MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS
MATTHEW SHIELDS
BEN WHITE

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DesignInc Sydney Pty Limited
Level 12
77 Pacific Highway
NORTH SYDNEY NSW 2060

Email: jurford@sydney.designinc.com.au

ATTN: JACQUELINE URFORD

Lindfield Learning Village – Response to Planning NSW and EPA Queries

1 INTRODUCTION

The following letter addresses queries regarding acoustics raised by Planning NSW and the EPA with respect to the Noise Impact Assessment prepared by this office.

2 PLANNING NSW COMMENTS.

Planning NSW had queried the fact that a noise logger placed at the south of the site was also used to provide representative background noise levels for residences to the north of the site (Tubbs View).

We confirm that additional long term noise logging was conducted at the site near the Tubbs View residences in June 2017.

Logger location is shown in Figure 1 of our amended Noise Impact Assessment (Revision 5, dated 30/10/2017). The logger location was a close as practicable to the Tubbs View residences and is appropriate data for use when setting noise emission goals to these residences.

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343

3 EPA COMMENTS.

3.1 CONSTRUCTION NOISE.

Section 2.2 – Construction Noise and Vibration.

The EPA has noted the potential construction noise impact on the Dunstan Grove and Tubbs View residences.

It is recommended by the EPA that:

- Standard Construction hours are adopted (7am-6pm on weekdays and 8am to 1pm on Saturdays - section 2.2.1) and

- Intra-day respite periods be adopted for equipment identified in section 4.5 of the Interim Construction Noise Guidelines (section 2.2.2).

ALC response:

- To our knowledge, there has been no proposal to work outside of standard construction hours. Further, as standard construction hours are typically imposed as a condition of consent in any approval, any proposal to work outside of these hours would require a s96 application.

- Any s96 application to modify construction hours would typically require an acoustic report. This report would specifically address the works proposed to be conducted outside of hours and the noise mitigation required to comply with Interim Construction Noise Guideline for work out of standard hours.

- It is not appropriate to impose respite periods based purely on proposed equipment type. The site is extremely large, with a significant amount of work being conducted indoors. Many construction activities would be able to comply either with the *Noise Management Level* or the *Highly Noise Affected Level* in Interim Construction Guidelines (particularly indoor work and work at the southern end of the site).

- Typically, a condition of consent is imposed which requires that a Construction Noise Management Plan (CNMP) is prepared prior to commencement of works. The CNMP would typically identify the work activities being proposed and the equipment required. This is only possible once a construction contractor is appointed. It is at this point, that the need for respite periods should be determined.

- A blanket adoption of respite periods based on equipment selection as opposed to noise level will simply prolong the construction period, which is not in anyone's interest (builder or resident).

This being the case, we suggest:

- A condition of consent be imposed requiring the preparation of a Construction Noise Management Plan prior to commencement of on-site work.

- In the event that construction noise is expected to exceed the Highly Noise Effected noise threshold, respite periods should be adopted for those work activities.

Section 2.2.3 and 2.2.4 – Vehicle Idling and Queuing and Vehicle Reversing Beacons.

In section 2.2.3 the EPA recommend that vehicles not arrive on site prior to permitted work hours. They also recommend the adoption of non-tonal vehicle reversing beacons if practicable.

ALC response – Agreed, and should be a recommendation incorporated in any Construction Noise Management Plan.

3.2 OPERATIONAL PHASE

Background Noise Measurement.

EPA Comment:

- A potential error in table 1 of the *Noise Impact Assessment* was noted by the EPA with respect to rating background noise levels at the southern-most logger (they identify that the noise level day/evening noise levels should be 40-45dB(A)L_{90}, as opposed to 47-48dB(A) as presented in table 1).

- The EPA also noted that there was filming conducted on the site during the monitoring period. They then refer to periods at 6.30pm each day that appear to be noise effected and the possibility that equipment such as generators, air-conditioners or vehicles may have influenced background noise levels.

ALC Response:

- The error referred to by the EPA in table 1 has been rectified in the amended Noise Impact Assessment (revision 5). (We note however that the southern-most noise logger had not been used when setting noise emission goals for the site in any event).

- Noise from equipment such as generators or air-conditioners will invariably produce a clearly noticeably constant noise level (a flat period in either the L_{90} or L_{eq} noise level). None of the logging graphs (the Appendices to the NIA) show this.

- Short duration noise events such as those identified at 6.30pm (30 minute duration) will have no impact on the L_{90} noise level, which looks at the quietest 10% of the time over the day/evening period. Short term peak noise events such as that at 6.30pm does not affect the quietest 10% noise level.

- Supplementary background noise logging was conducted at the north of the site (near Tubbs View, between 6 and 13 June) which is not affected by filming noise.

- Further supplementary attended measurements at all three logging locations were also conducted between 3pm and 5pm on 8/9/2017. The results of the measurements and comparison against long term logging data is presented below:

Table 3 – Measured Background Noise Levels (Short Term Attended Noise Measurements)

Location	Time Period	Background Noise Level - Long Term Noise Monitoring dB(A)L_{90}	Background Noise Level - Short Term Noise Monitoring dB(A)L_{90}
Gym	Daytime (7am-6pm)	42	43
South	Daytime (7am-6pm)	43*	45
North	Daytime (7am-6pm)	44	44

*From Table 1 of NIA. Previously documented as 48dB(A) but amended following error noted by the EPA in their correspondence.

- Attended measurements were made and a visual inspection confirmed no activity on site. Background noise levels equal to or even slightly higher than the background noise levels measured by the loggers were measured. The long term logging data is therefore appropriate for use in setting noise emission goals.

Assessment of noise generation from internal areas.

The EPA note the possibility of disturbance as a result of noise generation by the redeveloped auditorium (with dining room), gymnasium and lecture theatres 1 and 2, in particular given the potential after hours use of the site.

A numerical assessment of these uses was also requested by them.

ALC Response:

- Lecture Theatres 1 and 2 are not a part of this development proposal.

- Auditorium - Noise emissions from after hours use of the auditorium will comply with the EPA Industrial Noise Policy. The bounding walls and roof to the auditorium are concrete/masonry. The roof top vents are for smoke exhaust only and are closed with metal fire dampers during typical use. Further, there are rooms separating the auditorium from the eastern façade (the façade closest to the residences).

- Gymnasium:

    - While the gym was approved and operated prior to the construction of the apartments to the west, potential after-hours use of the gym to ensure no adverse noise impact is discussed below.

    - We note that there is a ventilation louvre located at low level on the western façade of the gym which faces the apartments to the west, creating a potential weak point with respect to noise emissions.

- In order to reduce noise emissions via the louvre, it is recommended to construct a solid screen externally, in front of the louvre (breaking the line of site from the louvre to the apartments). Screen height should be no less than 2m, and spaced no more than 1m from the louvre.

- The screen should be constructed of minimum 6mm thick fc sheet or heavier material. The face of the screen facing the louvre is to be lined with noise absorptive material suitable for external use (50mm thick Echosoft or equal).

- With respect to numerical analysis:

  - Auditorium:

    - Assuming a sound pressure level within the auditorium of 95dB(A) (loud, amplified music – a worst case scenario use of the space), the predicted noise level at the nearest residence (top floor of the apartment building to the west) would be approximately 40dB(A) and compliant with the noise emission goals in tables 3 and 4 of the amended acoustic assessment for day/evening and night time periods.

    - It would necessary that management require that patrons remain within internal areas after a function except when walking to their cars.

    - Outdoor areas on the site should not be available for use after 6pm.

  - Gymnasium:

    - A typical sound pressure level within a gymnasium (competitive sports – whistle and moderate vocal noise from participants) is 80dB(A)L_{eq}.

    - Provided that the noise screen referred to above is implemented, the noise level at the eastern façade of the apartments west of the site would be 46dB(A)L_{eq}, which is compliant with daytime and evening time acoustic criteria.

    - It is recommended that the gym is not used prior to 7am or after 10pm.

  - Vehicle noise:

    - There are approximately 150 vehicle spaces on site, divided between two on-grade car parks (on the eastern side of the site) and an underground car park (on the western side of the site).

    - The underground car park (approximately 70 cars) would not be accessible to the public during after-hours use of the site.

    - As such, only the two on-grade car parks would be available for after-hours use (approximately 80 spaces). This car park is accessed via a driveway passing by Tubbs View apartments.

    - Assuming a sound power of 82dB(A) per car (typical for a car driving at 10km/h), and all 80 cars leaving the site in a 30 minute period (as may be the case after a function/concert), the noise level at the Tubbs View apartments is predicted to be

42dB(A)$L_{eq(15min)}$, and is compliant with the day, evening and night time noise emission goals in tables 3 and 4 of the *Noise Emission Assessment*.

- Departure noise (sleep disturbance):
  - Momentary peak noise events are assessed with reference to EPA Sleep Disturbance Guidelines for sites used after 10pm.
  - Typical EPA assessment practice recommends an initial test that the momentary ($L_{1(1min)}$) peak noise event not exceed background noise levels by more than 15dB(A).
  - As noted in table 1 of the Noise Impact Assessment the night time background noise level at Tubbs View is 38dB(A)L_{90}, making a noise emission goal of 53dB(A)$L_{1(1min)}$.
  - With respect to typical peak noise events (doors closing/cars starting), we note that the nearest parking space to the Tubbs View apartments is approximately 23m away. Assuming a sound power level of a door close/car start of 90dB(A)$L_{1(1min)}$ (typical in our experience), the noise level will be 54B(A)$L_{1(1min)}$ at the nearest window in the Tubbs View apartments. This is inaudibly louder than the 53dB(A) target, and applies only to the closest 4 parking spaces, The remaining spaces in the car park will be 53dB(A) or quieter.
  - Given that a completely full car park after 10pm would be infrequent, a 1d(A) exceedance for 4 parking spaces is negligible.
  - Further, with an *external* noise level of 54dB(A)$L_{1(1min)}$ from a car start/door close, the *internal* noise level within an apartment (windows open) would be approximately 44dB(A)$L_{1(1min)}$. Based on the sleep disturbance probabilities from Appendix B of the EPA document *Environmental Criteria for Road Traffic Noise*, the probability of sleep disturbance as a result of a 44dB(A)$L_{1(1min)}$ noise event is 0%.

Mechanical Plant and PA/School Bell.

The EPA has noted that a detailed assessment of plant noise and the PA system has not been provided in the Noise Impact Assessment and has recommended that a comprehensive quantitative assessment of all plant items be provided.

ALC Comment:

- This is an unreasonable request as this requires that comprehensive mechanical design to be conducted *prior* to it being even possible to commence a comprehensive *acoustic* assessment of that design.
- For a project of this scale (or almost any project in our experience), a comprehensive mechanical services design is never undertaken at project approval stage.
- It is typical practice that a condition of consent be imposed requiring that plant and equipment be designed such that compliance with the EPA Industrial Noise Policy be achieved.

- There is nothing about the subject site that indicates that compliance with these requirements is not achievable. The site area is large, and there are typically moderate separations between the site buildings and nearby residences.

- There is no reason why extremely significant consulting fees should be expended on a public project to prior to project approval when this process is routinely undertaken after approval, such that the expense is not wasted in the event the project does not proceed.

- Given that conditions of consent routinely set noise emission requirements and impose post operation verification measurements. This provides an adequate safeguard to nearby residents, and there is no reason why this commonplace practice should not be adopted for this project.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Thomas Taylor