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Sydney International Convention Centre - Supplementary Acoustic Report

1 INTRODUCTION

This supplementary acoustic report addresses acoustic issues which have been raised by the Environmental Protection Authority and Department of Planning with regards to the environmental noise emissions associated with the construction and operation of the SICEEP.

Specifically, this report will:

- Provide comment on the EPA draft proposed conditions;
- Provide comment on the Department of Planning acoustic queries; and
- Provide an acoustic review of the proposed changes to the development application design.

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2 EPA DRAFT CONDITIONS

This section of the report provides a review of the EPA proposed draft Conditions. All proposed conditions/comments with any acoustic content are addressed below:

2.1 CONSTRUCTION NOISE LEVELS IN ENVIA

EPA Comment

The predicted construction noise levels in the ENVIA do not appear to include the addition of 5dB for annoyance from certain construction equipment/ activities (such as rock hammering or jackhammering), as required by Section 4.5 (page 16) of the Interim Construction Noise Guideline (DECC 2009). The EPA recommends that this issue should be addressed by the proponent prior to planning approval.

ALC Comment

A Construction Noise and Vibration Management plan prepared by Acoustic Logic Consultancy is attached as an addendum to the ENVIA which incorporates the EPA comments.

2.2 PROPOSED CONSTRUCTION HOURS

EPA Comment

The ENVIA has proposed construction hours that do not comply with the standard construction hours contained within the Interim Construction Noise Guideline (DECC 2009). The EPA considers that construction should be limited to standard construction hours. Only construction activities that do not cause background + 5dB or more L_{Aeq} levels at residential receivers should be allowed outside standard construction hours, as permitted by the Guideline. The EPA recommends a condition of approval (CoA) requiring that construction works only occur within the standard construction hours of:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1 pm
- No work on Sundays or public holidays unless works do not cause background + 5dB or more L_{Aeq} levels at residential receivers

ALC Comment

It is recommended that the standard hours of construction for weekdays be 7am to 7pm and Saturdays be 7am to 5pm.

The reasons for this modification to the proposed condition are as follows:

- The EPA guidelines are general, “catch all” guidelines that would be applicable in more sensitive situations - in quiet residential suburbs, for example. In this particular case, the affected properties are adjacent to a major entertainment precinct that is largely comprised of commercial premises with some residential receivers.
- We note City of Sydney guidelines are less stringent than standard EPA time restrictions and there are precedents for longer Saturday construction hours in the vicinity, including Darling Quarter, Cockle Bay; Global Switch, Ultimo; The Brewery, Broadway; UTS FEIT, Broadway; UTS Chau Chak, Ultimo and 420 George Street, Sydney CBD.

- Adopting the proposed hours will allow for efficient construction on Saturdays and the entire construction timetable will be expedited which will benefit the surrounding community.
- Additional noise restrictions are proposed to limit noise during the non-standard construction hours. These are:
 - Between the hours of 7am and 8am on Saturday, only activities that comply with “background + 5dB(A)” criteria at residential receivers be permitted in accordance with EPA guideline.
 - Between the hours of 6pm and 7pm weekdays and 1pm and 5pm on Saturday, only operations complying with “background +10dB(A)” limit at residential receivers will be permitted. It is noted that the “background + 10dB(A)” will be a noise emission limit rather than a management level.

2.3 CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

EPA Comment

The proponent must prepare and implement a detailed Construction Noise and Vibration Management Plan (CNVMP), prior to commencement of construction activities, that includes but is not necessarily limited to;

- a) identification of each work area, site compound and access route (both private and public);
- b) identification of the specific activities that will be carried out and associated noise sources at the premises and access routes;
- c) identification of all potentially affected sensitive receivers;
- d) the construction noise objectives identified in accordance with the *Interim Construction Noise Guideline* (DECC 2009);
- e) assessment of potential noise and vibration from the proposed construction methods (including noise from construction traffic) against the objectives identified in (d);
- f) where the objectives are predicted to be exceeded an analysis of feasible and reasonable noise mitigation measures that can be implemented to reduce construction noise impacts;
- g) description of management methods and procedures and specific noise mitigation treatments that will be implemented to control noise and vibration during construction, including the early erection of operational noise control barriers;
- h) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity; and
- i) measures to monitor noise performance and respond to complaints.

The CNVMP should also include demolition methods that do not require the use of rock breakers or other similar high noise generating equipment, such as rock (or concrete) splitting of building sections for transport and break up off site, unless not feasible and reasonable. Where rock breakers or other high noise generating equipment are to be used such that the appropriate

criteria are exceeded (given the comments made above about the nominated criteria), the hours of operation for high noise generating equipment must include respite periods.

ALC Comment

A Construction Noise and Vibration Management plan prepared by Acoustic Logic Consultancy is attached as an addendum to the ENVIA. We note that as detailed review of construction methods has not been carried out the prepared Plan must remain a preliminary Plan that indicates the methodology that will be adopted to review and manage construction noise and vibration impacts. The details of the actions arising from the Plan's implementation will be revised throughout the project in response to more detailed information and site conditions.

2.4 CONSTRUCTION NOISE IMPACT AT UTS

EPA Comment

The ENVIA does not provide construction noise management levels for the educational sensitive receiver located at the University of Technology Haymarket Campus. It is not clear whether the ENVIA has considered construction noise impacts on this sensitive receiver. The EPA recommends that additional information is provided regarding noise assessment during construction on this receiver prior to planning approval.

ALC Comment

The Construction Noise and Vibration Management plan prepared by Acoustic Logic Consultancy identifies the UTS Haymarket Campus as a sensitive receiver and assesses noise impacts at this receiver.

2.5 CONSTRUCTION VIBRATION

EPA Comment

The EPA notes that the ENVIA provides an assessment of construction vibration through the use of safe working distances rather than vibration dose values, and that some sensitive receivers are located within these safe distances. The EPA considers that the proponent should ensure that no unacceptable impacts are experienced by surrounding sensitive receivers by applying reasonable and feasible mitigation measures to meet the vibration dose values contained with Table 2.4 of 'Assessing Vibration: a technical guideline' (DEC 2006). Where the values cannot be met and adverse impacts are experienced, additional measures such as respite may be appropriate.

ALC Comment

The ENVIA does not advocate the use of the safe working distances as the sole management measure. The recommended safe working distances presented in the ENVIA can be regarded as a worst case scenario. Site testing and confirmation of actual "safe" working distances are likely to show they can be reduced. The site testing will also confirm if vibration levels exceed the goals and mitigation needs to be assessed.

The analysis in the ENVIA indicates residential receivers are outside the (conservative) zone of vibration impacts even for sources generating the highest levels of ground vibration. The structures and buildings that fall within the safe working distances are commercial in nature, and there are some structures (such as the road viaducts and columns) where tactile impacts do not need to be assessed, and only damage criteria will be applied. Additional mitigation will be applied

to vibration producing activities occurring within the safe working distances. This will be established in the detailed CNVMP to be developed.

Also, the distances in the preliminary plan do not take into account that alternative methods may be employed to mitigate potential vibration impacts identified.

2.6 LOCATION OF BACKGROUND NOISE MONITORS

EPA Comment

The operational noise criteria in Table 12 and Table 13 of the ENVIA for residential receivers are based on noise levels measured at the described monitoring locations. However, none of the monitoring locations appear to be residential. This means that the criteria appear to be based on background levels that may not be representative of those at residential receivers. The criteria in Table 11 may not be appropriate for residential receivers if the background levels were not measured at residential receiver locations. The EPA recommends that additional information be provided prior to approval regarding the locations where noise monitoring was undertaken, the land use at these locations, and the proximity to the nearest residential receivers.

ALC Comment

ENVIA utilised a monitor in front of the Bullecourt Apartments on Pymont St, and while not strictly on the residential receiver's property, the monitoring location would clearly adequately represent ambient noise conditions at Bullecourt.

The Noise Catchment 1 monitor was located at the Novotel. While this is not immediately adjacent to the Goldsbrough Apartments, we do not expect this location to yield significantly different background noise levels. In any case, the noise environment around the Goldsbrough Apartment building is likely to vary significantly due to its close proximity (at the Southern end) to the Western Distributor. For the southern end of Goldsbrough the monitoring location used is likely to yield conservative results (that is, the monitored noise levels are likely to be less than the actual noise levels).

Regardless, it is intended to conduct further monitoring at the Goldsbrough Apartments at both ground level and roof level to confirm existing background noise levels.

2.7 EVENTS DECK- OPERATIONAL NOISE MANAGEMENT PLAN

EPA Comment

Under clause 90 of *Protection of the Environment Operations (General) Regulation 2009* the EPA is the appropriate regulatory authority (ARA) for outdoor entertainment activities involving 200 people or more carried out within the Darling Harbour area. The ENVIA states that a noise management plan must be developed for Darling Harbour under this Regulation. Whilst the Regulation does not actually require a noise management plan to be developed, the EPA supports this strategy in managing noise from outdoor events held in the SICEEP precinct. The EPA therefore recommends a CoA requiring the proponent to develop an Operational Noise Management Plan for all outdoor events to be held on the Events Deck, to be submitted for the approval of the EPA. The EPA recommends the following CoA:

Events Deck- Operational Noise Management Plan

The proponent must develop an Operational Noise Management Plan (ONMP) to be submitted to the EPA for approval. The plan must be approved prior to operations beginning at the Events Deck. The ONMP must apply to all outdoor events to be held on the Events Deck.

The ONMP must contain, but not be limited to, the following:

(a) The ONMP must be prepared in consultation with all relevant stakeholders, including the local community, EPA and City of Sydney Council.

(b) In developing the ONMP, the proponent must take into account the existing requirements of any relevant development consent or approval and any noise monitoring data.

(c) The ONMP must contain, but does not need to be limited to, the following:

(i) A brief description of each of Events Deck venue including: venue layout, description of permanent amplification systems and the types of activities to be held in the venue;

(ii) Identification of noise sensitive receivers (such as residences, schools, hospitals, churches), existing and proposed, likely to be adversely affected by activities at the venue;

(iii) Details of a noise monitoring program that monitors sound levels from outdoor entertainment activities held at the Events Deck, and retains records of the results and details of the monitoring equipment used, including its location and settings;

(iv) Clearly defined noise management objectives for the Events Deck;

(v) The maximum allowable sound levels and limitation level of excessive low frequency (bass) noise;

(vi) A procedure or noise model (or other means of assessment) that allows for the prediction and assessment of noise levels for proposed activities;

(vii) The operating hours for different events to be held at the Events Deck;

(viii) A procedure for notifying potentially affected residents and other sensitive noise receivers of activities to be held at the venue;

(ix) Details of a noise complaints handling procedure and actions to be taken at the time of each complaint to monitor and minimise noise impact;

(x) Details of the community consultation procedure used after the event to obtain additional information relating to the noise impact as well as to provide the complainant with information on proposed actions to prevent a recurrence of the impact;

(xi) Identification and prioritisation of noise management problems and issues, including a summary of the outcomes from monitoring and community consultation, undertaken in preparing the ONMP;

(xii) A mechanism for reporting the effectiveness of the ONMP to stakeholders, including the local community, the EPA and City of Sydney Council; and

(xiii) A program for review of the ONMP, including ongoing assessment and improvement of the ONMP.

The program must address the effectiveness of:

- Community consultation (consultation prior to, during (complaints handling and response) and after outdoor events and consultation as part of the plan review process);
- The use of technology or the set up of equipment prior to events to mitigate or prevent noise impact;
- The use of real time mitigation measures to mitigate or prevent noise impact; and
- The use of monitoring programs, the monitoring data records and community consultation information to prevent or mitigate noise impacts from outdoor events.

The program of review must also provide an Implementation Strategy that commits to specific management actions, including operational procedures to be implemented along with timeframes. The specific management actions must incorporate best management practice that adequately addresses the identified problems and issues with both non-structural and structural aspects of noise management, such as community consultation, equipment set up, use of technology, real time noise mitigation measures, and monitoring program.

The EPA recommends a CoA also requiring the facility operator/s to comply with the ONMP once the facility is in operation.

ALC/DHL Comment

DHL commit to preparing an Operational Noise Management Plan for the Event Deck in consultation with the EPA. Recommendations of the EPA, acting reasonably, will be adopted, with appropriate management of operations to ensure compliance with EPA guidelines.

Events or functions will be undertaken between the hours of 7am and 10pm (including bump in and bump out) except for large celebratory events.

Low noise events or functions where there is no risk of exceeding the recommended noise level at the nearest residence at Night Time (after 10 pm) will be finished by 11.00pm as recommended in the Environmental Noise and Vibration Impact Assessment prepared by AECOM.

2.8 CELEBRATORY EVENTS ON EVENT DECK

EPA Comment

The EPA has reviewed the proposed operation of the Events Deck for 'Large celebratory events'. While the EPA is the ARA for outdoor events within the Darling Harbour area, it does not currently have a policy or guideline regarding noise limits or hours for large cultural events. The selection of noise limits, operational hours and number of events permitted is a matter of balancing the achievement of cultural outcomes or requirements and minimising the impacts on surrounding sensitive receivers. The EPA recommends that the Department of Planning and Infrastructure (DP&I) consider this in making a decision as to whether the proposal for 'large celebratory events' is appropriate and, if so, set an appropriate CoA to regulate the noise levels, number, frequency and duration of these events.

ALC/DHL Comment

DHL consider that large celebratory events are appropriate for the Event Deck, and more broadly are compatible with Darling Harbour's role as an event and entertainment destination.

The EPA appears to agree that some concessions in regards to Event Deck operation are reasonable, however does not appear to want to commit to the level of concession (number of events and noise levels).

2.9 EMERGENCY GENERATOR CRITERIA

ALC/DHL Comment

The EPA considers that the criteria of "background + 10dB" for emergency generators in Section 3.2.6 of the ENVIA is unnecessarily high and the need for this higher criteria has not been adequately justified. The EPA considers that emergency backup generators must be installed to meet "background+ 5dB," as required by the NSW Industrial Noise Policy (EPA 2000).

ALC Comment

ALC confirm that emergency back-up plant will be installed to meet "background + 5dB.

2.10 BUMP IN / BUMP OUT NOISE

EPA Comment

The EPA recommends that bump in / bump out for events at all venues should be limited to daytime only. The only bump in/ bump out activities permitted outside standard daytime hours should be those that do not cause background + 5dB or more L_{Aeq} levels, or background + 15dB L_{Amax} levels, at residential receivers. The EPA recommends a CoA to ensure this limit is enforced.

ALC /DHL Comment

DHL considered it unreasonable for bump in / bump out to occur only during the daytime as this will limit events with the Facilities. The existing facilities feature open loading docks that operate 24/7 each day of the year.

Noise emissions from all proposed night bump-in /bump out activities will be reviewed, and appropriate mitigation and operational management measures adopted to ensure compliance with normal EPA guidelines at night.

2.11 APPLICATION OF OLGR CRITERIA

EPA Comment

The EPA considers that events (other than 'large celebratory events') must end at 10pm or 11pm as suggested, unless they do not cause the relevant Office of Liquor Gaming and Racing criteria to be exceeded at residential receivers, (noting the above issues identified with the criteria in Table 12 and 13 of the ENVIA). The EPA recommends a CoA to ensure this occurs.

ALC/DHL Comment

In response to the EPA comment the following precinct noise emission guidelines are proposed to determine noise emission limits covering the various noise sources and operating times:

Noise emissions from exhibitions, concerts, functions and internal events shall comply with the following:

- *From 7am until 11pm – comply with NSW EPA Industrial Noise Policy guidelines*
- *From 11pm to 7am – comply with NSW EPA Industrial Noise Policy and the requirements of the Office of Liquor, Gambling and Racing NSW (OLGR)*

Noise emissions from events on the event deck and other external spaces shall comply with the following:

- *Events that may not meet EPA INP noise guidelines will terminate at 10pm. Events extending past 10pm must strictly comply with the EPA INP guideline between 10pm and 11pm. Events after 11pm are to comply with OLGR guidelines.*
- *Up to 6 large celebratory events per year will be permitted that comply with the noise emission goal of RBL + 15 dB(A).*
- *Operational Plan of Management should be developed to manage operation of the event deck and external spaces and minimise noise emissions.*

Noise emissions from plant and equipment, bump in/bump out operations:

- *Comply with NSW EPA Industrial Noise Policy at all times.*

The assessment of noise emissions from all event buildings, the Theatre, Exhibition Halls and the ICC and the determination of envelope construction will be undertaken using the noise levels from typical events as required in Section 1.1f of the iNSW A12 brief.

2.12 EVENT LOUDSPEAKERS

EPA Comment

The EPA recommends that specifications for event loudspeakers / amplification system design be obtained similar to those for the FIFA Fan Festival held in Darling Harbour and reported in: "Assessment of Environmental Noise Produced by the Sound System Used in the International FIFA Fan Fest". Report prepared by Acoustic Directions for Community Engagement and Events, Department of Premier and Cabinet. Report Ref: 100504 Fan Fest v1.0 May 2010.

ALC/DHL Comment

DHL has no objection to EPA proposal.

2.13 LOADING AREA NOISE EMISSIONS

EPA Comment

Section 3.2.3 of the ENVIA states that it has been assumed that activities at the loading dock will not contain any annoying noise characteristics. Operations of heavy vehicles around loading docks often involve the use of reversing beepers, which are considered to have annoying noise characteristics. It appears that the ENVIA has not considered this issue. The EPA recommends that

additional information be provided prior to planning approval indicating either that reversing alarms have been considered in the loading dock design (e.g. through ensuring that reversing will not be required to reverse at any point in the loading dock area), or provide an assessment of the impact of reversing beepers on surrounding sensitive receivers.

ALC/DHL Comment

Loading dock activities have been reviewed by ALC and the appropriate modifying factors and a 5dB(A) penalty has been applied to reversing alarms. Reasonable mitigation measures have been adopted with appropriate management of operations to ensure compliance with EPA guidelines. Mitigation measures have been included in architectural design documentation. It is noted that as further operator information regarding the loading docks is received, further reviews will be conducted to ensure ongoing compliance with EPA noise emission goals.

3 DEPARTMENT OF PLANNING COMMENTS

This section of the report provides a review of the Department of Planning's comments on the SICEEP. All proposed conditions/comments with any acoustic content are addressed below:

3.1 NOISE FROM EVENTS DECK

DoP Comment

The event deck has the potential to generate significant noise to nearby residential receivers particularly during special events. In terms of operational noise the background noise levels should be measured at the nearest residential receivers. The Environmental Noise and Vibration Impact Assessment indicates a noise logger location at No. 220 Pymont Street and shows it as the Bullecourt apartments. However, the Bullecourt apartments is addressed No. 287 Pymont Street. Clarification is sought as to whether a noise logger was used to measure noise levels at the Bullecourt apartments noting its proximity to the proposed event deck. It is also recommended that the Goldsbrough residential building at No. 243 Pymont Street is also included as a noise logger location. Provide further detail of mitigation measures that will be adopted to minimise noise impacts to surrounding residential properties from the event deck.

ALC Comment

ENVIA utilised a monitor in front of the Bullecourt Apartments on Pymont St, and while not strictly on the residential receiver's property, the monitoring location would adequately represent ambient noise conditions at Bullecourt.

Although the background noise levels measured at the Novatel are unlikely to differ significantly from those at the Goldsbrough Apartments, it is intended to conduct further monitoring at both ground level and roof level to confirm existing background noise levels.

3.2 DRAFT EVENT MANAGEMENT PLAN

DoP Comment

The Departments seeks a draft Event Management Plan for the use of the outdoor deck which includes but is not limited to details of the frequency and type of outdoor events likely to occur, amplified and live music and measures to mitigate noise impacts, occupancy, the layout and location of plant and equipment, pedestrian management, hours of operation, noise monitoring and complaints handling.

ALC/DHL Comment

A draft Event Management Plan has been prepared for the Event Deck.

3.3 TRUCK MOVEMENTS

DoP Comment

Confirm whether or not the at-grade loading areas off Darling Drive for the Convention Centre will be designed to allow trucks to enter and leave in a forward motion so as to minimise amenity and safety impacts.

DHL Comment

DHL confirm that at grade loading areas off Darling Drive are designed to allow trucks to enter and leave in a forward motion.

4 PROPOSED DESIGN CHANGES

Presented below is an acoustic review of the design changes that are proposed for the Theatre and ICC.

Theatre changes:

- Seating bowl has been lowered to RL3.4
- Loading dock lowered on grade to match Darling Drive level - trucks drive in/out one way
- Car parking for approximately 200 cars located above the loading dock
- Revised ventilation discharge locations

The proposed changes have been reviewed by ALC and there is no adverse environmental acoustic impact associated with the changes.

ICC Changes:

- An open balcony is proposed to wrap around the east, north and south sides of the upper levels.

An acoustic assessment of the proposed balcony has been undertaken to determine its acoustic impact on the surrounding receivers. As the balcony uses are currently being determined, a preliminary review has been conducted assuming that the balcony would accommodate similar activities to typical Event Deck activities (excluding Large Celebratory Events). It has also been assumed that the balcony would have the same operating hours and noise restrictions as the Event Deck.

The assessment indicates the proposed balcony could support a range of uses while not adversely impacting sensitive receivers. An acoustic assessment conducted in conjunction with the plan of management for the use of these spaces (similar to the event deck) will determine the permissible range of uses based on the expected noise generation from the uses, taking into account the final design of the terrace and any physical or management controls implemented.

As discussed, a detailed acoustic review of the proposed balcony would be required upon the finalisation of the balcony's operation. Preliminary noise management strategies for typical balcony activities are presented below:

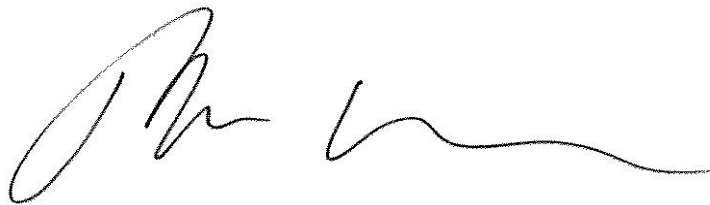
- Appropriate selection and positioning of loudspeaker systems to minimise noise spill to sensitive receivers.
- Distributing louder aspects of events further from sensitive receivers (i.e. eastern side)
- Time management
- Conscientious crowd management including limits to crowd numbers.
- Use of physical screens.
- Consideration of impacts on events occurring within the ICC (if not related to the balcony activity)

5 CONCLUSION

This report presents an acoustic review of Environmental Protection Authority and Department of Planning comments regarding the design of the SICEEP in addition to an assessment of the acoustic impacts of proposed design changes to the ICC and Theatre.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Thomas Aubusson', with a stylized, flowing script.

Acoustic Logic Consultancy Pty Ltd
Thomas Aubusson