

WALSH BAY ARTS AND CULTURAL PRECINCT

RESPONSE TO SUBMISSIONS

SSDA 8671

APPENDIX 2: SUPPLEMENTARY NOISE AND VIBRATION REPORT

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Project title	Walsh Bay Arts and Cultural Precinct	Job number
		248995
cc	Tom Kennedy (GTK Consulting), Nicola Gibson (MG Planning)	File reference
		2018-01-23 WBACP Supplementary Noise and Vibration Impact Assessment
Prepared by	Mathew Simon (Sydney) Nick Boulter (Arup)	Date
		23 January 2018
Subject	Response to submissions for WBACP Noise and Vibration Impact Assessment	

1 Introduction

This file note details submissions received in relation to the Noise and Vibration Impact Assessment (2017-10-11 SEARs Noise Impact Assessment_Final, Arup, October 2017) (NVIA) from the public exhibition of the Walsh Bay Arts and Cultural Precinct State Significant Development (SSD 17_8671), as well as Arup's responses.

2 Construction noise

2.1 Comments

A number of submissions received expressed concern with construction noise. Specific comments received in relation to construction noise are presented in Table 1.

Table 1 - Comments - Construction noise

Submitter	No.	Issues Raised
Walsh Bay Precinct Association	B1j	<ul style="list-style-type: none"> Construction noise exceedance of 11dB could have a major impact on commercial operators within the precinct. Only soft management measures are proposed. The proponent should be required by enforceable conditions of consent to abide by project-specific construction noise targets. Where impacts in excess of Noise Management Levels are predicted, affected receivers should be compensated.

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Submitter	No.	Issues Raised
Dynamic Property Services on behalf of Strata Plan 73989 – 13 Hickson Rd	B3	<ul style="list-style-type: none">That the conditions of the DA will include the Rules of Engagement for the contractor and sub-contractors working on the redevelopment.That the conditions of the DA include, but not be limited to, that the contractor(s) need to work with the Stakeholders for “no-noise” dates and times.
Department of Planning and Environment	C1g, C1h	<ul style="list-style-type: none">Provide an estimate of the time taken to complete each stage of construction works identified in Table 13 of the Noise and Vibration Impact Assessment (NVIA).Clarify instances if the construction stages in Table 13 of the NVIA would be undertaken sequentially or where they would be undertaken concurrently, provide a discussion of the resultant cumulative noise impacts. For example, if scenario 1 and scenario 2 were to be undertaken concurrently, would there be a significant increase in noise levels?
Albert Talone	A1	<ul style="list-style-type: none">No noise sensitive receptors within the area identified in the report are subject to construction and post construction noise.List of construction activities not definitive.Large proportion of work will be external not internal.Internal works will still have significant noise impacts and have not been modelled.No. of trucks significant in terms of noise impacts but not considered.
Ruth Colaguiri	A10	<ul style="list-style-type: none">Noise impact not adequately addressed especially in relation to noise receptors within the precinct.Construction truck impact will be significant but DA states that the impact is not significant.Need to consider alternative means of managing construction traffic similar to approach used at Headland Park.

2.2 Response

2.2.1 Noise Sensitive receivers

All potentially worst affected noise sensitive receivers, including commercial, residential and passive recreation, have been included in the assessment, including those located within the redevelopment area, namely receiver C4 – View by Sydney & Simmer on the Bay. (Refer Table 1: Noise sensitive receivers and Figure 2: Noise sensitive receiver locations and NCAs in NVIA).

The predicted construction noise levels are worst case assuming all plant operating externally and concurrently. In practice, this is very unlikely to occur. The NML criteria is the level at which there ‘may be some community reaction to noise.’ At a worst case level predicted level of 69 dBL_{Aeq}, the noise levels are well below the ‘highly noise affected’ threshold of 75 dBL_{Aeq}. Specific recommendations are set out to control noise, including the installation of noise loggers and effective community liaison.

2.2.2 Construction noise management measures

The recommendations for construction noise management include specific requirements on the eventual contractor to prepare a full and detailed Construction Noise and Vibration Management

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Plan, which will need to include noise monitoring. The recommendations for noise management given in the NVIA are as detailed as can be made at this time given that the eventual contractor will be determining the construction delivery methodology.

The proposals for construction noise management are in accordance with the guidance in the Interim Construction Noise Guidelines. The Applicant commits to providing upgrades to existing party walls between operating tenancies and areas where there are construction activities taking place. This will be in the form of additional plasterboard linings, sound absorptive finishes etc. within the work area. Whilst this treatment will improve the sound insulation between the work areas and the tenancies, it is not practicable to make the partitions 'soundproof'. Compensation is not considered appropriate or warranted.

Measures regarding management of noise are set out in the NVIA that formed Appendix 19 of the project EIS. Provision is made for a Responsible Person to be nominated from the contractor to liaise with surrounding tenants and land owners regarding construction noise. Meetings will be held with tenants and landowners prior to works commencing outlining the program of works and how noise will be dealt with during construction. Tenants will be encouraged to provide information regarding any events that are taking place within their tenancies so mitigations can be undertaken. This may include additional respite periods or reprogramming of works to avoid noisy works during sensitive events.

The contact details of the Responsible Person from the contractor will be provided to surrounding tenants and landowners in order to address any concerns during construction promptly.

Table 13 of the Noise and Vibration Impact Assessment (NVIA) demonstrates the key types of work that are anticipated during construction of the project, that are likely to have a noise or vibration impact. The works are detailed by activity and do not dictate the staging of the works or represent all construction activities associated in delivery of the works. The final construction methodology will be developed by the Contractor and detailed in the final Construction, Environmental and Site Management Plan as well as the Construction Noise and Vibration Plan.

2.2.3 Construction staging and noise management

Construction equipment and staging are based on the most recent information available from the construction contractor, and align with typical equipment used for similar projects based on Arup's experience. Modelled construction scenarios therefore represent the most accurate worst case scenarios based on the available information and make conservative assumptions.

The Applicant anticipates that there will be two distinct phases during the construction period:

1. Demolition – primarily focused in the early phases of the project with the majority of demolition works at Wharf 4/5; and
2. All other construction works - these are likely to be occurring sequentially and concurrently between Wharves 4/5, shoredowns and Pier 2/3.

The demolition period is anticipated to take approximately 4-5 months, with some of the key activities listed at item 1 in Table 13 of the NVIA. This phase is expected to take place at the commencement of construction and may occur concurrently with preparatory fit out works and external cladding/roof works.

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The remaining construction activities, (some of the key activities are included as items 2-5 in Table 13 of the NVIA) represent the construction phase of the project and will occur over the remaining construction period (Approximately 20 months).

2.2.4 Construction noise impact of internal and external works

The works are primarily internal fitout of a heritage timber structure, with structural and relatively minor façade works. The heritage nature of the building envelope limits what can be done to the outside of the building and in this regard also assists in reducing the overall level of construction noise.

External activities, including roof sheeting, insulation and sarking, external lifts, raising of roof of Pier 2/3, raising of roof of workshop and raising of roof of Wharf 1 and new gantries have all been modelled and included in the assessment.

The internal fit out works are not expected to further impact the predicted external noise levels outlined at section 3.6 of the NVIA.

2.2.5 Cumulative noise impact

The NVIA assumes that all activities listed in items 2-5 will occur concurrently (Table 15). This forms the basis of the assessment in the report and the results are outlined in section 3.6 and Table 16 of the NVIA which breaks down noise levels under notional construction stages.

To allow for the potential cumulative effect of the works taking place after the demolition stage, an updated table has been prepared (see table below) which totals the noise from all the nominated activities previously identified separately (i.e. the sum of noise from stairs, balconies, façade modifications, roof works, structural works utilities and lifts).

Table 2 - Predicted construction noise levels, dBA (NVIA Table 16)

Receiver	NML	Construction Activity	
		1. Demolition and removal works	All other construction activities
		Highest predicted noise level, $dB_{L_{Aeq}, 15min}$	
R1 - Pier One Hotel suites	58	69	61
R2 - Shore 6/7 apartments	59	62	60
R3 - 18 Hickson Road Hickson Apartments	63	46	45
R4 - Lower Fort Street North Terraces	63	63	59
R5 - Lower Fort Street South Terraces	63	56	58
R6 - Pottinger Street Terraces	63	52	53

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R7 - Pier 6/7 apartments	59	63	67
R8 - Blues Point Tower	58	50	50
R9 - Warung Street Residences	58	47	46
R10 - East Crescent Street Residences	58	47	46
C1 - Pier One Hotel Bar & Restaurant	70	66	58
C2 - Shore 6/7 ground floor commercial	70	59	57
C3 - 18 Hickson Road commercial	70	44	43
C4 - View By Sydney, Simmer on the Bay	70	72	73
C5 - 16 Hickson Road commercial	70	55	55
C6 - Roslyn Packer Theatre	70	42	41
P1 - Blues Point Reserve	60	50	50

As can be seen in the last column of the table above, noise is predicted to exceed the Noise Management Level by 11dBL_{Aeq} at location R1 during demolition. The NML is exceeded by 8dB at R7 under the same conditions. There is also a small predicted exceedance of the NML at C4.

Noise levels are generally not expected to exceed 75dBL_{Aeq,15 min} at any receivers under any conditions.

As noise levels are predicted to exceed the Noise Management Level, action must be taken to manage noise levels. The requirements for this noise management process are set out in the NVIA. As noted, the Contractor will need to prepare a detailed Noise and Vibration Management Plan to reflect the actual plant to be used and the construction methods employed. The Applicant undertakes to require the Contractor to do this.

2.2.6 Construction traffic noise

Existing traffic counts showed on average 5549 vehicles travelled along Hickson Road between 7am and 10pm, with 5% of these (277) classified as heavy vehicles. Relative to the existing traffic noise levels, an increase of 80 heavy vehicles would increase the average daytime noise level by less than 1 dB. The Roads and Maritime Services Road Noise Policy states “an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person”.

3 Noise from hospitality uses

3.1 Comments

A number of the submissions raised concern with noise from events. Specific comments were received in relation to hospitality related noise are presented in Table 3.

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Table 3 - Comments - Hospitality noise

Submitter	No.	Issues Raised
Walsh Bay Precinct Association	B11	<ul style="list-style-type: none">• Difficult to understand how the conclusion that the venue will operate in compliance with project specific noise goals at all sensitive receivers.• NVIA assumes patrons will not be affected by alcohol and music will only be played at very low levels• Assumptions are not realistic• Other hospitality venues in Walsh Bay are subject to conditions that prevent the use of outdoor space late at night.

3.2 Response

The methodology for predicting operational noise levels are described in the NVIA at Section 4.

The nature of the events intended to be hosted would not include large numbers of intoxicated patrons. The Operational Plan of Management details specific requirements for future operators to abide by “responsible service of alcohol” obligations. In addition, organisers of functions would be required to have security staff on site for the duration of the event to manage patron behaviour.

Amplified music has to be carefully controlled in order to protect the noise-sensitive performance venues within the precinct, as well as the surrounding noise-sensitive receivers. The Applicant commits to imposing specific noise limits on users of the internal venues.

The Applicant also commits to the installation of noise monitors within the precinct. The location of the monitors will be developed as part of the Operational Noise Management Plan and be managed by the Precinct Manager. Noise results from the monitors will be available to enforcements agencies.

The assumptions made are based on the proposed usage of the venues in the precinct.

4 Noise from events

4.1 Comments

Comments received in relation to event noise are presented in Table 4.

Table 4 - Comments - Event noise

Submitter	No.	Issues Raised
Walsh Bay Precinct Association	B1m	<ul style="list-style-type: none">• Modelling of event noise based solely on Sydney Writer’s Festival and Biennale is unlikely to reflect potential impact of other events• The proponent has not said that it will not hold a concert or large festival

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Submitter	No.	Issues Raised
	C1n, C1o, C1p, C1q, C1r, C1s	<ul style="list-style-type: none">• Part 3 of the EIS indicates approval is sought for the use of the pier and wharf aprons for external events associated with the internal use of the facilities, however no assessment of cumulative noise from internal events and external events held in the public domain appears to have been undertaken (Section 4.3. of the NVIA). Clarification is needed on the scope of the application in this regard.• Provide further information regarding scope of approval sought for events associated parameters/ restrictions (event type, frequency, maximum patron numbers, finishing times and duration, restrictions on indoor activities/ uses, restrictions on use of outdoor amplified music etc.) to ensure events would not result in adverse amenity impacts to nearby sensitive receivers.• Confirm the hours of operation sought for external events held in the public domain in associated with events within the buildings and provide further information justifying the proposed finishing time of 12 midnight for events (all days).• Provide more detailed information around the nature and type of events to be held in the public domain and their associated impacts.• Clarify if the event noise modelling in Section 5.4 of the NVIA incorporates playing of amplified music outdoors and if proposed, update the noise modelling. Outline controls for playing amplified music outdoors (e.g. speaker number, type, arrangement and restrictions) during events to ensure compliance with the proposed event noise criteria and to protect the amenity of nearby residents.• Clarify if the event noise modelling in Section 5.4 of the NVIA incorporates noise from the internal use of tenancies? Confirm any internal uses/ activities that would be undertaken in associated with events and ensure they are considered in the event noise modelling.
Noel Webster	A30	<ul style="list-style-type: none">• Noise impact from external events and outdoor spill areas likely to be significant and will impact on residential amenity

4.2 Response

The only events for which approval is sought for is Sydney Writer's Festival and Biennale. The applicant is not seeking approval to hold any other concerts, festivals or large precinct-wide events. It is understood that these events have taken place over several years without issue.

The cumulative noise from internal events and external activities associated with them has been modelled (see 4.3.1.2 of the NVIA). Calculations show that noise from internal activities (with the attenuation of the building envelope) is negligible relative to the noise from external patrons.

The external events have been assumed to take place without amplified music, which is in accordance with the conditions of consent for these events currently. For the event noise modelling, the noise sources have been assumed to be external. The activities of the two specific events noted are primarily speech based and so the noise from internal activities (with the attenuation of the building envelope) has been assumed to be negligible relative to the external noise.

The Applicant commits to conclude events midnight.

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5 Monitoring of noise

5.1 Comments

Comments received in relation to noise monitoring are presented in Table 5.

Table 5 - Comments – Noise monitoring

Submitter	No.	Issues Raised
Walsh Bay Precinct Association	B1n	<ul style="list-style-type: none">• It is unsafe to rely on soft management measures such as management plans and guidelines to ensure compliance with operational noise criteria.• It will be impossible to enforce such measures• Proposal should be subject to the requirement for noise logging and maximum noise limits.

5.2 Response

The Applicant commits to the installation of noise monitors within the precinct. The location of the monitors will be developed as part of the Operational Noise Management Plan and be managed by the Precinct Manager. Noise results from the monitors will be available to enforcements agencies.

6 Traffic and late night activity noise

6.1 Comments

Comments received in relation to traffic and late night activity noise are presented in Table 6.

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Table 6 - Comments – Traffic and late night activity noise

Submitter	No.	Issues Raised
Walsh Bay Precinct Association	B1o, B1p	<ul style="list-style-type: none">• If vehicle traffic has been underestimated the road noise assessment is flawed and will have to be redone• It should avoid averaging noise over lengthy periods as it will provide a misleading assessment of impact• Traffic noise from entertainment venues should be assessed as operational noise even if generated on a public road or by relevance to criteria which assess the noise impact of traffic congestion when a major event or several venues disgorge patrons at the same time• 1-15 minute criteria should have been adopted to reflect the peak noise period and the incidental noise of car doors slamming, honking, loud shouts and hailing taxis should have been included in noise assessment• measurements of noise from similar entertainment conurbations should have been considered for sound power levels, intermittency and so on.• Congested traffic and free flowing traffic have different noise impacts and this should have been assessed• Query whether late night noise has been correctly modelled as it was considered to be largely vocal noise• With vehicle pick-ups the noise will be dominated by car braking and acceleration, slamming of car doors, hailing taxis and vehicle congestion• It is the general hubbub interspersed with annoying noise that should have been assessed, not for sleep disturbance but for annoyance• Hickson Road was classified as freeway arterial/sub-arterial for free flowing traffic and this does not account for stop-start traffic likely when events finish• The most annoying evening to night noises have not been assessed
Department of Planning and Environment	C11	<ul style="list-style-type: none">• Ensure noise associated with vehicle pick-up and drop-offs (e.g. car doors slamming, car horns etc.) is addressed in the operational noise assessment.

6.2 Response

A majority of the projected precinct population for typical days will be attending performances and activities in the 13 individual venues around the precinct. These performances and activities will finish at different times and therefore patrons leaving the precinct will not normally all leave together. Similarly, start times for events and performances will be staggered which will also have the effect of avoiding large numbers of patrons arriving concurrently.

The traffic estimates have been reviewed and are considered representative. Given the relatively small change in overall numbers of vehicles associated with the operation of the precinct, the traffic flow conditions would not be expected to change in a significant way. It is therefore considered reasonable to assess traffic noise on the basis of a percentage change in traffic volume (as per the methods given in “The Calculation of Road Traffic Noise¹”). This is the approach taken to derive the results presented in Table 36 of the NVIA.

Hailing of taxis is not a significant noise issue given that almost all taxis are ordered via phone.

¹ Calculation of Road Traffic Noise. Department of Transport, Welsh Office. HMSO

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A car door slam would typically have a sound power level of 105 dBL_{Amax}. This would give a noise level at the nearest window in R1 of 76 dBL_{Amax}. There is an existing parking lane outside R1 which would be affected by door slam noise. The existing noise levels (documented in Appendix C of the NVIA) can be seen to regularly exceed 71 dBL_{Amax} up to and including midnight.

7 Noise from operating scenarios and hours of operation

7.1 Comments

Comments received in relation to operating scenarios and hours of operation are presented in Table 7.

Table 7 - Comments – Operating scenarios and hours of operation

Submitter	No.	Issues Raised
Department of Planning and Environment	C1i, C1j, C1k	<p>Provide a more detailed description of each of the operating scenarios described in Section 4.3.1.2 of the NVIA and a summary of the key modelling assumptions/ patron inputs for each scenario. For example, no details appear to have been provided on the modelled indoor patron numbers for each scenario.</p> <p>Ensure the operational assessment in the NVIA aligns with the proposed hours of operation in Table 5 of the EIS. Consider reducing and rationalising the proposed hours of operation for all tenancies to align with existing facilities and uses within the precinct.</p> <p>Provide further information justifying the proposed operating hours up until 1am (all days) for performances, productions, internal events and functions as outlined in Table 5 of the EIS. Further consider adopting controls around the use of outdoor spill areas (e.g. closing all doors and louvres and no patrons in outdoor seating and balcony areas after 10pm).</p>
Margaret Goss	A7	<p>Existing noise impacts from teaching/rehearsal/performance spaces already significant. These impacts will be made worse if hours extended.</p> <p>Detrimental impact on residents' sleep if hours of operation extended from 22.00 to 01.00</p> <p>Needs to be balance between rights of visitors and residents. Noise impacts will have detrimental impact on quality of life of residents.</p>
Noel Webster	A30	<p>Proposed hours of operation to 1am are not supported and hours should be subject to further public review and consultation</p>

7.2 Response

Internal noise levels from patrons have been based on measurements taken at other similar events (refer Table 25 of NVIA).

In order to allow ventilation to non-air conditioned spaces, the Applicant requests windows and doors to remain open after 10pm. Noise modelling demonstrates there is no discernible difference to noise levels with the windows and doors closed.

Noise modelling shows under typical conditions, operational noise levels including outdoor patrons are predicted to comply with noise limits until midnight at all receiver locations. Under worst case conditions, minor exceedances of 1 dB are predicted, however, since a 2 dB change in noise levels is considered barely perceptible by the average person, no significant disturbance to the community is expected.

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The internal noise levels from patrons have to be controlled to protect the noise sensitive performing venues. An internal noise level of 90 dB(A) is the highest that would be allowed and is controlled by the level of foreground music rather than the level of general patron noise – the latter being more dependent on numbers of patrons.

The cumulative noise from internal events and external activities associated with them has been modelled (see 4.3.1.2 of NVIA). Calculations show that noise from internal activities (with the attenuation of the building envelope) is negligible relative to the noise from external patrons.

8 Liquor & gaming NSW assessment

8.1 Comments

Comments received in relation to assessing against Liquor & Gaming NSW criteria (LGNSW or Office of Liquor and Gaming as it was known previously) are presented in Table 8.

Table 8 - Comments – Additional modelling

Submitter	No.	Issues Raised
Department of Planning and Environment	C1m	Consider additional modelling of operational noise (i.e. indoor singing, music etc.) against the relevant Office of Liquor, Gaming and Racing noise criteria.

8.2 Response

The LGNSW criteria are known to be particularly onerous, apply only to licensed premises and were not requested in the SEARs requirements. While not considered to be applicable to the development, the following is provided for information.

The LGNSW standard criteria for licensed premises are as follows:

The L_{A10} noise level emitted from the licensed premises shall not exceed the background noise level in an Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) by more than 5dB between 7:00am and 12:00 midnight at the boundary of any affected residence.

The assessment has used the sound pressure levels set out in Table 25 of the NVIA with an additional 5 dB to convert between L_{Aeq} and L_{10} . Comparison has been made with the measured background noise spectrum (L_{90}).

As can be seen from the NVIA, the worst affected location for patron noise is the Pier One Hotel.

A hotel has a higher potential tolerance to external noise than a domestic building for the following reasons:

- Bedrooms are provided with internal air conditioning and ventilation meaning that windows are generally kept shut.
- The glazing is generally thicker – noting that in this case, the hotel is located close to the harbour and the harbour bridge and the façade will need to offer a good degree of sound insulation to protect against noise intrusion from the harbour and road/rail traffic on the bridge.

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The thicker glazing on a hotel would be expected to improve the façade sound insulation by at least 3 to 5dB

- A better quality of seal is provided to the glazing – partly to reduce the cost of operating the air conditioning and partly to reduce noise intrusion.

The recent Noise Policy for Industry includes a factor of 5dB for hotels (when compared to residences) to allow for these effects.

Based on the measured background noise at midnight, the assessment against the LGNSW criteria is presented in **Table 9**.

Table 9 - LGNSW assessment results

	Sound Pressure Level (dB re 10 ⁻⁹ Pa) Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Predicted L ₁₀ patron noise	24	32	39	48	47	47	41
Criteria based on measured background noise plus 5dB plus 5dB for improved facade	69	66	62	57	53	46	35

As can be seen, the intent of the LGNSW criteria are generally achieved with a nominal excess of 1 dB at 2 kHz which is unlikely to be noticeable in practice given the other activity taking place in the harbour.

DOCUMENT CHECKING (not mandatory for File Note)

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