

**HENDERSON DEVELOPMENT HUB
81 QUILL WAY
HENDERSON**

**DEVELOPMENT APPLICATION
ACOUSTIC REPORT**

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SCOPE PROPERTY GROUP

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1.0 INTRODUCTION

Herring Storer Acoustics was commissioned by Scope Property Group to conduct a preliminary review of the proposed Henderson Development Hub, located at 81 Quill Way, Henderson for the Development Application.

This report has been based on the Development Application drawings provided.

2.0 PROPOSED DEVELOPMENT

The proposed development site is located at 81 Quill Way, Henderson, being on the south east corner of Quill Way and Redemptora Road.

The development comprises:

- Hotel.
- Social Hub.
- Commercial Office / medical spaces.
- Retail / Food and Beverage tenancies.

For information, we note that site is located to the east of the Henderson ship building facility, as shown on the following aerial (Figure 01) of the site and the surrounds.



FIGURE 1 – SITE LOCATION

For information, a site plan is attached in Appendix A.

3.0 CRITERIA

3.1 ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

The *Environmental Protection (Noise) Regulations 1997* stipulate the allowable noise levels at any noise sensitive premises from other premises. For this development, the surrounding premises are zoned Industry. It is noted that the site is within the Kwinana Industrial Area. Thus, the assigned noise levels for the neighbouring premises would be as listed in Table 3.1.

TABLE 3.1 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Industrial and utility premises in the Kwinana Industrial Area	All hours	75	85	90

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at other premises, defined below as per Regulation 9.

“impulsiveness” means a variation in the emission of a noise where the difference between L_{Apeak} and L_{Amax Slow} is more than 15dB when determined for a single representative event;

“modulation” means a variation in the emission of noise that –

- (a) is more than 3dB L_{A Fast} or is more than 3dB L_{A Fast} in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

“tonality” means the presence in the noise emission of tonal characteristics where the difference between –

- (a) the A-weighted sound pressure level in any one-third octave band; and
- (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as L_{Aeq,T} levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{A Slow} levels.

Where the above characteristics are present and cannot be practicably removed, the following adjustments are made to the measured or predicted level at other premises.

TABLE 3.2 – ADJUSTMENTS FOR ANNOYING CHARACTERISTICS

Where tonality is present	Where modulation is present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB

3.2 NCC PROVISIONS

Under the NCC, the hotel would be classed as Class 2 or 3. For Class 2 or 3 buildings, Part F7 “Sound transmission and insulation” of the National Construction Code (NCC), outlines the minimum acoustic isolation of apartments. The following summarises the acoustic criteria:

TABLE 3.3– SUMMARY OF NCC REQUIREMENTS

Space of separation	Acoustic Rating	Discontinuous Construction Required
WALLS		
Wet to wet	$R_W + C_{tr}$ not less than 50 dB	NO
Living to living	$R_W + C_{tr}$ not less than 50 dB	NO
Wet to living	$R_W + C_{tr}$ not less than 50 dB	YES
Kitchens to living	$R_W + C_{tr}$ not less than 50 dB	YES
Unit to plantroom, stairway Public corridor / lobby or alike	R_W not less than 50 dB.	NO
Unit to Lift shaft	R_W not less than 50 dB.	YES
FLOORS		
Between Sole Occupancy Units	$R_W + C_{tr}$ not less than 50 dB.	N/A
	$L_{n,w}$ not more than 55 dB is recommended	N/A
SERVICE RISERS / STORM WATER DOWN PIPES		
to Habitable Rooms	$R_W + C_{tr}$ not less than 40 dB.	NO
to Non-Habitable Rooms	$R_W + C_{tr}$ not less than 25 dB	NO
DOORS		
Doors to Sole Occupancy Units	R_W not less than 30 dB	NO

Notes:

- 1 Where kitchens are part of an open living area, kitchens are considered to be part of the living area and in these cases discontinuous construction is required. This also includes cases where kitchens are back-to-back, however, discontinuous construction is only required on one side.
- 2 Wet area include bathrooms, ensuites, sanitary compartments/powder rooms, laundries and kitchens.
- 3 For the purposes of this Part, discontinuous construction means a wall having a minimum 20 mm cavity between 2 separate leaves, and—
 - (a) for masonry, where wall ties are required to connect leaves, the ties are of the resilient type; and
 - (b) for other than masonry, there is no mechanical linkage between leaves except at the periphery.

The development will be designed to comply with the requirements of Part F7 of the BCA.

4.0 NOISE FROM DEVELOPMENT

The main source of noise from the proposed development will be from mechanical services consisting of a ventilation systems and air-conditioning condenser units. Noise received at neighbouring premises from these items need to comply with the assigned noise levels as determined under the *Environmental Protection (Noise) Regulations 1997*.

4.1 MECHANICAL SERVICES

The main source of noise from the proposed development will be from mechanical services consisting of a ventilation systems and air-conditioning plant and condenser units. Noise received at neighbouring premises from these items need to comply with the assigned noise levels as determined under the *Environmental Protection (Noise) Regulations 1997*.

For this development, the mechanical services could operate at any time of the day or night, however, for the neighbouring premises, the assigned L_{A10} noise level would be 75 dB(A) at any time. Potentially, noise emissions from mechanical services could be tonal, in which case an +5 dB(A) penalty for a tonal component could be applied to the resultant noise levels. Even so, noise received at the neighbouring premises would easily comply with the assigned noise level.

4.2 TAVERN / FOOD AND BEVERAGE

Noise levels associated with operations of the food and beverage tenancies on the ground floor will need to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*.

Noise received at the neighbouring premises from the tavern / Food and beverage tenancies would also need to comply with the assigned L_{A10} noise level would be 75 dB(A) at any time. Potentially, noise emissions from the uses could contain music and thus a +10 dB(A) penalty may be applicable depending on the volume. Even so, noise received at the neighbouring premises would easily comply with the assigned noise level.

5.0 NCC REQUIREMENTS

The proposed development will be constructed to comply with the requirements of Part F5 of the NCC.

6.0 NOISE INGRESS

We understand that concerns have been raised with regards to the noise received at the hotel and consequently within the hotel rooms from noise emissions from the ship building facility and neighbouring industry. Thus, we provide the following preliminary assessment of noise received at the hotel.

6.1 CRITERIA

With regards to internal noise levels within the hotel rooms, the acoustic criteria would be based on the recommended "satisfactory" background noise levels provided in Table 1 of AS/NZS 2107:2016 - "*Acoustics – Recommended design sound levels and reverberation times for building interiors*". Given the location of the hotel, the background noise level within the rooms for "hotels and motels in inner city area or entertainment districts or near

major roads” of 35 to 40 dB(A). Thus, it is recommended that the internal design noise level be 35 dB(A).

6.2 NOISE LEVEL MEASUREMENTS

As part of the preliminary review, noise level measurements of noise received at the development site, near the corner of Quill Way and Redemptora Road, being the location on site for the proposed hotel. As the ship building facility, across Quill Way, is down a large embankment, noise level measurements were recorded at height (approximately 11 metres above the ground level) using a mast arrangement, as shown on Figure 2.



FIGURE 2 – PHOTO OF MAST ARRANGEMENT

Based on the noise level measurements recorded, noise received at the site was determined to be 63 dB(A). We note that this noise level was associated with all noise sources, including industry noise and road traffic.

6.3 PRELIMINARY ASSESSMENT

To quantify the noise received at the site from the ship building facility, noise modelling was undertaken using “SoundPlan”. Based on the following sound power level, being for loudest equipment that would be used within the shipbuilding facility, noise received at the façade of the hotel was determined to be 60 dB(A).

Generator (without acoustic enclosure)	108 dB(A)
Angle Grinder	104 dB(A)

The above resultant noise level was the combined noise level with a generator and grinder both operating with both items of equipment located on the deck of the closest ship, at height to ensure direct line of site between the noise sources and the hotel. We believe that this would be a conservative assessment, given that it is unlikely the generator would not be attenuated and given the nature of the other neighbouring industries, would be considered the worst case scenario.

The above calculated noise level correlates with the measured noise level. However, to be conservative, the assessment of the façade glazing required to achieve internal noise levels that comply with the proposed acoustic criteria would be based on the measured noise level of 63 dB(A).

Based on the resultant noise level of 63 dB(A) received at the hotel, the acoustic performance of the façade to achieve acceptable internal noise levels would be 28 dB(A). This noise reduction would be achieved using standard 10mm float glass. However, we understand that the façade glazing, to satisfy other requirements, would either be a laminated single glazing or a double glazed unit, which would result in even lower internal noise levels within the hotel rooms.

Noise received within the hotel rooms from the surrounding industry would be acceptable. However, as part of design development, a full analysis of would be undertaken to ensure compliance with the appropriate internal noise level would be achieved.

APPENDIX A

SITE PLAN

