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EME Advisory Pty Ltd
17 Carlotta Street
Greenwich
Sydney
NSW 2065

Attention: Brian Cullinane

Dear Brian

Consultant Advice Notice (DRAFT)
102 Wyndam Street, Alexandria, NSW
Noise & Vibration Review - New Health Research Facility (SSD-63067458)

1 Introduction

Waves Acoustic Consulting Pty Ltd (Waves Consulting) has been engaged by EME Advisory Pty Ltd on behalf of the owners of 102 Wyndam Street, Alexandria, NSW to provide a Noise & Vibration Review of the proposed New Health Research Facility (the Project) located at 74 - 108 Botany Road / 86 - 100 Wyndham Street, Alexandria, NSW.

The Project has been submitted to the Department of Planning, Housing and Infrastructure under the application: SSD-63067458. The Environmental Impact Statement (EIS) for the Project includes a Noise and Vibration Impact Assessment (NVIA) as Appendix BB of the report. This review is focused on the NVIA prepared for the Project EIS.

Specifically the Project SSD seeks approval for the following:

- Demolition of all existing buildings, site preparation and remediation works.
- Bulk excavation to create two (2) levels of basement with access from Wyndham Street, including allowance for a below ground Proton Therapy Cancer Treatment Centre, car parking, loading and services.
- Construction and use of two (2) new health research buildings. One (1) building is proposed along Botany Road which has a stepped built form between seven (7) storeys to the south and eleven (11) storeys to the north. One (1) building is proposed along Wyndham Street which is five (5) storeys. The two (2) buildings will include the following:
  a. Ground floor lobby and retail uses fronting Botany Road and Wyndham Street.
  b. Proton Therapy patient lobby from Wyndham Street.
  c. Various laboratories, write up areas and office spaces.
  d. A series of outdoor landscaped terraces within the Botany Road building.
  e. One (1) rooftop plant level on each building.

- Landscaping and public domain works including:
  a. Construction and extension of Wyndham Lane as a shared laneway.
  b. Construction of a pedestrian network including two (2) pathways from Botany Road and an east-west through-site link.
- Extension and augmentation of services and utilities to the development, as required.

Refer to the Environmental Impact Statement for a detailed description of the proposed development.

The owners of 102 Wyndam Street share a boundary (with virtually no separation) to the Project boundary as illustrated in Figure 1 below. The property is a double storey residential terrace house.

Figure 1. Project Boundary and Location of 102 Wyndam Street

Site Boundaries

Note: 1. Image Courtesy of the Project EIS
2. Boundary of 102 Wyndam Street added by this report in Blue.

2 Summary of Requests for Information

Waves Consulting have reviewed the NVIA associated with Project EIS and have a series of Requests for Information (RFIs) which should be answered as part of the submissions to the EIS. The RFIs identified in this review are summarised in Table 1 below. The following sections of this review will discuss each RFI in more detail.

Table 1. Summary of the Noise & Vibration Requests for Information

RFI Number	Operational / Construction	Location in the EIS NVIA Report	RFI Description
1	Operational	Section 3 Existing Noise Environment	Representative measurement locations
2	Operational	Section 5.3.1 Plant and Equipment Noise	No noise predictions for plant noise
3	Operational	Table 15	No individual receiver levels
4	Construction	Section 7.3 Construction Noise and Vibration Assessment	No discussion of construction duration
5	Construction	Table 28	No individual receiver levels
6	Construction	Table 28	Highly noise affected receivers not recognised
7	Construction	Table 28	Low predicted noise levels
8	Construction	Section 7.4 Vibration Assessment	No vibration assessment

3 RFI 1 - Representative Measurement Locations

Figure 2 below shows the background measurement locations: L1 and L2 as per the NVIA report.

Figure 2. NVIA Background Monitoring Locations

Note: 1. Image courtesy of the EIS NVIA report.

The NSW Noise Policy for Industry (NPI) requires the '*reasonably most – or potentially most affected residences'* should be used for long-term background noise monitoring (as per Table A1 of the NPI). Note 3 of Table A1 also notes that *'where it is impractical or not possible to monitor at the reasonably most- or potentially most-affected location(s), the location selected should be fully justified as being representative of background noise levels.'*

The NVIA report states: '*One noise monitor was installed on the eastern boundary of the site (facing Botany Road, L1), while another noise monitor was installed on the western boundary of the site (facing Wyndham Street, L2).'* Based on the assessment locations L1 and L2 the following should be clarified:

- Were facade reflections from the existing buildings taken into account in the measured background data?
- Were the monitors affected by plant noise from the existing buildings?
- Would location L2 be representative (as per NSW NPI) of the background noise at the rear of buildings and back gardens for receivers in R1, R2 and R3?

A more representative background monitoring location would most likely measure lower background noise levels than locations that are directly adjacent to busy roads. A reduction in the background noise levels would reduce the Project Specific Noise Levels applicable to the project.

4 RFI 2 - No Noise Predictions for Plant Noise

The report discusses the locations of the proposed plant for the development and potential mitigation measures. However, there are no predictions of the plant noise emissions at the nearest noise sensitive receivers.

Where are the plant noise emission predictions at the nearest receivers as per the NSW NPI requirements?

The site should be able to prove that it can meet the noise emission targets of the NSW NPI when all plant is operational under worst-case conditions (eg a hot summers day is typical).

5 RFI 3 - No Individual Receiver Levels

In general the NVIA report does not show any operational noise levels at individual receivers. Instead, the NVIA groups a series of adjacent receivers and presents predicted noise levels for the group of receivers.

Modern noise prediction software makes it straight forward to predict noise levels at each facade and each floor level of each receiver. From these predictions the worst-case noise level for receiver can easily be identified and reported.

Why has the report grouped receivers and provided operational noise level predictions that seem to apply to the whole receiver group?

This approach obfuscates the noise levels at each receiver and does not provide a clear picture of the noise impacts.

Table 15 of the NVIA is one example where the receivers have been grouped. The NVIA report should provide the worst-case facade noise levels at each of the noise sensitive receivers around the development site for this operational scenario.

6 RFI 4 - No Discussion of Construction Duration

The proposed development is large and will require prolonged periods of demolition, excavation and construction. The report does not provide any detail on the construction duration for each of these phases. On a large multi-year construction project the duration of each phase adds context to the assessment.

A construction noise impact over a few days is very different to a noise impact over several months. This should be quantified in the report to provide sufficient information for the consent authority / regulator.

The NSW Draft Construction Noise Guideline, DCNG, (2020) which would be applicable to this assessment requires that the duration of the construction phases be considered.

Why have the durations of the construction phases not been considered in the report?

7 RFI 5 - No Individual Receiver Levels

Similar to RFI 3 above the construction noise predictions have grouped receivers instead of providing noise levels on a per receiver basis.

Modern noise prediction software makes it straight forward to predict noise levels at each facade and each floor level of each receiver. From these predictions the worst-case noise level for receiver can easily be identified and reported.

Why has the report grouped receivers and provided construction noise level predictions that seem to apply to the whole receiver group?

This obfuscates the noise levels at each receiver and does not provide a clear picture of the construction noise impacts.

Table 28 of the NVIA is another example where the receivers have been grouped. The NVIA report should provide the worst-case facade noise levels at each of the noise sensitive receivers around the development site during each construction phase.

8 RFI 6 - Highly Noise Affected Receivers Not Recognised

Table 28 of the NVIA shows construction noise levels at the group R1 which are significantly over the Highly Noise Affected Level of 75 dB L_{Aeq}.

Why has the report not identified when receivers are Highly Noise Affected?

When a receiver is highly noise affected the DCNG recommends the following:

> *Where noise is above the highly noise affected management level, all feasible and reasonable mitigation shall be applied as well as engagement with the consent authority or regulator to identify other measures to manage noise impacts. Where appropriate, engagement with the community is encouraged to determine the preferred mitigation approach, such as:*
> - *negotiated agreements and/or respite periods to restrict work activity*
> - *identification of times when the community is less sensitive to noise, including options for longer periods of construction in exchange for restrictions on construction times.*

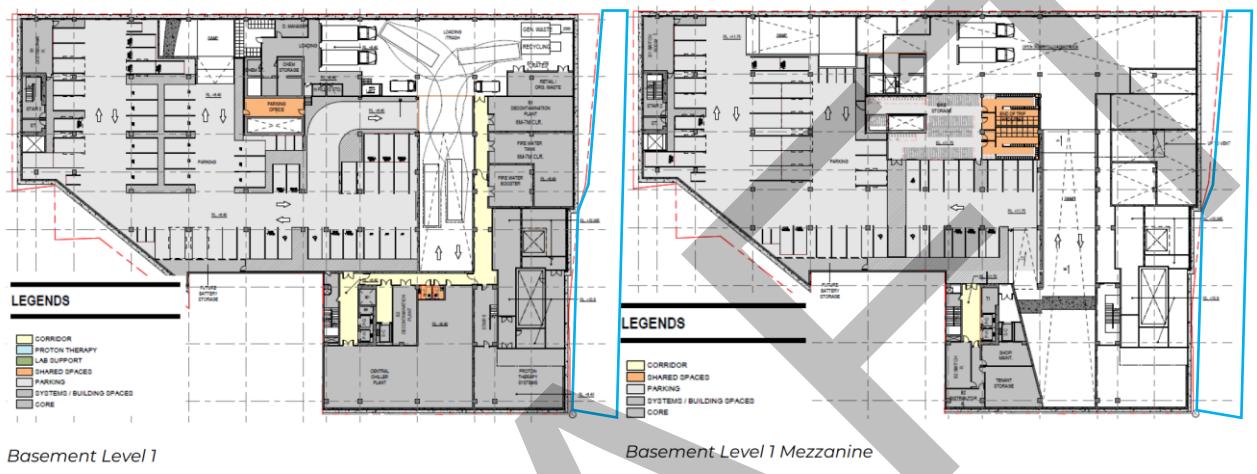
The report should demonstrate that all feasible and reasonable levels of mitigation shall be applied to the development and notify the consent authority / regulator that other measures to mitigate impacts should be identified.

The consent authority / regulator should consider Section 5.4.1 of the DCNG when any receivers are Highly Noise Affected. Noting that the duration of works would need to be factored into the assessment as highlighted in RFI 4.

9 RFI 7 - Low Predicted Noise Levels

During the excavation phase of the Project heavy machinery will be required to operate directly on the boundary of 102 Wyndam Street (in R1). Figure 3 below illustrates the proposed excavation areas for the Basement Level 1 & Mezzanine of the Project and the proximity of 102 Wyndam Street.

Figure 3. Proposed Basement Excavation and Proximity of 102 Wyndam Street



Note: 1. Image Courtesy of the Project EIS.
2. 102 Wyndam Street boundary in Blue.

The residential building of 102 Wyndam Street is located right on the edge of the boundary. Any excavator or heavy machinery operating on the Project excavation would be within 1 – 2 m of the 102 Wyndam Street facade.

Table 28 of the NVIA reports worst-case noise levels of 93 dB L_{Aeq} at R1 (102 Wyndam Street) during the excavation using an excavator with hammer. Table 27 of the NVIA shows that the excavator with hammer has a sound power level of 115 dB L_w and that this machine can operate anywhere on site.

Our calculation of the noise levels when the excavator with hammer operates at the boundary (during excavation of the basement) shows potential noise levels in excess of 100 dB L_{Aeq}. Based on a simple calculation the NVIA noise level appears to be low.

A level of 93 dB L_{Aeq} at R1 would mean the excavator is located approximately 5 m away at all times along the entire boundary of the excavation.

The hammering head of the excavator must operate along the boundary of the excavation area so would be within 1 – 2 m of the 102 Wyndam facade.

How have the excavation noise levels been calculated?

How have the noise levels for the other phases of construction been calculated?

The NVIA should report how the calculations have been made and show construction noise levels for the worst-affected facades for each receiver not just for the group R1.

10 RFI 8 - No Vibration Assessment

Figure 3 above shows that the excavation of the basement levels will be within 1 – 2 m of the 102 Wyndam Street building facades. Excavators with hammers can generate high vibration levels at this distance. It is not unusual to see vibration levels in excess of cosmetic damage criteria and possibly structural damage criteria if shared structural foundations between buildings are impacted by the machines.

At this distance the impacts of ground borne vibration and structure borne noise would easily exceed human comfort criteria.

Why does the NVIA report not predicted ground borne vibration and structure borne noise levels at the nearest affected receivers to the basement excavation?

The NVIA should report the construction vibration levels, durations of impacts and provide suitable mitigation measures as per the guidance in *Assessing Vibration: A Technical Guideline (DEC 2006).*

11 Conclusion

Waves Consulting has reviewed the NVIA prepared for the EIS of the proposed New Health Research Facility (SSD-63067458) located between Botany Road and Wyndam Street, Alexandria. This review has been undertaken at the request of the owners of 102 Wyndam Street, Alexandria who live directly adjacent to the proposed development site.

This review has identified eight (8) items in the NVIA that do not provide sufficient evidence of compliance with the assessment legislation / guidelines. This review makes eight (8) requests for information to clarify the NVIA report and the provide the necessary evidence that the proposed Project is a complying development.

I trust this letter provides sufficient details for your current requirements. If you have any questions, please do not hesitate to contact me.

Yours sincerely

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Waves Acoustic Consulting Pty Ltd