

3 March 2023

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Dear Andrew,

Building F - Acoustics - Environmental Noise Emission Measurements

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) has been engaged by the University of Newcastle to undertake acoustic measurements of noise emission from Building F, the Bioresources Facility Building, at the University of Newcastle to satisfy the following condition in the Minister's Conditions of Approval (MCoA) for SSD 8937 dated 20 February 2019:

Operational Noise Limits

- E3. The Applicant must ensure that noise generated by operation of the development does not exceed the noise limits in the Noise and Vibration Impact Assessment dated August 2018 by Muller Acoustic Consulting.*
- E4. Noise associated with the operation of any plant, machinery, or other equipment on the site, must not exceed 5 dB(A) above the rating background noise level when measured at the boundary of any sensitive receiver.*
- E5. The Applicant must undertake short term noise monitoring in accordance with the Noise Policy for Industry, to collect valid data and provide a quantitative assessment of operational noise impacts following occupation of the building. The noise monitoring must be carried out by an appropriately qualified person and a monitoring report must be submitted.*

Should noise monitoring identify any exceedance of the recommended noise levels, the Applicant must implement appropriate on-site noise attenuation measures to ensure operational noise levels do not exceed the recommended noise levels and/or provide noise attenuation measures at the affected noise sensitive receivers.

2.0 Location

Building F is located on the western perimeter of the University of Newcastle Campus, Callaghan as indicated in Figure 1. The nearest noise sensitive receivers are other educational buildings within the campus and residential receivers located on Vale Street, Birmingham Gardens, directly across the Newcastle Inner City Bypass from Building F.

Figure 1 Building F and sensitive receiver locations



3.0 Operational noise limits

3.1 Residential receivers

Long term ambient noise monitoring was undertaken in the vicinity as part of the Newcastle Inner City Bypass - Rankin Park to Jesmond project and are presented in the GHD report *Newcastle Inner City Bypass – Rankin Park to Jesmond Technical Paper 3 – Noise and Vibration Assessment November 2016*. The measurements conducted at 18 Janet Street are considered representative of the noise environment on Vale Street being a similar distance from the Newcastle inner City Bypass and having similar land use. The measurement summary for this location is presented in Table 1.

Table 1 Summary of background and ambient noise levels, dB(A)

Location	Rating Background Level (RBL), dB(A)			Ambient Noise Level, dB(A)		
	Day	Evening	Night	Day	Evening	Night
18 Janet Street	49	43	35	59	55	51

Notes:

1. Day is defined as 7:00am to 6:00pm Monday to Saturday and 8:00 am to 6:00 pm Sundays and Public Holidays
2. Evening is defined as 6:00pm to 10:00 pm Monday to Sunday and public holidays
3. Night is defined as 10:00 pm to 7:00 am Monday to Saturday and 10:00 pm to 8:00 am Sundays and Public Holidays

The residential receiver criteria have been determined in accordance MCoA E4 and are presented in Table 2.

Table 2 Residential receiver criteria

Location	Period	RBL (L _{A90}), dB(A)	Intrusive criteria (RBL+5), dB(A)
Residential receivers	Day	49	54
	Evening	43	48
	Night	35	40

3.2 Educational receivers

The 'Proposed Bioresources Facility Development, University of Newcastle, Callaghan, NSW' dated August 2018, adopted the school classroom internal criterion from the Noise Policy for Industry. Table 3 presents the educational buildings criterion.

Table 3 Educational building internal criteria

Type of receiver	Indicative noise amenity area	Time of day	Recommended amenity noise level, dB(A)
			L _{Aeq} (period)
School classroom (internal)	All	Noisiest 1-hour period when in use	40 ¹

Notes:

- As these educational buildings are already affected by industrial noise the internal criterion has been increased to 40 dB(A) in accordance with the notes to Table 2.2 of the Noise Policy for Industry.

4.0 Compliance measurements

Attended measurements were conducted at 6 Vale Street, Birmingham Gardens to determine compliance with the criteria set out in the MCoA after 10pm on 15 February 2023. The measurements were made in accordance with the procedure set out in Section 7 of the Noise Policy for Industry (NPfI) and the measured levels are presented in Table 4. The plant at Building F was unable to be switched off due to the criticality of some equipment. Measurements were therefore only conducted with Building F plant in full operation.

Table 4 Compliance measurement results

Measurement	L _{Aeq,15min} , dB(A)	L _{A90,15min} , dB(A)
6 Vale Street, Birmingham Gardens 15 February 10:55 pm	55	43

It was noted that noise from road traffic using the Newcastle Inner City Bypass and surrounding roads dominated the noise environment and noise from the operation of Building F plant was inaudible over the traffic noise. As a rule of thumb a source noise level 10 dB or more below ambient noise level is considered to be inaudible. Given that noise from the operation of the plant was inaudible this indicates that the plant noise level was at least 10 dB(A) below the L_{Aeq} level, ie less than 45 dB(A).

Supplementary noise measurements were taken on the Building F rooftop to quantify noise levels produced by the rooftop plant. Measurements conducted on the western perimeter of the roof top ranged from L_{Aeq} 60 to 62 dB(A). A noise level of 58 dB(A) was measured at ground level, around 18 m from Building F.

Based on these noise measurements and accounting for distance loss and acoustic shielding from property boundary fences at the receivers the noise level from operation of the plant at the residential receivers would be around 38 dB(A). This complies with the night-time criterion at residential receivers in Table 2.

Based on the noise measurements and accounting for distance loss the noise levels at the façades of adjacent education buildings would be around 47dB(A) at the Medical Science Building (openable windows), 52 dB(A) at the Medical Sciences West Building and the Science building (non-openable windows). Based on the assumption that a 20 dB(A) reduction from outside to inside would be achieved where buildings have non-openable windows and a 10 dB(A) reduction from outside to inside would be achieved through an open window, noise levels within the adjacent education buildings would comply with the internal criterion of 40dB(A).

5.0 Conclusion

Noise measurements were made after 10 pm on 15 February 2023 of operational noise from the building services plant serving the new Bioresources Facility Building in the Callaghan Campus of the

University of Newcastle. Noise measurements were made at the location representative of the nearest residential receivers at Vale Street, Birmingham Gardens and around the Bioresources Facility Building.

Noise measurements and observations showed that noise from the operation of the building services plant complied with the Minister's Conditions of Approval for the development (for SSD 8937 dated 20 February 2019) at both nearby residential receivers and adjacent educational buildings.

No further noise control measures are considered necessary.

Yours faithfully

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