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ACOUSTICAL REPORT

EXTENDED TRADING ON THE GROUND FLOOR

MONA VALE GOLF CLUB

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ACOUSTICAL REPORT

EXTENDED TRADING ON THE GROUND FLOOR

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 a proposal to modify the existing approved trading hours for the ground floor level of Mona Vale Golf Club under Section 4.55 of the Environmental Planning and Assessment Act 1979 (EPA Act).

The acoustical assessment considers noise emitted from the proposed development and the potential impacts on surrounding noise sensitive land uses. There are two main aspects of the application that need to be considered from an acoustic perspective and they relate to:

1. Noise emissions from patrons and music within licensed areas of the golf club, and
2. Noise emission from mechanical plant and the car park.

The following sections of this report provide a brief outline of the development, establish the project noise objectives, predict noise levels to surrounding receivers and inside the subject development, and recommend noise mitigation/management measures considered necessary to meet the project noise objectives.

2.0 THE PROPOSAL

In 2022 a development application (DA2022/0581) was submitted to the Council seeking alterations and additions to the lower ground floor of the golf club to expand the outdoor seating area and update the internal areas.

This application (DA2022/0581) was approved by the council on 31.08.2022. As a result of that DA, the hours of operation of the entire club were limited under Condition 40 and not just the hours for the lower ground floor level of the club to which the application related.

Consequently, the club is proposing under this S4.55 modification to DA2022/0581 to reinstate those hours of operation formerly approved for the **ground floor level only** of the club as detailed below:

- 8 am to 11 pm (with all patrons off-site by 11.30 pm) 7 days.

With the club already approved under Condition 40 to operate from 8 am to 9 pm, the modification will result in two additional hours from 9 pm to 11 pm.

We note that two key items that would warrant consideration in terms of potential acoustical implications of the proposal have already been assessed by Koikas Acoustics as follows:

1. Noise emissions from patrons and music in the licensed areas of the club have been assessed within the DA acoustic report (ref: 5255R20220128asMonaValeGC_DA, dated 03.02.2022, noted under Condition 1 of DA2022/0581)
2. Mechanical plant noise emission from the club has been assessed in the CC acoustic report (ref: 5255R20221215asMVGC_CC, dated 21.12.2022, required under Condition 14 of DA2022/0581).

3.0 NEARBY RECEIVERS

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 1. Aerial imagery – Site and surrounds (SixMaps)

4.0 EXISTING NOISE ENVIRONMENT

An unattended noise logging survey was conducted at the site between the 25th and 31st of 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-minute 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 were noted during the initial site visit and construction noise was 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

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. 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]

	1/1 octave band centre frequency [Hz]								
Description	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total**
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

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 diurnal patterns with reduced background noise during the night hours. This is typically correlated with reduced traffic flows on the surrounding road network.

5.0 NOISE CRITERIA

Noise criteria that apply to the site are discussed in this section of the report. Separate criteria apply to noise emissions from:

1. Patrons and music in licensed areas of the club, and
2. Mechanical plant and the car park.

5.1 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 (Tf - 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]**								
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**Total**
7 am to 6 pm: L90 + 5 (res. boundary)	31	37	39	44	45	44	40	29	50
6 pm to 10 pm: L90 + 5 (res. boundary)	30	36	40	44	45	44	39	30	50
10 pm to 12 am: L90 + 5 (res. boundary)	28	35	40	44	45	43	38	27	50

5.2 MECHANICAL PLANT AND THE CAR PARK

The Pittwater DCP generally supports adopting noise limits as per the NSW EPA Noise Policy for Industry 2017 (formerly Industrial Noise Policy).

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. NPfI 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: 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. 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.

5.3 SLEEP DISTURBANCE

The potential for noise-induced sleep disturbance should be considered where a noise source or activity from a particular development occurs before 7 am (Monday to Saturday) or 8 am (Sundays or public holidays) and/or after 10 pm (Monday to Sunday). Specific to the golf club, this is relevant for cars in the car park and particularly for car doors opening/closing and car engines starting.

The process followed by Koikas Acoustics when determining the potential for sleep disturbance is:

1. Conduct a screening assessment that identifies the potential for sleep disturbance impacts as per:
    a. Section 2.5 of the NSW EPA Noise Policy for Industry (NPfI) 'Maximum noise level event assessment' and/or
    b. Section 2.2.4 of the NSW EPA Noise Guide for Local Government (NGLG) 'Assessment of sleep disturbance'

2. Where the screening assessment identifies a potential for sleep disturbance, a further and more rigorous analysis of the maximum noise levels attributed to the noise source or activity under assessment is prepared. This detailed assessment would:
    a. Compare the maximum noise levels and the number of maximum noise events from the subject source or activity to that of typical ambient maximum noise events in the local area such as from passing traffic etc.
    b. Assess the maximum event noise level inside an affected residence and compare this to further guidance on sleep disturbance impacts presented in the NSW EPA Road Noise Policy (RNP).
3. Present a final opinion on the potential for sleep disturbance and/or the need for any specific noise mitigation and/or management.

For reference, the NPfI and NGLG screening levels and RNP internal maximum noise levels are presented below.

Table 5. Sleep disturbance assessment levels

Description	Assessment period	L_{Aeq} noise level	L_{Amax} noise level
Screening assessment 'a' NSW EPA Noise Policy for Industry (2017)	**Night only** 10 pm to 7 am (Mon-Sat) 10 pm to 8 am (Sun & pub hols)	$L_{Aeq\ 15\ mins}$ ≤ 40 dB or the RBL + 5, whichever is the greater	$L_{Amax\ outdoors}$ ≤ 52 dB or the RBL + 15, whichever is the greater
Screening assessment 'b' NSW EPA Noise Guide for Local Government (2013)	**Night only** 10 pm to 7 am (Mon-Sat) 10 pm to 8 am (Sun & pub hols)	n/a	$L_{Amax\ outdoors}$ ≤ RBL + 15 ($L_{A1,\ 1\ minute}$ may also be used where appropriate)
Internal L_{Amax} assessment NSW EPA Road Noise Policy (2013)	**Night only** 10 pm to 7 am (Mon-Sat) 10 pm to 8 am (Sun & pub hols)	n/a	$L_{Amax\ indoors}$ ≤ 50-55 dB is "unlikely to cause awakenings"

For this assessment, the provisional sleep disturbance screening levels are set at L_{Amax} 60 dB, assessed at the residential property boundary.

We recognise that the point at which noise causes sleep disturbance is not well established and that the EPA advises that "more research is needed to better understand this relationship". Therefore, the above should be used as a guide only and applied with caution on a case-by-case basis.

6.0 NOISE MODEL

6.1 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, and 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.

6.1.1 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 shown in **Figure 2**.

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.

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.

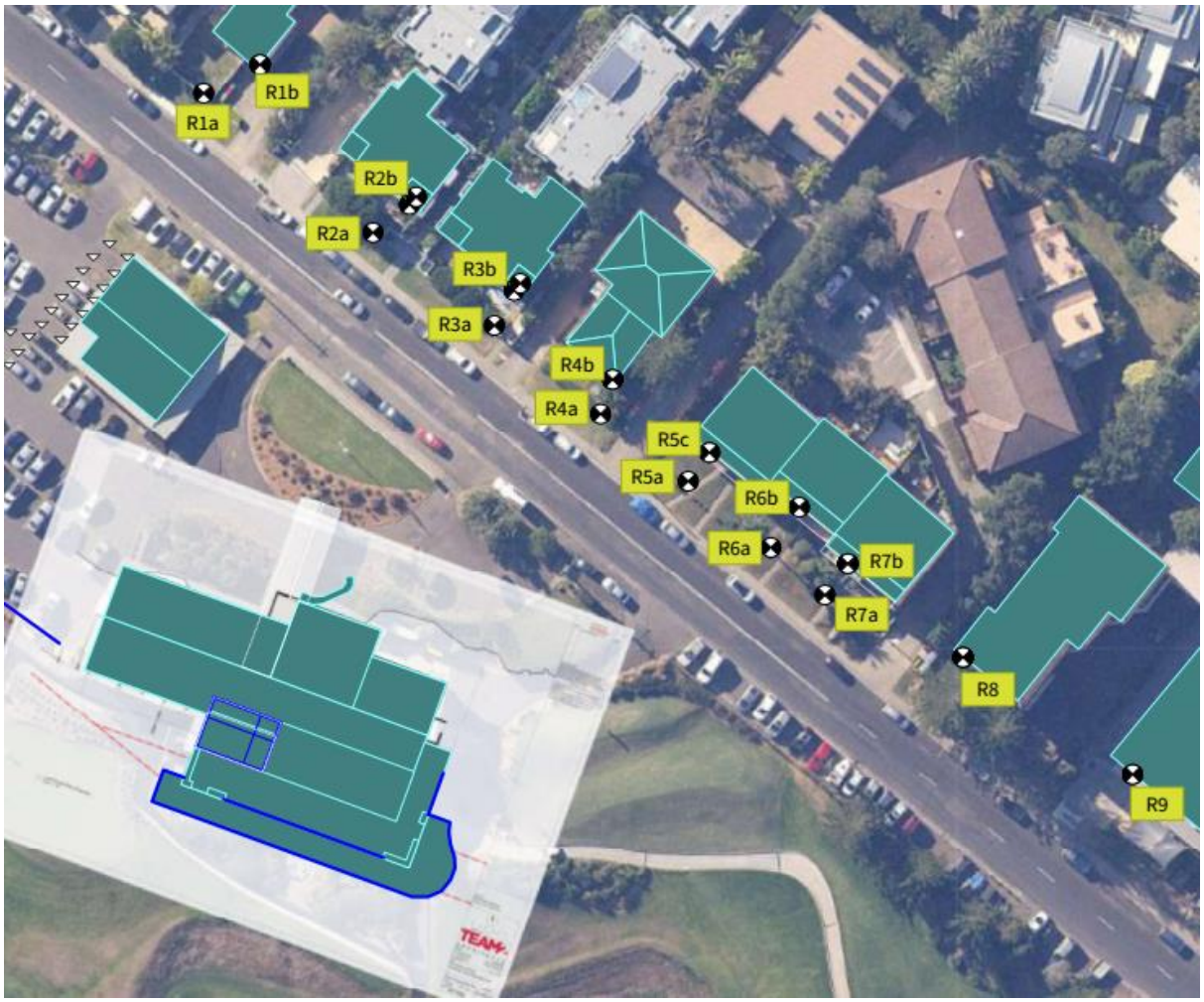


Figure 2. Receiver locations

7.0 LICENSED PREMISES ASSESSMENT

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

7.1 ASSESSMENT SCENARIOS AND MODELLING ASSUMPTIONS

The application only seeks to extend trading hours for the ground floor level of the club. The lower ground floor level will retain the current trading hours noted in Condition 40 of DA2022/0581. This means that we need only assess noise emission from the ground floor level of the club as it is the only area of the club open to the public during the period that we are assessing.

Two assessment scenarios have been considered that look at 'typical' operations (no functions), and 'maximum' operations (with a function being held).

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)**
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.
Bistro / Dining	Patrons (150) and background music. Windows open.	Patrons (150) and background music. Windows and doors closed.
Existing balcony	30 patrons – 50% talking with 'raised' vocal effort.	30 patrons – 50% talking with 'raised' vocal effort.

Sound transmission loss values are included in the noise model to represent noise breakout via 6.38 mm thick laminated glass windows and doors, built into aluminium frames and with acoustic seals.

7.2 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, and Function Room.

Sound power levels attributed to patrons conversing on the terrace/balcony have been sourced from published sound power levels for human talkers conversing at 'raised' speech levels/vocal effort. A group size (ie. the 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
Sound power level 1 person (raised voice)	47	56	64	74	74	69	64	53	78
Sound power level 30 people (50% raised voice)	59	68	76	86	86	81	76	65	90

7.3 IDENTIFIED NOISE SENSITIVE RECEIVERS

Assessment locations are identified in **Figure 2**.

7.4 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. Similarly, we have only provided an assessment against the criterion derived from 10 pm to 12 am as being the most sensitive period to assess. Compliance at this time implies compliance for earlier hours.

7.4.1 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)	-4	9	13	19	19	17	11	-4	24
R2: (L1 balcony)	-2	12	16	22	20	15	9	-5	26
R3: (L1 balcony)	0	13	19	25	22	17	12	-1	28
R4: (GF front boundary)	4	17	24	30	31	29	25	14	36
R5: (GF front boundary)	5	19	25	32	33	31	27	15	38
R6: (GF front boundary)	4	17	25	32	32	31	26	14	37
R7: (GF front boundary)	4	17	24	31	32	30	25	14	36
R8: (L2 window)	2	12	20	27	27	26	20	8	32
R9: (L1 balcony)	0	9	17	24	25	23	18	4	30

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

7.4.2 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	9	11	17	13	5	-2	-20	20
R2: (L1 balcony)	3	11	14	21	19	11	4	-12	24
R3: (L1 balcony)	4	11	16	23	19	10	3	-13	25
R4: (L1 balcony)	4	12	14	20	16	9	1	-15	23
R5: (GF front boundary)	3	13	16	22	18	12	4	-12	25
R6: (GF front boundary)	2	10	15	21	18	12	4	-12	24
R7: (GF front boundary)	1	11	13	20	17	10	3	-14	23
R8: (L2 window)	0	6	9	17	14	6	-1	-19	20
R9: (L1 balcony)	-2	3	6	13	9	3	-5	-23	16

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

7.5 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 and Bistro/Dining may be open when amplified entertainment is **not occurring**.
- Function Room doors/windows must be closed during functions/events.
- The design occupancy level for the existing balcony is 30 patrons at any one time.

8.0 MECHANICAL AND CAR PARK ASSESSMENT

The cumulative impact of all mechanical plant and equipment servicing the golf club and club patrons using the car park is assessed for potential impacts on adjacent residential receivers.

Noise is assessed over the proposed extended trading hours. The assessment must also consider certain operational aspects of the club that will govern the overall level of noise emitted from the site, for instance, the kitchen will not operate past 10 pm meaning the kitchen exhaust fan need only be assessed until 10 pm.

Several scenarios have been assessed to fully capture noise emissions from the site. These include:

Scenario 1 (9 pm to 10 pm):

- All mechanical plant operating.
- 30 vehicles enter/leave the car park (1) between 9 pm and 10 pm.
- 30 patrons walking and half talking as they move to/from the club and their cars.

Scenario 2 (10 pm to 11 pm):

- All mechanical plant operating (excl. kitchen ventilation equipment).
- 30 vehicles enter/leave the car park (1) between 9 pm and 10 pm.
- 30 patrons walking and half talking as they move to/from the club and their cars.

Scenario 3 (Sleep disturbance - 10 pm to 11 pm):

- Maximum noise levels from car doors opening and closing and engines starting.

8.1 SOURCE NOISE LEVELS

Koikas Acoustics has assessed all mechanical plant during the CC report and this data in terms of equipment sound levels is retained for this assessment. In addition, sound levels attributed to vehicles in the car park are referenced from data previously measured by Koikas Acoustics within other car parks.

A summary of the relevant sound data is presented below in **Tables 9 (mechanical) and 10 (car park)**.

(1) Peak use of the car park is presumed to equate to 30 vehicles entering or leaving in 15 minutes, equivalent to 120 vehicles in 1-hour.

Table 9. 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**	
Existing AC condenser unit (x2) calculated sound power level	54.7	65.6	76.0	79.7	78.7	74.8	67.8	57.4	83.9
Refrigeration compressors (x3) calculated sound power level	55.1	63.2	74.8	75.9	78.9	75.8	71.2	6.9	83.0
Lower ground floor kitchen exhaust Fantech PCD636DD	67.8	81.9	85.4	78.8	83.0	82.2	83.0	78.9	90.9
Lower ground floor make-up air (x2) Fantech TD-2000/315	33.8	49.9	59.4	63.8	70.0	69.2	62.0	52.9	73.7
Ground floor kitchen exhaust (x2) Fantech CDEC56VGL	48.8	64.9	71.4	74.8	71.0	67.2	63.0	68.9	78.7
Ground floor make-up air (x3) Fantech TD-2000/315	33.8	49.9	59.4	63.8	70.0	69.2	62.0	52.9	73.7
Toilet exhaust fan 1 Fantech PUD406DD	35.8	45.9	48.4	54.8	59.0	59.2	56.0	47.9	64.0
Toilet exhaust fan 2 Fantech JETLINE-100ECO	26.8	35.9	43.4	48.8	47.0	46.2	47.0	31.9	53.9
Locker exhaust fans 1 and 2 Fantech PUD406DD	35.8	45.9	48.4	54.8	59.0	59.2	56.0	47.9	64.0
Outside air fan 1 Fantech PUEEC28	29.8	34.9	43.4	46.8	49.0	49.2	46.0	35.9	54.5
Outside air fan 2 (x3) Fantech PUEEC35	30.8	40.9	44.4	44.8	45.0	47.2	46.0	37.9	53.0
Outside air fan 3 (x2) Fantech PUEEC28	29.8	34.9	43.4	46.8	49.0	49.2	46.0	35.9	54.5
Outside air fan 4 Fantech PUE406ER	37.8	48.9	51.4	54.8	53.0	56.2	56.0	47.9	62.0
Outside air fan 5 Fantech TD-350/125SIL (Lo speed)	21.8	28.9	40.4	45.8	53.0	39.2	34.0	25.9	54.2
Condenser unit 1 Daikin RXYMQ4AV4A	41.0	54.0	62.0	66.0	64.0	58.0	55.0	50.0	70.0
Condenser unit 2 Daikin RXYMQ8AY1	46.3	59.3	67.3	71.3	69.3	63.3	60.3	55.3	75.0
Condenser unit 3 Daikin RXYMQ6BVM	47.3	60.3	68.3	72.3	70.3	64.3	61.3	56.3	76.0
Condenser unit 4 Daikin 5MXM100RVMA	32.3	45.3	53.3	57.3	55.3	49.3	46.3	41.3	61.0
Condenser unit 5 Daikin RXYQ10AYM	49.3	62.3	70.3	74.3	72.3	66.3	63.3	58.3	78.0

Table 10. Car park 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**	
L_{Aeq} sound power level One car moving at low speed	59	62	67	71	74	73	70	61	79
L_{Aeq} sound power level Car doors open and close [one event in 15 minutes]	37	45	44	49	47	49	43	34	55
L_{Aeq} sound power level Car engine starting [one event in 15 minutes]	28	31	30	39	42	45	44	38	49
L_{Aeq} sound power level 1 person talking with raised voice	44	53	61	71	71	66	61	50	75
L_{Amax} sound power level Car door open and close	77	87	86	87	86	84	82	73	94
L_{Amax} sound power level Car engine starting	70	72	78	80	81	79	80	73	87

8.2 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 2**.

Figure 2. Receiver locations (Image from CadnaA model)

8.3 RECEIVER LEVELS

The following noise levels are predicted at each assessment location. Only the worst-affected location for each receiver is shown. Reduced loading of the air conditioning systems is considered in the model based on -2 dB (evening) and -3 dB (night).

Detailed receiver levels, including source contributions at each receiver and equipment sound power levels are attached as an Appendix to this report.

Table 11. Receiver noise levels – Mechanical and car park [dB]

Receiver ID	Receiver noise level – $L_{Aeq,\ 15\ minutes}$	
	Scenario 1 - Evening	Scenario 2 - Night
CRITERIA	48	43
R1 (front boundary)	40	40
R2 (L1 balcony)	45	43
R3 (L1 balcony)	44	42
R4 (L1 window)	42	40
R5 (L1 balcony)	43	41
R6 (L1 balcony)	40	39
R7 (L1 balcony)	42	41
R8 (L2 window)	39	38
R9 (L1 balcony)	35	33

The mechanical plant and car park noise levels comply with the NPfI PNTL.

8.4 SLEEP DISTURBANCE – MAXIMUM NOISE LEVELS

Maximum noise level events will occur from the car park and particularly from car doors and engines, being the sources with the highest transient noise levels. We calculate noise levels at the most affected residential boundary at L_{Amax} 58 dB which is less than the sleep disturbance criterion (screening level). This indicates a low probability of sleep disturbance impacts for residents.

8.5 RECOMMENDATIONS

We have assessed the club's mechanical plant and car park uses to be compliant to the project noise criteria. We recommend some form of signage be erected to remind patrons when leaving to be respectful of the club's neighbours and to keep noise to a minimum.

9.0 CONCLUSION

Koikas Acoustics was requested to assess noise emission from Mona Vale Golf Club over extended trading hours being proposed for the ground floor level only.

The assessment is to support an S4.55 modification to DA2022/0581 and relates solely to the ground floor of the club, whereby it is proposed to reinstate trading hours for the ground floor level of the club that were formerly approved but subsequently modified under DA2022/0581.

Under the proposal, the ground floor level of the club would operate over the hours of 8 am to 11 pm Monday to Sunday. The remainder of the club will continue to operate in compliance with the hours currently conditioned within DA2022/0581.

Noise sources requiring assessment include patrons and music within the licensed areas of the club, noise from mechanical plant servicing the club, and noise attributed to the car park.

The assessment has found that noise emissions are within the project noise limits when assessed at the nearest affected residential premises to the north and east of the golf club along Golf Avenue. Noise control recommendations are provided in this report to achieve this compliant outcome. Generally, the proposal will not impact the residential receivers and the only recommendation to be adhered to is for windows and doors to remain closed during functions that include live/amplified music or entertainment.

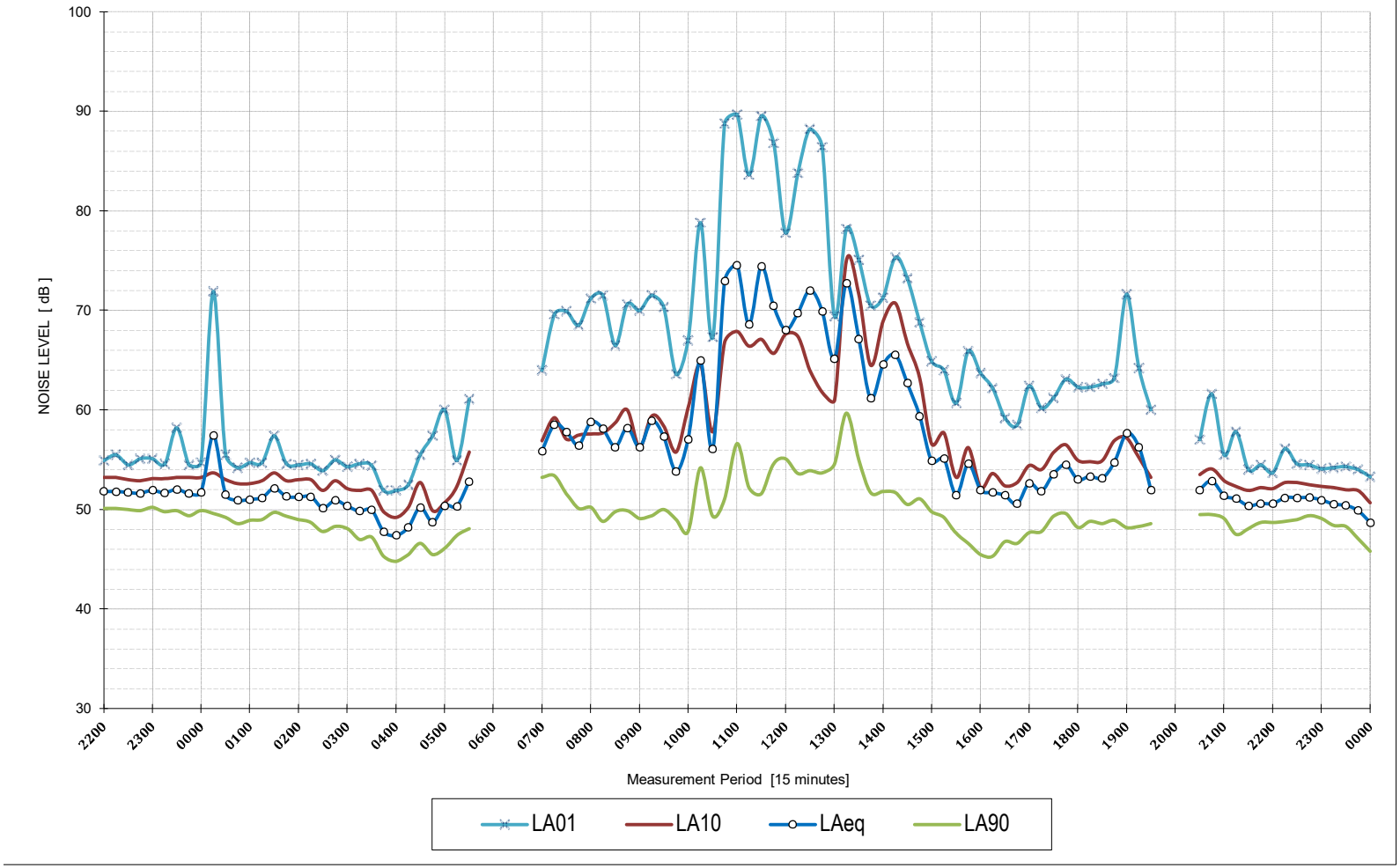
As such, Koikas Acoustics is satisfied that the proposal will not result in adverse acoustic impacts for nearby residents.

APPENDIX A

APPENDIX A

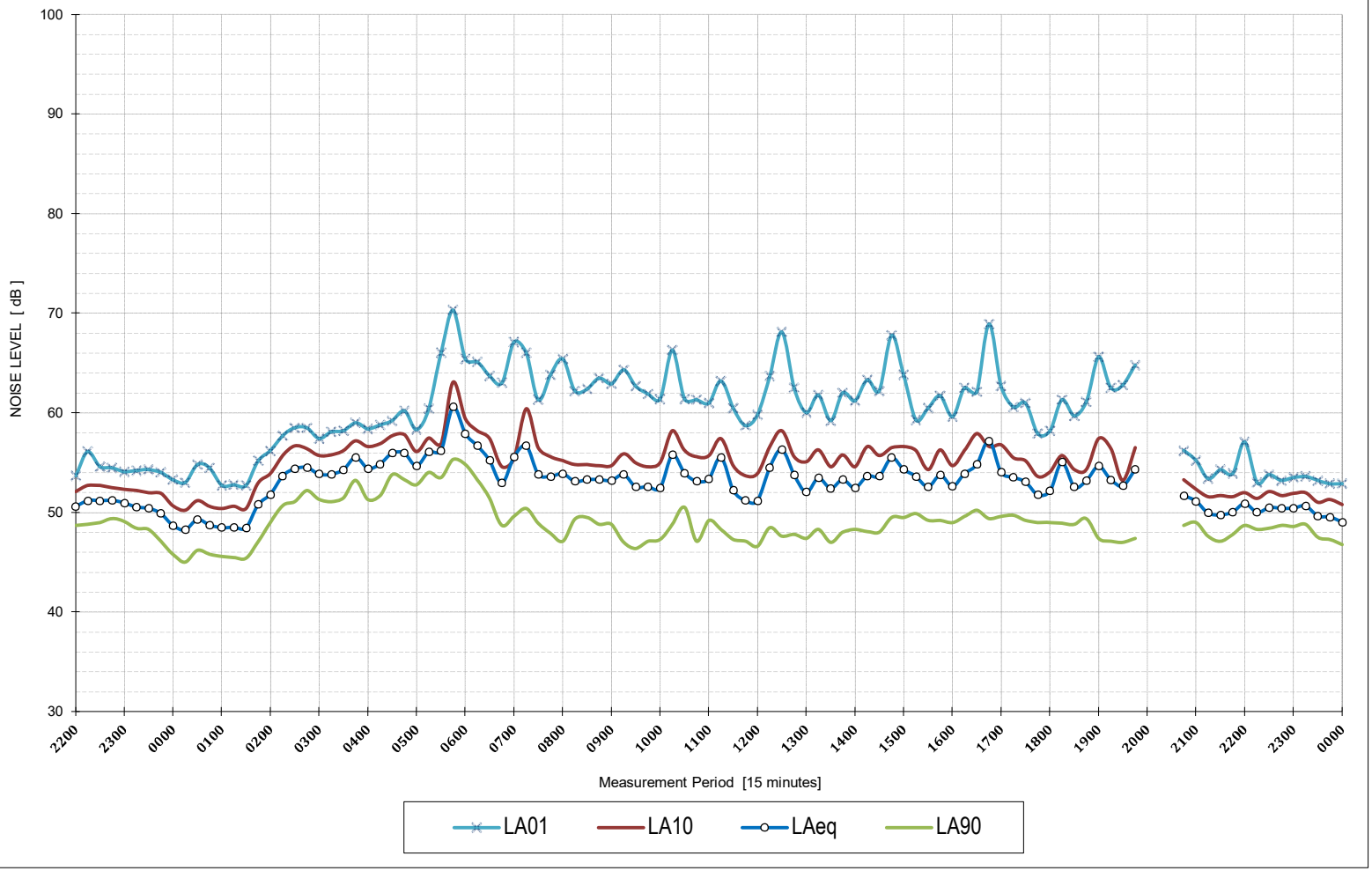
APPENDIX A

DAY 1 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Tuesday, 25 January 2022



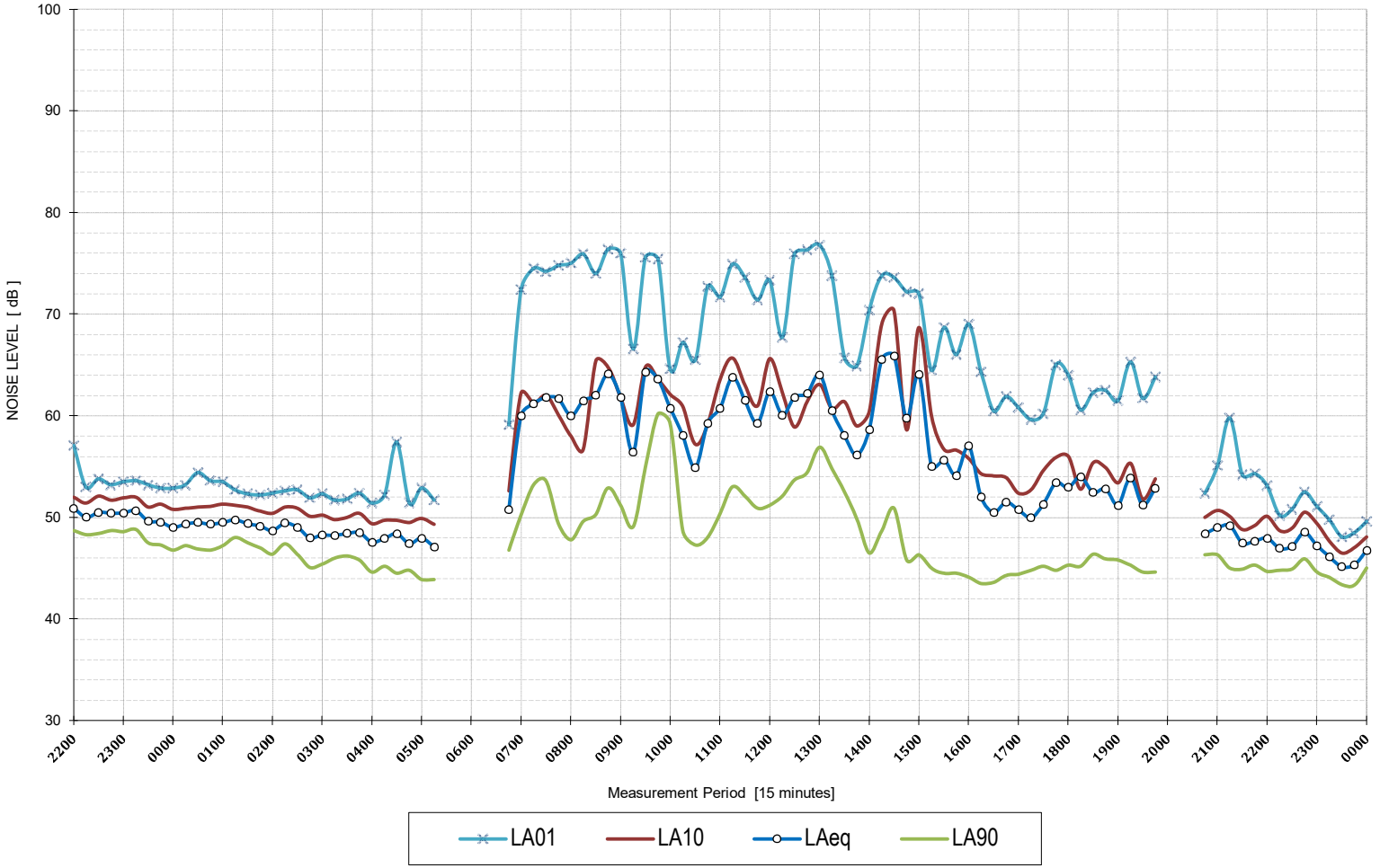
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 2 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Wednesday, 26 January 2022



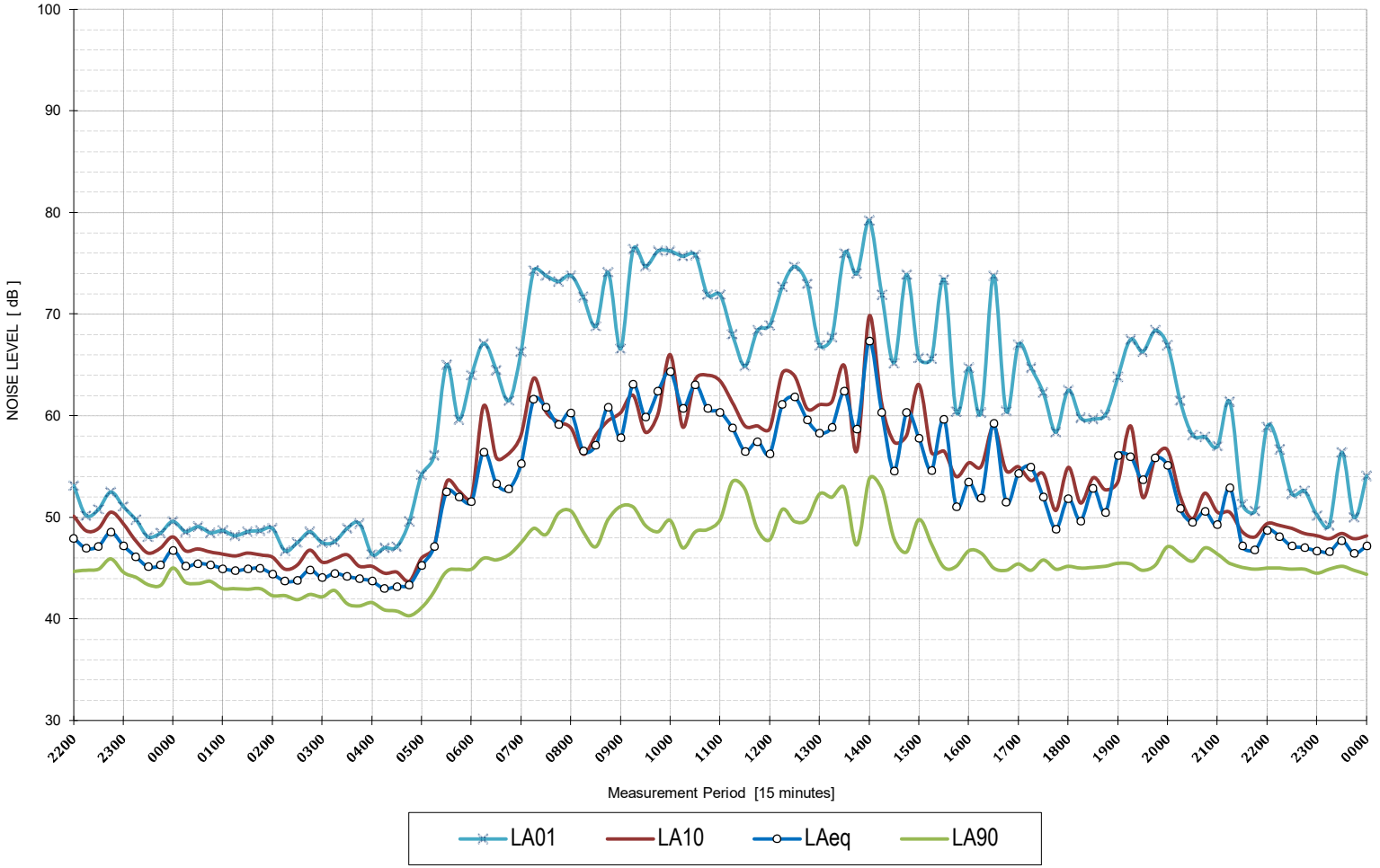
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 3 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Thursday, 27 January 2022



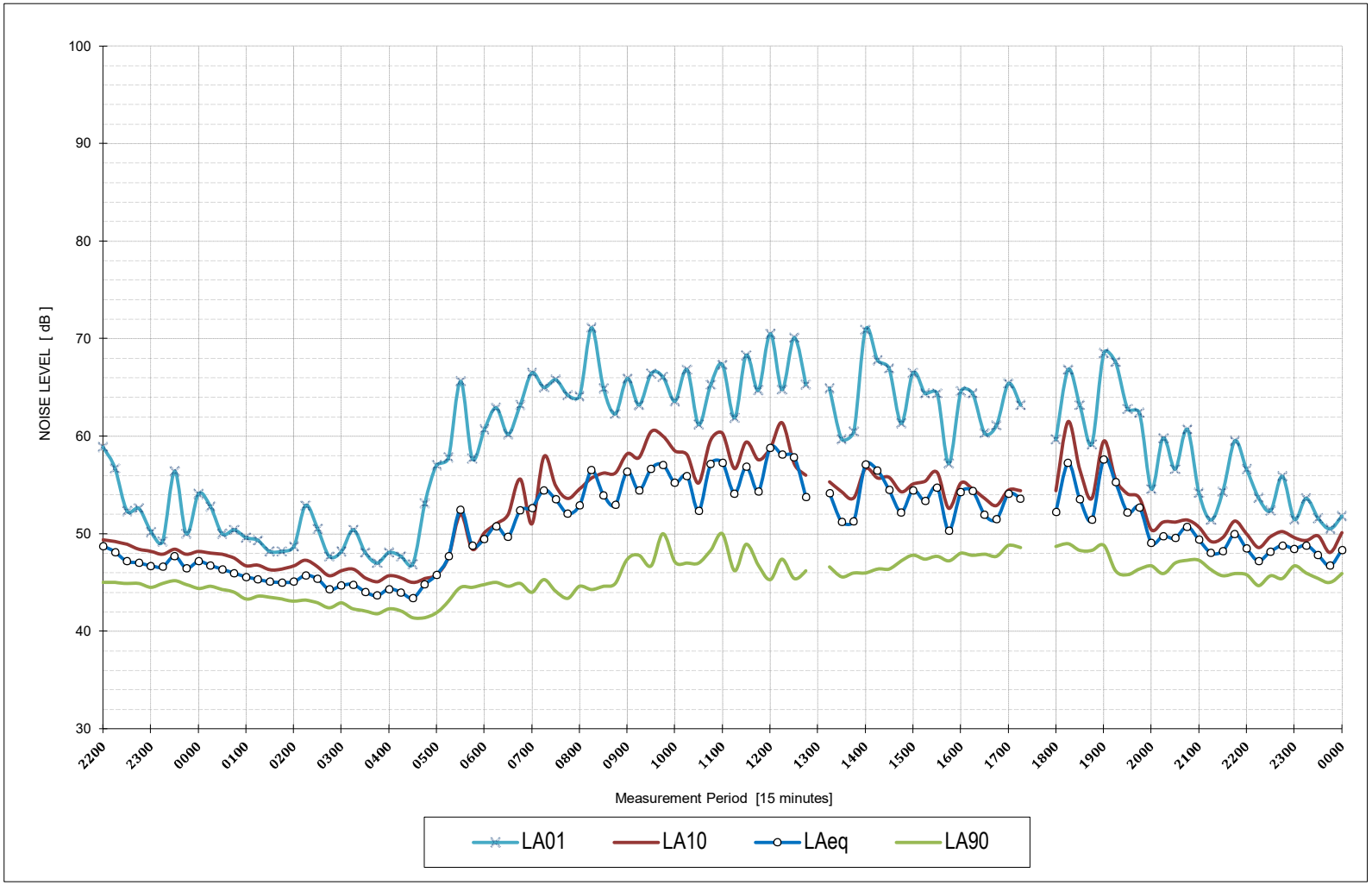
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 4 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Friday, 28 January 2022



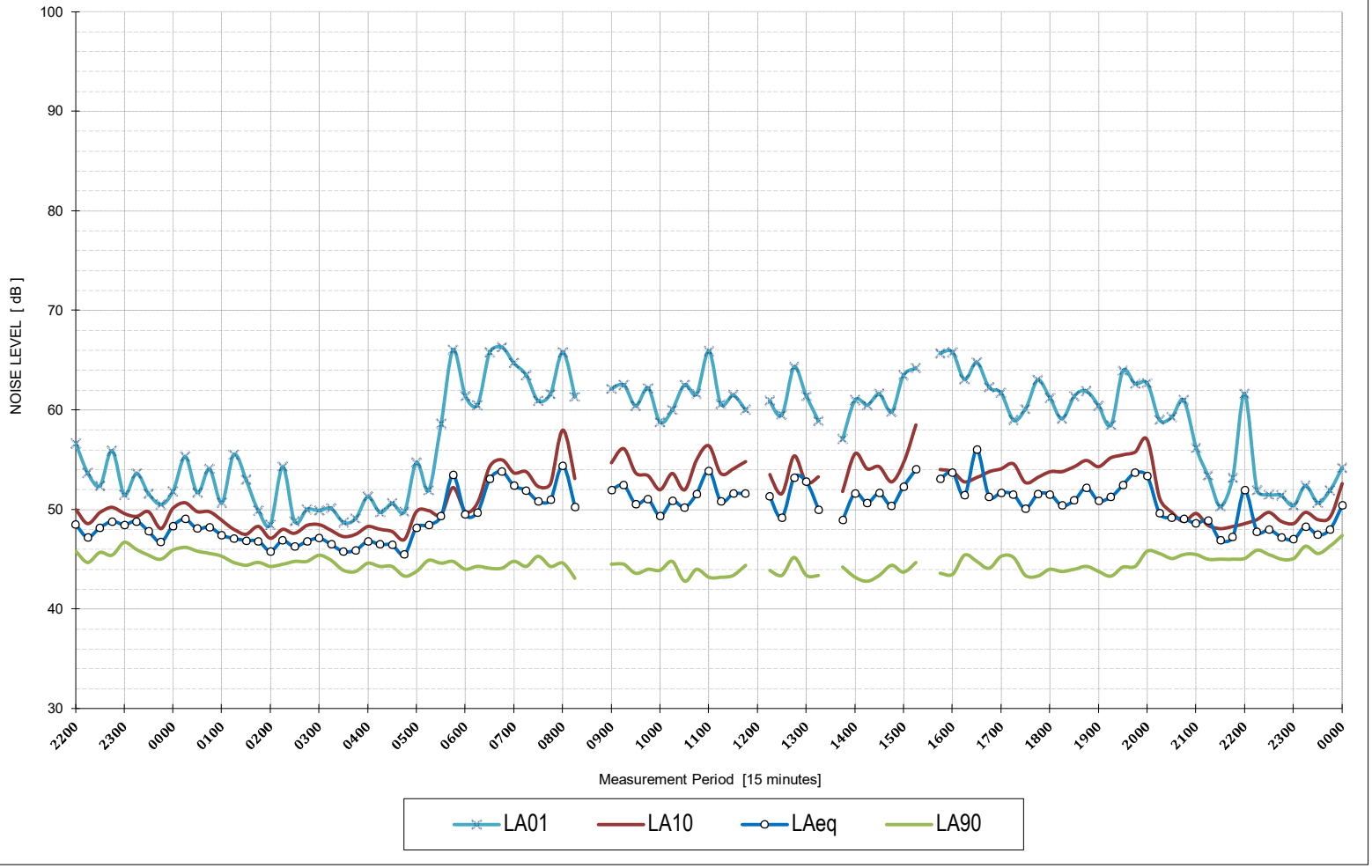
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 5 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Saturday, 29 January 2022



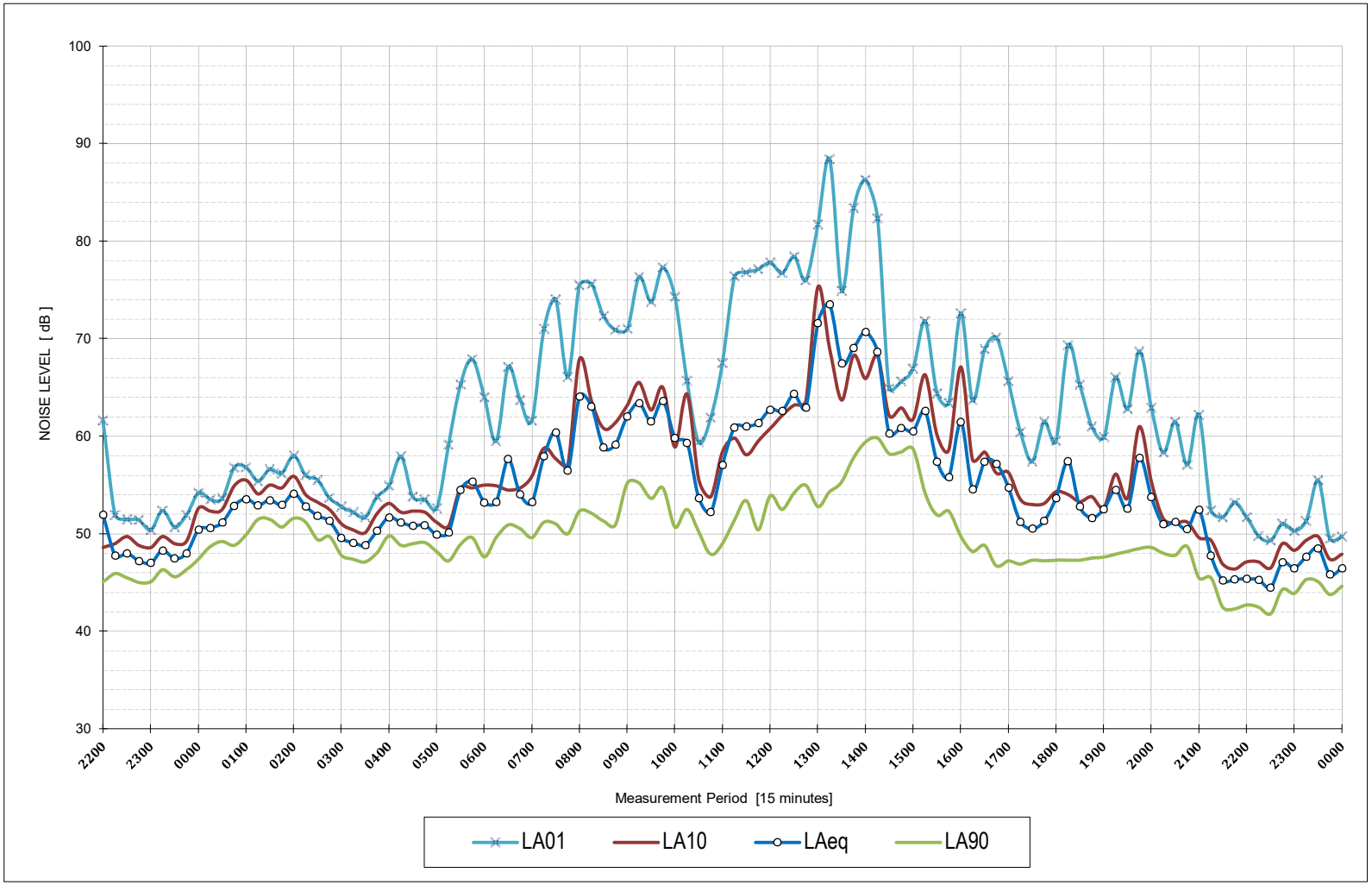
koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 6 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Sunday, 30 January 2022



koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 7 **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **DATE:** Monday, 31 January 2022



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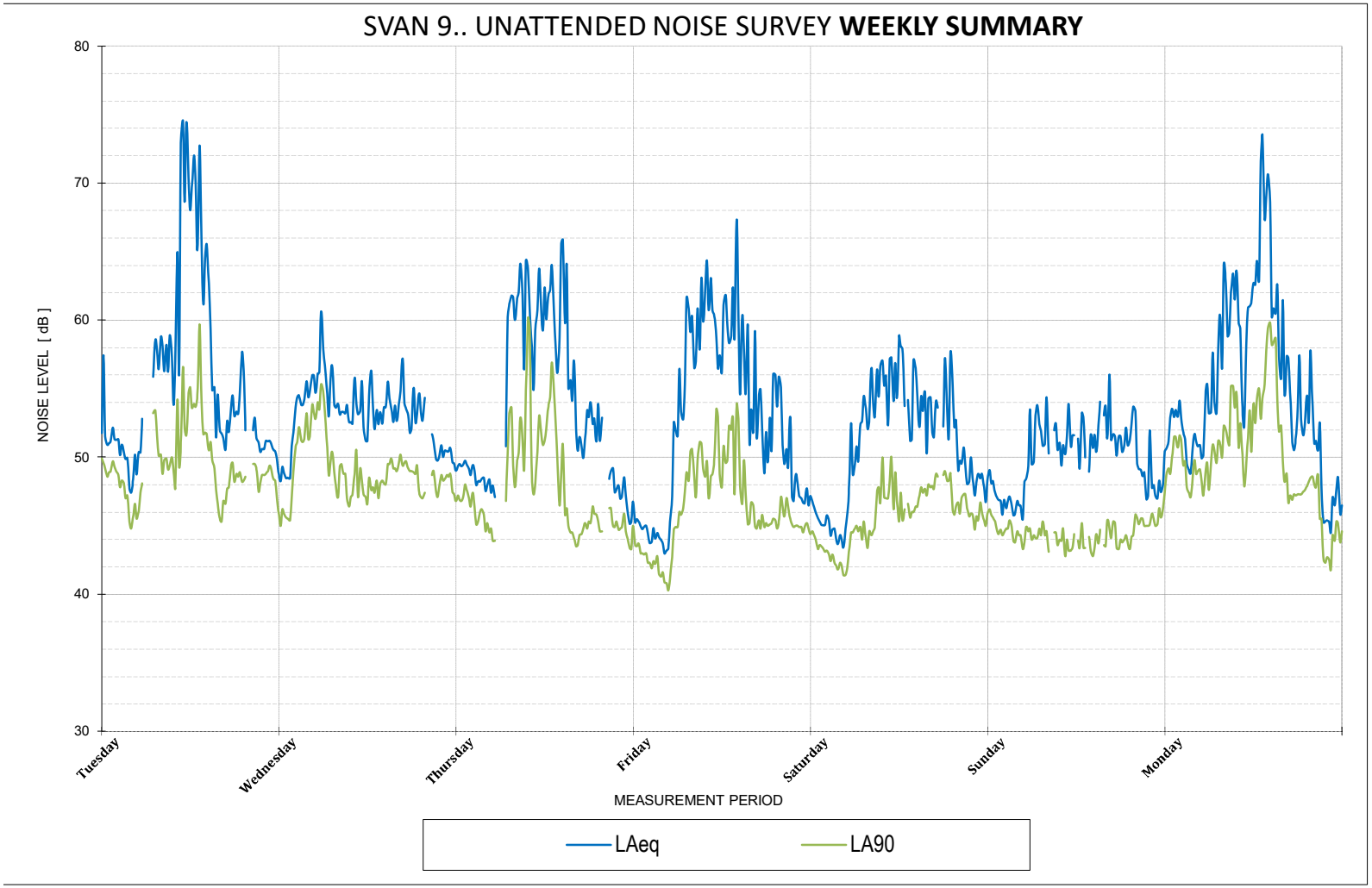
CONSULTANTS IN NOISE & VIBRATION

WEEKLY SUMMARY **LOGGER LOCATION:** 46 Golf Ave, Mona Vale **PERIOD:** 25th to the 31st January 2022



Sundays and Public Holidays the hours change to 0800

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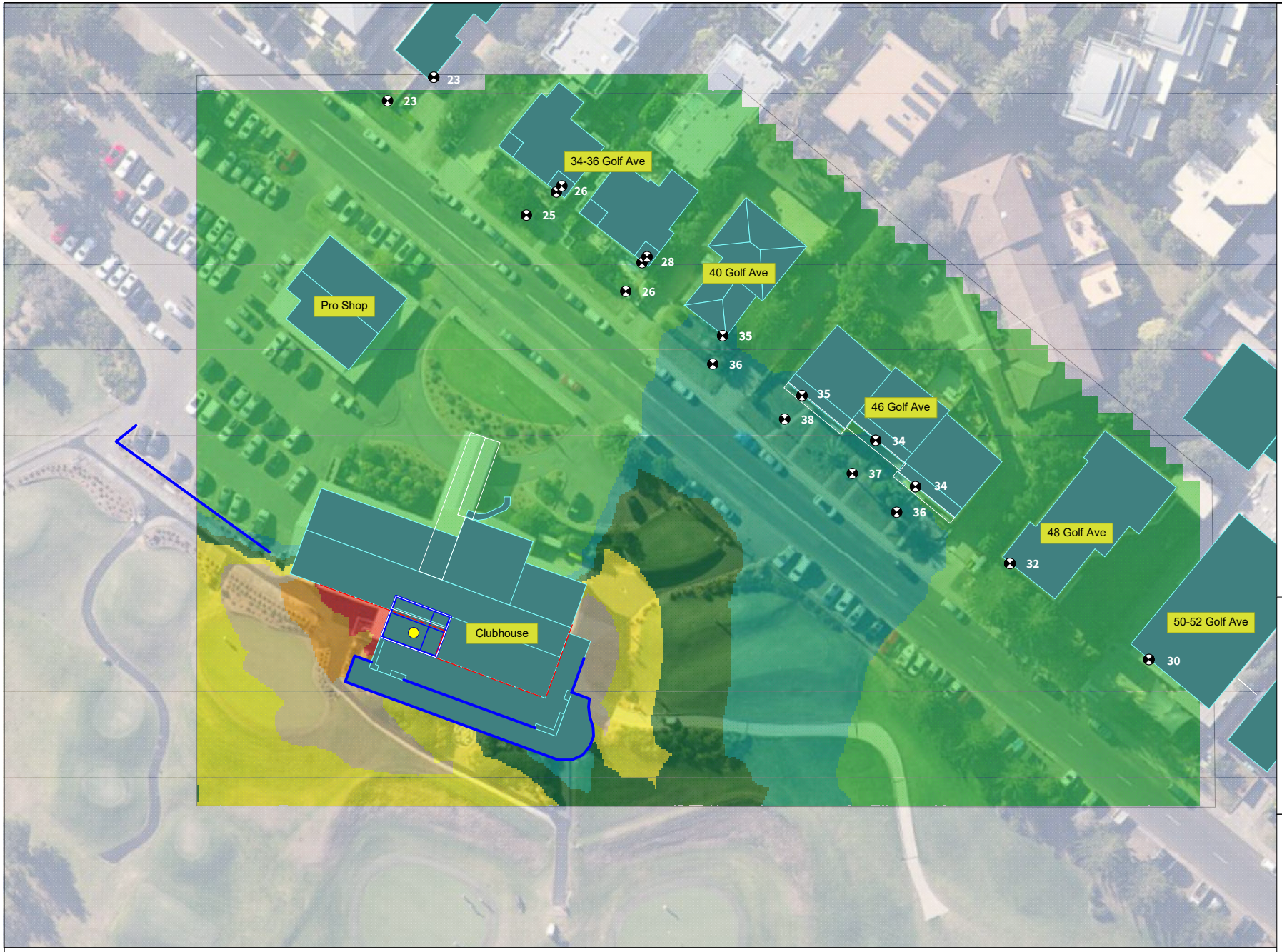
CONSULTANTS IN NOISE & VIBRATION

APPENDIX B

APPENDIX B

APPENDIX B



**** NOISE SOURCES ****

LICENSED VENUE NOISE
[Operation before midnight]

~ 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)

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: 05.10.2023
VERSION: 5255 - GF (typ)

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

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

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

Source sound power levels - Licensed venue noise emission (No functions)

Name	Sound Power Level PWL (dBA)								
	63	125	250	500	1000	2000	4000	8000	A
Root	51	68	76	85	85	81	76	67	90
Terrace		67	74	84	84	77	72	60	88
30 patrons - 15 talking		67	74	84	84	77	72	60	88
Bistro	48	60	68	75	76	75	71	63	81
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	40	52	60	67	68	67	63	55	73
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	40	52	60	67	68	67	63	55	73
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	40	52	60	67	68	67	63	55	73
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	40	52	60	67	68	67	63	55	73
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	40	52	60	67	68	67	63	55	73
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	40	52	60	67	68	67	63	55	73
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro doors	25	33	36	40	38	38	30	18	44
Function Room	48	60	68	75	76	75	71	63	81
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function fixed windows - low level	20	28	31	35	33	33	25	13	40
Function windows - high level	40	52	60	67	68	67	63	55	73
Function windows - high level	22	30	33	37	35	35	27	15	42
Function windows - high level	40	52	60	67	68	67	63	55	73
Function windows - high level	22	30	33	37	35	35	27	15	42
Function windows - high level	40	52	60	67	68	67	63	55	73
Function windows - high level	22	30	33	37	35	35	27	15	42
Function windows - high level	40	52	60	67	68	67	63	55	73
Function windows - high level	22	30	33	37	35	35	27	15	42
Function windows - high level	40	52	60	67	68	67	63	55	73
Function windows - high level	22	30	33	37	35	35	27	15	42
Function windows - high level	22	30	33	37	35	35	27	15	42
Function windows - high level	40	52	60	67	68	67	63	55	73
Function windows - high level	22	30	33	37	35	35	27	15	42
Function doors	25	33	36	40	38	38	30	18	44

Noise source contributions at each receiver - Licensed venue noise emission (No functions)

	Partial Level																										
Name	R1a	R1b EG	R1b 1.OG	R2a	R2b GF	R2b L1	R3a	R3b GF	R3b L1	R4a	R4b GF	R4b L1	R5a	R5b GF	R5b L1	R6a	R6b GF	R6b L1	R7a	R7b GF	R7b L1	R8 L1	R8 L2	R8 L3	R9 GF	R9 L1
Root	23	24	23	25	24	26	26	27	28	36	35	35	38	35	35	37	34	35	36	34	34	32	32	32	30	30
Terrace	18	19	20	24	22	24	23	23	25	23	22	22	24	22	23	24	21	22	22	20	21	19	19	18	15	15
30 patrons - 15 talking	18	19	20	24	22	24	23	23	25	23	22	22	24	22	23	24	21	22	22	20	21	19	19	18	15	15
Bistro	21	22	19	17	17	19	22	22	23	35	35	35	38	35	35	37	34	34	36	34	34	32	32	32	30	29
Bistro fixed windows - low level	-29	-29	-28	-25	-25	-24	-25	-24	-24	-24	-25	-24	-22	-24	-23	-23	-24	-24	-22	-24	-24	-26	-26	-26	-26	-26
Bistro fixed windows - low level	-29	-29	-28	-25	-25	-24	-25	-24	-24	-23	-24	-24	-22	-24	-23	-23	-24	-24	-22	-24	-24	-26	-26	-26	-26	-26
Bistro fixed windows - low level	-28	-29	-28	-23	-25	-24	-25	-24	-23	-24	-24	-23	-22	-23	-23	-23	-24	-24	-22	-24	-24	-26	-26	-25	-25	-26
Bistro fixed windows - low level	-28	-29	-28	-26	-25	-24	-25	-25	-24	-24	-23	-23	-22	-23	-22	-22	-24	-23	-22	-24	-23	-26	-25	-25	-25	-25
Bistro fixed windows - low level	-29	-29	-29	-26	-25	-24	-25	-25	-24	-24	-23	-23	-22	-22	-22	-22	-23	-23	-22	-23	-23	-25	-25	-25	-24	-25
Bistro fixed windows - low level	-29	-29	-29	-27	-25	-24	-25	-25	-24	-23	-23	-23	-22	-23	-22	-22	-23	-23	-21	-23	-23	-25	-25	-24	-24	-24
Bistro fixed windows - low level	-29	-29	-29	-26	-25	-24	-25	-25	-24	-23	-22	-22	-21	-22	-22	-21	-23	-22	-21	-23	-22	-24	-24	-24	-23	-24
Bistro fixed windows - low level	-29	-29	-29	-26	-26	-24	-25	-25	-24	-23	-22	-22	-21	-22	-22	-21	-22	-22	-21	-22	-22	-23	-23	-23	-23	-23
Bistro fixed windows - low level	-29	-29	-29	-26	-26	-25	-25	-24	-24	-23	-22	-22	-21	-22	-21	-20	-22	-22	-21	-22	-21	-23	-23	-22	-22	-22
Bistro fixed windows - low level	-29	-29	-28	-26	-26	-25	-25	-24	-23	-22	-22	-21	-20	-21	-21	-20	-21	-21	-20	-21	-21	-22	-21	-21	-21	-21
Bistro fixed windows - low level	-29	-29	-28	-26	-26	-25	-24	-24	-23	-21	-21	-21	-19	-20	-20	-18	-20	-20	-19	-20	-20	-20	-20	-20	-19	-20
Bistro fixed windows - low level	-29	-28	-28	-25	-25	-24	-23	-23	-22	-19	-19	-19	-17	-18	-18	-17	-18	-18	-17	-18	-18	-18	-18	-18	-17	-18
Bistro fixed windows - low level	-27	-26	-26	-22	-22	-21	-16	-15	-15	-2	-3	-3	0	-2	-2	0	-3	-3	-1	-4	-4	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-26	-26	-26	-22	-21	-21	-15	-15	-14	-2	-2	-2	1	-2	-2	0	-3	-3	-1	-4	-4	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-26	-26	-26	-22	-21	-20	-15	-14	-14	-1	-2	-2	1	-2	-2	0	-3	-3	-1	-3	-3	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-26	-25	-19	-21	-20	-20	-14	-14	-13	-1	-2	-2	1	-2	-2	0	-2	-2	-1	-3	-3	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-25	-25	-17	-21	-20	-19	-14	-13	-13	-1	-2	-2	1	-2	-1	1	-2	-2	0	-3	-2	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-25	-24	-17	-20	-19	-19	-13	-13	-12	-1	-1	-1	2	-1	-1	1	-2	-2	0	-2	-2	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-24	-24	-17	-19	-19	-18	-13	-12	-12	0	-1	-1	2	-1	-1	1	-2	-2	1	-2	-2	-5	-4	-4	-7	-7
Bistro fixed windows - low level	-22	-22	-16	-18	-17	-16	-12	-11	-11	0	-1	-1	2	-1	-1	1	-2	-2	1	-2	-2	-4	-4	-4	-7	-7
Bistro fixed windows - low level	-28	-28	-27	-24	-24	-23	-26	-25	-24	-25	-27	-27	-24	-25	-25	-24	-26	-26	-25	-27	-27	-31	-31	-31	-33	-33
Bistro fixed windows - low level	-28	-26	-26	-23	-23	-21	-27	-25	-24	-25	-27	-27	-24	-26	-26	-25	-27	-26	-25	-27	-27	-31	-31	-31	-33	-33
Bistro windows - high level	-11	-11	-23	-11	-19	-19	-20	-20	-19	-19	-21	-20	-18	-20	-20	-20	-21	-20	-19	-21	-21	-24	-24	-23	-23	-23
Bistro windows - high level	20	20	5	9	9	10	8	9	11	10	9	10	11	9	10	10	9	9	10	9	9	5	5	6	6	6
Bistro windows - high level	-23	-24	-23	-21	-21	-19	-20	-20	-19	-20	-20	-15	-18	-20	-19	-19	-21	-20	-19	-21	-20	-24	-23	-23	-22	-22
Bistro windows - high level	-23	-24	-23	-21	-21	-19	-20	-20	-19	-20	-20	-19	-18	-19	-19	-19	-20	-20	-19	-21	-20	-22	-23	-22	-22	-22
Bistro windows - high level	5	5	5	8	8	10	8	9	11	9	10	10	11	10	11	10	10	9	11	9	9	7	8	8	8	7
Bistro windows - high level	-24	-24	-24	-22	-21	-19	-20	-20	-19	-20	-19	-19	-18	-19	-19	-19	-20	-19	-18	-20	-20	-21	-21	-20	-21	-21
Bistro windows - high level	-24	-24	-24	-21	-21	-19	-20	-20	-19	-19	-19	-19	-18	-19	-17	-17	-19	-19	-17	-19	-18	-20	-20	-20	-20	-20
Bistro windows - high level	5	4	5	7	7	10	8	9	10	10	11	11	12	11	14	12	10	11	12	11	11	9	9	9	9	9
Bistro windows - high level	-25	-25	-24	-21	-22	-20	-20	-20	-19	-18	-18	-18	-17	-18	-16	-16	-18	-18	-17	-18	-18	-19	-19	-19	-19	-19
Bistro windows - high level	-25	-25	-24	-21	-22	-20	-20	-20	-19	-18	-18	-18	-16	-17	-16	-15	-17	-17	-16	-17	-17	-18	-18	-18	-18	-18
Bistro windows - high level	4	5	5	7	7	9	9	9	11	11	12	12	14	13	15	14	13	13	13	13	13	12	12	12	13	13
Bistro windows - high level	-25	-24	-24	-21	-21	-20	-19	-19	-18	-16	-16	-16	-13	-15	-14	-13	-14	-14	-14	-15	-14	-15	-15	-15	-14	-15
Bistro windows - high level	-23	-24	-23	-19	-18	-17	-13	-13	-11	0	0	0	3	0	0	2	-1	-1	1	-2	-1	-3	-3	-3	-5	-5
Bistro windows - high level	7	6	6	10	11	12	16	17	18	32	31	31	34	31	31	33	31	31	32	30	30	28	28	28	26	26
Bistro windows - high level	-22	-22	-22	-19	-18	-17	-12	-12	-11	1	0	0	3	0	0	2	0	0	1	-1	-1	-3	-3	-3	-5	-5
Bistro windows - high level	-22	-17	-17	-18	-18	-17	-12	-11	-11	1	0	0	3	1	1	3	0	0	2	-1	-1	-3	-3	-3	-4	-5
Bistro windows - high level	-20	-16	-15	-18	-17	-16	-11	-11	-10	1	1	1	3	1	1	3	0	0	2	0	0	-3	-2	-2	-4	-5
Bistro windows - high level	-20	-16	-15	-17	-17	-16	-11	-10	-10	2	1	1	4	1	1	3	0	0	3	0	0	-2	-2	-2	-4	-5
Bistro windows - high level	11	17	18	12	13	14	19	20	20	33	32	32	35	32	32	34	32	32	34	31	31	29	29	29	27	26
Bistro windows - high level	-18	-15	-14	-15	-15	-14	-9	-9	-9	2	1	1	4	1	2	3	1	1	3	0	0	-2	-2	-2	-4	-5
Bistro windows - high level	-22	-23	-22	-19	-20	-18	-24	-22	-22	-23	-24	-24	-22	-23	-23	-22	-24	-23	-23	-24	-24	-28	-28	-28	-30	-31
Bistro windows - high level	-22	-20	-20	-17	-18	-15	-24	-23	-22	-23	-24	-24	-22	-23	-23	-23	-24	-24	-22	-24	-24	-28	-28	-28	-30	-31
Bistro doors	-19	-17	-17	-13	-15	-8	-21	-20	-19	-21	-22	-22	-20	-21	-21	-21	-22	-22	-20	-22	-22	-26	-26	-26	-28	-29
Function Room	13	13	13	18	16	17	18	22	19	17	15	16	17	15	16	16	14	15	15	14	14	11	11	11	8	8
Function fixed windows - low level	-27	-28	-28	-23	-24	-23	-23	-24	-24	-24	-26	-26	-26	-26	-25	-28	-27	-26	-26	-27	-27	-30	-29	-29	-32	-32
Function fixed windows - low level	-28	-28	-28	-23	-24	-24	-23	-24	-24	-24	-26	-26	-25	-26	-25	-27	-27	-26	-26	-27	-27	-30	-29	-29	-32	-32
Function fixed windows - low level	-28	-28	-28	-23	-24	-24	-23	-23	-24	-24	-26	-26	-24	-26	-25	-26	-26	-26	-26	-27	-27	-29	-29	-29	-32	-32
Function fixed windows - low level	-28	-28	-27	-23	-24	-24	-23	-23	-22	-24	-26	-26	-24	-26	-25	-26	-26	-26	-25	-27	-26	-29	-29	-29	-31	-31
Function fixed windows - low level	-28	-28	-27	-23	-24	-24	-23	-23	-22	-24	-26	-23	-24	-25	-25	-26	-26	-26	-25	-26	-26	-30	-30	-30	-32	-32
Function fixed windows - low level	-28	-29	-27	-23	-24	-24	-8	-9	-22	-24	-26	-25	-23	-25	-20	-25	-26	-26	-25	-27	-26	-30	-30	-30	-32	-32
Function fixed windows - low level	-28	-27	-27	-23	-24	-24	-21	-23	-22	-21	-22	-25	-24	-25	-25	-24	-26	-26	-25	-27	-26	-30	-30	-29	-32	-32
Function fixed windows - low level	-28	-27	-27	-23	-25	-24	-23	-23	-22	-24	-26	-26	-24	-25	-25	-24	-26	-26	-25	-27	-26	-30	-30	-30	-32	-32
Function fixed windows - low level	-29	-28	-28	-24	-25	-24	-24	-24	-23	-24	-26	-25	-24	-25	-25	-24	-26	-26	-25	-27	-27	-30	-30	-30	-32	-33
Function fixed windows - low level	-29	-28	-28	-24	-25	-24	-24	-24	-23	-25	-26	-26	-23	-25	-25	-24	-26	-26	-25	-27	-26	-30	-30	-30	-32	-32
Function fixed windows - low level	-29	-28	-28	-24	-25	-24	-25	-24	-23	-24	-26	-26	-23	-25	-25	-24	-26	-26	-25	-26	-26	-30	-29	-29	-32	-32
Function fixed windows - low level	-29	-28	-28	-25	-25	-24	-26	-24	-23	-24	-25	-25	-23	-25	-25	-24	-26	-26	-25	-26	-26	-30	-30	-30	-32	-33
Function fixed windows - low level	-25	-26	-26	-25	-25	-24	-25	-24	-23	-25	-26	-26	-24	-25	-25	-24	-26	-26	-25	-27	-27	-30	-30	-31	-32	-32
Function windows - high level	5	5	5	10	9	10	11	10	10	9	7	7	8	7	9	5	6	7	7	6	6	3	3	4	1	1
Function windows - high level	-24	-24	-24	-19	-20	-18	-19	-20	-19	-19	-21	-21	-21	-22	-21	-22	-22	-22	-22	-23	-22	-25	-25	-25	-28	-28
Function windows - high level	5	5	6	10	9	10	11	10	11	10	7	8	9	7	8	8	7	7	7	6	7	3	4	4	0	0
Function windows - high level	-24	-24	-22	-19	-20	-18	-19	-19	-19	-19	-21	-21	-20	-22	-20	-21	-22	-21	-21	-23	-22	-25	-25	-24	-28	-28
Function windows - high level	5	5	6	11	9	10	11	11	13	10	7	8	10	8	8	8	7	7	8	7	7	2	2	2	1	0
Function windows - high level	-24	-24	-22	-19	-20	-18	-19	-19	-18	-19	-21	-20	-19	-21	-20	-21	-22	-21	-22	-24	-23	-27	-27	-26	-29	-29
Function windows - high level	6	6	6	11	9	10	11	20	12	9	7	9	9	7	7	9	6	6	7	6	6	2	2	3	1	1
Function windows - high level	-24	-22	-22	-19	-20	-18	-11	-19	-18	-21	-22	-22	-20	-22	-22	-21	-23	-23	-22	-24	-23	-27	-27	-26	-29	-29
Function windows - high level	5	5	5	10	9	8	11	11	12	9	8	10	9	7	8	9	7	7	8	6	6	2	2	3	1	1
Function windows - high level	-25	-24	-24	-21	-21	-20	-19	-21	-20	-22	-22	-22	-20	-22	-21	-21	-23	-23	-22	-23	-23	-27	-26	-26	-27	-27
Function windows - high level	-25	-25	-24	-21	-21	-20	-22	-21	-20	-21	-22	-22	-20	-22	-21	-21	-23	-22	-21	-23	-23	-25	-24	-24	-27	-27
Function windows - high level	5	4	5	8	8	10	7	9	10	9	7	7	10	8	8	9	7	7	8	6	6	3	3	2	0	0
Function windows - high level	-21	-23	-23	-21	-22	-20	-22	-21	-20	-22	-23	-23	-21	-23	-23	-22	-24	-23	-23	-24	-24	-27	-27	-28	-30	-30
Function doors	-24	-23	-23	-19	-20	-19	-19	-19	-18	-20	-21	-21	-19	-20	-20	-19	-21	-21	-20	-22	-21	-25	-24	-24	-27	-27

**** NOISE SOURCES ****

LICENSED VENUE NOISE
[Operation before midnight]

~ 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)

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: 05.10.2023
VERSION: 5255 - GF (max)

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

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

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

Source sound power levels - Licensed venue noise emission (With functions)

Name	Sound Power Level PWL Day (dBA)								
	63	125	250	500	1000	2000	4000	8000	A
Root	58	68	74	84	84	78	72	60	88
Terrace		67	74	84	84	77	72	60	88
30 patrons - 15 talking		67	74	84	84	77	72	60	88
Bistro	38	46	49	53	51	51	43	31	58
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro fixed windows - low level	20	28	31	35	33	33	25	13	40
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro windows - high level	22	30	33	37	35	35	27	15	42
Bistro doors	25	33	36	40	38	38	30	18	44
Function Room	58	63	63	64	64	61	52	39	70
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	54
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function fixed windows - low level	42	47	47	48	48	45	36	23	55
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function windows - high level	44	49	49	50	50	47	38	25	57
Function doors	47	52	52	53	53	50	41	28	59

Noise source contributions at each receiver - Licensed venue noise emission (With functions)

Partial Level Day

Name	R1a	R1b EG	R1b 1.OG	R2a	R2b GF	R2b L1	R3a	R3b GF	R3b L1	R4a	R4b GF	R4b L1	R5a	R5b GF	R5b L1	R6a	R6b GF	R6b L1	R7a	R7b GF	R7b L1	R8 L1	R8 L2	R8 L3	R9 GF	R9 L1
Root	18	19	20	24	22	24	24	23	25	23	22	23	25	23	24	24	22	22	23	21	22	19	20	19	16	16
Terrace	18	19	20	24	22	24	23	23	25	23	22	22	24	22	23	24	21	22	22	20	21	19	19	18	15	15
30 patrons - 15 talking	18	19	20	24	22	24	23	23	25	23	22	22	24	22	23	24	21	22	22	20	21	19	19	18	15	15
Bistro	-5	-4	-4	-3	-4	-2	1	1	2	13	12	12	15	12	12	14	11	11	13	11	11	9	9	9	7	6
Bistro fixed windows - low level	-29	-29	-28	-25	-25	-24	-25	-24	-24	-24	-25	-24	-22	-24	-23	-23	-24	-24	-22	-24	-24	-26	-26	-26	-26	-26
Bistro fixed windows - low level	-29	-29	-28	-25	-25	-24	-25	-24	-24	-23	-24	-24	-22	-24	-23	-23	-24	-24	-22	-24	-24	-26	-26	-26	-26	-26
Bistro fixed windows - low level	-28	-29	-28	-23	-25	-24	-25	-24	-23	-24	-24	-23	-22	-23	-23	-23	-24	-24	-22	-24	-24	-26	-26	-25	-25	-26
Bistro fixed windows - low level	-28	-29	-28	-26	-25	-24	-25	-25	-24	-24	-23	-23	-22	-23	-22	-22	-24	-23	-22	-24	-23	-26	-25	-25	-25	-25
Bistro fixed windows - low level	-29	-29	-29	-26	-25	-24	-25	-25	-24	-24	-23	-23	-22	-22	-22	-22	-23	-23	-22	-23	-23	-25	-25	-25	-24	-25
Bistro fixed windows - low level	-29	-29	-29	-27	-25	-24	-25	-25	-24	-23	-23	-23	-22	-23	-22	-22	-23	-23	-21	-23	-23	-25	-25	-24	-24	-24
Bistro fixed windows - low level	-29	-29	-29	-26	-25	-24	-25	-25	-24	-23	-22	-22	-21	-22	-22	-21	-23	-22	-21	-23	-22	-24	-24	-24	-23	-24
Bistro fixed windows - low level	-29	-29	-29	-26	-26	-24	-25	-25	-24	-23	-22	-22	-21	-22	-22	-21	-22	-22	-21	-22	-22	-23	-23	-23	-23	-23
Bistro fixed windows - low level	-29	-29	-29	-26	-26	-25	-25	-24	-24	-23	-22	-22	-21	-22	-21	-20	-22	-22	-21	-22	-21	-23	-23	-22	-22	-22
Bistro fixed windows - low level	-29	-29	-28	-26	-26	-25	-25	-24	-23	-22	-22	-21	-20	-21	-21	-20	-21	-21	-20	-21	-21	-22	-21	-21	-21	-21
Bistro fixed windows - low level	-29	-29	-28	-26	-26	-25	-24	-24	-23	-21	-21	-21	-19	-20	-20	-18	-20	-20	-19	-20	-20	-20	-20	-20	-19	-20
Bistro fixed windows - low level	-29	-28	-28	-25	-25	-24	-23	-23	-22	-19	-19	-19	-17	-18	-18	-17	-18	-18	-17	-18	-18	-18	-18	-18	-17	-18
Bistro fixed windows - low level	-27	-26	-26	-22	-22	-21	-16	-15	-15	-2	-3	-3	0	-2	-2	0	-3	-3	-1	-4	-4	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-26	-26	-26	-22	-21	-21	-15	-15	-14	-2	-2	-2	1	-2	-2	0	-3	-3	-1	-4	-4	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-26	-26	-26	-22	-21	-20	-15	-14	-14	-1	-2	-2	1	-2	-2	0	-3	-3	-1	-3	-3	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-26	-25	-19	-21	-20	-20	-14	-14	-13	-1	-2	-2	1	-2	-2	0	-2	-2	-1	-3	-3	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-25	-25	-17	-21	-20	-19	-14	-13	-13	-1	-2	-2	1	-2	-1	1	-2	-2	0	-3	-2	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-25	-24	-17	-20	-19	-19	-13	-13	-12	-1	-1	-1	2	-1	-1	1	-2	-2	0	-2	-2	-5	-5	-5	-7	-7
Bistro fixed windows - low level	-24	-24	-17	-19	-19	-18	-13	-12	-12	0	-1	-1	2	-1	-1	1	-2	-2	1	-2	-2	-5	-4	-4	-7	-7
Bistro fixed windows - low level	-22	-22	-16	-18	-17	-16	-12	-11	-11	0	-1	-1	2	-1	-1	1	-2	-2	1	-2	-2	-4	-4	-4	-7	-7
Bistro fixed windows - low level	-28	-28	-27	-24	-24	-23	-26	-25	-24	-25	-27	-27	-24	-25	-25	-24	-26	-26	-25	-27	-27	-31	-31	-31	-33	-33
Bistro fixed windows - low level	-28	-26	-26	-23	-23	-21	-27	-25	-24	-25	-27	-27	-24	-26	-26	-25	-27	-26	-25	-27	-27	-31	-31	-31	-33	-33
Bistro windows - high level	-11	-11	-23	-11	-19	-19	-20	-20	-19	-19	-21	-20	-18	-20	-20	-20	-21	-20	-19	-21	-21	-24	-24	-23	-23	-23
Bistro windows - high level	-11	-11	-23	-20	-21	-19	-20	-20	-19	-19	-20	-19	-18	-20	-19	-20	-21	-20	-19	-21	-20	-24	-23	-23	-22	-23
Bistro windows - high level	-23	-24	-23	-21	-21	-19	-20	-20	-19	-20	-20	-15	-18	-20	-19	-19	-21	-20	-19	-21	-20	-24	-23	-23	-22	-22
Bistro windows - high level	-23	-24	-23	-21	-21	-19	-20	-20	-19	-20	-20	-19	-18	-19	-19	-19	-20	-20	-19	-21	-20	-22	-23	-22	-22	-22
Bistro windows - high level	-24	-24	-24	-21	-21	-19	-20	-20	-19	-20	-19	-19	-18	-19	-18	-19	-20	-20	-19	-21	-20	-21	-21	-21	-21	-22
Bistro windows - high level	-24	-24	-24	-22	-21	-19	-20	-20	-19	-20	-19	-19	-18	-19	-19	-19	-20	-19	-18	-20	-20	-21	-21	-20	-21	-21
Bistro windows - high level	-24	-24	-24	-21	-21	-19	-20	-20	-19	-19	-19	-19	-18	-19	-17	-17	-19	-19	-17	-19	-18	-20	-20	-20	-20	-20
Bistro windows - high level	-24	-25	-24	-21	-22	-19	-20	-20	-19	-19	-18	-19	-17	-18	-16	-17	-19	-18	-17	-18	-18	-20	-20	-19	-19	-20
Bistro windows - high level	-25	-25	-24	-21	-22	-20	-20	-20	-19	-18	-18	-18	-17	-18	-16	-16	-18	-18	-17	-18	-18	-19	-19	-19	-19	-19
Bistro windows - high level	-25	-25	-24	-21	-22	-20	-20	-20	-19	-18	-18	-18	-16	-17	-16	-15	-17	-17	-16	-17	-17	-18	-18	-18	-18	-18
Bistro windows - high level	-25	-24	-24	-21	-22	-20	-20	-20	-18	-17	-17	-17	-15	-16	-15	-14	-16	-16	-15	-16	-16	-17	-17	-16	-16	-17
Bistro windows - high level	-25	-24	-24	-21	-21	-20	-19	-19	-18	-16	-16	-16	-13	-15	-14	-13	-14	-14	-14	-15	-14	-15	-15	-15	-14	-15
Bistro windows - high level	-23	-24	-23	-19	-18	-17	-13	-13	-11	0	0	0	3	0	0	2	-1	-1	1	-2	-1	-3	-3	-3	-5	-5
Bistro windows - high level	-23	-22	-22	-19	-18	-17	-13	-12	-11	1	0	0	3	0	0	2	-1	0	1	-1	-1	-3	-3	-3	-5	-5
Bistro windows - high level	-22	-22	-22	-19	-18	-17	-12	-12	-11	1	0	0	3	0	0	2	0	0	1	-1	-1	-3	-3	-3	-5	-5
Bistro windows - high level	-22	-17	-17	-18	-18	-17	-12	-11	-11	1	0	0	3	1	1	3	0	0	2	-1	-1	-3	-3	-3	-4	-5
Bistro windows - high level	-20	-16	-15	-18	-17	-16	-11	-11	-10	1	1	1	3	1	1	3	0	0	2	0	0	-3	-2	-2	-4	-5
Bistro windows - high level	-20	-16	-15	-17	-17	-16	-11	-10	-10	2	1	1	4	1	1	3	0	0	3	0	0	-2	-2	-2	-4	-5
Bistro windows - high level	-20	-15	-15	-17	-16	-16	-10	-10	-9	2	1	1	4	1	1	3	0	1	3	0	0	-2	-2	-2	-4	-5
Bistro windows - high level	-18	-15	-14	-15	-15	-14	-9	-9	-9	2	1	1	4	1	2	3	1	1	3	0	0	-2	-2	-2	-4	-5
Bistro windows - high level	-22	-23	-22	-19	-20	-18	-24	-22	-22	-23	-24	-24	-22	-23	-23	-22	-24	-23	-23	-24	-24	-28	-28	-28	-30	-31
Bistro windows - high level	-22	-20	-20	-17	-18	-15	-24	-23	-22	-23	-24	-24	-22	-23	-23	-23	-24	-24	-22	-24	-24	-28	-28	-28	-30	-31
Bistro doors	-19	-17	-17	-13	-15	-8	-21	-20	-19	-21	-22	-22	-20	-21	-21	-21	-22	-22	-20	-22	-22	-26	-26	-26	-28	-29
Function Room	6	6	7	10	9	11	12	12	10	10	9	9	10	8	9	8	7	8	8	7	7	4	5	5	2	2
Function fixed windows - low level	-11	-11	-11	-7	-7	-6	-7	-7	-7	-7	-9	-8	-9	-10	-8	-11	-10	-9	-10	-10	-10	-12	-12	-12	-15	-15
Function fixed windows - low level	-11	-11	-11	-7	-7	-6	-7	-7	-7	-7	-9	-8	-9	-10	-8	-10	-10	-9	-10	-10	-10	-12	-12	-12	-15	-15
Function fixed windows - low level	-11	-12	-11	-7	-8	-6	-7	-7	-7	-7	-9	-8	-8	-9	-8	-10	-10	-9	-9	-10	-10	-12	-12	-12	-15	-15
Function fixed windows - low level	-11	-12	-9	-7	-8	-6	-7	-7	-6	-7	-9	-8	-8	-9	-8	-9	-10	-9	-8	-10	-9	-12	-12	-12	-15	-15
Function fixed windows - low level	-11	-12	-10	-7	-8	-6	-7	-7	-6	-6	-8	-5	-7	-8	-8	-9	-9	-9	-8	-10	-9	-13	-13	-12	-15	-15
Function fixed windows - low level	-11	-12	-10	-7	-8	-6	7	6	-6	-7	-8	-8	-7	-8	-3	-9	-9	-9	-9	-10	-10	-13	-13	-12	-15	-15
Function fixed windows - low level	-12	-10	-10	-7	-8	-6	-4	-7	-6	-4	-5	-8	-7	-9	-8	-8	-10	-9	-9	-10	-10	-13	-13	-12	-15	-15
Function fixed windows - low level	-12	-10	-10	-7	-8	-7	-7	-7	-6	-8	-10	-9	-7	-9	-8	-8	-10	-9	-9	-10	-10	-13	-13	-12	-15	-15
Function fixed windows - low level	-13	-11	-11	-8	-8	-8	-7	-8	-7	-7	-10	-9	-7	-9	-8	-8	-10	-9	-9	-10	-10	-13	-13	-13	-16	-16
Function fixed windows - low level	-13	-11	-11	-8	-8	-8	-7	-8	-7	-8	-9	-9	-7	-8	-8	-8	-10	-9	-9	-10	-10	-13	-13	-13	-15	-15
Function fixed windows - low level	-13	-11	-11	-8	-8	-7	-9	-8	-7	-8	-9	-9	-7	-8	-8	-8	-9	-9	-9	-10	-9	-12	-12	-12	-15	-15
Function fixed windows - low level	-13	-11	-11	-8	-8	-7	-9	-8	-7	-8	-9	-8	-7	-8	-8	-8	-10	-9	-9	-10	-10	-13	-13	-13	-16	-16
Function fixed windows - low level	-8	-10	-10	-8	-8	-7	-9	-8	-8	-9	-10	-10	-8	-9	-9	-9	-10	-10	-10	-11	-11	-14	-14	-14	-16	-17
Function windows - high level	-7	-7	-7	-2	-3	-1	-2	-3	-2	-2	-4	-3	-4	-5	-3	-6	-5	-4	-5	-6	-5	-8	-8	-7	-11	-11
Function windows - high level	-7	-7	-7	-2	-3	-1	-2	-3	-2	-2	-4	-3	-4	-5	-3	-5	-5	-4	-5	-6	-5	-8	-7	-7	-11	-11
Function windows - high level	-7	-7	-7	-2	-3	-1	-2	-2	-1	-2	-4	-3	-3	-5	-3	-4	-5	-4	-5	-5	-5	-8	-7	-7	-13	-13
Function windows - high level	-7	-7	-4	-2	-3	-1	-2	-2	-2	-1	-3	-3	-3	-5	-3	-4	-5	-4	-4	-5	-5	-8	-7	-7	-12	-12
Function windows - high level	-7	-7	-4	-2	-3	-1	-2	-2	-1	-1	-3	-3	-2	-4	-3	-4	-5	-4	-4	-5	-4	-9	-9	-9	-11	-13
Function windows - high level	-7	-7	-4	-2	-3	-1	-2	-2	-2	-2	-3	-3	-2	-3	-3	-4	-5	-4	-5	-7	-6	-9	-9	-9	-11	-11
Function windows - high level	-7	-5	-5	-2	-3	-1	-2	4	-1	-3	-4	-2	-4	-5	-5	-5	-6	-6	-5	-7	-6	-9	-9	-9	-11	-11
Function windows - high level	-7	-5	-5	-2	-3	-1	4	-2	-2	-4	-5	-5	-4	-5	-5	-5	-6	-6	-5	-7	-6	-9	-9	-9	-11	-11
Function windows - high level	-9	-7	-7	-4	-5	-3	-2	-2	-3	-3	-6	-2	-3	-5	-4	-5	-6	-6	-5	-7	-6	-9	-9	-9	-11	-11
Function windows - high level	-9	-7	-7	-4	-5	-4	-2	-4	-3	-4	-5	-5	-3	-5	-4	-5	-6	-5	-5	-6	-6	-9	-9	-9	-10	-10
Function windows - high level	-9	-7	-7	-4	-5	-4	-5	-4	-4	-4	-5	-5	-3	-5	-4	-4	-6	-5	-5	-6	-6	-7	-7	-6	-10	-10
Function windows - high level	-9	-7	-7	-5	-5	-3	-5	-5	-4	-4	-5	-4	-3	-5	-4	-5	-6	-6	-5	-7	-6	-9	-10	-10	-12	-12
Function windows - high level	-4	-6	-6	-5	-5	-3	-5	-5	-4	-6	-7	-7	-6	-7	-7	-7	-8	-7	-7	-8	-8	-11	-11	-11	-14	-14
Function doors	-8	-6	-6	-3	-3	-2	-2	-3	-2	-3	-4	-4	-2	-3	-3	-3	-5	-4	-3	-5	-5	-7	-7	-7	-9	-9

APPENDIX C

APPENDIX C

APPENDIX C

MECHANICAL PLANT AND CAR PARK [9 pm to 10 pm]

~ Refrigeration plant

~ AC plant [-2 dB loading]

~ Kitchen ventilation

~ Building ventilation

~ Vehicles in the car park

~ Patrons walking to their cars

NOTES:

1. Noise levels shown are LAeq 15 mins

2. Noise levels shown at 1.5 m above the ground or relevant upper floor level

PRINT DATE: 03.10.2023

VERSION: 5255 - Mech - Sc1 [9-10]

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

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

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

Source sound power levels - Mechanical and car park noise emission - 9 pm to 10 pm

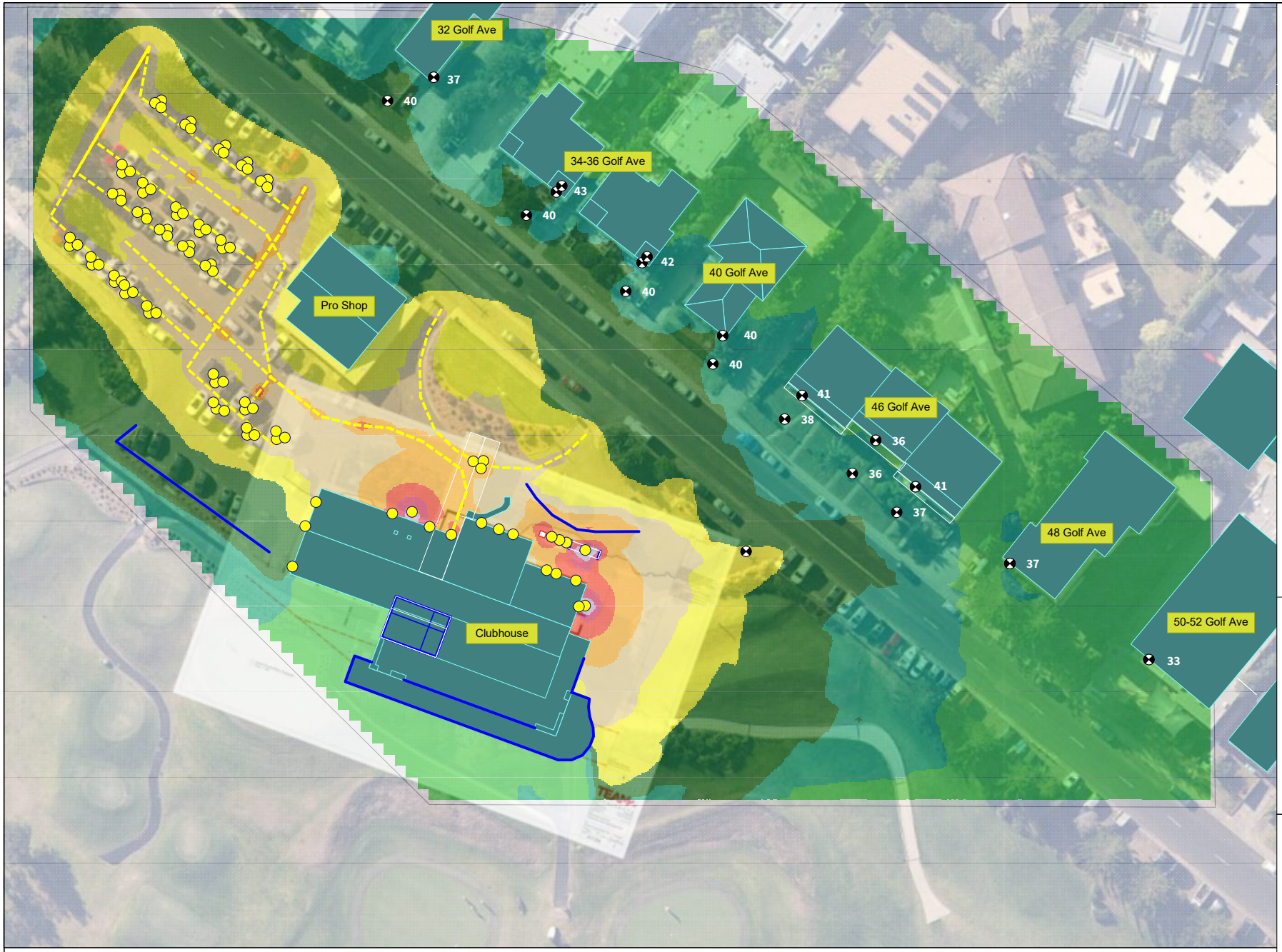
Name	Sound Power Level PWL Day (dBA)								
	63	125	250	500	1000	2000	4000	8000	A
Root	67	75	81	84	84	81	76	73	89
Car park	60	66	68	74	75	74	70	62	80
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine (x5)	35	38	37	46	49	52	51	45	56
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55

Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close (x5)	44	52	51	56	54	56	50	41	62
Car doors open and close (x5)	44	52	51	56	54	56	50	41	62
Cars - drop-off / pick-up (x5)	49	52	57	61	64	63	60	51	69
Cars - 5 cars arrive or depart	50	53	58	62	65	64	61	52	70
Cars - 5 cars arrive or depart	52	55	60	64	67	66	63	54	72
Cars - 5 cars arrive or depart	51	54	59	63	66	65	62	53	71
Cars - 5 cars arrive or depart	51	54	59	63	66	65	62	53	70
Cars - 5 cars arrive or depart	49	52	57	61	64	63	60	51	69
Patrons talking - 10 total, 5 talking		46	54	64	64	57	51	39	67
Patrons talking - 10 total, 5 talking		48	55	66	66	59	53	41	69
Patrons talking - 10 total, 5 talking		49	56	67	66	60	54	42	70
Existing AC	56	67	77	81	80	76	69	58	85
AC unit	53	64	74	78	77	73	66	55	82
AC unit	53	64	74	78	77	73	66	55	82
Existing refrigeration	55	63	75	76	79	76	71	63	83
Fridge	55	63	75	76	79	76	71	63	83
New AC	49	62	70	74	72	66	63	58	78
CU-1	35	48	56	60	58	52	49	44	64
CU-3	37	50	58	62	60	54	51	46	66
CU-2	38	51	59	63	61	55	52	47	67
CU-4	30	43	51	55	53	47	44	39	59
CU-5	47	60	68	72	70	64	61	56	76
CU-5	32	45	53	57	55	49	46	41	61
CU-5	32	45	53	57	55	49	46	41	61
CU-5	32	45	53	57	55	49	46	41	61
CU-5	32	45	53	57	55	49	46	41	61
New fans	65	73	76	78	75	72	69	72	83
TEF2	27	36	43	49	47	46	47	32	54
OAF4	36	47	49	53	50	53	53	45	59
OAF2	29	39	42	43	42	44	43	35	50
OAF2	29	39	42	43	42	44	43	35	50
OAF2	29	39	42	43	42	44	43	35	50
OAF5	22	29	40	46	53	39	34	26	54
OAF3	28	33	41	45	46	46	43	33	52
LEF2	33	43	45	52	55	55	52	44	60
OAF3	28	33	41	45	46	46	43	33	52
LEF1	33	43	45	52	55	55	52	44	60
TEF1	31	42	45	52	55	55	52	44	60
OAF1	28	33	41	45	46	46	43	33	52
KEF1	54	61	55	45	49	56	59	56	66
MUA - LGF	29	48	56	58	62	62	58	49	67
MUA - GF	31	50	57	59	64	64	59	50	69
Horizontal transfer duct - KEF1	57	62	52	33	33	35	31	24	64
Roof transfer duct - KEF1	59	60	45	28	34	36	33	25	63
KEF2	49	65	71	75	71	67	63	69	79
KEF2	49	65	71	75	71	67	63	69	79
Vertical rier breakout - KEF1	60	61	49	33	35	36	33	25	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64

Noise source contributions at each receiver - Mechanical and car park noise emission - 9 pm to 10 pm

Source Name	Partial Level R1a	R1b EG	R1b 1.OG	R2a	R2b GF	R2b L1	R3a	R3b GF	R3b L1	R4a	R4b GF	R4b L1	R5a	R5b GF	R5b L1	R6a	R6b GF	R6b L1	R7a	R7b GF	R7b L1	R8 L1	R8 L2	R8 L3	R9 GF	R9 L1
Root	41	36	38	41	40	45	42	40	44	41	40	42	40	39	43	38	38	40	39	39	42	39	40	39	31	35
Car park	40	33	33	38	36	37	37	35	35	36	34	34	32	32	33	28	29	31	27	28	30	23	26	28	17	20
Car engine	9	-8	-8	4	3	-5	2	1	-9	2	1	0	-6	-2	-2	-11	-8	-5	-13	-9	-4	-15	-10	-5	-22	-19
Car engine	11	-6	-6	6	4	-2	3	2	-6	1	2	0	-5	-1	-1	-10	-7	-5	-13	-9	-4	-14	-10	-5	-22	-18
Car engine	13	-4	-4	8	5	1	4	3	-6	1	1	1	-5	-1	-1	-9	-6	-4	-12	-8	-3	-14	-9	-5	-21	-18
Car engine	14	-2	-2	10	6	6	5	3	-3	2	1	1	-4	0	-1	-9	-6	-3	-12	-7	-3	-13	-9	-4	-21	-17
Car engine	14	1	1	9	6	6	6	4	-3	2	2	2	-4	0	0	-6	-5	-3	-11	-7	-2	-13	-9	-4	-20	-17
Car engine	10	0	0	5	5	5	-9	-11	-9	1	-1	-2	-2	-5	-7	-14	-13	-11	-15	-14	-11	-21	-20	-16	-24	-25
Car engine	10	-2	-2	7	4	4	1	-6	-4	0	-3	-4	-3	-5	-7	-13	-18	-19	-15	-14	-12	-20	-19	-15	-24	-24
Car engine	10	-4	-4	7	4	4	2	2	2	-1	-3	-4	-4	-5	-7	-13	-15	-12	-15	-13	-9	-19	-18	-15	-23	-23
Car engine	9	-6	-6	6	3	3	4	1	-4	-3	-6	-5	-4	-5	-9	-14	-13	-9	-15	-17	-16	-11	-12	-8	-23	-22
Car engine	9	-8	-8	6	3	3	4	1	-5	-3	0	-1	-4	-4	-5	-13	-13	-9	-14	-15	-15	-11	-12	-8	-23	-21
Car engine	8	-7	-7	6	3	3	4	1	-4	-12	-8	-8	-5	-5	-7	-14	-13	-10	-16	-17	-17	-19	-18	-13	-23	-23
Car engine	9	-6	-6	6	3	3	1	1	1	-3	-11	-11	-4	-5	-5	-14	-13	-10	-15	-15	-12	-18	-19	-13	-23	-23
Car engine	9	-4	-4	6	4	3	1	-6	-3	-3	-13	-13	-4	-5	-9	-15	-13	-9	-15	-19	-19	-18	-19	-13	-23	-23
Car engine	9	-2	-2	7	4	4	-10	-10	-9	0	-2	-2	-4	-5	-10	-18	-13	-9	-14	-15	-12	-17	-19	-13	-23	-24
Car engine	10	0	0	3	-3	-1	-10	-10	-12	0	-1	-2	-3	-5	-7	-14	-16	-12	-14	-15	-12	-17	-19	-15	-22	-23
Car engine	6	-8	-8	5	2	2	-11	-11	-8	-15	-16	-16	-18	-15	-13	-10	-17	-14	-11	-11	-8	-18	-17	-14	-22	-19
Car engine	7	-7	-7	2	2	2	-13	-13	-11	-16	-16	-17	-18	-19	-15	-10	-15	-13	-9	-11	-7	-17	-16	-14	-22	-19
Car engine	7	-5	-5	1	-3	0	-14	-15	-14	-5	-6	-9	-17	-18	-18	-9	-6	-6	-8	-10	-7	-16	-15	-13	-21	-19
Car engine	7	-4	-4	1	-7	-4	-14	-16	-15	-5	-6	-9	-15	-16	-11	-8	-5	-6	-8	-10	-6	-15	-12	-11	-21	-17
Car engine	7	-3	-3	-11	-12	-10	-4	-5	-15	-13	-5	-5	-12	-15	-14	-8	-5	-5	-8	-9	-6	-14	-9	-9	-20	-17
Car engine	7	5	5	-11	-13	-4	-10	-12	-8	-3	-4	1	-5	-5	0	-5	-5	0	-5	-5	0	-11	-8	-4	-18	-14
Car engine	5	-6	-6	-11	-13	-10	-1	-7	-7	-1	-4	1	-5	-5	0	-6	-6	-2	-6	-7	-2	-9	-6	-2	-18	-15
Car engine	-8	-12	-11	-10	-12	-10	-1	-2	3	3	-3	2	-4	-4	0	-4	-2	1	-4	-5	0	-10	-3	-3	-17	-15
Car engine	-10	-13	-13	-8	-9	-8	1	-2	3	3	2	2	-4	-4	0	-6	-6	-1	-7	-6	-2	-8	-2	-1	-18	-16
Car engine	-11	-14	-13	1	-1	6	5	3	3	3	2	3	-3	-4	1	-2	-2	2	-4	-3	1	-8	-2	-1	-18	-15
Car engine (x5)	5	6	12	14	12	17	16	16	18	16	13	15	9	10	14	5	7	13	7	9	12	0	7	8	-7	-3
Car doors open and close	14	1	1	9	9	3	8	7	0	7	7	5	1	5	4	-3	-2	0	-5	-2	2	-7	-4	1	-12	-10
Car doors open and close	14	1	1	10	9	3	8	7	0	7	7	6	1	5	4	-3	-1	0	-5	-2	2	-6	-4	1	-12	-10
Car doors open and close	17	2	3	11	10	4	8	8	1	8	7	6	1	5	5	-3	-1	1	-4	-2	3	-6	-4	1	-12	-9
Car doors open and close	17	3	3	11	10	5	8	8	1	7	7	6	1	5	5	-2	-1	1	-4	-2	3	-6	-4	1	-12	-9
Car doors open and close	18	4	5	12	11	7	9	8	2	7	7	7	1	5	5	-2	0	1	-4	-2	3	-6	-3	2	-12	-9
Car doors open and close	18	5	5	13	11	11	9	8	2	8	7	7	1	5	5	-2	0	1	-4	-2	3	-5	-3	2	-11	-9
Car doors open and close	19	6	6	15	11	11	10	9	3	7	7	7	2	6	5	0	0	2	-4	-1	3	-5	-3	2	-11	-8
Car doors open and close	19	6	7	14	12	12	10	10	4	8	7	7	2	6	5	0	0	2	-3	-1	4	-5	-3	2	-11	-8
Car doors open and close	19	8	8	15	12	12	12	10	5	8	8	7	2	6	6	0	0	2	-3	-1	4	-5	-3	2	-11	-8
Car doors open and close	19	8	8	15	12	12	12	10	4	8	8	8	2	6	6	0	0	2	-3	-1	4	-5	-2	2	-11	-8
Car doors open and close	14	1	1	12	9	9	9	7	1	7	6	5	1	2	4	-4	-12	-8	-6	-4	-3	-8	-7	-6	-13	-11
Car doors open and close	14	1	2	11	9	9	9	7	2	4	6	5	1	1	1	-4	-7	-5	-6	-5	-3	-8	-8	-6	-13	-11
Car doors open and close	15	2	2	12	9	9	10	7	2	3	6	5	1	1	1	-5	-7	-5	-6	-5	-4	-8	-8	-7	-13	-11
Car doors open and close	15	2	3	12	9	9	10	7	2	3	7	6	1	1	0	-5	-7	-5	-7	-6	-4	-9	-9	-7	-13	-11
Car doors open and close	15	4	4	12	10	10	8	8	3	4	3	3	1	0	-1	-6	-8	-6	-7	-7	-6	-9	-9	-8	-13	-12
Car doors open and close	15	4	4	12	10	10	8	8	8	4	2	2	1	0	0	-6	-9	-8	-7	-7	-6	-10	-10	-8	-13	-12
Car doors open and close	16	5	5	13	10	10	7	5	8	4	2	2	1	0	-1	-5	-9	-9	-7	-7	-6	-10	-10	-8	-14	-13
Car doors open and close	16	5	6	13	10	10	7	3	5	4	2	2	1	0	-1	-5	-6	-4	-7	-6	-5	-11	-10	-9	-14	-13
Car doors open and close	16	7	7	13	11	11	-1	0	2	5	2	2	2	0	-1	-6	-10	-10	-7	-6	-5	-12	-12	-11	-14	-14
Car doors open and close	16	7	7	11	11	11	-1	-1	0	5	3	2	2	0	-1	-5	-11	-11	-7	-7	-5	-12	-12	-12	-15	-14
Car doors open and close	15	7	7	9	3	4	-1	-2	-4	4	2	2	0	0	-2	-6	-8	-5	-8	-7	-5	-10	-11	-7	-12	-13
Car doors open and close	15	6	6	9	5	6	-4	-4	-3	4	4	3	0	-1	-5	-9	-8	-5	-6	-7	-5	-10	-11	-7	-12	-13
Car doors open and close	15	5	5	10	10	10	-2	-2	-1	2	3	2	0	0	-2	-8	-8	-5	-7	-10	-10	-11	-11	-8	-12	-13
Car doors open and close	15	5	5	12	10	10	-2	-1	0	2	-3	-1	0	0	-2	-9	-8	-5	-8	-10	-10	-10	-11	-8	-13	-13
Car doors open and close	15	4	4	12	9	9	0	1	2	1	-5	-4	0	-1	-5	-7	-8	-5	-8	-10	-10	-11	-11	-8	-13	-13
Car doors open and close	14	3	4	12	9	9	7	2	4	1	-4	-4	0	-1	-3	-7	-8	-5	-7	-8	-6	-11	-11	-8	-13	-13
Car doors open and close	14	3	3	12	9	9	6	7	7	1	-3	-3	0	0	0	-6	-8	-6	-8	-9	-9	-11	-11	-8	-13	-13
Car doors open and close	14	2	2	11	9	9	7	7	7	-3	-2	-2	0	0	0	-6	-8	-6	-8	-9	-9	-10	-10	-7	-13	-13
Car doors open and close	14	1	2	11	9	9	7	7	2	-2	-1	-1	0	0	-1	-6	-8	-6	-8	-8	-7	-10	-10	-7	-13	-13
Car doors open and close	14	1	1	11	8	8	9	7	2	-3	0	0	0	0	-1	-6	-8	-6	-8	-8	-6	-10	-10	-7	-13	-12
Car doors open and close	12	0	1	10	7	8	-1	-1	1	-6	-6	-6	-8	-7	-7	-5	-3	-3	-6	-6	-3	-9	-9	-8	-13	-11
Car doors open and close	12	1	1	10	8	8	-2	-2	0	-6	-6	-6	-8	-7	-7	-5	-2	-3	-6	-6	-3	-9	-9	-7	-13	-11
Car doors open and close	12	1	1	10	8	8	-3	-3	-1	-6	-7	-6	-8	-8	-8	-4	-2	-2	-5	-6	-3	-9	-8	-7	-12	-10
Car doors open and close	12	2	2	8	8	8	-4	-4	-2	-6	-7	-3	-8	-8	-7	-4	-2	-2	-5	-6	-3	-8	-8	-6	-12	-10
Car doors open and close	13	2	3	8	8	8	-4	-5	-4	-1	-7	-3	-8	-8	-6	-4	-2	-2	-4	-5	-2	-8	-8	-7	-12	-10
Car doors open and close	13	3	3	7	4	6	-5	-5	-4	-1	-7	-3	-7	-8	-6	-4	-1	-2	-4	-5	-2	-7	-7	-6	-12	-10
Car doors open and close	13	3	3	8	3	5	-5	-6	-4	-1	-1	-3	-7	-8	-8	-3	-1	-2	-3	-5	-2	-7	-7	-6	-12	-10
Car doors open and close	13	3	3	8	1	3	-5	-6	-5	-1	-1	-3	-5	-8	-8	-3	-1	-1	-3	-4	-2	-7	-6	-5	-11	-9
Car doors open and close	13	4	4	-1	-2	0	-5	-6	-5	-6	-1	-7	-4	-6	-4	-2	-1	-1	-2	-3	-1	-7	-4	-2	-10	-8
Car doors open and close	13	4	5	-2	-3	-1	0	-6	-5	-6	-1	-1	-4	-7	-6	-2	-1	-1	-2	-3	-1	-7	-4	-3	-11	-8
Car doors open and close	13	11	11	-2	-4	-1	-1	-4	1	3	1	1	2	1	6	2	3	6	0	0	5	-3	-2	3	-8	-6
Car doors open and close	13	5	5	-2	-4	2	0	-3	-1	3	3	7	2	1	6	3	3	6	1	0	5	-3	-2	3	-8	-6
Car doors open and close	5	0	0	-2	-4	-1	5	3	3	5	3	7	2	1	6	1	0	5	1	-1	4	-2	-1	4	-9	-7
Car doors open and close	11	4	4	-2	-4	1	3	0	0	5	2	7	2	1	6	1	0	5	1	-1	4	-3	-1	4	-9	-7
Car doors open and close	1	-2	-2	-2	-3	-1	5	3	3	6	3	7	4	2	6	3	4	6	2	1	6	-3	-2	3	-8	-6
Car doors open and close	-1	-3	-3	-1	-2	0	5	4	9	9	8	8	4	2	6	3	4	6	2	1	6	-3	3	3	-8	-6

Car doors open and close	-1	-4	-3	0	-1	1	6	4	8	9	8	7	2	2	6	2	0	5	2	0	5	-1	4	4	-9	-7
Car doors open and close	-2	-5	-3	2	1	2	7	4	9	9	8	8	3	2	6	2	0	5	2	0	5	-1	4	5	-9	-7
Car doors open and close	-3	-5	-4	6	5	6	11	9	9	9	8	9	6	7	9	3	4	7	3	1	6	-2	4	4	-8	-6
Car doors open and close	-4	-5	-4	8	5	12	11	9	9	9	8	9	6	7	9	4	4	8	3	2	6	-2	4	4	-8	-6
Car doors open and close (x5)	11	11	17	18	16	23	21	18	23	19	18	21	15	15	20	15	11	17	14	14	17	7	9	14	2	4
Car doors open and close (x5)	11	12	17	18	16	22	21	21	23	22	21	21	15	15	20	12	13	18	13	14	17	8	14	14	2	5
Cars - drop-off / pick-up (x5)	25	25	26	31	29	31	31	29	30	31	28	29	27	26	27	24	23	25	23	22	24	18	21	21	12	15
Cars - 5 cars arrive or depart	30	24	24	24	21	21	21	19	19	19	18	20	16	17	18	16	14	17	13	13	18	10	12	16	3	5
Cars - 5 cars arrive or depart	32	24	24	27	25	24	23	22	18	21	20	20	18	18	18	14	15	16	12	13	17	9	11	15	3	6
Cars - 5 cars arrive or depart	32	22	22	27	25	24	24	22	18	21	20	20	17	18	18	12	12	14	10	11	15	7	9	13	2	3
Cars - 5 cars arrive or depart	32	21	21	28	25	25	24	22	19	21	21	20	17	18	18	12	11	13	9	11	15	7	9	13	1	3
Cars - 5 cars arrive or depart	31	19	19	27	25	23	24	22	16	22	21	21	17	19	19	13	13	15	10	12	17	8	11	16	1	4
Patrons talking - 10 total, 5 talking	19	20	21	27	25	27	28	25	26	27	25	24	23	23	23	19	20	22	18	19	21	14	18	18	9	11
Patrons talking - 10 total, 5 talking	25	22	22	27	25	27	28	25	26	27	25	24	23	23	23	19	20	22	18	19	21	14	18	19	9	11
Patrons talking - 10 total, 5 talking	29	24	24	29	26	28	28	26	27	27	25	25	23	24	24	19	20	22	18	19	21	14	18	19	9	11
Existing AC	27	29	33	36	35	42	36	35	40	35	34	37	37	36	41	34	33	36	37	35	40	38	38	38	29	34
AC unit	16	16	16	19	19	22	28	27	32	31	30	33	36	35	40	34	33	35	37	35	40	38	38	38	29	34
AC unit	27	29	33	36	35	42	35	34	40	33	32	35	28	29	31	21	26	27	22	23	24	16	19	20	12	11
Existing refrigeration	26	23	28	29	29	33	31	30	35	33	32	35	28	26	27	29	29	33	29	33	30	27	32	29	17	17
Fridge	26	23	28	29	29	33	31	30	35	33	32	35	28	26	27	29	29	33	29	33	30	27	32	29	17	17
New AC	16	15	21	19	19	24	27	26	31	28	28	31	28	28	31	27	26	32	22	25	31	14	20	21	7	9
CU-1	-4	-3	-3	8	7	11	9	8	13	10	10	12	13	12	17	11	10	14	7	13	15	13	18	18	-14	-15
CU-3	-3	-2	-2	11	10	14	11	11	15	12	12	15	15	14	18	17	16	19	10	15	17	-13	-10	-9	-12	-12
CU-2	-5	-5	-4	2	11	16	13	13	17	14	18	17	17	16	20	19	18	20	8	15	17	-13	-8	-8	-10	-10
CU-4	-1	-3	-2	4	2	2	-1	-2	-2	-3	-4	-5	-5	-6	-6	-6	-7	-7	-7	-8	-8	-15	-15	-15	-15	-17
CU-5	16	14	21	17	16	22	26	26	30	28	27	30	27	26	31	24	24	32	21	23	31	8	15	18	6	8
CU-5	1	0	5	3	0	5	9	9	13	6	5	7	5	10	4	2	1	3	1	0	2	-7	-3	-2	-7	-7
CU-5	-2	-3	1	-1	-2	3	3	3	7	5	5	6	6	10	6	4	3	7	2	3	7	-8	-3	-2	-8	-8
CU-5	-3	-5	-4	-2	-1	2	9	8	13	10	9	12	11	14	13	10	9	14	7	9	14	-7	-3	-2	-6	-6
CU-5	-2	-2	1	0	-1	2	9	9	13	11	9	12	13	14	15	12	11	16	7	9	14	-6	-1	0	-7	-7
New fans	28	31	31	35	33	37	37	34	38	36	35	36	36	34	35	33	32	32	33	32	32	29	30	30	26	27
TEF2	-9	-9	-9	-6	-6	-3	-4	-4	4	9	8	13	16	13	13	15	12	12	14	12	12	10	10	10	7	7
OAF4	6	4	7	9	9	13	11	11	15	14	14	16	20	16	19	19	18	18	15	17	17	17	18	17	10	14
OAF2	-1	-2	1	1	1	5	3	2	6	4	3	6	6	4	11	10	8	8	7	8	9	4	9	9	2	6
OAF2	-1	-1	3	2	1	6	3	2	6	3	3	5	5	3	11	10	8	9	7	11	11	4	9	10	2	7
OAF2	0	-1	7	5	4	12	4	4	7	2	2	4	4	2	4	0	-1	3	2	0	3	-1	4	5	-7	-5
OAF5	4	4	10	11	8	15	10	14	16	7	6	8	6	4	7	3	2	5	4	2	5	2	7	7	-5	-2
OAF3	-3	-3	0	4	5	7	10	8	10	7	6	12	3	2	5	1	0	3	1	-1	3	0	5	5	-8	-5
LEF2	-2	-3	1	5	4	5	5	4	5	5	4	3	1	-1	2	-2	-3	-2	-2	-4	-3	-8	-8	-7	-10	-12
OAF3	3	3	8	12	10	12	13	11	13	8	8	11	3	3	6	-8	-7	-1	-9	-10	-9	-14	-14	-14	-17	-15
LEF1	5	11	17	20	18	20	21	20	21	20	19	19	18	18	17	9	16	18	8	15	12	-4	7	12	-8	-8
TEF1	-1	-1	1	8	6	7	5	3	4	2	1	1	0	0	0	-2	-2	-2	-2	-4	-3	-7	-7	-6	-11	-12
OAF1	-8	-9	-6	-7	-8	-8	-11	-12	-11	-13	-15	-15	-14	-15	-15	-17	-16	-16	-16	-17	-16	-20	-20	-19	-22	-22
KEF1	23	23	21	23	22	25	27	26	25	27	26	24	28	26	24	26	24	22	26	24	24	21	22	22	16	18
MUA - LGF	13	12	14	16	17	18	19	18	20	18	19	20	16	15	17	14	13	15	14	12	15	15	16	17	9	12
MUA - GF	16	25	26	30	27	29	31	28	29	30	28	28	28	26	24	25	24	20	26	24	21	17	17	18	9	10
Horizontal transfer duct - KEF1	10	11	10	15	15	15	22	23	23	23	23	24	23	24	26	23	19	24	24	23	23	19	19	19	12	17
Roof transfer duct - KEF1	13	13	15	18	18	21	22	21	20	22	21	21	23	20	21	19	19	19	19	18	18	16	16	16	12	13
KEF2	18	21	22	25	23	32	29	24	32	28	24	29	24	24	28	22	20	21	23	20	21	17	18	19	16	17
KEF2	17	21	22	25	23	32	26	24	32	26	24	29	24	22	28	20	20	21	21	19	21	19	20	21	17	17
Vertical rier breakout - KEF1	12	13	13	17	17	18	24	23	23	25	24	24	27	25	25	25	24	25	25	23	23	21	21	21	17	17
KEF2 radiated	14	18	18	21	20	22	18	17	17	17	16	16	15	14	14	12	12	13	10	11	12	8	8	9	9	8
KEF2 radiated	14	18	18	21	20	22	22	20	22	22	20	20	21	19	19	18	17	17	17	16	16	13	14	14	14	13
KEF2 radiated	9	15	15	21	20	22	22	20	22	22	20	20	21	19	19	18	17	17	19	16	16	16	14	14	14	14
KEF2 radiated	7	13	13	16	15	16	16	15	16	16	15	15	16	14	15	11	13	14	16	12	13	14	9	9	11	11
KEF2 radiated	15	18	18	21	20	22	18	17	17	17	16	16	15	14	14	12	12	13	11	11	12	9	9	9	9	8
KEF2 radiated	15	18	18	21	20	22	22	20	22	22	20	20	21	19	19	16	17	17	17	17	17	14	14	14	14	13
KEF2 radiated	11	15	15	21	20	22	22	20	22	22	20	20	21	19	19	17	17	17	19	17	17	15	14	14	14	14
KEF2 radiated	7	13	13	16	15	16	16	15	16	17	15	15	16	15	15	12	13	14	17	13	13	15	11	11	12	11



MECHANICAL PLANT AND CAR PARK [10 pm to 11 pm]

~ Refrigeration plant

~ AC plant [-3 dB loading]

~ Building ventilation

~ Vehicles in the car park

~ Patrons walking to their cars

NOTES:

1. Noise levels shown are LAeq 15 mins
2. Noise levels shown at 1.5 m above the ground or relevant upper floor level
3. No kitchen ventilation equipment

PRINT DATE: 03.10.2023

VERSION: 5255 - Mech - Sc2 [10-11]

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

- < 35
- 35 <---> 40
- 40 <---> 45
- 45 <---> 50
- 50 <---> 55
- 55 <---> 60
- 60 <---> 65
- 65 <---> 70
- 70 <---> 75
- 75 <---> 80
- 80 <---> 85
- 85 <---> 90
- 90 <---> 95
- 95 <---> 100
- > 100dB(A)

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

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

Source sound power levels - Mechanical and car park noise emission - 10 pm to midnight

Name	Sound Power Level PWL (dBA)								
	63	125	250	500	1000	2000	4000	8000	A
Root	62	70	79	83	83	80	75	67	88
Car park	60	66	68	74	75	74	70	62	80
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine	28	31	30	39	42	45	44	38	49
Car engine (x5)	35	38	37	46	49	52	51	45	56
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55

Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close	37	45	44	49	47	49	43	34	55
Car doors open and close (x5)	44	52	51	56	54	56	50	41	62
Car doors open and close (x5)	44	52	51	56	54	56	50	41	62
Cars - drop-off / pick-up (x5)	49	52	57	61	64	63	60	51	69
Cars - 5 cars arrive or depart	50	53	58	62	65	64	61	52	70
Cars - 5 cars arrive or depart	52	55	60	64	67	66	63	54	72
Cars - 5 cars arrive or depart	51	54	59	63	66	65	62	53	71
Cars - 5 cars arrive or depart	51	54	59	63	66	65	62	53	70
Cars - 5 cars arrive or depart	49	52	57	61	64	63	60	51	69
Patrons talking - 4 total, 2 talking		46	54	64	64	57	51	39	67
Patrons talking - 4 total, 2 talking		48	55	66	66	59	53	41	69
Patrons talking - 4 total, 2 talking		49	56	67	66	60	54	42	70
Existing AC	55	66	76	80	79	75	68	57	84
AC unit	52	63	73	77	76	72	65	54	81
AC unit	52	63	73	77	76	72	65	54	81
Existing refrigeration	55	63	75	76	79	76	71	63	83
Fridge	55	63	75	76	79	76	71	63	83
New AC	48	61	69	73	71	65	62	57	77
CU-1	34	47	55	59	57	51	48	43	63
CU-3	36	49	57	61	59	53	50	45	65
CU-2	37	50	58	62	60	54	51	46	66
CU-4	29	42	50	54	52	46	43	38	58
CU-5	46	59	67	71	69	63	60	55	75
CU-5	31	44	52	56	54	48	45	40	60
CU-5	31	44	52	56	54	48	45	40	60
CU-5	31	44	52	56	54	48	45	40	60
CU-5	31	44	52	56	54	48	45	40	60
New fans	41	51	55	60	62	62	59	51	67
TEF2	27	36	43	49	47	46	47	32	54
OAF4	36	47	49	53	50	53	53	45	59
OAF2	29	39	42	43	42	44	43	35	50
OAF2	29	39	42	43	42	44	43	35	50
OAF2	29	39	42	43	42	44	43	35	50
OAF5	22	29	40	46	53	39	34	26	54
OAF3	28	33	41	45	46	46	43	33	52
LEF2	33	43	45	52	55	55	52	44	60
OAF3	28	33	41	45	46	46	43	33	52
LEF1	33	43	45	52	55	55	52	44	60
TEF1	31	42	45	52	55	55	52	44	60
OAF1	28	33	41	45	46	46	43	33	52
KEF1	54	61	55	45	49	56	59	56	66
MUA - LGF	29	48	56	58	62	62	58	49	67
MUA - GF	31	50	57	59	64	64	59	50	69
Horizontal transfer duct - KEF1	57	62	52	33	33	35	31	24	64
Roof transfer duct - KEF1	59	60	45	28	34	36	33	25	63
KEF2	49	65	71	75	71	67	63	69	79
KEF2	49	65	71	75	71	67	63	69	79
Vertical rier breakout - KEF1	60	61	49	33	35	36	33	25	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64
KEF2 radiated	43	59	60	59	50	41	35	38	64

Noise source contributions at each receiver - Mechanical and car park noise emission - 10 pm to midnight

Source Name	Partial Level R1a	R1b EG	R1b 1.OG	R2a	R2b GF	R2b L1	R3a	R3b GF	R3b L1	R4a	R4b GF	R4b L1	R5a	R5b GF	R5b L1	R6a	R6b GF	R6b L1	R7a	R7b GF	R7b L1	R8 L1	R8 L2	R8 L3	R9 GF	R9 L1
Root	40	34	37	40	38	43	40	38	42	40	38	40	38	37	41	36	36	39	37	37	41	37	38	38	29	33
Car park	40	33	33	38	36	37	37	35	35	36	34	34	32	32	33	28	29	31	27	28	30	23	26	28	17	20
Car engine	9	-8	-8	4	3	-5	2	1	-9	2	1	0	-6	-2	-2	-11	-8	-5	-13	-9	-4	-15	-10	-5	-22	-19
Car engine	11	-6	-6	6	4	-2	3	2	-6	1	2	0	-5	-1	-1	-10	-7	-5	-13	-9	-4	-14	-10	-5	-22	-18
Car engine	13	-4	-4	8	5	1	4	3	-6	1	1	1	-5	-1	-1	-9	-6	-4	-12	-8	-3	-14	-9	-5	-21	-18
Car engine	14	-2	-2	10	6	6	5	3	-3	2	1	1	-4	0	-1	-9	-6	-3	-12	-7	-3	-13	-9	-4	-21	-17
Car engine	14	1	1	9	6	6	6	4	-3	2	2	2	-4	0	0	-6	-5	-3	-11	-7	-2	-13	-9	-4	-20	-17
Car engine	10	0	0	5	5	5	-9	-11	-9	1	-1	-2	-2	-5	-7	-14	-13	-11	-15	-14	-11	-21	-20	-16	-24	-25
Car engine	10	-2	-2	7	4	4	1	-6	-4	0	-3	-4	-3	-5	-7	-13	-18	-19	-15	-14	-12	-20	-19	-15	-24	-24
Car engine	10	-4	-4	7	4	4	2	2	2	-1	-3	-4	-4	-5	-7	-13	-15	-12	-15	-13	-9	-19	-18	-15	-23	-23
Car engine	9	-6	-6	6	3	3	4	1	-4	-3	-6	-5	-4	-5	-9	-14	-13	-9	-15	-17	-16	-11	-12	-8	-23	-22
Car engine	9	-8	-8	6	3	3	4	1	-5	-3	0	-1	-4	-4	-5	-13	-13	-9	-14	-15	-15	-11	-12	-8	-23	-21
Car engine	8	-7	-7	6	3	3	4	1	-4	-12	-8	-8	-5	-5	-7	-14	-13	-10	-16	-17	-17	-19	-18	-13	-23	-23
Car engine	9	-6	-6	6	3	3	1	1	1	-3	-11	-11	-4	-5	-5	-14	-13	-10	-15	-15	-12	-18	-19	-13	-23	-23
Car engine	9	-4	-4	6	4	3	1	-6	-3	-3	-13	-13	-4	-5	-9	-15	-13	-9	-15	-19	-19	-18	-19	-13	-23	-23
Car engine	9	-2	-2	7	4	4	-10	-10	-9	0	-2	-2	-4	-5	-10	-18	-13	-9	-14	-15	-12	-17	-19	-13	-23	-24
Car engine	10	0	0	3	-3	-1	-10	-10	-12	0	-1	-2	-3	-5	-7	-14	-16	-12	-14	-15	-12	-17	-19	-15	-22	-23
Car engine	6	-8	-8	5	2	2	-11	-11	-8	-15	-16	-16	-18	-15	-13	-10	-17	-14	-11	-11	-8	-18	-17	-14	-22	-19
Car engine	7	-7	-7	2	2	2	-13	-13	-11	-16	-16	-17	-18	-19	-15	-10	-15	-13	-9	-11	-7	-17	-16	-14	-22	-19
Car engine	7	-5	-5	1	-3	0	-14	-15	-14	-5	-6	-9	-17	-18	-18	-9	-6	-6	-8	-10	-7	-16	-15	-13	-21	-19
Car engine	7	-4	-4	1	-7	-4	-14	-16	-15	-5	-6	-9	-15	-16	-11	-8	-5	-6	-8	-10	-6	-15	-12	-11	-21	-17
Car engine	7	-3	-3	-11	-12	-10	-4	-5	-15	-13	-5	-5	-12	-15	-14	-8	-5	-5	-8	-9	-6	-14	-9	-9	-20	-17
Car engine	7	5	5	-11	-13	-4	-10	-12	-8	-3	-4	1	-5	-5	0	-5	-5	0	-5	-5	0	-11	-8	-4	-18	-14
Car engine	5	-6	-6	-11	-13	-10	-1	-7	-7	-1	-4	1	-5	-5	0	-6	-6	-2	-6	-7	-2	-9	-6	-2	-18	-15
Car engine	-8	-12	-11	-10	-12	-10	-1	-2	3	3	-3	2	-4	-4	0	-4	-2	1	-4	-5	0	-10	-3	-3	-17	-15
Car engine	-10	-13	-13	-8	-9	-8	1	-2	3	3	2	2	-4	-4	0	-6	-6	-1	-7	-6	-2	-8	-2	-1	-18	-16
Car engine	-11	-14	-13	1	-1	6	5	3	3	3	2	3	-3	-4	1	-2	-2	2	-4	-3	1	-8	-2	-1	-18	-15
Car engine (x5)	5	6	12	14	12	17	16	16	18	16	13	15	9	10	14	5	7	13	7	9	12	0	7	8	-7	-3
Car doors open and close	14	1	1	9	9	3	8	7	0	7	7	5	1	5	4	-3	-2	0	-5	-2	2	-7	-4	1	-12	-10
Car doors open and close	14	1	1	10	9	3	8	7	0	7	7	6	1	5	4	-3	-1	0	-5	-2	2	-6	-4	1	-12	-10
Car doors open and close	17	2	3	11	10	4	8	8	1	8	7	6	1	5	5	-3	-1	1	-4	-2	3	-6	-4	1	-12	-9
Car doors open and close	17	3	3	11	10	5	8	8	1	7	7	6	1	5	5	-2	-1	1	-4	-2	3	-6	-4	1	-12	-9
Car doors open and close	18	4	5	12	11	7	9	8	2	7	7	7	1	5	5	-2	0	1	-4	-2	3	-6	-3	2	-12	-9
Car doors open and close	18	5	5	13	11	11	9	8	2	8	7	7	1	5	5	-2	0	1	-4	-2	3	-5	-3	2	-11	-9
Car doors open and close	19	6	6	15	11	11	10	9	3	7	7	7	2	6	5	0	0	2	-4	-1	3	-5	-3	2	-11	-8
Car doors open and close	19	6	7	14	12	12	10	10	4	8	7	7	2	6	5	0	0	2	-3	-1	4	-5	-3	2	-11	-8
Car doors open and close	19	8	8	15	12	12	12	10	5	8	8	7	2	6	6	0	0	2	-3	-1	4	-5	-3	2	-11	-8
Car doors open and close	19	8	8	15	12	12	12	10	4	8	8	8	2	6	6	0	0	2	-3	-1	4	-5	-2	2	-11	-8
Car doors open and close	14	1	1	12	9	9	9	7	1	7	6	5	1	2	4	-4	-12	-8	-6	-4	-3	-8	-7	-6	-13	-11
Car doors open and close	14	1	2	11	9	9	9	7	2	4	6	5	1	1	1	-4	-7	-5	-6	-5	-3	-8	-8	-6	-13	-11
Car doors open and close	15	2	2	12	9	9	10	7	2	3	6	5	1	1	1	-5	-7	-5	-6	-5	-4	-8	-8	-7	-13	-11
Car doors open and close	15	2	3	12	9	9	10	7	2	3	7	6	1	1	0	-5	-7	-5	-7	-6	-4	-9	-9	-7	-13	-11
Car doors open and close	15	4	4	12	10	10	8	8	3	4	3	3	1	0	-1	-6	-8	-6	-7	-7	-6	-9	-9	-8	-13	-12
Car doors open and close	15	4	4	12	10	10	8	8	8	4	2	2	1	0	0	-6	-9	-8	-7	-7	-6	-10	-10	-8	-13	-12
Car doors open and close	16	5	5	13	10	10	7	5	8	4	2	2	1	0	-1	-5	-9	-9	-7	-7	-6	-10	-10	-8	-14	-13
Car doors open and close	16	5	6	13	10	10	7	3	5	4	2	2	1	0	-1	-5	-6	-4	-7	-6	-5	-11	-10	-9	-14	-13
Car doors open and close	16	7	7	13	11	11	-1	0	2	5	2	2	2	0	-1	-6	-10	-10	-7	-6	-5	-12	-12	-11	-14	-14
Car doors open and close	16	7	7	11	11	11	-1	-1	0	5	3	2	2	0	-1	-5	-11	-11	-7	-7	-5	-12	-12	-12	-15	-14
Car doors open and close	15	7	7	9	3	4	-1	-2	-4	4	2	2	0	0	-2	-6	-8	-5	-8	-7	-5	-10	-11	-7	-12	-13
Car doors open and close	15	6	6	9	5	6	-4	-4	-3	4	4	3	0	-1	-5	-9	-8	-5	-6	-7	-5	-10	-11	-7	-12	-13
Car doors open and close	15	5	5	10	10	10	-2	-2	-1	2	3	2	0	0	-2	-8	-8	-5	-7	-10	-10	-11	-11	-8	-12	-13
Car doors open and close	15	5	5	12	10	10	-2	-1	0	2	-3	-1	0	0	-2	-9	-8	-5	-8	-10	-10	-10	-11	-8	-13	-13
Car doors open and close	15	4	4	12	9	9	0	1	2	1	-5	-4	0	-1	-5	-7	-8	-5	-8	-10	-10	-11	-11	-8	-13	-13
Car doors open and close	14	3	4	12	9	9	7	2	4	1	-4	-4	0	-1	-3	-7	-8	-5	-7	-8	-6	-11	-11	-8	-13	-13
Car doors open and close	14	3	3	12	9	9	6	7	7	1	-3	-3	0	0	0	-6	-8	-6	-8	-9	-9	-11	-11	-8	-13	-13
Car doors open and close	14	2	2	11	9	9	7	7	7	-3	-2	-2	0	0	0	-6	-8	-6	-8	-9	-9	-10	-10	-7	-13	-13
Car doors open and close	14	1	2	11	9	9	7	7	2	-2	-1	-1	0	0	-1	-6	-8	-6	-8	-8	-7	-10	-10	-7	-13	-13
Car doors open and close	14	1	1	11	8	8	9	7	2	-3	0	0	0	0	-1	-6	-8	-6	-8	-8	-6	-10	-10	-7	-13	-12
Car doors open and close	12	0	1	10	7	8	-1	-1	1	-6	-6	-6	-8	-7	-7	-5	-3	-3	-6	-6	-3	-9	-9	-8	-13	-11
Car doors open and close	12	1	1	10	8	8	-2	-2	0	-6	-6	-6	-8	-7	-7	-5	-2	-3	-6	-6	-3	-9	-9	-7	-13	-11
Car doors open and close	12	1	1	10	8	8	-3	-3	-1	-6	-7	-6	-8	-8	-8	-4	-2	-2	-5	-6	-3	-9	-8	-7	-12	-10
Car doors open and close	12	2	2	8	8	8	-4	-4	-2	-6	-7	-3	-8	-8	-7	-4	-2	-2	-5	-6	-3	-8	-8	-6	-12	-10
Car doors open and close	13	2	3	8	8	8	-4	-5	-4	-1	-7	-3	-8	-8	-6	-4	-2	-2	-4	-5	-2	-8	-8	-7	-12	-10
Car doors open and close	13	3	3	7	4	6	-5	-5	-4	-1	-7	-3	-7	-8	-6	-4	-1	-2	-4	-5	-2	-7	-7	-6	-12	-10
Car doors open and close	13	3	3	8	3	5	-5	-6	-4	-1	-1	-3	-7	-8	-8	-3	-1	-2	-3	-5	-2	-7	-7	-6	-12	-10
Car doors open and close	13	3	3	8	1	3	-5	-6	-5	-1	-1	-3	-5	-8	-8	-3	-1	-1	-3	-4	-2	-7	-6	-5	-11	-9
Car doors open and close	13	4	4	-1	-2	0	-5	-6	-5	-6	-1	-7	-4	-6	-4	-2	-1	-1	-2	-3	-1	-7	-4	-2	-10	-8
Car doors open and close	13	4	5	-2	-3	-1	0	-6	-5	-6	-1	-1	-4	-7	-6	-2	-1	-1	-2	-3	-1	-7	-4	-3	-11	-8
Car doors open and close	13	11	11	-2	-4	-1	-1	-4	1	3	1	1	2	1	6	2	3	6	0	0	5	-3	-2	3	-8	-6
Car doors open and close	13	5	5	-2	-4	2	0	-3	-1	3	3	7	2	1	6	3	3	6	1	0	5	-3	-2	3	-8	-6
Car doors open and close	5	0	0	-2	-4	-1	5	3	3	5	3	7	2	1	6	1	0	5	1	-1	4	-2	-1	4	-9	-7
Car doors open and close	11	4	4	-2	-4	1	3	0	0	5	2	7	2	1	6	1	0	5	1	-1	4	-3	-1	4	-9	-7
Car doors open and close	1	-2	-2	-2	-3	-1	5	3	3	6	3	7	4	2	6	3	4	6	2	1	6	-3	-2	3	-8	-6
Car doors open and close	-1	-3	-3	-1	-2	0	5	4	9	9	8	8	4	2	6	3	4	6	2	1	6	-3	3	3	-8	-6

Car doors open and close	-1	-4	-3	0	-1	1	6	4	8	9	8	7	2	2	6	2	0	5	2	0	5	-1	4	4	-9	-7
Car doors open and close	-2	-5	-3	2	1	2	7	4	9	9	8	8	3	2	6	2	0	5	2	0	5	-1	4	5	-9	-7
Car doors open and close	-3	-5	-4	6	5	6	11	9	9	9	8	9	6	7	9	3	4	7	3	1	6	-2	4	4	-8	-6
Car doors open and close	-4	-5	-4	8	5	12	11	9	9	9	8	9	6	7	9	4	4	8	3	2	6	-2	4	4	-8	-6
Car doors open and close (x5)	11	11	17	18	16	23	21	18	23	19	18	21	15	15	20	15	11	17	14	14	17	7	9	14	2	4
Car doors open and close (x5)	11	12	17	18	16	22	21	21	23	22	21	21	15	15	20	12	13	18	13	14	17	8	14	14	2	5
Cars - drop-off / pick-up (x5)	25	25	26	31	29	31	31	29	30	31	28	29	27	26	27	24	23	25	23	22	24	18	21	21	12	15
Cars - 5 cars arrive or depart	30	24	24	24	21	21	21	19	19	19	18	20	16	17	18	16	14	17	13	13	18	10	12	16	3	5
Cars - 5 cars arrive or depart	32	24	24	27	25	24	23	22	18	21	20	20	18	18	18	14	15	16	12	13	17	9	11	15	3	6
Cars - 5 cars arrive or depart	32	22	22	27	25	24	24	22	18	21	20	20	17	18	18	12	12	14	10	11	15	7	9	13	2	3
Cars - 5 cars arrive or depart	32	21	21	28	25	25	24	22	19	21	21	20	17	18	18	12	11	13	9	11	15	7	9	13	1	3
Cars - 5 cars arrive or depart	31	19	19	27	25	23	24	22	16	22	21	21	17	19	19	13	13	15	10	12	17	8	11	16	1	4
Patrons talking - 4 total, 2 talking	19	20	21	27	25	27	28	25	26	27	25	24	23	23	23	19	20	22	18	19	21	14	18	18	9	11
Patrons talking - 4 total, 2 talking	25	22	22	27	25	27	28	25	26	27	25	24	23	23	23	19	20	22	18	19	21	14	18	19	9	11
Patrons talking - 4 total, 2 talking	29	24	24	29	26	28	28	26	27	27	25	25	23	24	24	19	20	22	18	19	21	14	18	19	9	11
Existing AC	26	28	32	35	34	41	35	34	39	34	33	36	36	35	40	33	32	35	36	34	39	37	37	37	28	33
AC unit	15	15	15	18	18	21	27	26	31	30	29	32	35	34	39	33	32	34	36	34	39	37	37	37	28	33
AC unit	26	28	32	35	34	41	34	33	39	32	31	34	27	28	30	20	25	26	21	22	23	15	18	19	11	10
Existing refrigeration	26	23	28	29	29	33	31	30	35	33	32	35	28	26	27	29	29	33	29	33	30	27	32	29	17	17
Fridge	26	23	28	29	29	33	31	30	35	33	32	35	28	26	27	29	29	33	29	33	30	27	32	29	17	17
New AC	15	14	20	18	18	23	26	25	30	27	27	30	27	27	30	26	25	31	21	24	30	13	19	20	6	8
CU-1	-5	-4	-4	7	6	10	8	7	12	9	9	11	12	11	16	10	9	13	6	12	14	12	17	17	-15	-16
CU-3	-4	-3	-3	10	9	13	10	10	14	11	11	14	14	13	17	16	15	18	9	14	16	-14	-11	-10	-13	-13
CU-2	-6	-6	-5	1	10	15	12	12	16	13	17	16	16	15	19	18	17	19	7	14	16	-14	-9	-9	-11	-11
CU-4	-2	-4	-3	3	1	1	-2	-3	-3	-4	-5	-6	-6	-7	-7	-7	-8	-8	-8	-9	-9	-16	-16	-16	-16	-18
CU-5	15	13	20	16	15	21	25	25	29	27	26	29	26	25	30	23	23	31	20	22	30	7	14	17	5	7
CU-5	0	-1	4	2	-1	4	8	8	12	5	4	6	4	9	3	1	-1	2	0	-1	1	-8	-4	-3	-8	-8
CU-5	-3	-4	0	-2	-3	2	2	2	6	4	4	5	5	9	5	3	2	6	1	2	6	-9	-4	-3	-9	-9
CU-5	-4	-6	-5	-3	-2	1	8	7	12	9	8	11	10	13	12	9	8	13	6	8	13	-8	-4	-3	-7	-7
CU-5	-3	-3	0	-1	-2	1	8	8	12	10	8	11	12	13	14	11	10	15	6	8	13	-7	-2	-1	-8	-8
New fans	12	14	19	22	20	23	23	22	24	22	21	23	24	21	23	22	21	22	19	21	21	18	20	20	13	16
TEF2	-9	-9	-9	-6	-6	-3	-4	-4	4	9	8	13	16	13	13	15	12	12	14	12	12	10	10	10	7	7
OAF4	6	4	7	9	9	13	11	11	15	14	14	16	20	16	19	19	18	18	15	17	17	17	18	17	10	14
OAF2	-1	-2	1	1	1	5	3	2	6	4	3	6	6	4	11	10	8	8	7	8	9	4	9	9	2	6
OAF2	-1	-1	3	2	1	6	3	2	6	3	3	5	5	3	11	10	8	9	7	11	11	4	9	10	2	7
OAF2	0	-1	7	5	4	12	4	4	7	2	2	4	4	2	4	0	-1	3	2	0	3	-1	4	5	-7	-5
OAF5	4	4	10	11	8	15	10	14	16	7	6	8	6	4	7	3	2	5	4	2	5	2	7	7	-5	-2
OAF3	-3	-3	0	4	5	7	10	8	10	7	6	12	3	2	5	1	0	3	1	-1	3	0	5	5	-8	-5
LEF2	-2	-3	1	5	4	5	5	4	5	5	4	3	1	-1	2	-2	-3	-2	-2	-4	-3	-8	-8	-7	-10	-12
OAF3	3	3	8	12	10	12	13	11	13	8	8	11	3	3	6	-8	-7	-1	-9	-10	-9	-14	-14	-14	-17	-15
LEF1	5	11	17	20	18	20	21	20	21	20	19	19	18	18	17	9	16	18	8	15	12	-4	7	12	-8	-8
TEF1	-1	-1	1	8	6	7	5	3	4	2	1	1	0	0	0	-2	-2	-2	-2	-4	-3	-7	-7	-6	-11	-12
OAF1	-8	-9	-6	-7	-8	-8	-11	-12	-11	-13	-15	-15	-14	-15	-15	-17	-16	-16	-16	-17	-16	-20	-20	-19	-22	-22
KEF1	23	23	21	23	22	25	27	26	25	27	26	24	28	26	24	26	24	22	26	24	24	21	22	22	16	18
MUA - LGF	13	12	14	16	17	18	19	18	20	18	19	20	16	15	17	14	13	15	14	12	15	15	16	17	9	12
MUA - GF	16	25	26	30	27	29	31	28	29	30	28	28	28	26	24	25	24	20	26	24	21	17	17	18	9	10
Horizontal transfer duct - KEF1	10	11	10	15	15	15	22	23	23	23	23	24	23	24	26	23	19	24	24	23	23	19	19	19	12	17
Roof transfer duct - KEF1	13	13	15	18	18	21	22	21	20	22	21	21	23	20	21	19	19	19	19	18	18	16	16	16	12	13
KEF2	18	21	22	25	23	32	29	24	32	28	24	29	24	24	28	22	20	21	23	20	21	17	18	19	16	17
KEF2	17	21	22	25	23	32	26	24	32	26	24	29	24	22	28	20	20	21	21	19	21	19	20	21	17	17
Vertical rier breakout - KEF1	12	13	13	17	17	18	24	23	23	25	24	24	27	25	25	25	24	25	25	23	23	21	21	21	17	17
KEF2 radiated	14	18	18	21	20	22	18	17	17	17	16	16	15	14	14	12	12	13	10	11	12	8	8	9	9	8
KEF2 radiated	14	18	18	21	20	22	22	20	22	22	20	20	21	19	19	18	17	17	17	16	16	13	14	14	14	13
KEF2 radiated	9	15	15	21	20	22	22	20	22	22	20	20	21	19	19	18	17	17	19	16	16	16	14	14	14	14
KEF2 radiated	7	13	13	16	15	16	16	15	16	16	15	15	16	14	15	11	13	14	16	12	13	14	9	9	11	11
KEF2 radiated	15	18	18	21	20	22	18	17	17	17	16	16	15	14	14	12	12	13	11	11	12	9	9	9	9	8
KEF2 radiated	15	18	18	21	20	22	22	20	22	22	20	20	21	19	19	16	17	17	17	17	17	14	14	14	14	13
KEF2 radiated	11	15	15	21	20	22	22	20	22	22	20	20	21	19	19	17	17	17	19	17	17	15	14	14	14	14
KEF2 radiated	7	13	13	16	15	16	16	15	16	17	15	15	16	15	15	12	13	14	17	13	13	15	11	11	12	11