29 August 2022
TK309-02F01 Acoustic review s34 (r0)

Greg Walker
Macarthur Projects

Dear Greg,

1105-1109 Barrenjoey Road, Palm Beach - Response to SOFC

For acoustics, there were two items raised in the SOFC, which are as follows:

Acoustic Treatment

9. The Applicant has not provided sufficient information to allow a proper assessment of the potential acoustic impacts of the proposed development.

   Particulars:

   (a) Additional information regarding the location, type and expected impact of mechanical ventilation and other plant and equipment (such as air conditioning) may have on neighbouring residential occupiers.

   (b) Further, the acoustic impacts of the serviced apartments has not been addressed in the application.

In respect of 9b), we are advised by PBD architects that the Serviced Apartments which had been located on the Western side of the Ground Floor, had been amended to additional retail space. There are no longer any Serviced Apartments in the development. As such there will be no acoustic impacts of serviced apartments and 9b) is resolved.

In respect of 9a), project noise emission goals to surrounding receivers were presented in Tables 9 and 10 of the Acoustic Assessment for DA report prepared by this office under my instruction, (Reference: TK309-01F02 Acoustic Assessment for DA (r1), dated 02.12.2022). As stated in Section 5.2 of that report, an assessment of external noise emissions from use of mechanical plant and equipment will need to be undertaken during the detailed design phase, and mitigation measures determined for compliance with the project noise emission goals nominated in Section 5.1 (based on the NSW EPA Noise Policy for Industry 2017), including Tables 9 and 10, excerpts of which are presented overleaf.

Table 9: → NPfI Project Amenity Noise Levels, dB(A)

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Project Amenity Noise Level	
			$L_{Aeq,Period}$	$L_{Aeq,15min}$
Residence	Suburban	Day	55 - 5 = 50	50 + 3 = **53**
		Evening	45 - 5 = 40	40 + 3 = **43**
		Night	40 - 5 = 35	35 + 3 = **38**
Hotels/ holiday accommodation	Suburban	Day	60 - 5 = 55	55 + 3 = **58**
		Evening	50 - 5 = 45	45 + 3 = **48**
		Night	45 - 5 = 40	40 + 3 = **43**
Commercial premises	All	When in use	65 - 5 = 60	60 + 3 = **63**

Figure 1 - Excerpt from Acoustic Assessment for DA, table 9

Table 10: → Project Noise Trigger Levels, dB(A)

Receiver Location	$L_{Aeq,15min}$ Project Noise Trigger Levels		
	Day	Evening	Night
Nearby residential receivers that face Barrenjoey Road	53	43	38
Nearby residential receivers with no line of sight to Barrenjoey Road	44	40	35

Figure 2 - Excerpt from Acoustic Assessment for DA, table 10

PBD Architects provided an indicative layout for rooftop mechanical plant and equipment, Drawing DA104, Revision B, dated 2022.08.29. This included 16 x air conditioning condensers, a carpark exhaust fan, a kitchen exhaust fan and a Hot Water Unit. At this stage, no plant selections have been provided. On that basis, a preliminary acoustic assessment has been undertaken based on indicative sound power levels from similar projects.

Renzo Tonin & Associates have previously undertaken measurements in a Hot Water Plant Room with two centralised hot water boilers. Based on those measurements, the Sound Power Level of the proposed roof top Hot Water Unit is assumed to be 62dB(A) Lw. Taking into account distance attenuation and barrier affect from screening afforded by the building shell, the predicted noise level to the top level West facing window of SP69534 (Iluka Apartments) is approximately 25dB(A).

In respect of the air conditioning condensers, assuming a Sound Power Level of 65dB(A) per condenser, the cumulative impact from all 16 condensers running, to the top level West facing window of SP69534 (Iluka Apartments building adjacent to the South) is in the order of 34dB(A). At night time, it is unlikely that all condensers would be operating simultaneously. A conservative diversity factor is that 2 out of 3 units may run simultaneously at night, which would result in a night time noise level of 32dB(A) from the air-conditioning condensers. Noise levels at the Southern receivers (the neighbours closest to the

subject plant) could be further reduced either by relocating the condensers further North, or alternative treatments as determined during detailed design.

Based on previous projects, we anticipate a noise level of in the order of 93dB(A) for the carpark exhaust fan and similar for the retail exhaust fan. It is recommended that these fans be in-line fans so that they can take silencers on the intake and discharge to assist in noise mitigation to neighbours and that allowance be made to enclose the fan casing and flexible connections, if required. In addition, it is anticipated that the carpark fan should be fitted with a variable speed drive so that it can run at design speed for the morning and evening peak, but reduced speed (assume 60%) at night time, and that the retail fan is not likely to run overnight (just during the hours of trade). Taking into account distance attenuation, stack directivity, and a 1200mm long 38% open area rectangular silencer, discharge noise from the carpark exhaust fan to the upper level West facing window of Iluka Apartments is in the order of 38dB(A) in the evening time and 32dB(A) at night time (when the fan speed is reduced to 60%). For the retail exhaust fan, the contribution from the fan discharge would also be approximately 38dB(A) in the evening time, and the fan would not be likely to run overnight.

Taking into account the sources outlined in the above, the mechanical noise level to Iluka Apartments would be in the order of 35dB(A) at night time. In the evening time (when the KEF is running and the CPEF is running full speed), the predicted noise level is 42dB(A) (which would be compliant with the nominated Amenity goals for Holiday Accommodation but would require a further 2dB mitigation for Residential Receivers. That additional mitigation could be achieved by careful selection of the mechanical plant (quiet plant where practical), increasing the distance between the source and receiver, acoustic barriers/screens or by upgrading in-duct treatment (or a combination).

Based on the type of equipment which is envisaged to serve the development, subject to detailed design of mitigation treatments, noise emissions from mechanical plant and equipment are capable of complying with the project noise emission goals nominated in the Acoustic Assessment for DA. Subject to acoustic review of the final plant selections and associated detailed design of particular mitigation, it appears practicable to appropriately treat mechanical plant noise in accordance with the goals defined under the Noise Policy for Industry 2017. It is recommended that a follow up assessment be prepared prior to Construction Certificate, outlining the treatments proposed for compliance with the goals/triggers previously defined.

Regards,

Hilary Pearce
Senior Engineer
Hilary.Pearce@renzotonin.com.au