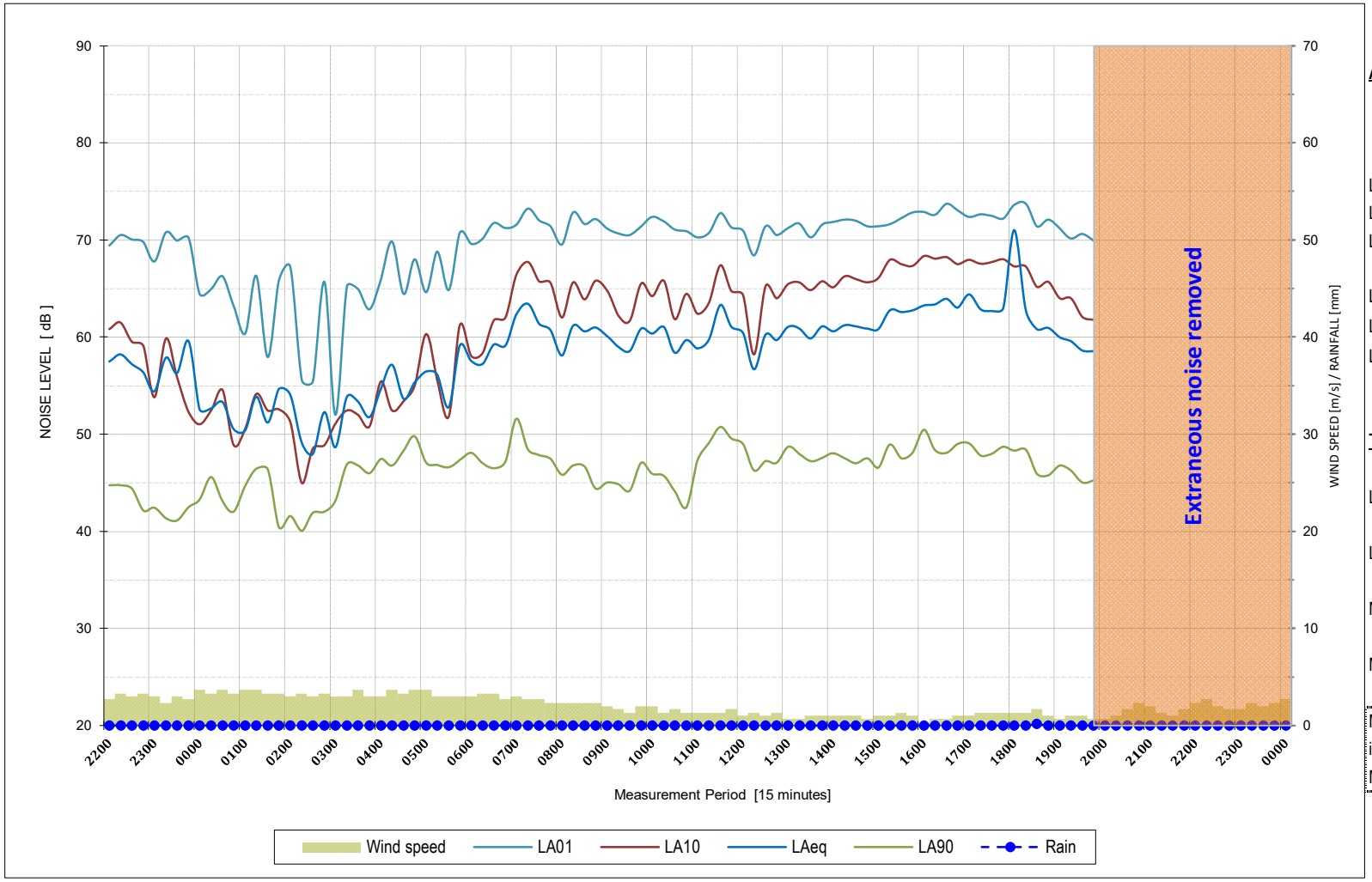
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	61	dB
LAeq 9 hours	2200-0700	59	dB
Max LAeq 1 hour	0700-2200	62	dB
Max LAeq 1 hour	2200-0700	63	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	14

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 4 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Friday, 7 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	45	dB
LA90 Night-time	2200-0700	41	dB
LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	64	dB
LAeq Night-time	2200-0700	56	dB

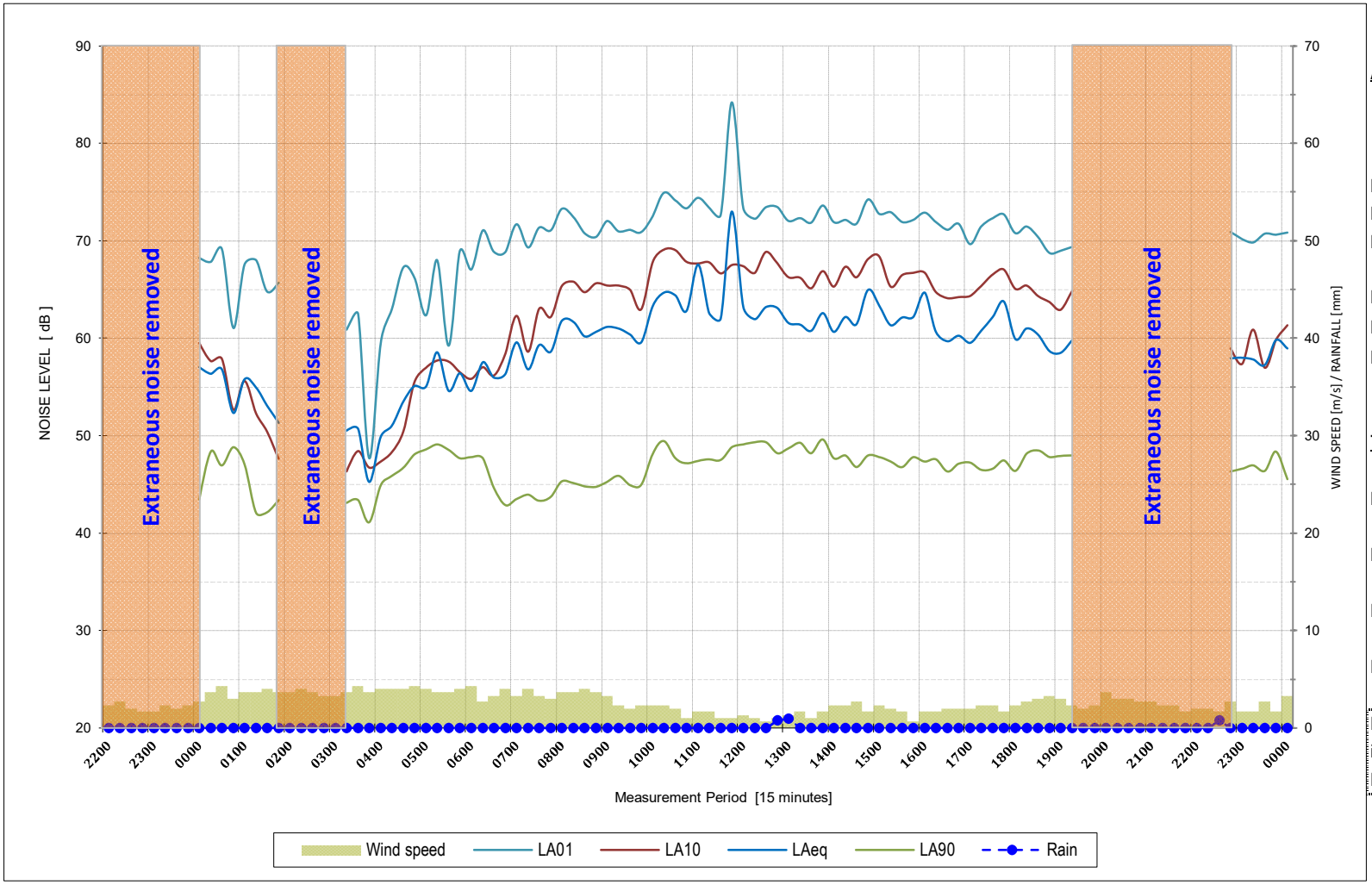
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	56	dB
Max LAeq 1 hour	0700-2200	64	dB
Max LAeq 1 hour	2200-0700	57	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	35

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 5 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Saturday, 8 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	47	dB
LA90 Night-time	2200-0700	42	dB
LAeq Daytime	0700-1800	63	dB
LAeq Evening	1800-2200	60	dB
LAeq Night-time	2200-0700	55	dB

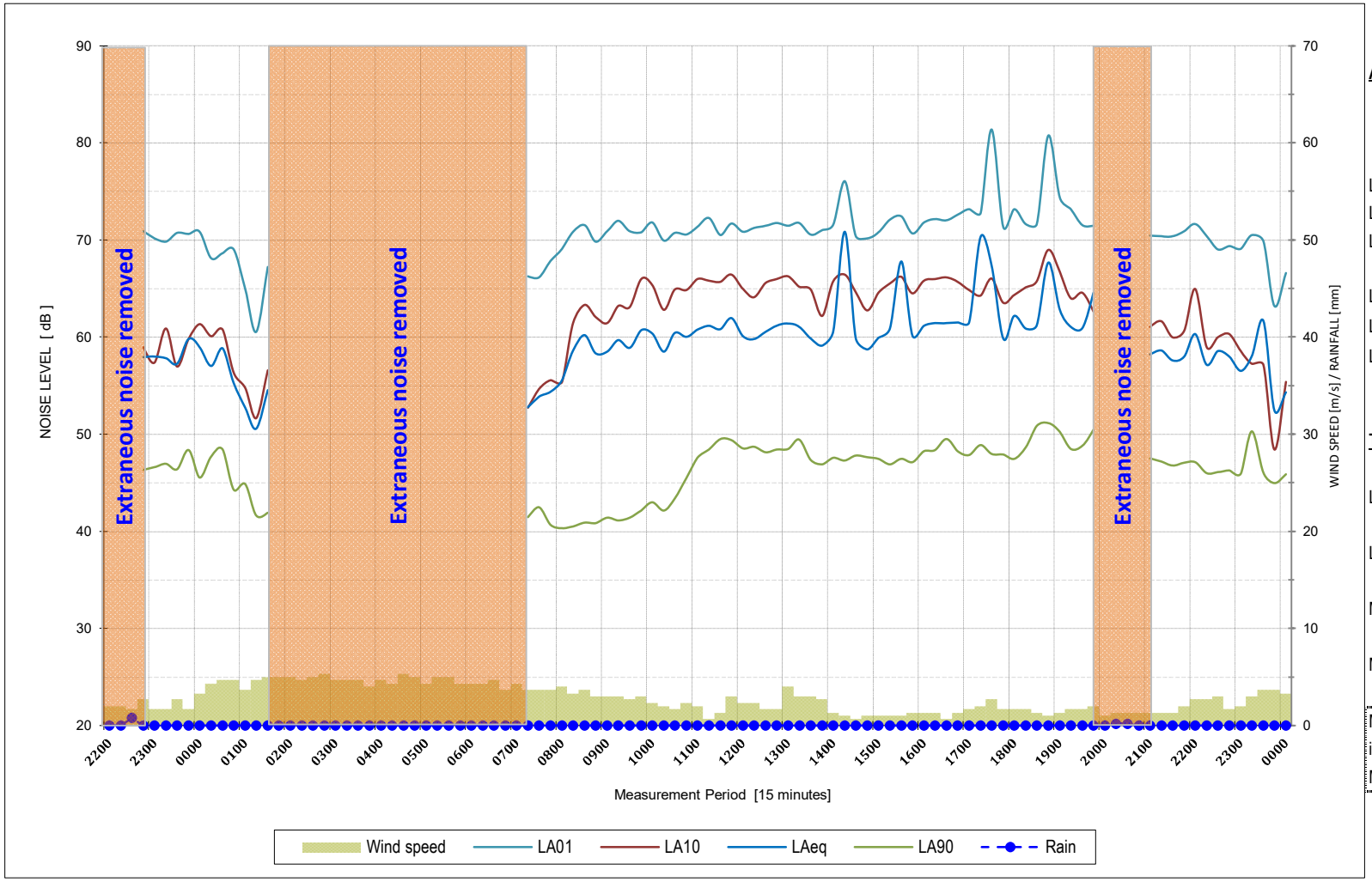
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	63	dB
LAeq 9 hours	2200-0700	55	dB
Max LAeq 1 hour	0700-2200	65	dB
Max LAeq 1 hour	2200-0700	57	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	21

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 6 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Sunday, 9 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	41	dB
LA90 Evening	1800-2200	47	dB
LA90 Night-time	2200-0800	42	dB
LAeq Daytime	0800-1800	63	dB
LAeq Evening	1800-2200	62	dB
LAeq Night-time	2200-0800	57	dB

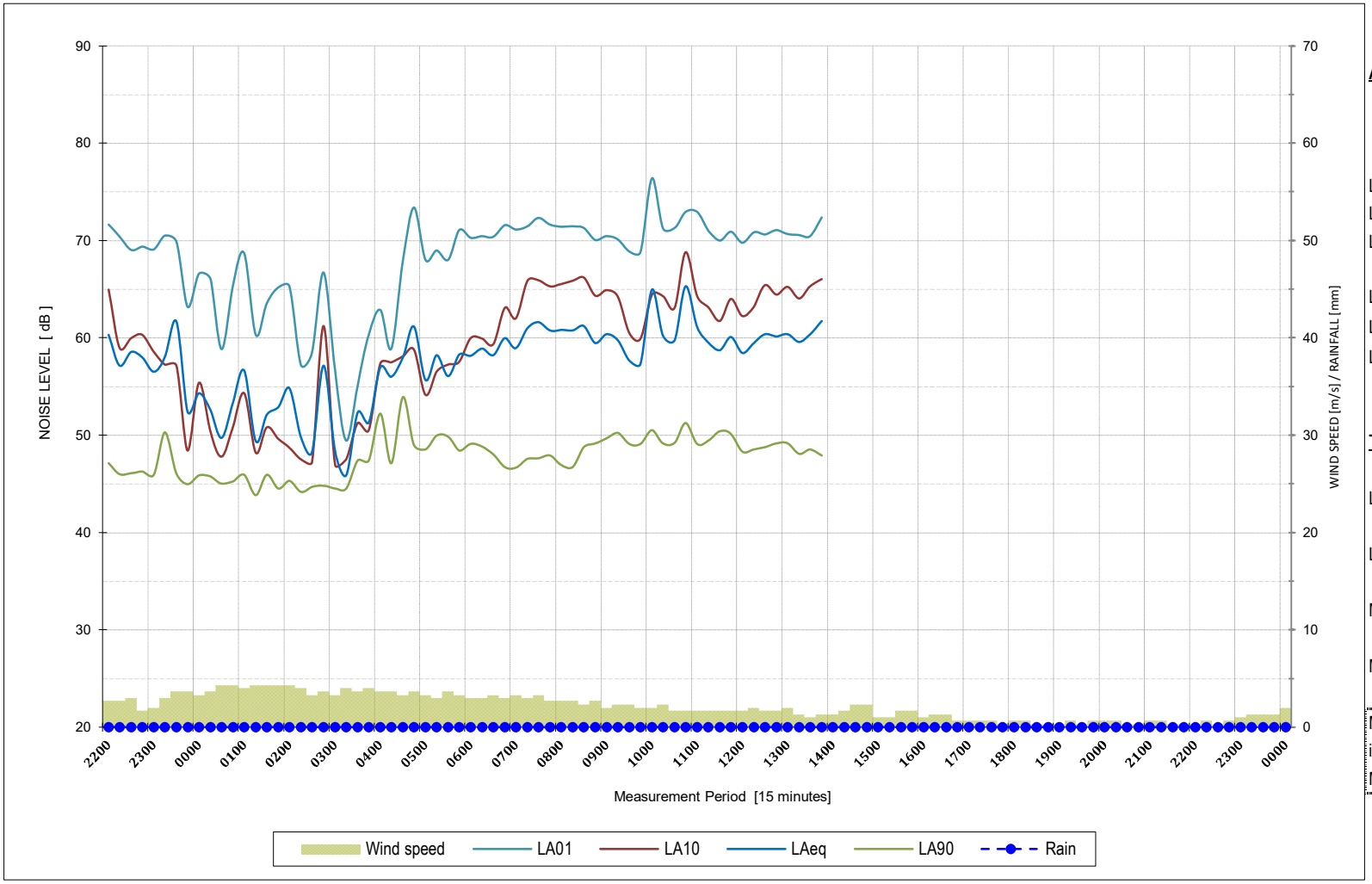
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	57	dB
Max LAeq 1 hour	0700-2200	66	dB
Max LAeq 1 hour	2200-0700	59	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	11

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 7 **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **DATE:** Monday, 10 March 2025



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	47	dB
LA90 Evening	1800-2200	#NUM!	dB
LA90 Night-time	2200-0700	45	dB
LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	#DIV/0!	dB
LAeq Night-time	2200-0700	57	dB

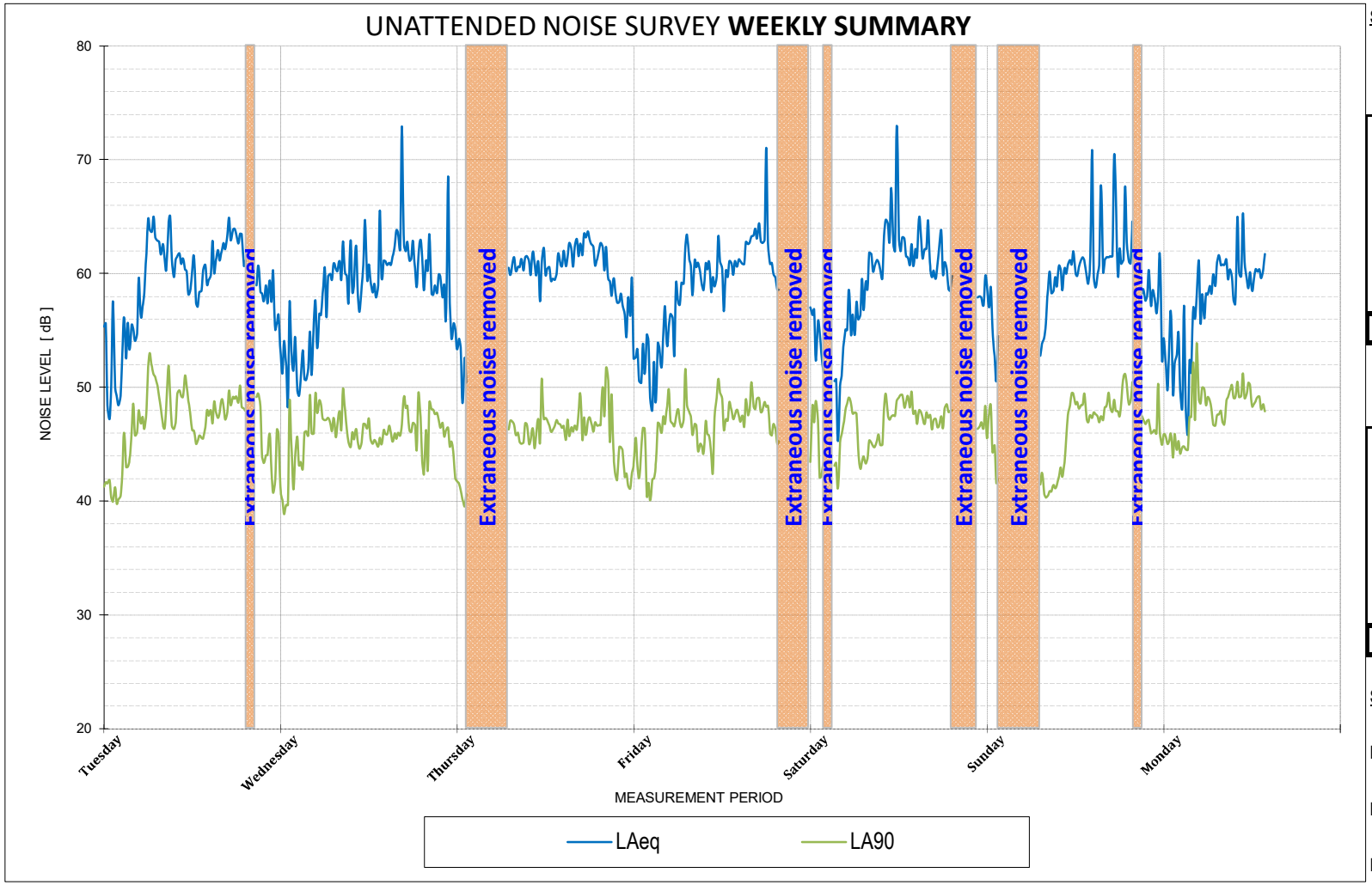
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	61	dB
LAeq 9 hours	2200-0700	57	dB
Max LAeq 1 hour	0700-2200	62	dB
Max LAeq 1 hour	2200-0700	59	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	34

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

WEEKLY SUMMARY **LOGGER LOCATION:** Monitoring Location 2 (Front Yard) **PERIOD:** 4 to 10 March 2025



Sundays and Public Holidays the hours change to 0800

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	*LA90* Evening	*LA90* Night-time
Day 1	46	44	40
Day 2	45	43	40
Day 3	45	43	40
Day 4	45	45	41
Day 5	45	47	42
Day 6	41	47	42
Day 7	47	NA	45
RBL	**45**	**45**	**41**

	LAeq Daytime	*LAeq* Evening	*LAeq* Night-time
Day 1	62	61	58
Day 2	62	61	56
Day 3	61	61	59
Day 4	61	64	56
Day 5	63	60	55
Day 6	63	62	57
Day 7	61	NA	57
Average	**62**	**62**	**57**

SUMMARY OF TRAFFIC LEVELS

LAeq 15 hrs	0700-2200	62	dB
LAeq 9 hrs	2200-0700	57	dB
Max LAeq 1 hr	0700-2200	63	dB
Max LAeq 1 hr	2200-0700	59	dB

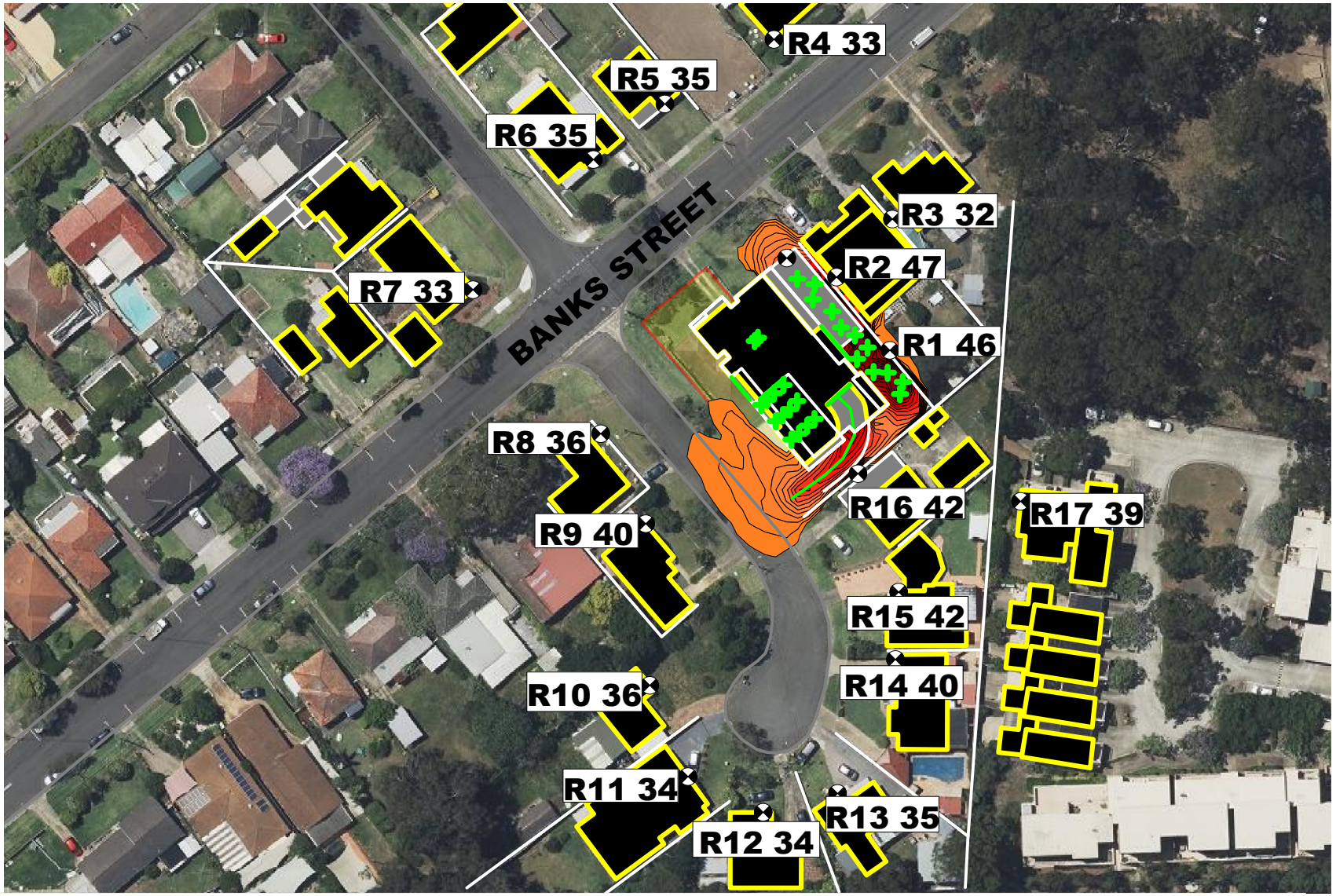
Maximum noise events as defined in the Environmental Noise Management Manual 7 day average - [LAmax - LAeq ≥ 15]	26

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

APPENDIX B

APPENDIX B

APPENDIX B



Scenario 1 - Daytime
**** NOISE SOURCES ****

~ See report

Note:
- LAeq,15minutes noise contours and receiver pointsare at a height of 1.5 m above the natural ground level or respective floor level

- The maximum reading at the nearest resident is 47 dB.

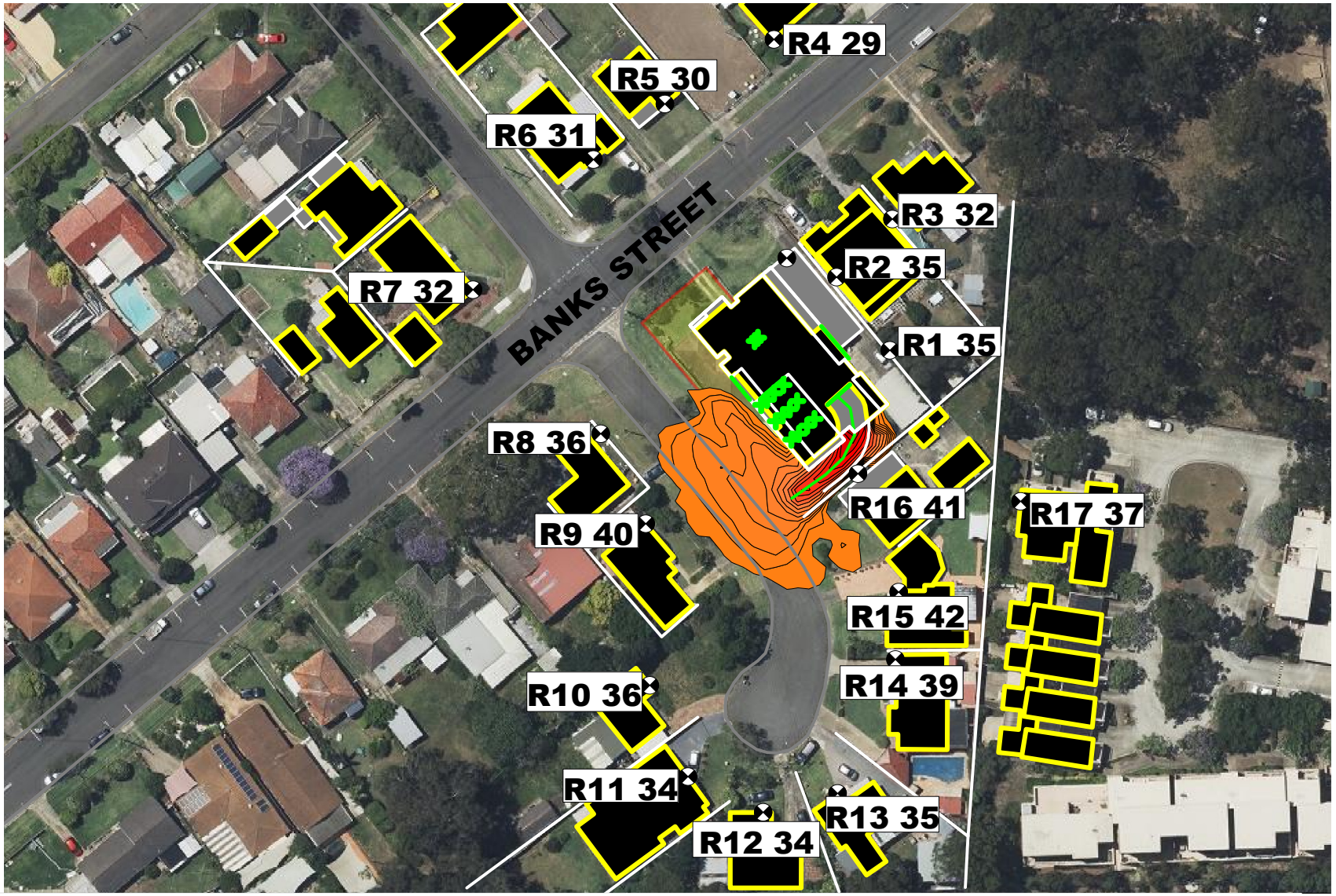
PRINT DATE: 10/04/25

- Point Source
- Line Source
- vert. Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Calculation Area

- > 40.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6565
CLIENT: CD Architects
SITE ADDRESS: 19-21 Banks Street, Padstow
ASSESSED TO: NSW EPA Noise Policy for Industry
LIMITING CRITERIA: 45-48 dB(A) - Residential (700-1800)



Scenario 2 - Evening
**** NOISE SOURCES ****

~ See report

Note:
- LAeq,15minutes noise contours and receiver pointsare at a height of 1.5 m above the natural ground level or respective floor level

- The maximum reading at the nearest resident is 41dB.

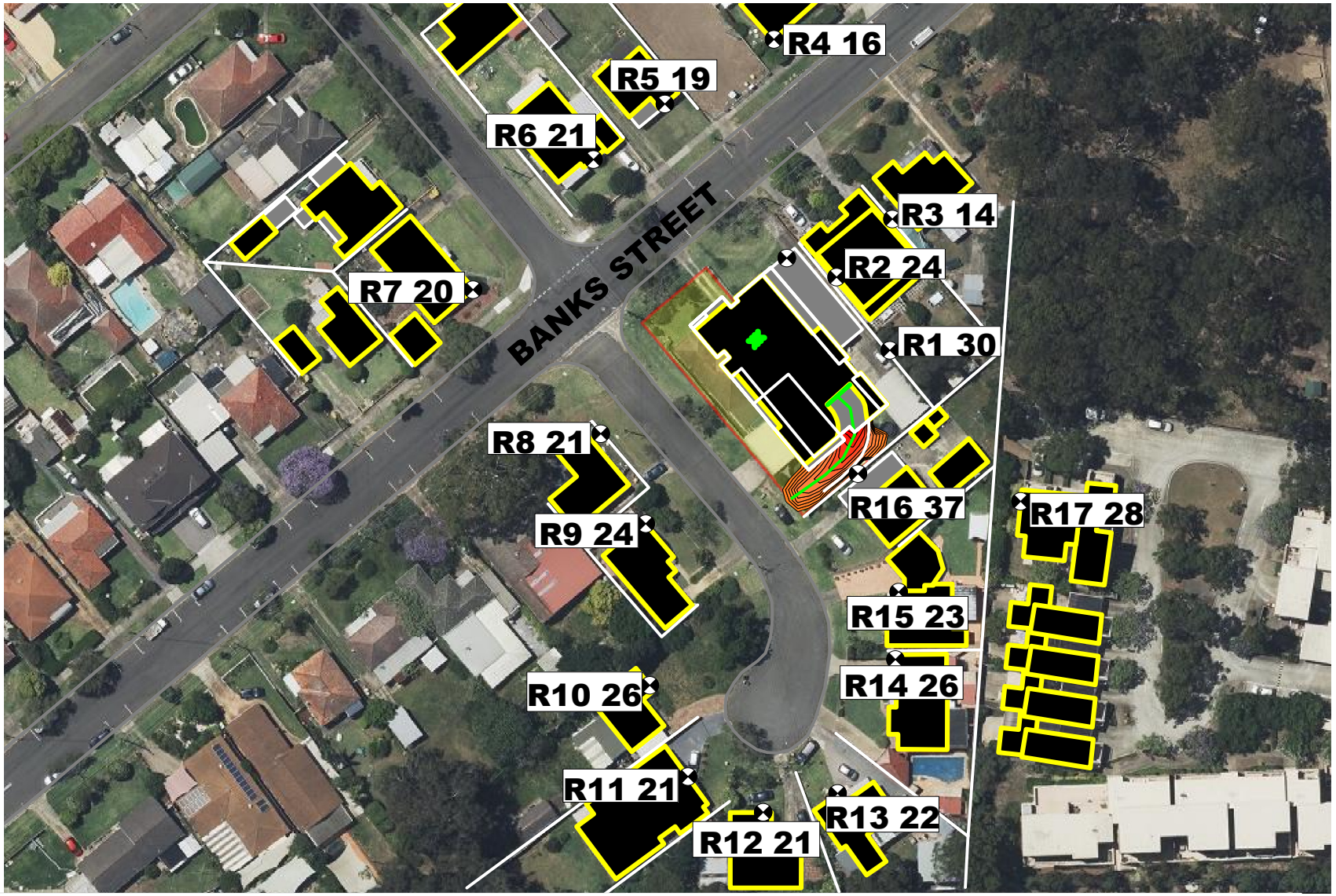
PRINT DATE: 10/04/25

- Point Source
- Line Source
- vert. Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Calculation Area

- > 40.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6565
CLIENT: CD Architects
SITE ADDRESS: 19-21 Banks Street, Padstow
ASSESSED TO: NSW EPA Noise Policy for Industry
LIMITING CRITERIA: 43 dB(A) - Residential (1800-2200)



Scenario 3 - Night-time
**** NOISE SOURCES ****

~ See report

Note:
- LAeq,15minutes noise contours and receiver pointsare at a height of 1.5 m above the natural ground level or respective floor level

- The maximum reading at the nearest resident is 37 dB.

PRINT DATE: 10/04/25

- Point Source
- Line Source
- vert. Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Calculation Area

- > 40.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6565
CLIENT: CD Architects
SITE ADDRESS: 19-21 Banks Street, Padstow
ASSESSED TO: NSW EPA Noise Policy for Industry
LIMITING CRITERIA: 38 dB(A) - Residential (2200-0700)