
To	Christopher Burns <christopher.burns@sydney.edu.au>	Date	9 August 2017
Copies	George Cunha <George.Cunha@arup.com> Vui Choun Lee <Vui-Choun.Lee@arup.com>	Reference number	248177-00
From	Glenn Wheatley <Glenn.Wheatley@arup.com>	File reference	AC 05 (v1)
Subject	Acoustic response to submissions re SSD 16_7894 Chau Chak Wing Museum		

1 Introduction

Additional information has been requested regarding the acoustic assessment prepared in support of SSD 16_7894 [Arup, AC02 (v2,1) *Acoustic SEARs Report Issue 2*].

The memo responds to the request received from the EPA (Recommendation 17) relating to a quantitative assessment of mechanical plant and equipment.

2 Recommendation from EPA

Recommendation given by the EPA is quoted as follows:

Recommendation 17

The proponent be required to:

- (a) *provide a quantitative assessment of predicted operational noise impacts on surrounding noise sensitive receivers, especially those residences which are likely to be the most affected by noise from mechanical plant and equipment, especially at night;*
- (b) *ensure plant and equipment does not generate noise (measured at the most affected or potentially most affected residence) that exceeds -*
 - (i) *53 dBA $L_{Aeq(period)}$ for the daytime and evening periods, and*
 - (ii) *45 dBA $L_{Aeq(15minute)}$ for the night-time period; and*
- (c) *ensure plant and equipment does not generate noise that exhibits tonal, low frequency or other annoying characteristics.*

3 Response

To carry out a quantitative assessment of mechanical plant and equipment, a detailed design of the system is required. At the development application stage, such information is not typically

Memorandum

available. As this is common for most developments, consent authorities typically apply conditions that require certification prior to construction commencing (for issue of Construction Certificate).

At the development application stage, a qualitative review can be carried out. In the case of the subject development, the proposed use is not atypical in its requirements for building services equipment and is reasonably removed from surrounding noise sensitive receivers. Furthermore, its use during the most sensitive night period is expected to be limited, and demands on heating and cooling etc. would be also be reduced. As such, the design presents limited constraints, and acoustic compliance can readily be achieved through appropriate equipment selection and commercially available attenuation measures.

Notwithstanding the above, as design development has progressed since issue of the SSD acoustic report, it is possible to provide further detail.

Based on the proposed design, the primary external noise emitting equipment are cooling towers to be located at level 1, in the northwestern corner of the building. Two towers are proposed, in a plant area surrounded by solid walls, but open to the sky. Based on the current selection of cooling towers (having an L_w of 95 dB(A) each), a noise level of 46 dB(A)/52 dB(C) is predicted to the nearest residential receiver location to the north of the site. It is noted that this conservatively assumes both towers operating at full load. Criteria for the most criteria period of operation is 50dB(A) $L_{Aeq(period)}$, being for 10 pm to midnight.

Additional building services equipment are in plantrooms on the southern side of the building, acoustically shielded from residential receivers to the north by the subject building envelope.

Acoustic assessment of all equipment will continue throughout the detailed design phase of the project, to confirm any acoustic requirements.