



5<sup>th</sup> March 2020

The Planning Secretary  
Department of Planning, Industry & Environment  
320 Pitt Street  
Sydney, NSW 2000

Attention: Megan Fu  
Project: Nihon University Newcastle Campus - SSD 9787  
Re: Conditions of Consent - Construction Noise Limits

Dear Megan,

Reference is made to SSD 9787 Conditions of Consent D12 in relation to the monitoring of the construction noise limits for the development during the construction processes.

Please find attached the Built Construction Noise Monitoring Report February 2020 prepared by Rapt Consulting. The monitoring has been carried out in accordance with the submitted Construction Noise and Vibration Management Sub-Plan.

Should you require further information on the compliance report please feel free to contact either Katherine Daunt or Edward Clode at dwp Australia Pty.

Yours sincerely,

Edward Clode  
Design Director  
Registered Architect – NSW ARBN 4100  
Email: [edward.c@dwp.com](mailto:edward.c@dwp.com)  
File: 17-0347\_A-d01-20\_let  
Encl.: Built Construction Noise Monitoring February 2020



**RAPT**  
**CONSULTING**

# Built

Construction Noise Monitoring – 9 Church Street  
Newcastle NSW February 2020

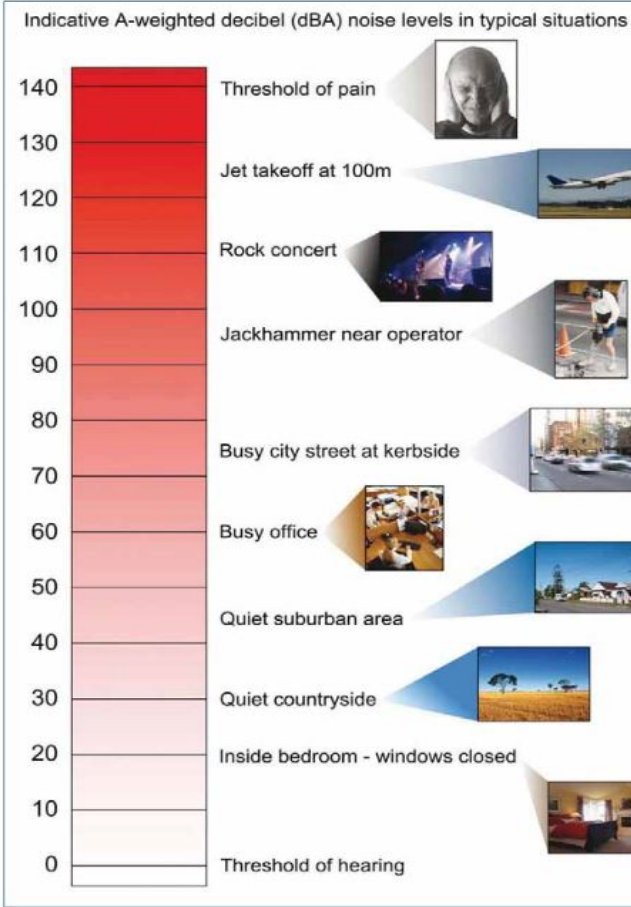
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**Relationships Attention Professional Trust**

## Table of Contents

Glossary of Acoustic Terms	3
1. Introduction	5
1.1 Limitations	6
2. Noise and Vibration Criteria	7
2.1 Construction Noise	7
3. Construction Noise Monitoring	9
4. Conclusion	15

## Glossary of Acoustic Terms

Term	Definition
dB	Decibel is the unit used for expressing the sound pressure level (SPL) or power level (SWL) in acoustics. The picture below indicates typical noise levels from common noise sources.
	<p>Indicative A-weighted decibel (dBA) noise levels in typical situations</p> 
dB(A)	Frequency weighting filter used to measure 'A-weighted' sound pressure levels, which conforms approximately to the human ear response, as our hearing is less sensitive at very low and very high frequencies.
$L_{Aeq(period)}$	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{A10(period)}$	The sound pressure level that is exceeded for 10% of the measurement period.
$L_{A90(period)}$	The sound pressure level that is exceeded for 90% of the measurement period.
$L_{Amax}$	The maximum sound level recorded during the measurement period.

Noise sensitive receiver	<ul style="list-style-type: none"> <li>⌚ An area or place potentially affected by noise which includes:</li> <li>⌚ A residential dwelling.</li> <li>⌚ An educational institution, library, childcare centre or kindergarten.</li> <li>⌚ A hospital, surgery or other medical institution.</li> <li>⌚ An active (e.g. sports field, golf course) or passive (e.g. national park) recreational area.</li> <li>⌚ Commercial or industrial premises.</li> <li>⌚ A place of worship.</li> </ul>
Rating Background Level (RBL)	The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
Feasible and Reasonable (Noise Policy for Industry Definition)	<p><b>Feasible</b> mitigation measure is a noise mitigation measure that can be engineered and is practical to build and/or implement, given project constraints such as safety, maintenance and reliability requirements.</p> <p>Selecting <b>Reasonable</b> measures from those that are feasible involves judging whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the mitigation measure. To make a judgement, consider the following:</p> <ul style="list-style-type: none"> <li>⌚ Noise impacts</li> <li>⌚ Noise mitigation benefits</li> <li>⌚ Cost effectiveness of noise mitigation</li> <li>⌚ Community views.</li> </ul>
Sound power level (SWL)	The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in dB(A).

# 1. Introduction

## Background

RAPT Consulting has been engaged to undertake daylong construction noise monitoring for Built as part of their project at Nihon University. Based on the information provided it is understood there is a requirement for noise and vibration monitoring to be undertaken during construction works of the Nihon University project located at 9 Church Street Newcastle. The site and surrounding area is provided in Figure 1.



Figure 1 Site Location and Surrounding Area

## **1.1 Limitations**

The purpose of this report is to provide an independent noise assessment for the project.

It is not the intention of the assessment to cover every element of the acoustic environment, but rather to conduct the assessment with consideration to the prescribed work scope.

The findings of the noise assessment represent the findings apparent at the date and time of the assessment undertaken. It is the nature of environmental assessments that all variations in environmental conditions cannot be assessed and all uncertainty concerning the conditions of the ambient environment cannot be eliminated. Professional judgement must be exercised in the investigation and interpretation of observations.

In conducting this assessment and preparing the report, current guidelines for noise were referred to. This work has been conducted in good faith with RAPT Consulting's understanding of the client's brief and the generally accepted consulting practice.

No other warranty, expressed or implied, is made as to the information and professional advice included in this report. It is not intended for other parties or other uses.

## 2. Noise and Vibration Criteria

### 2.1 Construction Noise

Construction noise is assessed with consideration to DECCW *Interim Construction Noise Guidelines* (ICNG) (July 2009). The ICNG is a non-mandatory guideline that is usually referred to by local councils and other NSW government entities when construction / demolition works require development approval. The ICNG recommend standard hours for construction activity as detailed in Table 1.

*Table 1 ICNG Recommended Construction Hours*

Work type	Recommended standard hours of work
Normal construction	Monday to Friday: 7 am to 6 pm. Saturday: 8 am to 1 pm. No work on Sundays or Public Holidays.
Blasting	Monday to Friday: 9 am to 5 pm. Saturday: 9 am to 1 pm. No work on Sundays or Public Holidays.

The ICNG provides noise management levels for construction noise at residential and other potentially sensitive receivers. These management levels are to be calculated based on the adopted rating background level (RBL) at nearby locations, as shown in Table 2.

*Table 2 ICNG Recommended Noise Management Levels*

Period	Management Level $L_{Aeq(15\text{ min})}$
Residential Recommended standard hours	Noise affected level: RBL + 10 Highly noise affected level: 75 dB(A)
Residential Outside recommended standard hours	Noise affected level: RBL + 5
Classrooms at schools and other educational institutions	Internal Noise Level 45 dB(A) (applies when properties are being used)
Offices, retail outlets (external)	70 dB(A)
industrial premises (external)	75 dB(A)

The above levels apply at the boundary of the most affected residences / offices or within 30 m from the residence where the property boundary is more than 30 m from the residence.

The *noise affected level* represents the point above which there may be some community reaction to noise. Where the *noise affected level* is exceeded all feasible and reasonable work practices to minimise noise should be applied and all potentially impacted residents should be informed of the nature of the works, expected noise levels, duration of works and a method of contact. The *noise affected level* is the background noise level plus 10 dB(A)



during recommended standard hours and the background noise level plus 5 dB(A) outside of recommended standard hours.

The *highly noise affected level* represents the point above which there may be strong community reaction to noise and is set at 75 dB(A). Where noise is above this level, the relevant authority may require respite periods by restricting the hours when the subject noisy activities can occur, considering:

- Times identified by the community when they are less sensitive to noise (such as mid-morning or mid-afternoon for works near residences).
- If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

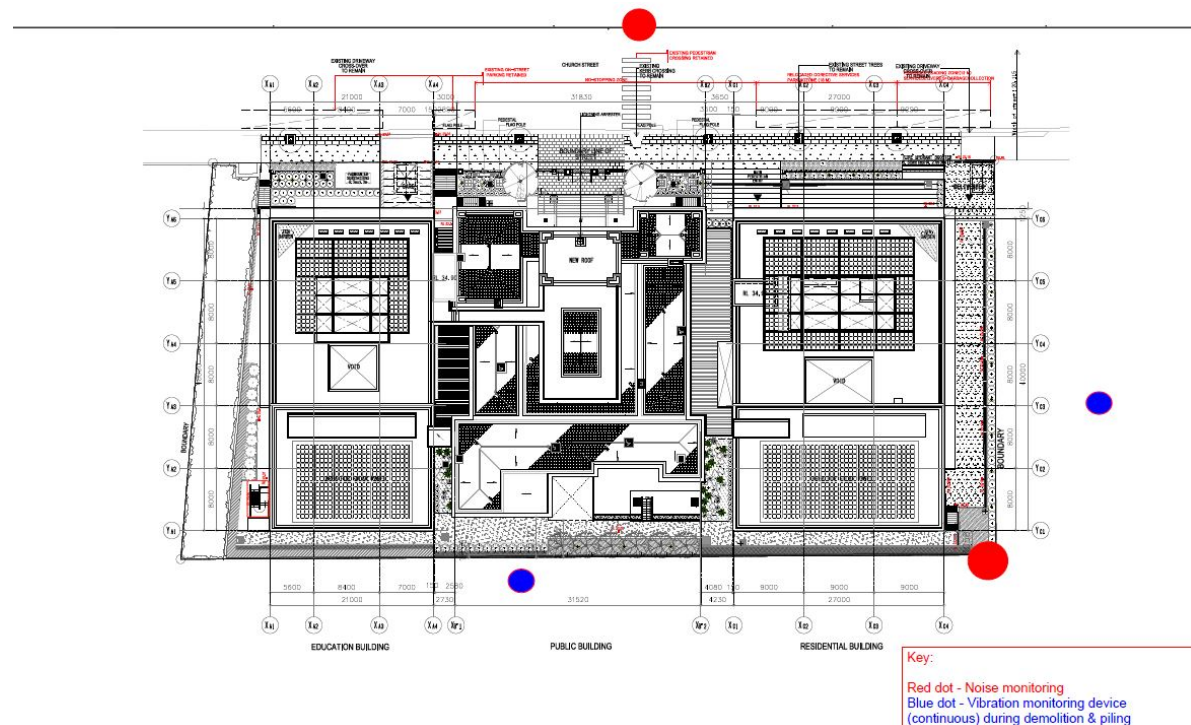
Construction noise trigger levels for the project were established by EMM and are found in their document *Noise and Vibration Assessment – Operational and Construction Nihon University – Newcastle Campus. May 2019, Report # H190015 RP#1*. Based on the above and the RBL determined from site monitoring, construction noise trigger levels have been derived, as shown in Table 3.

Table 3 ICNG Noise Goals  $Leq(15min)$  dB(A)

Receiver	Standard Hours
	Daytime (7am-6pm)
Residential (external)	59
Offices, retail outlets (external)	70
industrial premises (external)	75
Classrooms (when in use)	45/55 (internal/external)
Hospital Wards and Operating Theatres (when in use)	45/55 (internal/external)
Places of Worship (when in use)	45/55 (internal/external)

### 3. Construction Noise Monitoring

Noise monitoring was undertaken on February 19, 2020 at the located at the Grand Hotel located at the corner of Bolton and Church Street on the 1<sup>st</sup> floor balcony. Additionally, noise monitoring was undertaking on February 20, 2020 on the 1<sup>st</sup> floor balcony of the Newcastle Police Station which faces west towards demolition works. Active demolition was taking place on both days. These sites are consistent with recommended monitoring locations shown in Figure 2.



*Figure 2 Noise and Vibration Monitoring Locations*

This sites also presented as secure locations whereby minimising the risk of theft or vandalism to the monitoring equipment.

The monitoring locations are shown in Figures 3 and 4.



*Figure 3 Noise Monitoring Grand Hotel*





*Figure 4 Noise Monitoring Newcastle Police Station*

Active demolition can be seen in Figure 5 from the 1<sup>st</sup> floor balcony of the Newcastle Police Station.



*Figure 5 Demolition Works*

During site visits it was noted that road traffic noise sources primarily described the ambient noise environment at The Grand Hotel. Additionally, construction demolition noise was perceptible. The Newcastle Police Station balcony was primarily described by the demolition works as due to the close proximity and direct line of site as can be seen in Figure 5.

The monitoring was conducted using a RION NL-42 type 2 integrated noise logger within calibration. These units are capable of measuring continuous sound pressure levels and are able to record LAmin, LA90, LA10, LA1, LAmax and LAeq noise descriptors. Calibration was checked prior to and at the conclusion of the measurements with no significant drift.

Weather conditions were fine ranging from 23-28 degrees with wind speeds < 5 m/s.

Logged data was reviewed and filtered to exclude any extraneous data results during the monitoring period. The noise monitoring results are provided in Table 1.

*Table 3 Noise Monitoring Results*

Location	Lmax dB(A)	L1 dB(A)	L10 dB(A)	L90 dB(A)	Lmin dB(A)	Leq (dB(A))	Time Interval
The Grand Hotel	84	74	68	59	57	65	8:15am - 3:45pm
Newcastle Police Station	91	87	80	67	61	77	7:00am - 4:15pm

Charts of the noise monitoring are provided in Figures 6 and 7.

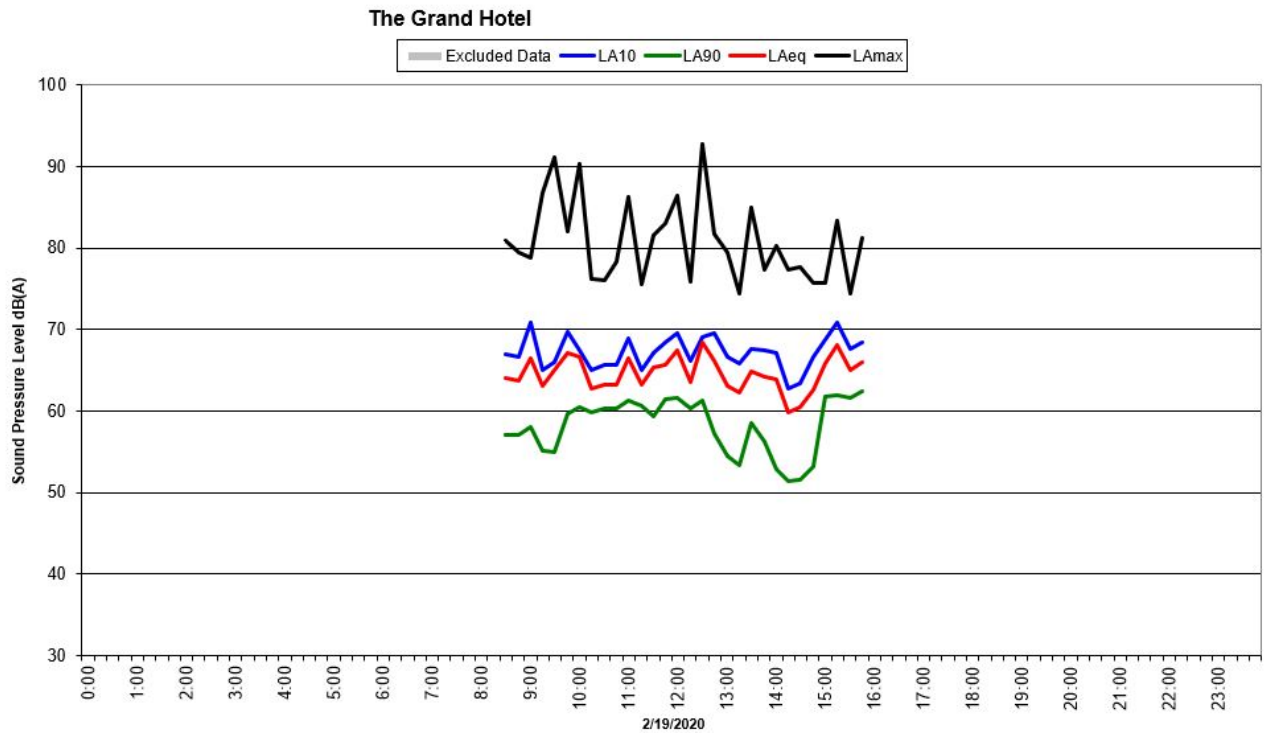


Figure 6 The Grand Noise Monitoring Results

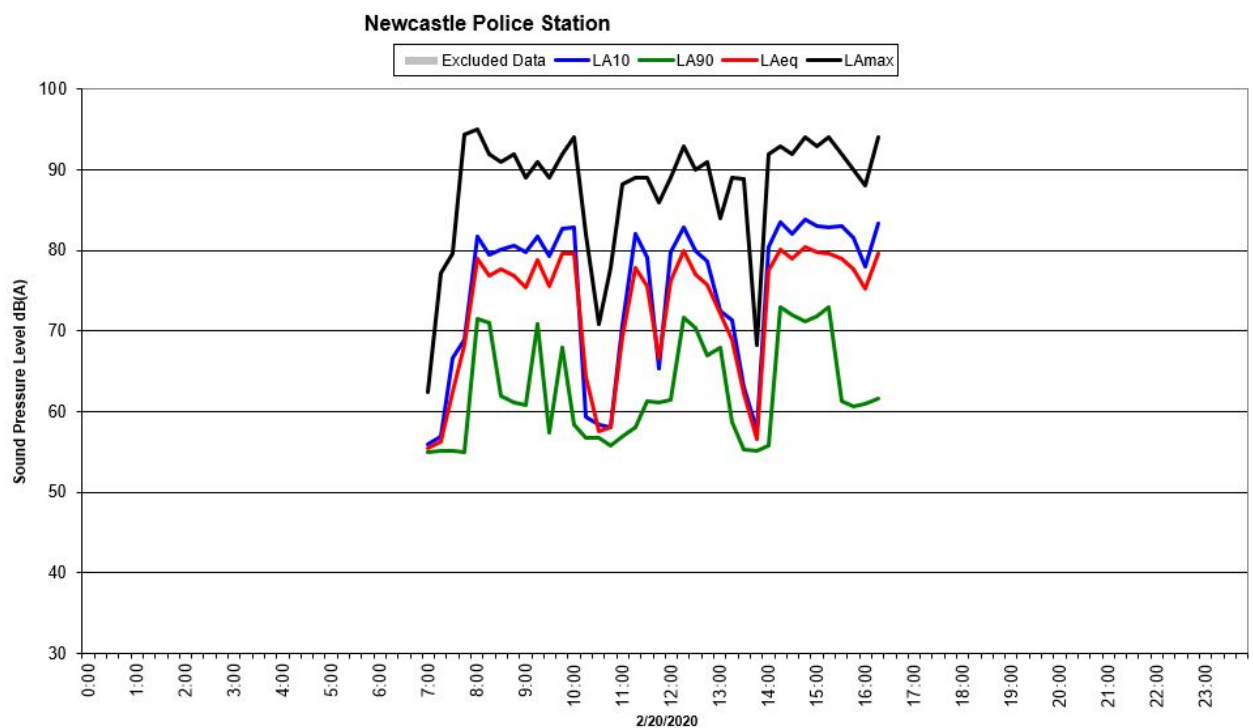


Figure 7 Newcastle Police Station Noise Monitoring Results

Attended noise measurements were undertaken within the police station call centre which is located on Level 1 adjacent to the balcony where noise logging was undertaken. Measured noise levels within the call centre ranged from 45 to 55 dB(A). The primary noise source was human voices resulting from call centre activity and conversation between personnel within



the call centre. Attended observations noted demolition activities ranged from just perceptible to imperceptible depending on location within the call centre.

## 4. Conclusion

RAPT Consulting has undertaken standard hours construction noise monitoring for Built. The purpose of the monitoring was to measure while standard hours construction activities particularly while demolition activities were taking place and compare against established project specific standard hours project noise trigger levels.

Should you have any further questions regarding this report, please do not hesitate to contact Greg Collins on 0488512224 or [greg@raptconsulting.com.au](mailto:greg@raptconsulting.com.au).

Thank you,



Greg Collins

Director – RAPT Consulting