



Our ref: PS120623-ACO-LTR-LST Rev0 Addendum NIA - Issue b

By email
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Dear Janelle

**25-27 Warriewood Road, Warriewood
Noise Impact Assessment Addendum Letter**

1. INTRODUCTION

Knowles Group is currently in the planning approval process for the 25-27 Warriewood Road, Warriewood project. WSP Australia Pty Ltd (WSP) understands that the proposed modified design submission DA2020/0579 for the project is not supported by the Northern Beaches Council. We understand that to address the council's Environmental Health Referral Response dated 18 June 2020, additional noise impact assessment related to the proposed rooftop plant operational noise emission is needed to ensure that the noise impacts at nearby receivers comply with the applicable noise criteria

WSP has previously prepared the approved noise impact assessment for the DA2018/1826 design. This Noise Impact Assessment Addendum letter review of the proposed rooftop mechanical plant and exhausts documentation for the project and demonstrate the proposed modified design can comply with the approved environmental noise conditions.

2. CRITERIA

The applicable noise criteria for this assessment are the approved environmental noise criteria established and outlined in the previous Noise Impact Assessment by WSP dated 15 August 2017 as part of the approved DA2018/1826 submission.

A summary of all relevant criteria established as part of our previous assessment is replicated in Table 2.1. The criteria apply to environmental noise emissions from the proposed rooftop mechanical plant equipment and are applicable at the property boundary of the nearest noise sensitive receivers.

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Table 2.1 – Project specific criteria

RECEIVER	TIME PERIOD	PROJECT SPECIFIC NOISE LEVEL dBA L _{eq} 15-minute
Residences	Day	50
	Evening	42
	Night	39
School classroom	When in use	35 (Internal) 45 (External) ¹

- (1) In accordance with the INP, where internal noise levels are specified, they refer to the noise level at the centre of the habitable room that is most exposed to the noise are to apply with windows opened sufficiently to provide adequate ventilation. In cases where the gaining of internal access for monitoring is difficult, external noise levels 10 dB above the internal levels apply.

In addition to the above INP criteria, guidance is also provided by the RNP for assessment of sleep disturbance. Internal noise levels in a sleeping area should be assessed against the following criteria:

- Up to two events in the night period (10 pm to 7 am) may reach 70dBA L_{max}
- The remaining events in the night period should not exceed 55 dBA L_{max} internally.

3. ASSESSMENT ASSUMPTIONS

This noise impact assessment has been based on the following reviewed mechanical design drawings prepared by Bestec, dated 15 April 2020:

- 30344 M02 Issue B – Basement North – Air Conditioning and Ventilation Arrangement
- 30344 M10 Issue B – Roof level North – Air Conditioning and Ventilation Arrangement
- 30344 M11 Issue B – Roof level South – Air Conditioning and Ventilation Arrangement

Based on the reviewed drawings, the modified design consists of one mechanical plant platform on each of the apartment buildings, North and South.

3.1 SENSITIVE RECEIVERS

The identified nearest sensitive receivers potentially impacted by the operation of the proposed rooftop mechanical plant are presented in Table 3.1 .

Table 3.1 – Nearby sensitive receivers

RECEIVERS	DISTANCE, m
Residential development north of the subject site	35
Residential dwellings along Warriewood Road east of the subject site, 50 to 56 Warriewood Road	75
<i>Only About Children</i> Childcare facility at 26 Hill Street	75

3.2 NOISE SOURCES

Noise sources from the two rooftop plant platforms used in the calculations for this assessment are listed below.

- North apartment building
 - VRF A/C outdoor units (x 25 units)
 - Car park exhaust discharge
- South apartment building
 - VRF A/C outdoor units (x 22 units)

As the actual final equipment selection is not yet available, an indicative VRF unit’s acoustic data was provided by Bestec for this assessment. The manufacturer’s laboratory measured sound pressure levels (at 1m distance in free-field conditions) for the indicative unit are presented in Table 3.2. Noise data for the heating mode has been adopted as these are the higher noise levels.

Table 3.2 – Indicative VRF unit noise data used within calculation

	SOUND PRESSURE LEVEL (dB) at 1m, OCTAVE BAND CENTRE FREQUENCY, Hz								dBA
	63	125	250	500	1k	2k	4k	8k	
Heating mode	61	58	59	51	49	46	47	33	56

Similarly, an indicative car park exhaust fan acoustic data was provided by Bestec for this assessment. The manufacturer’s laboratory measured sound power levels for the indicative fan are presented in Table 3.3.

Table 3.3 – Indicative car park exhaust fan noise data used within calculation

	SOUND POWER LEVEL (dB), OCTAVE BAND CENTRE FREQUENCY, Hz								dB
	63	125	250	500	1k	2k	4k	8k	
Outlet	88	90	88	85	89	86	87	77	96

Our modelling has been assessed to include all mechanical plant and equipment operating simultaneously at maximum capacity during the day, evening and night time periods. As it is unlikely that all equipment will run at maximum capacity during the night, this approach is considered to be a conservative worst case scenario.

4. RESULTS

Table 4.1 presents the predicted noise levels at nearest sensitive receivers and any considered mitigation measures to achieve compliance.

Table 4.1 – Predicted noise levels at nearby receivers to rooftop areas and mitigation measures

NEAREST RECEIVER	SOURCE AREA	APPROX. DISTANCE, m	INP CRITERIA, dBA Leq, 15 minutes	PREDICTED NOISE LEVELS, dBA Leq, 15 minutes	MITIGATION MEASURES	COMPLIES?
Residential development north of the subject site	Apartment North Plant Platform	35	39 (Night-time)	42	No treatment	No
				34	Noise barrier with height which extends min. 100mm beyond the top	Yes

					of VRF units along the northern edge of the platform (see Figure 4.1)	
Residential dwellings along Warriewood Road east of the subject site, 50 to 56 Warriewood Road	Apartment North and South Plant Platforms	75	39 (Night-time)	38	Not required	Yes
Only About Children Childcare facility at 26 Hill Street	Apartment North and South Plant Platforms	75	35 (Internal) (When in use) 45 (External)	38 external (internal level is expected to be < 28 dBA)	Not required	Yes

Figure 4.1 presents the indicative locations and extent of the recommended noise barrier (shown in red) required for north apartment plant platform noise mitigation measure. The length of the barrier is to be for the entire width of the northern edge of the north apartment rooftop platform. The height of the noise barrier shall be a minimum 100mm beyond the top of the installed VRF units.

The noise barrier shall be constructed as a solid element without any gaps or perforations, and shall have a minimum surface mass of 10 kg/m².

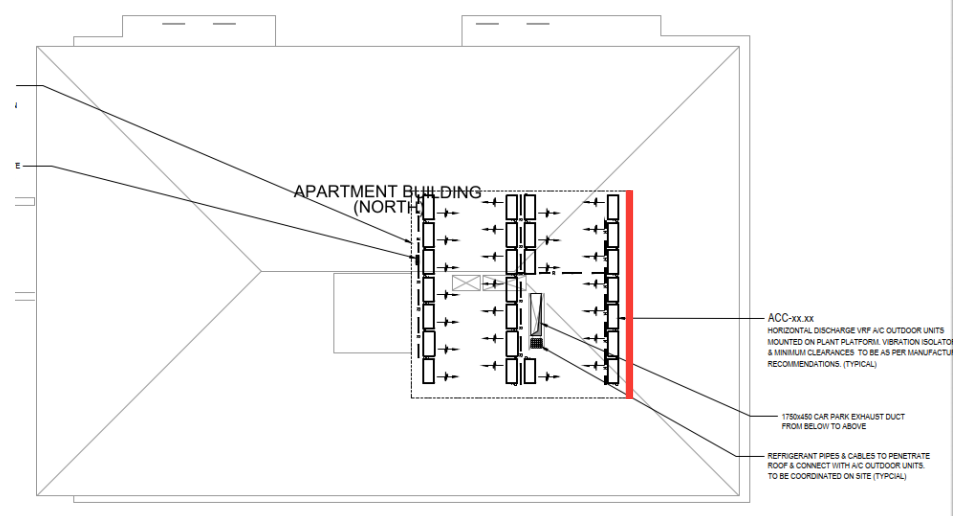


Figure 4.1 Indicative location and extent of solid barrier for the north apartment building rooftop plant platform

Note that the above is a predicted worst case scenario of all indicative VRF units in operation simultaneously. Should quieter VRF units than the assessed be selected (> 5 dB lower), then the noise

barrier treatment recommended above may not be required. This alternative is to be assessed and confirmed by a suitably qualified acoustic professional.

5. CONCLUSION

A noise impact assessment has been undertaken for the proposed modified design submission DA2020/0579 of the 25-27 Warriewood Road, Warriewood project.

This Noise Impact Assessment Addendum letter review the proposed rooftop mechanical plant and exhausts documentation for the project and demonstrate the proposed modified design can comply with the approved environmental noise conditions (DA2018/1826).

Operational environmental noise emission associated with the proposed rooftop mechanical plant equipment platforms is expected to be minor to moderate. Compliance with the relevant noise trigger levels is expected to be achievable with due acoustic considerations during the detailed design process.

Yours sincerely



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Senior Acoustic Engineer