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ACOUSTICAL REPORT

PROPOSED ALTERATIONS AND ADDITIONS

MONA VALE GOLF CLUB

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ACOUSTICAL REPORT
PROPOSED ALTERATIONS AND ADDITIONS
MONA VALE GOLF CLUB

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1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was engaged by Mona Vale Golf Club to prepare an acoustic report for the proposed alterations and additions to the lower ground floor level of Mona Vale Golf Club.

The development is assessed to the standard planning guidelines issued by the Council in their Local Environment Plan (LEP), Development Control Plan (DCP), and other standard noise guidelines such as the standard L_{A10} noise condition adopted by Liquor and Gaming NSW (L&GNSW).

The following sections of this report provide a brief outline of the development, identify surrounding noise-sensitive premises, establish the project noise objectives through referencing appropriate guidelines and documents, predicts noise levels to surrounding receivers, and recommend noise mitigation measures necessary to meet the project noise objectives.



2.0 THE PROPOSAL

Mona Vale Golf Club is located at 3 Golf Avenue, Mona Vale. The proposed alterations and additions works are to take place at the main clubhouse building and on the lower ground floor level. The Golf Pro Shop and Greenkeeper's/Maintenance Shed are other structures on the golf club site but have no relevance to the application nor this acoustic report.

The clubhouse includes a Function Room, Dining/Seating area, Kitchen, back-of-house facilities, and offices on the ground (upper) floor level. The typical mode of operation for this floor level is for both the Function Room and Dining/Seating area to be joined as one large dining and seating area. The club host functions only on occasion, however, as it does form part of the club's current operational use, it is considered in this assessment. Both the function and dining space have access to a small, shared balcony. Each room contains large, glazed façade areas to maximise coastal views over the golf club. These glazed areas present the most obvious location for noise break out into the surrounding environment.

The lower ground floor level is proposed to be refurbished by way of relocating the amenities, locker rooms, kitchen, and storerooms, and updating the existing dining room to a café and attaching that to a new Member's Bar are that will occupy the former Male Locker Rooms area. The modifications that will have the greatest potential for noise impacts to residential neighbours will be an extension to the existing terrace/deck that will allow it to wrap around the eastern side of the building and the construction of a new lower deck area.

The current lower ground floor plan is included below for reference. Current plans that have been used in this assessment were prepared by Team 2 Architects (Project No. 1053, dated 21.01.2022).



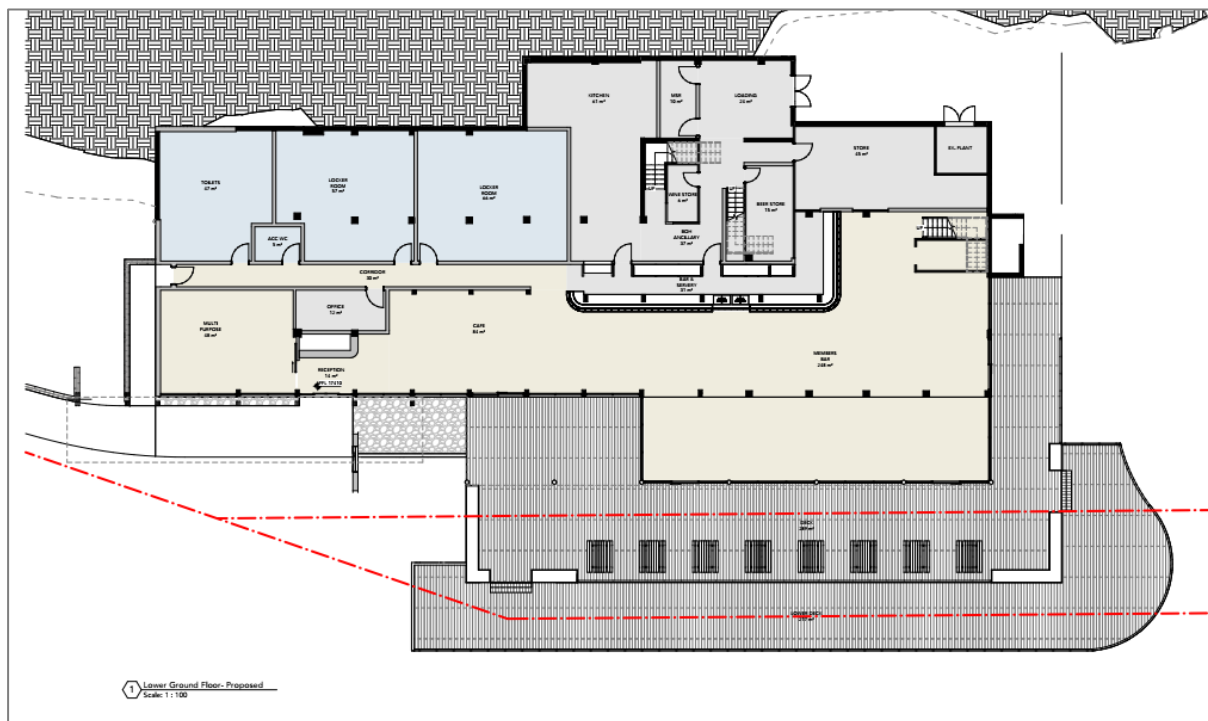


Figure 1. Proposed lower ground floor plan by Team 2 Architects

Koikas Acoustics are not aware of any trading hours limitations for the golf club. This assessment covers operation both before and after midnight and establishes relevant noise controls during each period to enable the club to comply with relevant noise criteria during each period.

The advised maximum capacity for the club is 400. The club currently restricts this to 350 patrons which provide an allowance for an additional 50 persons to include staff members.

Koikas Acoustics has been advised that the premises currently does not cater for significant numbers of patrons, but is proposing the following in terms of patron numbers:

- Up to 150 total patrons located within the lower ground floor areas (Café, Member's Bar, Upper Deck, Lower Deck).
- Allow for a 1-piece music act within the Member's Bar to provide amplified entertainment.
- Ambient background music to be provided outside of the time of amplified entertainment in the Member's Bar and Cafe.
- Allow for up to 200 patrons total within the ground floor areas (Function Room, Dining/Seating area).
- Allow for a DJ to provide amplified entertainment within the Function Room.
- Ambient background music to be provided outside of the time of amplified entertainment in the Function Room and Dining/Seating area.

The golf club is located on the southern side of Golf Avenue and approximately 260 metres west of Mona Vale Beach. The terrain slopes up from the beach to the golf club by approximately 20 metres such that the clubhouse and nearby residential properties have an unobstructed view of the ocean.

With regards to the nearest residential properties, they are located on the northern side of Golf Avenue. The noise assessment has considered potential impacts upon those residential properties nearest and most exposed to noise from the proposed golf club use. These properties are identified as:

- 32 Golf Avenue, Mona Vale (residential townhouses)
- 34-36 Golf Avenue, Mona Vale (residential apartments)
- 40 Golf Avenue, Mona Vale (residential apartments)
- 46 Golf Avenue, Mona Vale (residential townhouses)
- 48 Golf Avenue, Mona Vale (residential apartments)
- 50-52 Golf Avenue, Mona Vale (residential apartments – under construction)



Figure 2. Aerial imagery – Site and surrounds (SixMaps)

3.0 AMBIENT NOISE LEVELS

An unattended noise logging survey was conducted at the site between the 25th and 31st January 2022. The survey was conducted on the upper floor balcony of 46 Golf Avenue which overlooks the golf club and has been identified as a potentially noise-affected receiver location. The ambient noise at this location is expected to be representative of the ambient noise in the local area.

The installed noise logger was a Type 1 Svantek 977. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were stored within the logger memory at recurring 15 minutes intervals.

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

A review of the weather records from the Bureau of Meteorology and the noise level trends observed from the survey suggest 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. Construction works at 50-52 Golf Avenue was noted during the initial site visit and construction noise is evident at times during the survey period. However, given the nature of noise on construction sites, there are sufficient respite periods (breaks in construction noise) that mean the daily background noise levels are largely unaffected.

A summary of the recorded broadband ambient and background noise levels is presented below. The data is presented as per the NSW EPA classification of assessment periods (day/evening/night).

Table 1. Summary of noise logger results [dB]			
Location	Period, T ¹	Rating background level L _{A90}	Ambient noise level L _{Aeq}
46 Golf Avenue, Mona Vale	Day	45	61 ²
	Evening	45	53
	Night	45	51
Notes	- 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. - L_{Aeq} noise levels during the day are affected by construction works occurring on another site. Excluding construction noise, the general ambient noise level in the area between 7 am and 6 pm is around L_{Aeq} 55 dB.		



Octave band background noise levels are required for the assessment of licensed venue noise. The octave band background noise levels, separated into representative assessment periods are presented below.

Table 2. 1/1 octave band and overall background noise levels [L_{A90, Period} dB]									
Description	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1000	2000	4000	8000	
7 am to 6 pm	26	32	34	39	40	39	35	24	45
6 pm to 10 pm	25	31	35	39	40	39	34	25	45
10 pm to midnight	23	30	35	39	40	38	33	22	45
Midnight to 3 am	21	30	35	40	40	37	34	21	45

The survey data show ambient and background levels remaining stable throughout the day/evening/night periods. This is consistent with coastal areas adjacent to the shoreline where the ocean noise (waves crashing) is constant. This environmental noise pattern has been observed by Koikas Acoustics at other locations throughout Sydney.

The constant ambient noise environment in coastal areas differs from other suburban/urban areas that will typically have observed diurnal patterns with reduced background noise during the night hours. This is typically correlated with reduced traffic flows on the surrounding road network.



4.0 NOISE ASSESSMENT GUIDELINES

According to the NSW EPA Noise Guide for Local Government (NGLG), the appropriate regulatory authority (ARA) for the clubhouse (licensed venue) is the current liquor authority (Liquor and Gaming NSW – L&GNSW). This relates to noise emission from patrons, music, gaming machines.

The refurbishment will also require an update to the kitchen ventilation systems. Commercial plant and equipment noise is regulated by the local Council. The Pittwater DCP generally supports adopting noise limits as per the NSW EPA Noise Policy for Industry 2017 (formerly Industrial Noise Policy).

4.1 LICENSED VENUE NOISE

The standard noise condition that is typically applied to noise assessments of licensed venues was originally developed by the Liquor Administration Board (LAB) and is now adopted by Liquor and Gaming NSW (L&GNSW). The criteria require an assessment of noise before and after midnight and as per the 1/1 octave band components of the noise (31.5 Hz to 8 kHz inclusive).

Before midnight (7 am to midnight), the L_{A10} noise level from licensed premises must not exceed the background by more than 5 dB in any 1/1 octave band centre frequency from (31.5 Hz to 8 kHz inclusive) at the boundary of any residential premises.

After midnight (midnight to 7 am) the L_{A10} noise level from licensed premises must not exceed the background noise level in any 1/1 octave band centre frequency (31.5 Hz to 8 kHz inclusive) at any residential boundary, and must not be audible within any habitable room of any residential premises.

Determining compliance with the residential inaudibility clause would require knowledge of the internal ambient noise environment within each habitable room of each identified noise-sensitive residential premises. It is not practically achievable to obtain this data, thus the determination of compliance with the inaudibility clause is based on an external assessment of the noise, whereby noise from licensed premises is deemed to meet this standard where it is shown to be 10 dB below the external ambient background noise level at each 1/1 octave band centre frequency or below the threshold of hearing (T_f - ISO 226:2003) at the corresponding 1/1 octave band centre frequency.

A detailed summary of the licensed area noise criteria with associated 1/1 octave centre frequency bands is provided below.



Table 3. Licensed venue noise criteria, $L_{A10\ 15\ mins}$ [dB]									
Assessment Period	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1k	2k	4k	8k	
7 am to 6 pm: $L_{90} + 5$ (res. boundary)	31	37	39	44	45	44	40	29	50
6 pm to 10 pm: $L_{90} + 5$ (res. boundary)	30	36	40	44	45	44	39	30	50
10 pm to 12 am: $L_{90} + 5$ (res. boundary)	28	35	40	44	45	43	38	27	50
12 am to 3 am: $L_{90} + 0$ (res. boundary)	21	30	35	40	40	37	34	21	45
12 am to 3 am: $L_{90} - 10$ (res. façade)	11	20	25	30	30	27	24	11	35
Notes:									
1.	Inaudibility is determined as the background noise level minus 10 dB.								

4.2 MECHANICAL PLANT AND EQUIPMENT

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 correction +3 dB correction is applied to the project amenity noise level to equate the $L_{Aeq, Period}$ to $L_{Aeq, 15\ minutes}$.

To derive the project amenity noise level, the standard procedure requires a 5 dB reduction to be applied to the recommended amenity noise level. 3 dB is then added to equate it to a 15-minute assessment period. However, the EPA recognises that for areas where cumulative industrial noise is not a consideration because no other industry is present and there is not likely to be any introduced in the future, then the 5 dB reduction need not apply, and the recommended amenity noise level may be considered as the project amenity noise level. This is relevant to the current assessment as no other industrial premises are in the area and it is unlikely any will be in the future. Furthermore, should any additional industrial noise sources be located on the golf club site, they would need to be assessed cumulatively with the existing plant and equipment at the golf club.



Table 4. NPfl planning levels (RESIDENTIAL) – L_{Aeq, 15 minutes} [dB]							
Period,T (Note 1)	Intrusive		Amenity				Project noise trigger level
	RBL	RBL + 5	Area classification	Recomm. amenity noise level	High traffic/ind. area ²	Project amenity noise level	
Day	45	50	Suburban	55	No	55 + 3 = 58	50
Evening	45	50	Suburban	45	No	45 + 3 = 48	48
Night	45	50	Suburban	40	No	40 + 3 = 43	43
Notes:	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. - Does the area meet the EPA requirements for classification as ‘high traffic/industrial noise’?						

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.

4.3 SLEEP DISTURBANCE

The NPfl also includes a ‘maximum noise level assessment’ component that reviews the potential for noise-induced sleep disturbance at night. Mechanical plant noise is generally observed as broadband and steady-state and not relevant for the assessment of maximum noise levels. Where mechanical plant noise is found to comply with the PNTL at night, sleep disturbance is not expected.



5.0 NOISE MODEL

5.1 CADNA-A

Noise emission from the golf club is assessed with the assistance of acoustic modelling conducted using CadnaA.

The program predicts noise levels to receiver points as well as presents a graphical representation of noise level contours for a defined area of interest. The input parameters to this model include the source sound power levels, ground contours, ground absorption/reflections, the presence of any acoustic shielding objects.

Noise propagation calculations are determined under *ISO 9613 Acoustics – Attenuation of sound during propagation outdoors*. The sound propagation algorithms adopted in the ISO standard result in the calculation of a downwind sound pressure level which constitutes an assessment of noise-enhancing weather conditions.

5.1.1 Modelled receiver points

The nearest residential properties that have been assessed are shown in Figure 1. Noise is assessed at several locations on each property as required by the governing criteria.

Licensed venue noise is assessed at the most affected point on the residential boundary before midnight. For multi-level residential buildings, Koikas Acoustics also assesses the noise at upper floor windows and/or balconies. After midnight, in addition to the residential boundary assessment location, licensed venue noise is also assessed outside the most affected residential façade as part of the inaudibility assessment.

Mechanical noise is assessed at the most affected point on or within the residential boundary. For multi-level residential buildings, Koikas Acoustics also assesses the noise at upper floor windows and/or balconies.

Noise levels are assessed at 1.5 metres above the ground or relevant upper floor level at all receiver points.



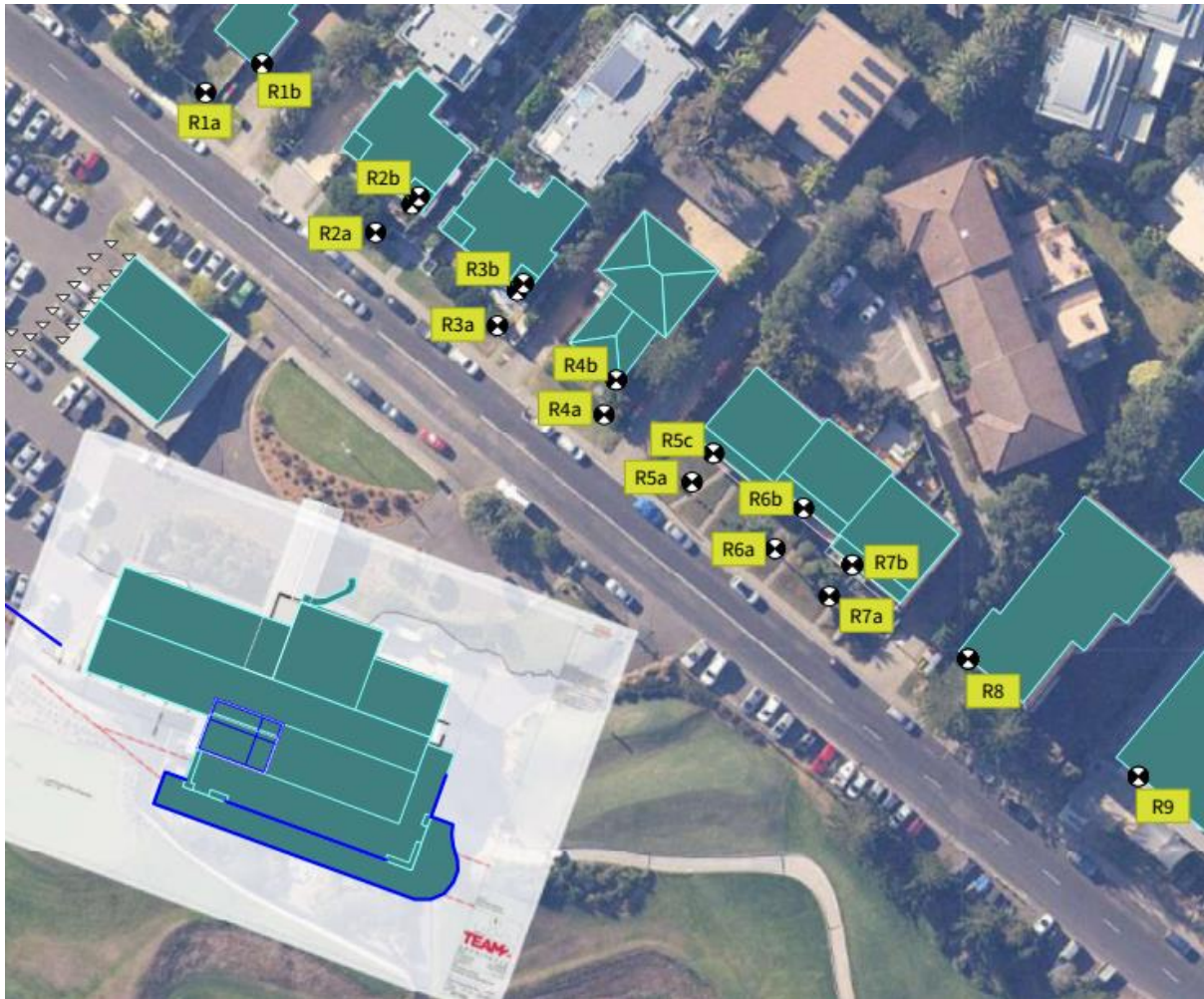


Figure 3. Receiver locations

6.0 NOISE ASSESSMENT OF THE FOOD AND DRINK PREMISES

Noise emitted from the licensed areas of the golf club premises were assessed to the L&GNSW noise criteria at the surrounding residential properties.

6.1 ASSESSMENT SCENARIOS AND MODELLING ASSUMPTIONS

Three (3) assessment scenarios have been considered:

- two (2) before midnight which looks at:
 - ‘typical operation’ which presumes no functions or live entertainment and with some open windows and doors, and
 - ‘maximum operation’ presumes a function occurring and live music in the Member’s Bar downstairs. All windows and doors are presumed closed.
- one (1) after midnight scenario which assumes maximum internal operation (ie. a function and live music in the Member’s Bar) and limited patrons outdoors on the balcony and deck areas.

Specific details related to each assessment are presented in the table below.

Table 5. Licensed venues assessment scenarios			
Club area	Assessment scenario		
	Before midnight (typical operation)	Before midnight (maximum operation)	After midnight
Function Room	No functions – area used as an extension of the Bistro/Dining. Windows open.	Small function – internal L_{A10} noise level of 90 dB. Windows and doors closed.	Small function – internal L_{A10} noise level of 90 dB. Windows and doors closed.
Bistro Dining	Patrons (150) and background music. Windows open.	Patrons (150) and background music. Windows and doors closed.	Patrons (150) and background music. Windows and doors closed.
Café and Member’s Bar	Patrons and background music only – no live performer. Doors open.	60 patrons and a solo artist musician. Windows and doors closed.	60 patrons and a solo artist musician. Windows and doors closed.
Upper deck	50 patrons – 50% talking with raised voice	50 patrons – 50% talking with raised voice	40 patrons – 50% talking with raised voice – restricted occupiable area
Lower deck	50 patrons – 50% talking with raised voice	50 patrons – 50% talking with raised voice	Not occupied
Existing balcony	30 patrons – 50% talking with raised voice	30 patrons – 50% talking with raised voice	30 patrons – 50% talking with raised voice



Sound transmission loss values are included in the noise model to represent noise breakout via the glazing as follows:

1. 6.38 mm thick laminated glass windows and doors, built into aluminium frames and with acoustic seals.

6.2 SOURCE NOISE LEVELS

Noise data used in the assessment is sourced from:

- Database noise levels (measurements conducted at similar premises) and
- Published noise data from other reference material such as research papers, acoustical texts etc.

Database noise levels obtained from surveys conducted at similar licensed premises have been used as a base to establish representative internal noise levels within the internal Bistro/Dining area, Function Room, and new Member's Bar/Cafe.

Sound power levels attributed to patrons conversing in the terrace have been sourced from published sound power levels for human talker's conversing at 'raised' speech levels/vocal effort. A group size (ie. number of patrons per 1 speaking patron) is typically taken as 2-3. A group size of 2 is adopted for this assessment (50% speaking at one time). A directivity correction that applies to the random orientation of each speaking patron (what direction the head is facing) is also applied in the noise model. The indicated sound power levels for raised voice speech in the table below do not show the effect of directivity corrections.



Table 6. Noise level data, [L_{A10} dB]									
Measurement	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1k	2k	4k	8k	
Average noise level inside a Function Room hosting a small function/event (DJ music dominant).	65	74	79	83	86	82	77	68	90
Average noise level inside Bistro/Dining 150 patrons + background music.	43	55	63	70	71	70	66	58	76
Average noise level inside a bar with a solo musician playing and approx.. 60 patrons.	45	63	68	78	78	76	68	57	83
Sound power level 1 person (raised voice)	47	56	64	74	74	69	64	53	78
Sound power level 50 people (50% raised voice)	61	70	78	88	88	83	78	67	92
Sound power level 30 people (50% raised voice)	59	68	76	86	86	81	76	65	90

6.3 IDENTIFIED NOISE SENSITIVE RECEIVERS

Assessment locations are identified in Figure 3.

6.4 PREDICTED RECEIVER LEVELS

The following noise levels are predicted to surrounding residential receivers and are inclusive of the recommended noise controls further specified in this report. For conciseness, only the noise levels predicted at the most affected location for each receiver are shown.

6.4.1 Before midnight – typical operation

Table 7. Receiver noise levels – Before midnight – typical operation, L_{A10} [dB]									
Description	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1k	2k	4k	8k	
Background + 5 criterion (10 pm to 12 am)	28	35	40	44	45	43	38	27	50
R1: (L1 balcony)	-3	14	18	26	25	19	12	-5	30
R2: (L1 balcony)	0	16	21	27	25	19	13	-2	30
R3: (L1 balcony)	2	19	27	37	36	30	23	7	40
R4: (GF front boundary)	7	24	31	40	40	35	30	18	44
R5: (GF front boundary)	7	25	32	42	42	37	31	18	46
R6: (GF front boundary)	7	26	33	43	43	37	32	19	47
R7: (GF front boundary)	6	25	31	42	42	37	31	18	46
R8: (L3 window)	5	22	29	39	39	34	27	13	43
R9: (L1 balcony)	2	19	25	37	37	31	24	9	41

The noise levels are shown to comply with the L&GNSW assessment criteria.



6.4.2 Before midnight – maximum operation

Table 8. Receiver noise levels – Before midnight – typical operation, L_{A10} [dB]									
Description	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1k	2k	4k	8k	
Background + 5 criterion (10 pm to 12 am)	28	35	40	44	45	43	38	27	50
R1: (L1 balcony)	1	13	18	26	25	17	10	-8	29
R2: (L1 balcony)	3	16	20	27	25	17	9	-8	30
R3: (L1 balcony)	4	19	27	36	36	29	22	6	40
R4: (GF front boundary)	4	23	29	40	39	32	25	12	43
R5: (GF front boundary)	3	23	30	41	41	34	27	12	45
R6: (GF front boundary)	3	25	31	42	42	35	28	13	46
R7: (GF front boundary)	2	25	30	41	42	35	28	12	45
R8: (L3 window)	1	21	28	39	39	32	24	8	43
R9: (L1 balcony)	-2	18	24	37	36	29	22	4	40

The noise levels are shown to comply with the L&GNSW assessment criteria.

6.4.3 After midnight

Licensed premises noise levels (L_{10}) must not exceed the background noise level at the residential boundary at any time after midnight or before 7 am. Furthermore, noise from the licensed premises must not be audible within any residential premises after midnight or before 7 am. It is generally the inaudibility requirement that determines the type and extent of noise controls/management measures required for a licensed premise to operate in compliance with the noise criteria.

After midnight noise controls generally require all windows and doors to be closed to contain any noise from internal areas of a venue to within the venue. Restrictions on or limits to the use of outdoor areas will also typically apply. In some cases, it may be that outdoor areas cannot be reasonably or feasibly operated without significant risk of generating audible noise in nearby residential properties.

For the clubhouse at Mona Vale Golf Club to operate after midnight and comply with the requirements of the L&GNSW criteria, windows and doors to both the lower ground floor and ground floor levels must be closed, the lower deck area must not be occupied, and significant restrictions imposed on the use of the upper deck area.

The restrictions imposed on the use of the upper deck area are that only a small portion of the deck may be occupied by 40 patrons after midnight. The restricted area is highlighted below.



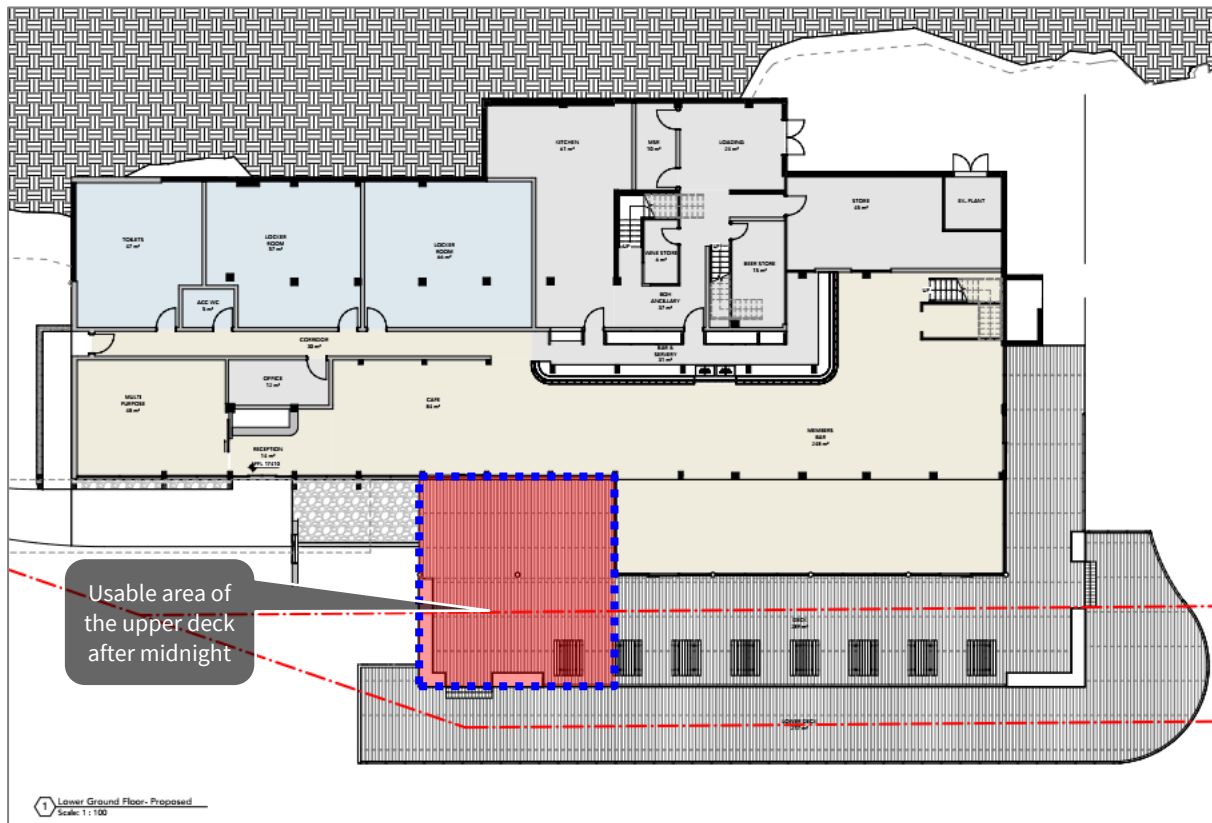


Figure 4. Restricted deck area after midnight – Plan by Team 2 Architects

Tables 9 and 10 present the calculated noise levels at the residential boundary (Table 9) and residential facades (Table 10) during after midnight operation and presuming the following:

- A function occurring in the Function Room
- Patrons talking in the Bistro/Dining area with background music
- A solo musician providing entertainment in the Member's Bar/Café
- Up to 30 patrons talking on the existing balcony
- Up to 40 patrons talking in the restricted upper deck area

Table 9. Receiver noise levels – After midnight at the residential boundary, L_{A10} [dB]

Description	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1k	2k	4k	8k	
Background + 0 criterion (12 am to 3 am)	21	30	35	40	40	37	34	21	45
R1: (L1 window)	1	10	13	19	16	8	1	-16	22
R2: (L1 window)	3	13	16	22	21	14	7	-10	26
R3: (L1 window)	4	13	17	25	21	14	6	-10	27
R4: (GF front boundary)	4	14	16	23	20	15	7	-10	26
R5: (GF front boundary)	3	15	17	24	22	16	7	-9	27
R6: (GF front boundary)	3	14	17	24	22	16	7	-9	27
R7: (GF front boundary)	2	14	15	23	21	14	6	-11	26
R8: (L2 window)	1	10	12	20	17	11	2	-16	23
R9: (GF window)	-2	7	8	15	13	17	9	-10	21

The noise levels are shown to comply with the L&GNSW assessment criteria at the residential boundary.

Table 10. Receiver noise levels – After midnight at the residential facades, L_{A10} [dB]

Description	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1k	2k	4k	8k	
Inaudibility criterion: background -10 (12 am to 3 am)	11	20	25	30	30	27	24	11	35
R1: (L1 window)	1	10	13	19	16	8	1	-16	22
R2: (L1 window)	3	13	16	22	21	14	7	-10	26
R3: (L1 window)	4	13	17	25	21	14	6	-10	27
R4: (L1 window)	4	14	16	23	19	14	5	-12	26
R5: (L1 window)	4	14	16	23	20	15	6	-10	26
R6: (L1 window)	3	13	15	22	20	14	5	-12	25
R7: (L1 window)	3	12	15	22	19	14	5	-12	25
R8: (L2 window)	1	10	12	20	17	11	2	-16	23
R9: (GF window)	-2	7	8	15	13	17	9	-10	21

The noise levels are shown to meet the criteria adopted by Koikas Acoustics for residential inaudibility resulting in compliance with the L&GNSW assessment criteria.

6.5 RECOMMENDATIONS

This report finds that the following noise control/noise management strategies are recommended for the Mona Vale Golf Club clubhouse:



- Windows and doors in the Function Room, Bistro/Dining, and Member's Bar/Café may be open when amplified entertainment is not occurring and only before midnight.
- Function Room doors/windows must be closed during functions/events.
- Member's Bar/Café windows/doors must be closed during live entertainment (advised to be from a solo musician).
- After midnight, all windows and doors must be closed.
- The design occupancy level for the existing balcony is 30 patrons at any one time, before or after midnight.
- The design occupancy level for the proposed upper deck is 50 patrons at any one time before midnight.
- After midnight, the upper deck shall be restricted in usable floor area and patron numbers such that a maximum of 40 patrons are permitted to occupy the small area adjacent to the Cafe – see Figure 4.
- The design occupancy level for the proposed lower deck is 50 patrons at any one time before midnight.
- The lower deck shall not be occupied after midnight.
- Small speakers may be used to provide background/ambient music for the outdoor deck areas. The speakers shall be located only on the southern façade of the clubhouse building and directed out over the deck. Music levels should be provisionally set to not exceed $L_{A10,15}$ minutes 75 dB at 1 metre from any speaker.



7.0 NOISE ASSESSMENT OF MECHANICAL PLANT

The refurbishment works to the lower ground floor level of the clubhouse at Mona Vale Golf Club will require the installation of new kitchen ventilation systems (supply and exhaust air). At this stage of the project (application), the system design and equipment selections have not been completed. It is not possible to conduct a detailed assessment of the new kitchen ventilation system without the design and selections being completed.

We can, however, calculate the existing mechanical plant noise levels at each nearby residence from the current air conditioning and refrigeration systems. This will allow us to set a provisional limit on the noise emission levels for the kitchen exhaust equipment. The subsequent design of the kitchen ventilation systems can then incorporate appropriate noise control measures such that the combined mechanical noise emission from the golf club meets the project noise criteria at nearby residential premises.

7.1 EXISTING MECHANICAL PLANT NOISE LEVELS

The existing air conditioning and refrigeration plant and equipment were measured by Koikas Acoustics on the 24th of January 2022. Measurements were conducted with an NTi Audio XL2 sound level meter. The instrument was field calibrated before and after the survey with no system drift recorded.

At the time of conducting the noise survey, one of the main air conditioning units was not operational thus could not be measured. It was, however, observed to be identical to a second condenser unit that was operating thus the data recorded for the operational condenser is implied for the non-operational condenser in the assessment.

Several small individual condenser units were observed but not operating. Given the low noise generation from such units, and the negligible impact they would have on surrounding residents, they have been excluded from the assessment.

A summary of the measured sound pressure levels and derived sound power levels are presented below.



Table 11. Mechanical plant noise levels. dB(A)

Source	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1 k	2 k	4 k	8 k	
AC condenser unit – noise level measured at 2 metres	43.7	54.6	65.0	68.7	67.7	63.8	56.8	46.4	72.9
AC condenser unit – calculated sound power level	54.7	65.6	76.0	79.7	78.7	74.8	67.8	57.4	83.9
Refrigeration compressors – noise level measured at 3 metres	39.3	47.4	59.0	60.1	63.1	60.0	55.4	47.1	67.3
Refrigeration compressors – calculated sound power level	55.1	63.2	74.8	75.9	78.9	75.8	71.2	6.9	83.0

7.2 ASSESSMENT LOCATIONS

Noise levels are assessed at the boundary of each identified residential property, be that at the ground floor boundary line or upper floor balcony/window location. Indicative receiver locations are shown in Figure 3.

7.3 RECEIVER LEVELS - INTRUSIVE

The following noise levels are predicted at each assessment location. Only the worst-affected location for each receiver is shown. A -2 dB (evening) and -3 dB (night) correction is applied to account for reduced loading capacities on the equipment resulting from lower external ambient temperatures.

Table 12. Receiver noise levels - Mechanical [dB]

Receiver ID	Noise criteria – $L_{Aeq, 15 \text{ minutes}}$			Receiver noise level – $L_{Aeq, 15 \text{ minutes}}$		
	Day	Evening	Night	Day	Evening	Night
R1 (L1 balcony)	50	48	43	36	34	33
R2 (L1 balcony)	50	48	43	45	43	42
R3 (L1 balcony)	50	48	43	43	41	40
R4 (L1 window)	50	48	43	41	39	38
R5 (L1 balcony)	50	48	43	44	42	41
R6 (L1 balcony)	50	48	43	42	40	39
R7 (L1 balcony)	50	48	43	45	43	42
R8 (L2 window)	50	48	43	42	40	39
R9 (L1 balcony)	50	48	43	36	34	33

The existing plant and equipment comply with the NPfI PNTL. Any noise generated by the new kitchen ventilation systems must be suitably mitigated so as not to result in a cumulative noise exceeding the PNTL.



7.4 RECOMMENDATIONS

This assessment for the DA does not include any potential noise generated by the proposed new kitchen ventilation systems. This noise must be assessed cumulatively with the operational noise emitted by the existing air conditioning and refrigeration systems.

A meaningful assessment can only be completed once the kitchen ventilation equipment selection is known. This typically occurs during the detailed design phase of works and before the Construction Certificate application. **A detailed review of mechanical plant noise emission should be completed for the CC documentation.**



8.0 CONCLUSION

This report presents the results of an acoustical assessment conducted for the proposed Mona Vale Golf Club clubhouse refurbishment works.

In terms of the approval requirements, the assessment considers potential noise impacts to surrounding noise sensitive receivers, identified as residential receivers on the northern side of Golf Avenue.

The applied residential criteria are referenced from the standard noise conditions adopted by L&GNSW and the NSW EPA.

Both criteria are derived from the existing ambient noise environment. In this case, the site is proximate to Mona Vale Beach which generates a constant noise throughout the day and night due to the crashing of waves. This results in a steady background noise that does not follow typical diurnal patterns associated with non-coastal locations whereby the background noise is commonly governed by traffic.

The assessment finds that:

1. Licensed venue noise is calculated to comply with the L&GNSW standard L_{A10} assessment criteria during trading hours both before and after midnight on the presumption of adopting suitable noise control recommendations as included within this report.
2. Existing air conditioning and refrigeration plant and equipment noise levels are found to comply with the PNTL for the site. Any additional noise that may be generated by the proposed new kitchen ventilation systems shall not result in an increase in noise level at the residential assessment locations above the PNTL as defined in this report. A detailed assessment and design of noise controls (where required) shall be completed before the CC.

It is the finding of this report that the proposed development will comply with the project noise criteria as established within this report.



APPENDIX A

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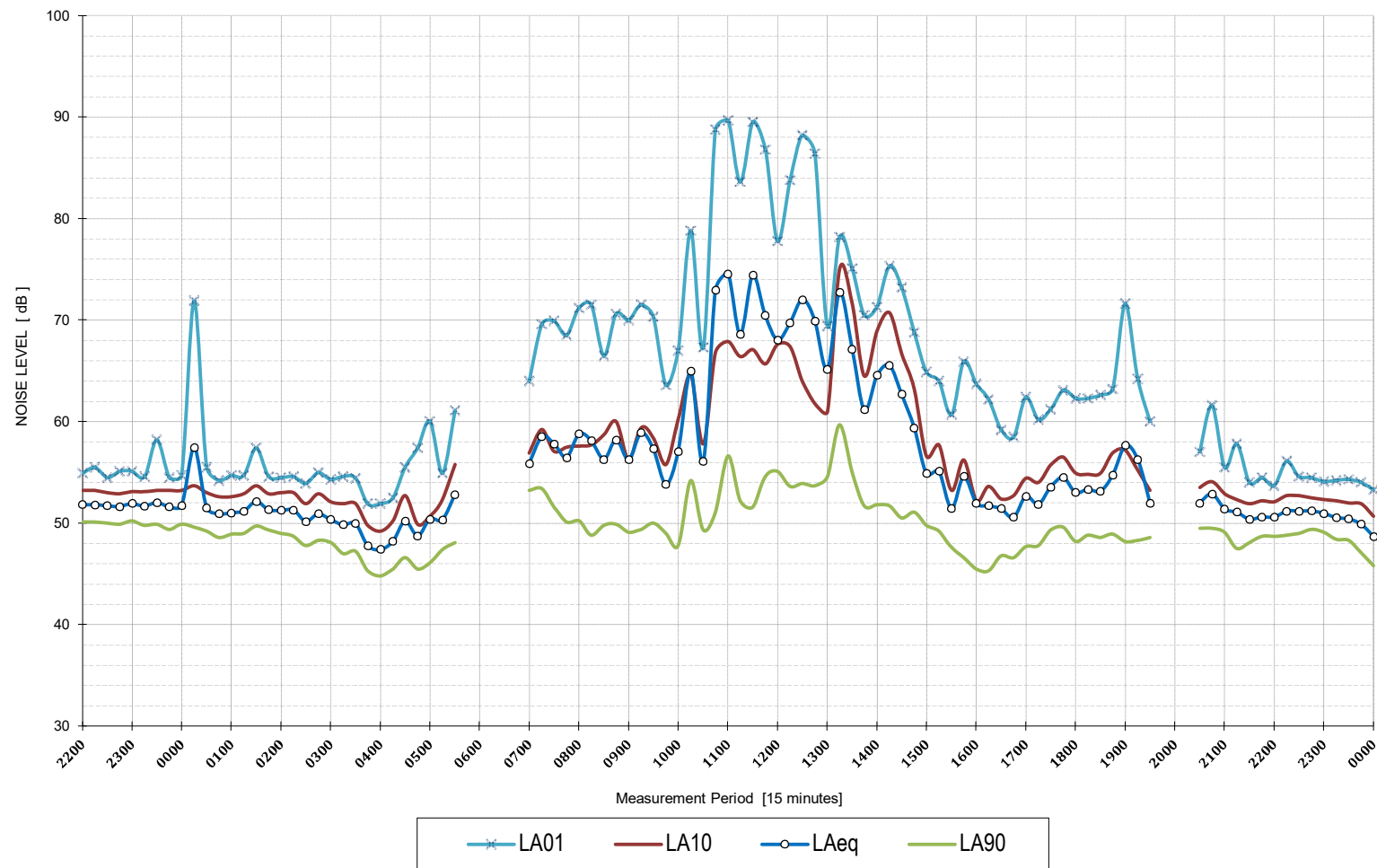
A**

APPENDIX A

DAY 1

LOGGER LOCATION: 46 Golf Ave, Mona Vale

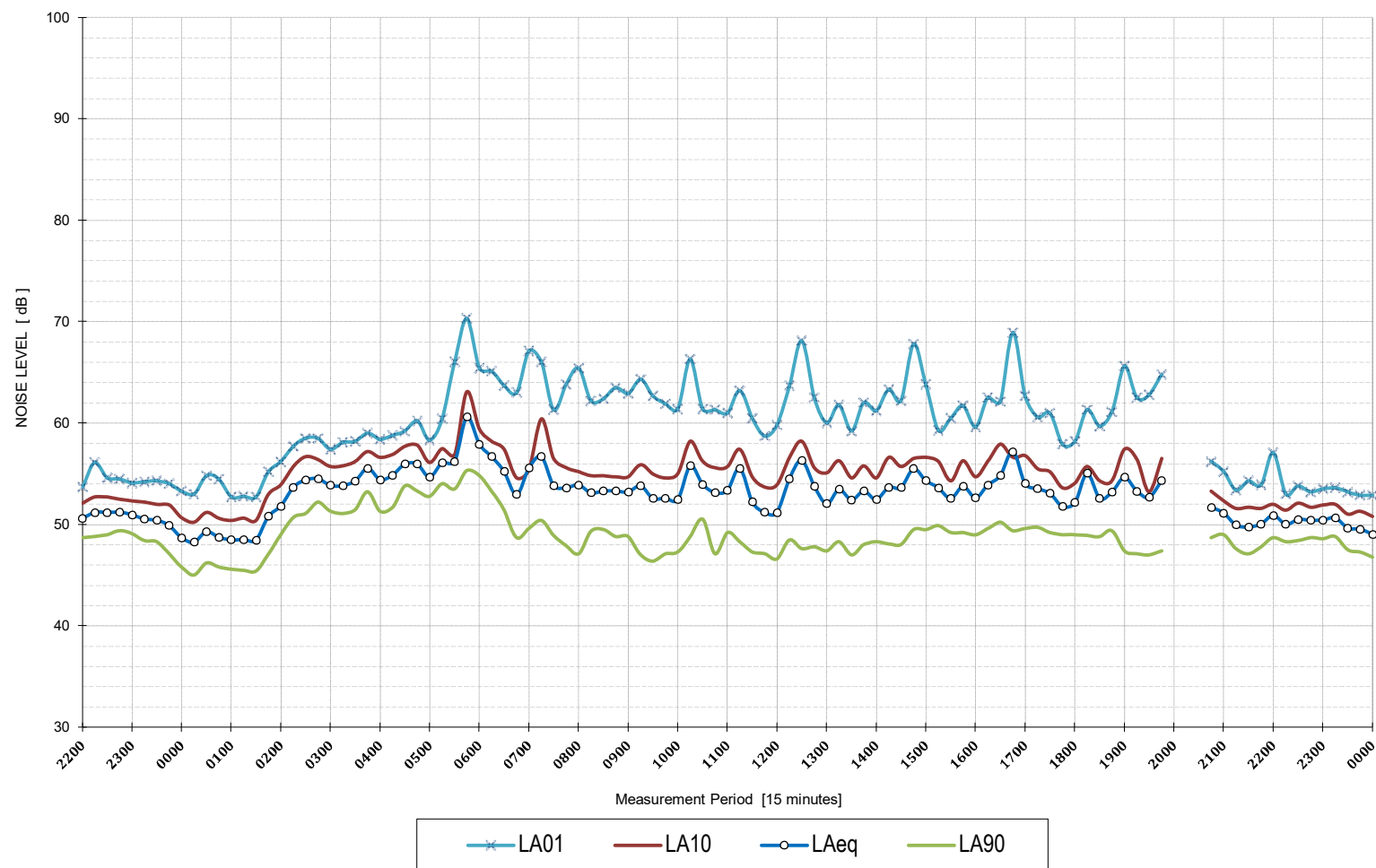
DATE: Tuesday, 25 January 2022



DAY 2

LOGGER LOCATION: 46 Golf Ave, Mona Vale

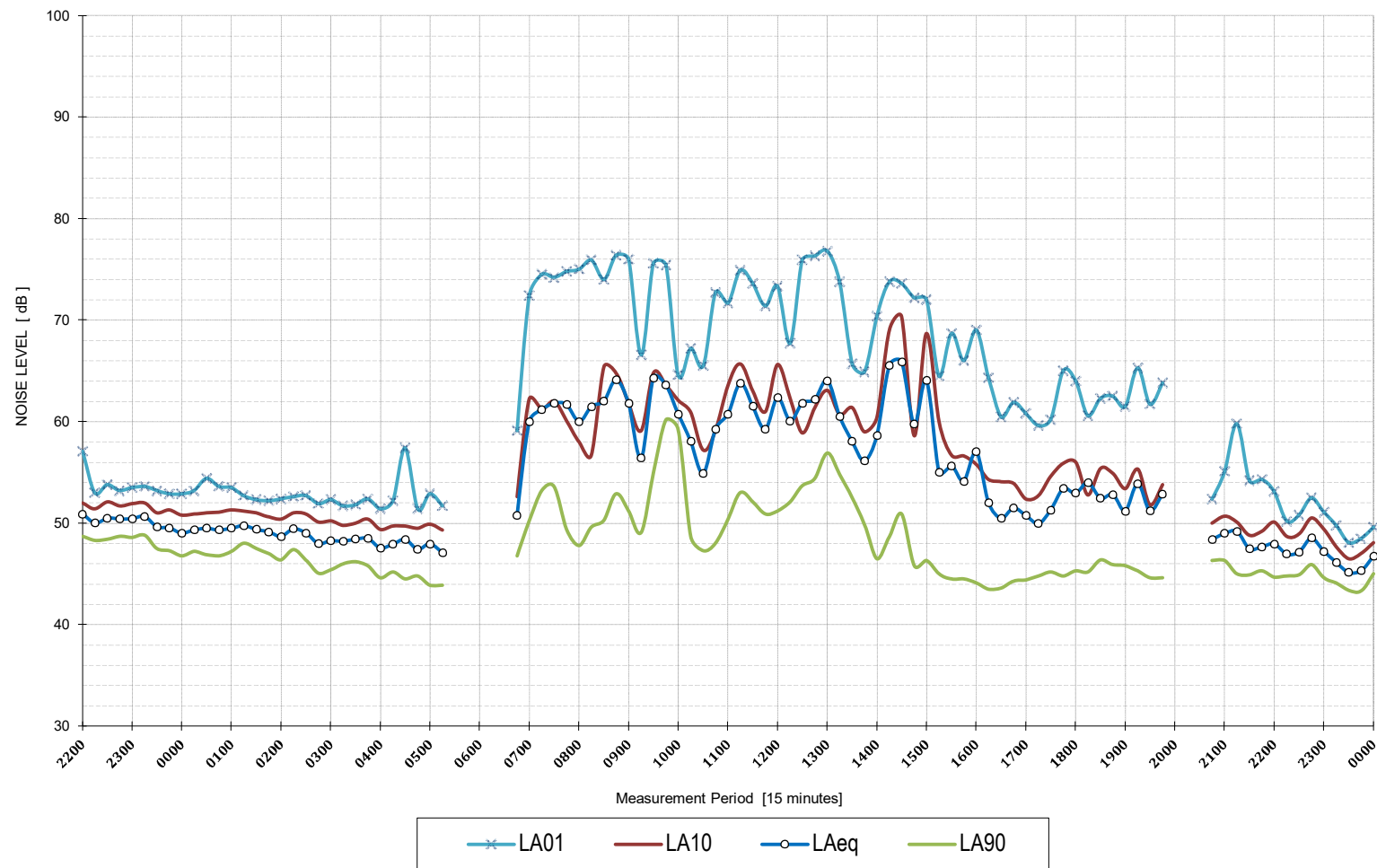
DATE: Wednesday, 26 January 2022



DAY 3

LOGGER LOCATION: 46 Golf Ave, Mona Vale

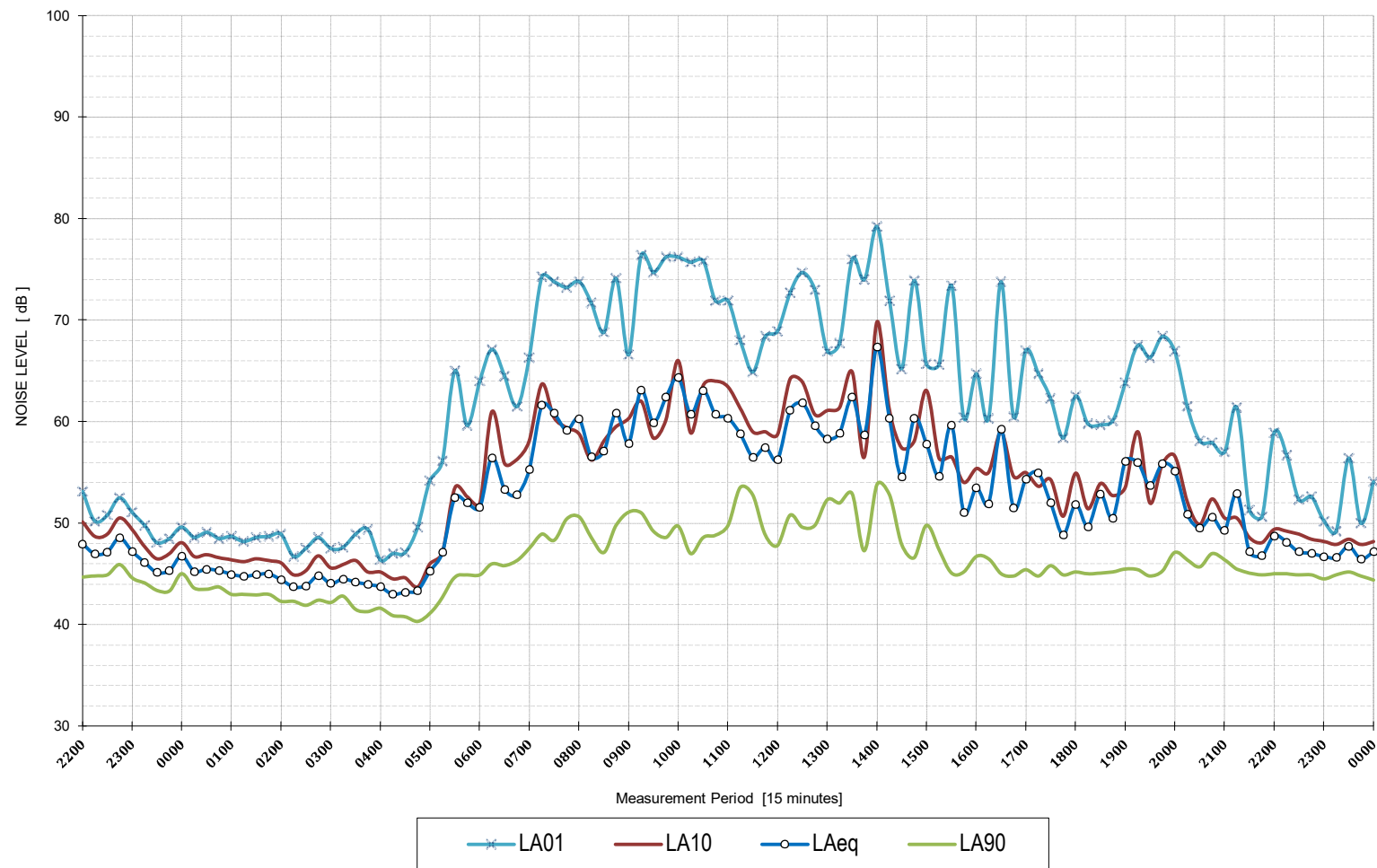
DATE: Thursday, 27 January 2022



DAY 4

LOGGER LOCATION: 46 Golf Ave, Mona Vale

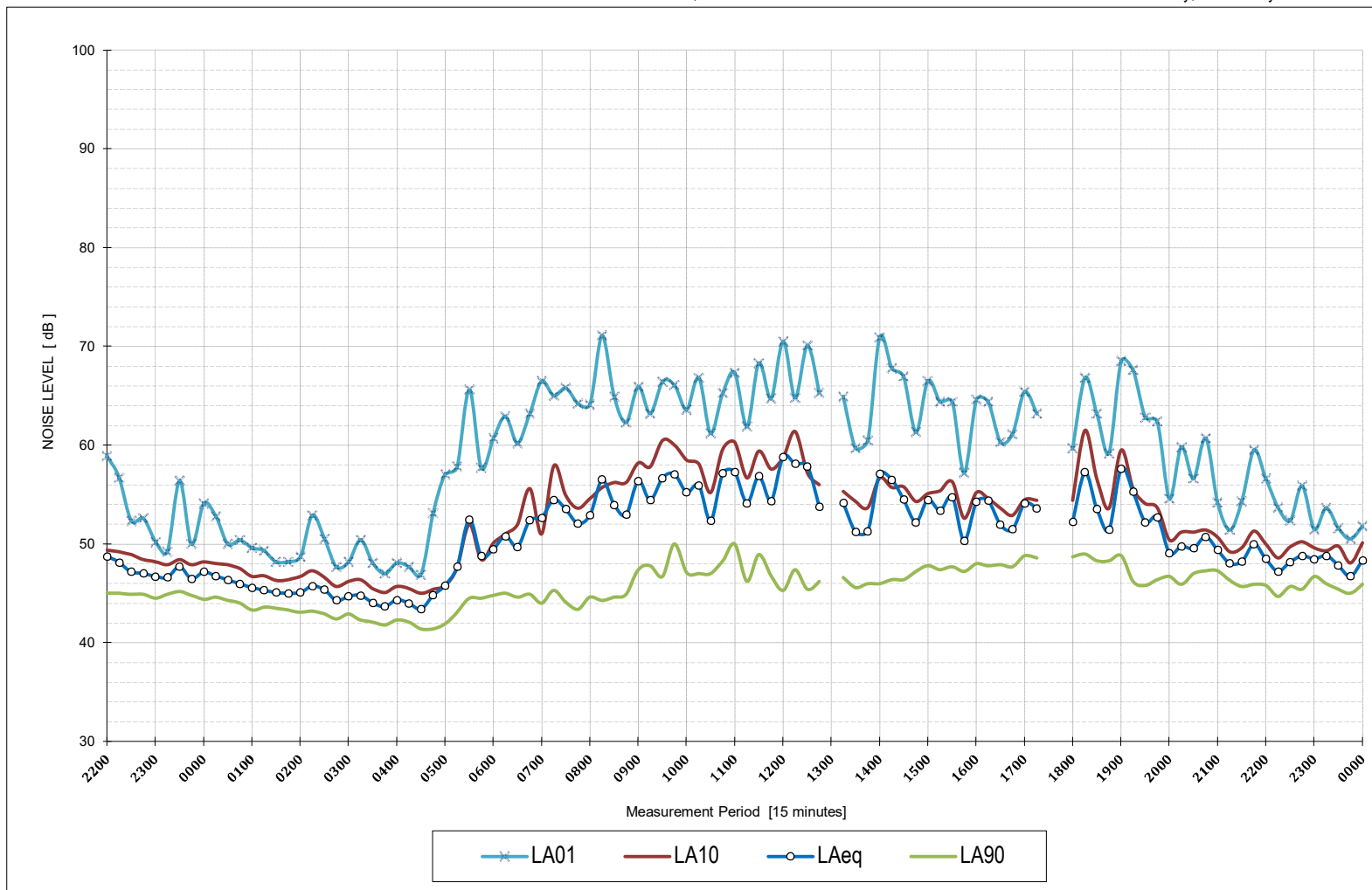
DATE: Friday, 28 January 2022



DAY 5

LOGGER LOCATION: 46 Golf Ave, Mona Vale

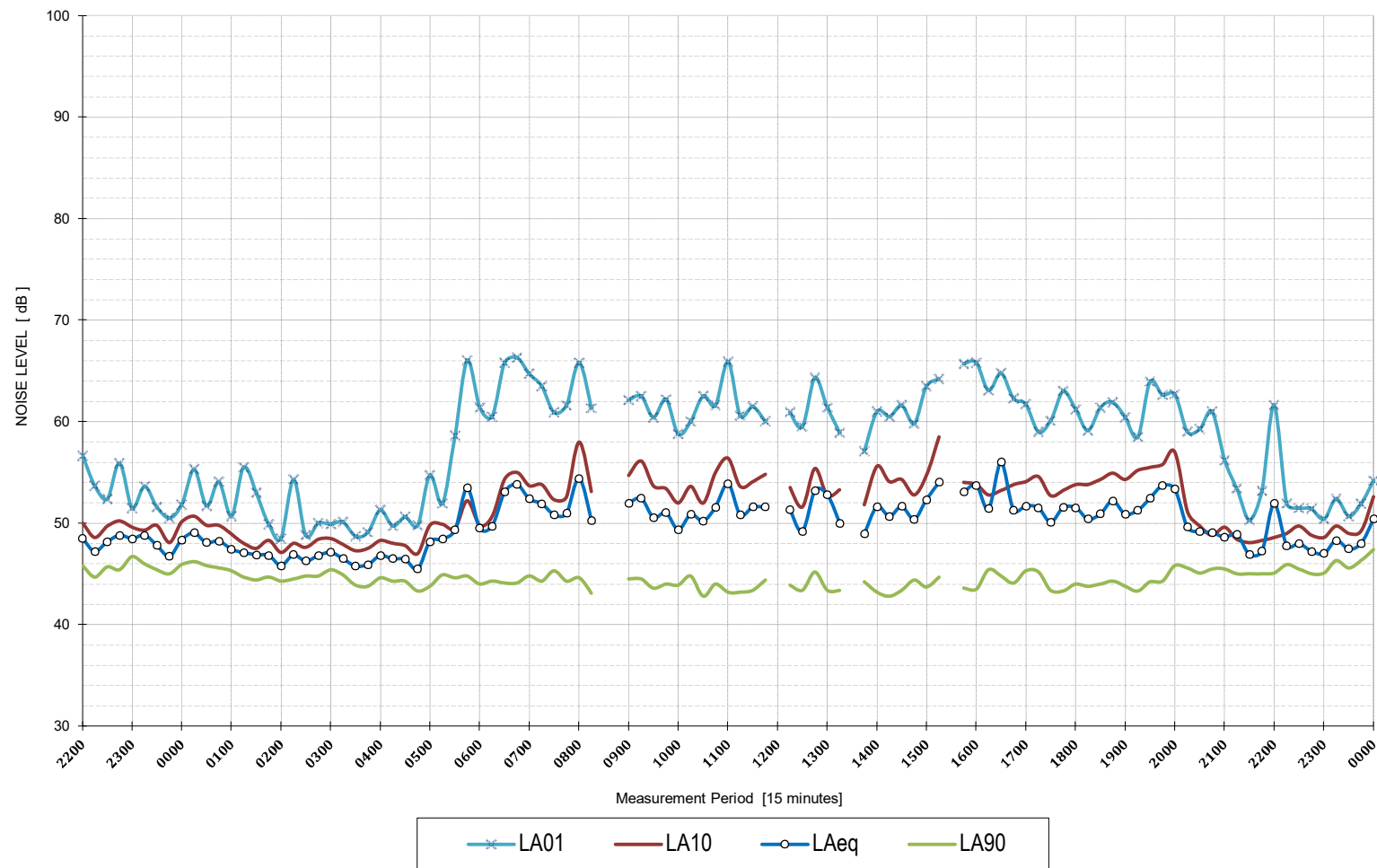
DATE: Saturday, 29 January 2022



DAY 6

LOGGER LOCATION: 46 Golf Ave, Mona Vale

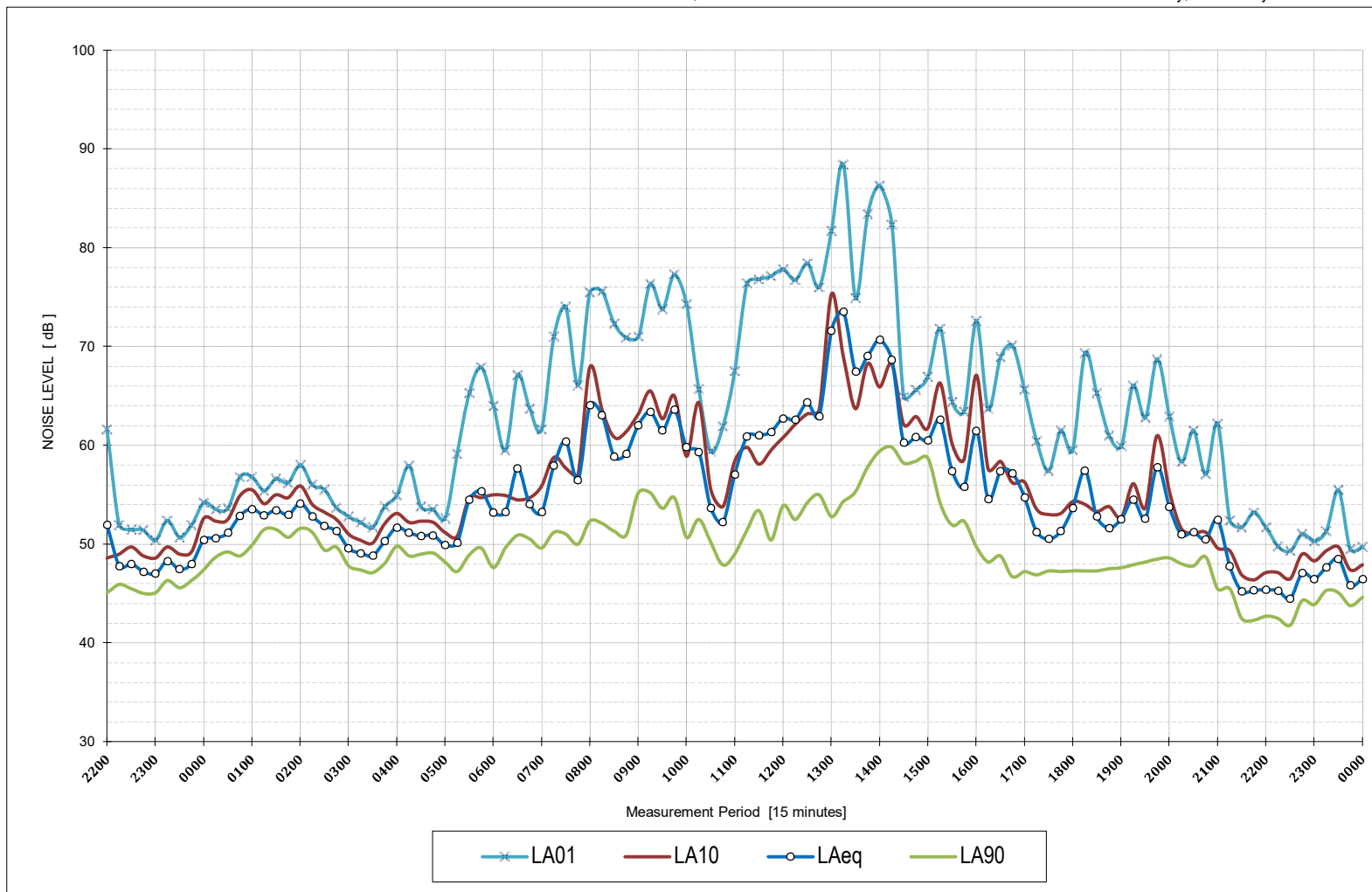
DATE: Sunday, 30 January 2022



DAY 7

LOGGER LOCATION: 46 Golf Ave, Mona Vale

DATE: Monday, 31 January 2022

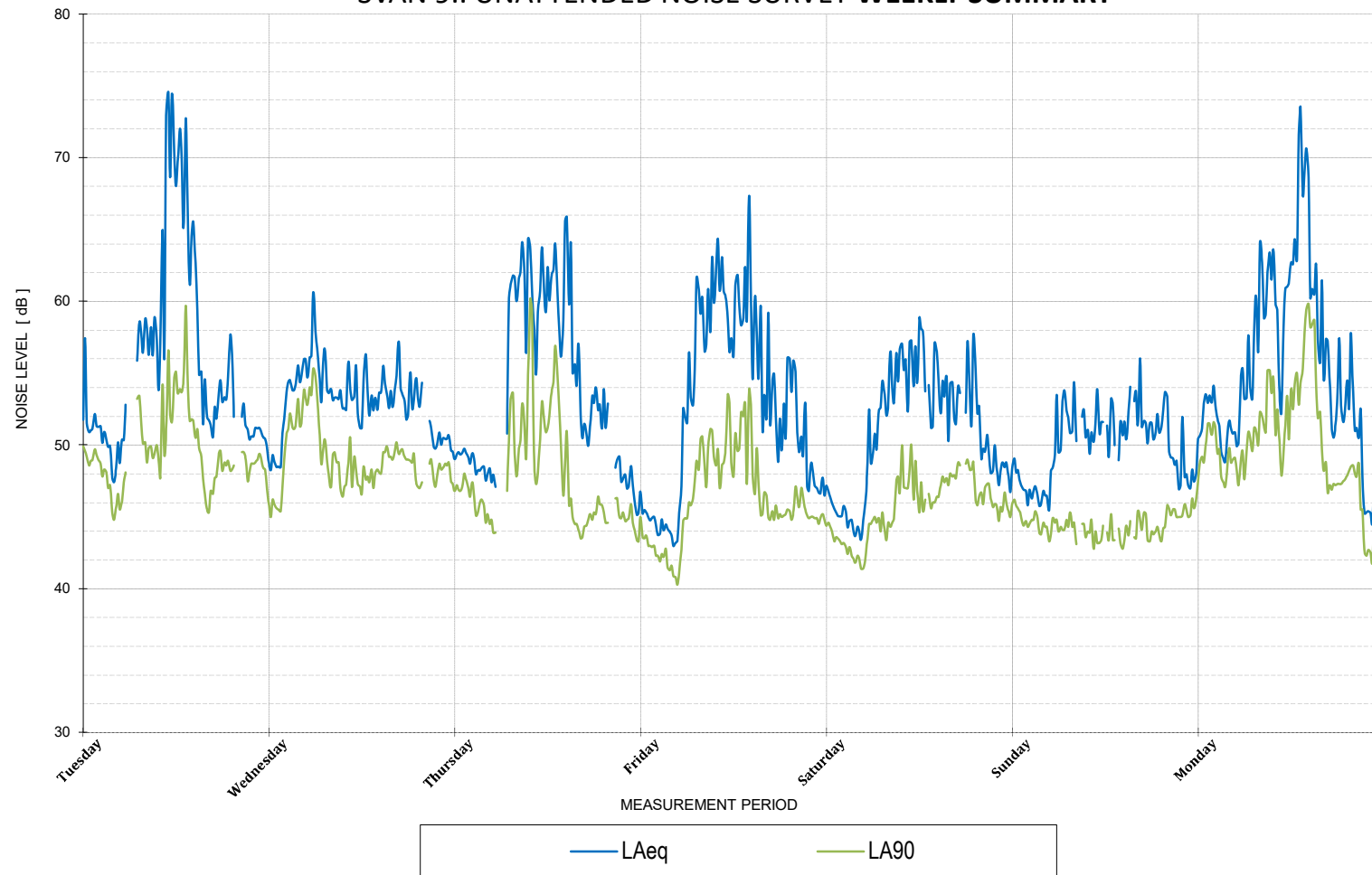


WEEKLY SUMMARY

LOGGER LOCATION: 46 Golf Ave, Mona Vale

PERIOD: 25th to the 31st January 2022

SVAN 9.. UNATTENDED NOISE SURVEY WEEKLY SUMMARY



Sundays and Public Holidays the hours change to 0800

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** NOISE SOURCES **

LICENSED VENUE NOISE [Operation before midnight]

- ~ 50 patrons on the upper deck
50% talking with raised voice
- ~ 50 patrons on the lower deck
50% talking with raised voice
- ~ 30 patrons on the existing balcony
50% talking with raised voice
- ~ Noise breakout from the Function Room - No function - open windows and doors (6.38 mm lam)
- ~ Noise breakout from the Bistro/Dining via open windows/doors (6.38 mm lam)
- ~ Noise breakout from the Cafe/Member's Bar via open doors (6.38 mm lam)

NOTES:

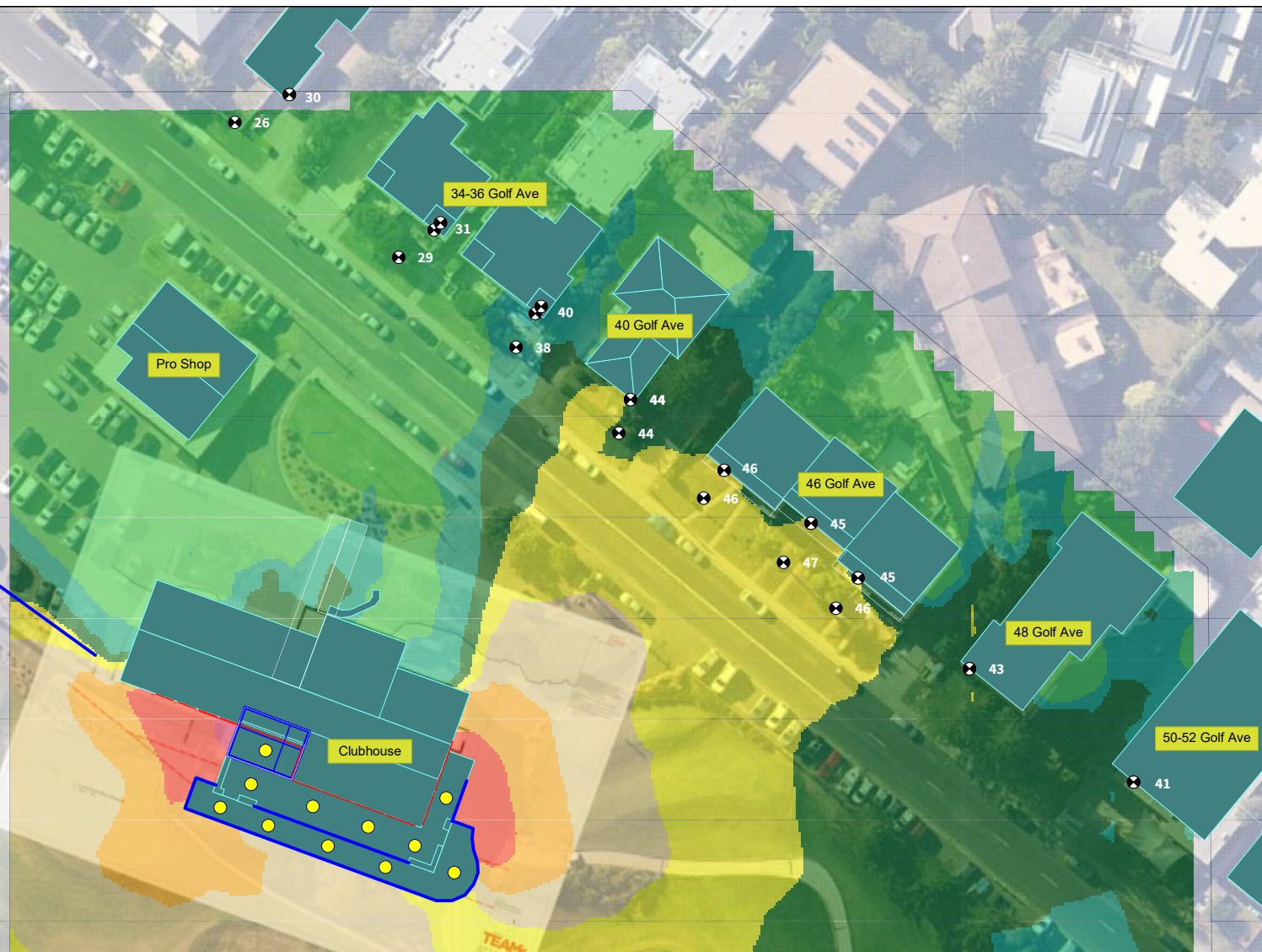
1. Noise levels shown are LA10 15 mins
2. Noise levels shown at 1.5 m above the ground or relevant upper floor level

PRINT DATE: 04.02.2022

VERSION: 5255 - Pre12(typ) - v20220204

- Point Source
- vert. Area Source
- Building
- Barrier
- 3D-Reflector
- Ground Absorption
- ▽ Height Point
- Contour Line
- ⊗ Receiver
- Calculation Area

- ... < 35.0
- 35.0 <= ... < 40.0
- 40.0 <= ... < 45.0
- 45.0 <= ... < 50.0
- 50.0 <= ... < 55.0
- 55.0 <= ... < 60.0
- 60.0 <= ... < 65.0
- 65.0 <= ... < 70.0
- 70.0 <= ... < 75.0
- 75.0 <= ... < 80.0
- 80.0 <= ... < 85.0
- 85.0 <= ... < 90.0
- 90.0 <= ... < 95.0
- 95.0 <= ... < 100.0
- 100.0 <= ...



Job number: 5255
Client: Mona Vale Golf Club
Site address: 3 Golf Avenue, Mona Vale
Assessed to: See acoustic report
Limiting criteria: See acoustic report

** NOISE SOURCES **

LICENSED VENUE NOISE [Operation before midnight]

- ~ 50 patrons on the upper deck
50% talking with raised voice
- ~ 50 patrons on the lower deck
50% talking with raised voice
- ~ 30 patrons on the existing balcony
50% talking with raised voice
- ~ Noise breakout from the Function Room via closed windows and doors (6.38 mm lam)
- ~ Noise breakout from the Bistro/Dining via closed windows/doors (6.38 mm lam)
- ~ Noise breakout from the Cafe/Member's Bar via closed windows/doors (6.38 mm lam)

NOTES:

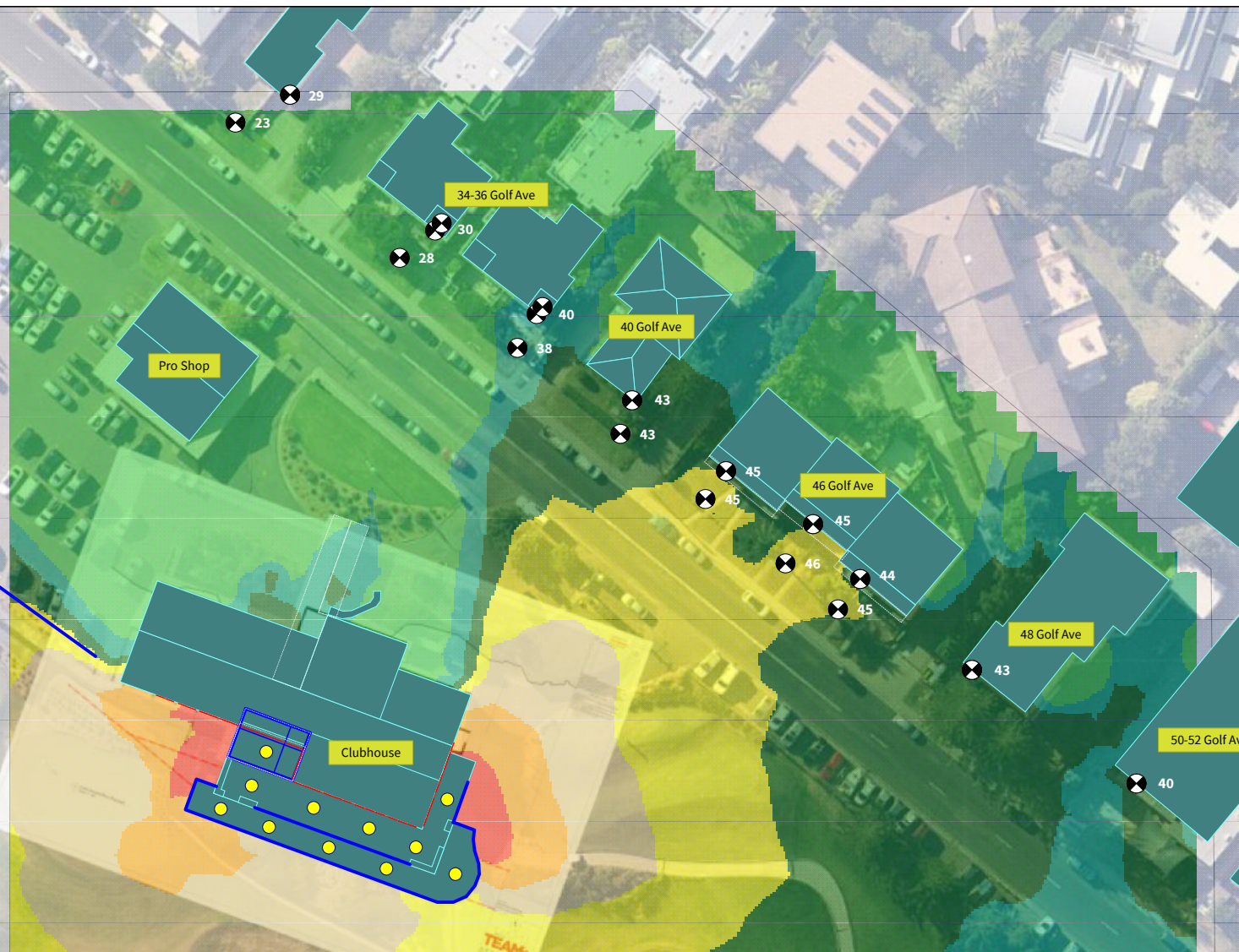
- Noise levels shown are LA10 15 mins
- Noise levels shown at 1.5 m above the ground or relevant upper floor level

PRINT DATE: 04.02.2022

VERSION: 5255 - Pre12(max) - v20220204

- Point Source
- vert. Area Source
- Building
- Barrier
- 3D-Reflector
- Ground Absorption
- ▽ Height Point
- Contour Line
- ⊗ Receiver
- Calculation Area

- ... < 35.0
- 35.0 <= ... < 40.0
- 40.0 <= ... < 45.0
- 45.0 <= ... < 50.0
- 50.0 <= ... < 55.0
- 55.0 <= ... < 60.0
- 60.0 <= ... < 65.0
- 65.0 <= ... < 70.0
- 70.0 <= ... < 75.0
- 75.0 <= ... < 80.0
- 80.0 <= ... < 85.0
- 85.0 <= ... < 90.0
- 90.0 <= ... < 95.0
- 95.0 <= ... < 100.0
- 100.0 <= ...



Job number: 5255
Client: Mona Vale Golf Club
Site address: 3 Golf Avenue, Mona Vale
Assessed to: See acoustic report
Limiting criteria: See acoustic report



** NOISE SOURCES **

LICENSED VENUE NOISE [Operation after midnight]

- ~ 40 patrons on the upper deck
50% talking with raised voice
- ~ 30 patrons on the existing balcony
50% talking with raised voice
- ~ Noise breakout from the Function Room via closed windows/doors (6.38 mm lam)
- ~ Noise breakout from the Bistro/Dining via closed windows/doors (6.38 mm lam)
- ~ Noise breakout from the Cafe/Member's Bar via closed windows/doors (6.38 mm lam)

NOTES:

1. Noise levels shown are LA10 15 mins
2. Noise levels shown at 1.5 m above the ground or relevant upper floor level

PRINT DATE: 04.02.2022

VERSION: 5255 - venue_Post12 - v20220204

- Point Source
- vert. Area Source
- Building
- Barrier
- 3D-Reflector
- Ground Absorption
- ▽ Height Point
- Contour Line
- x Receiver
- Calculation Area

- ... < 35.0
- 35.0 <= ... < 40.0
- 40.0 <= ... < 45.0
- 45.0 <= ... < 50.0
- 50.0 <= ... < 55.0
- 55.0 <= ... < 60.0
- 60.0 <= ... < 65.0
- 65.0 <= ... < 70.0
- 70.0 <= ... < 75.0
- 75.0 <= ... < 80.0
- 80.0 <= ... < 85.0
- 85.0 <= ... < 90.0
- 90.0 <= ... < 95.0
- 95.0 <= ... < 100.0
- 100.0 <= ...