POWERHOUSE PARRAMATTA
RESPONSE TO SUBMISSIONS REPORT

APPENDIX Q
ADDENDUM NOISE AND VIBRATION ASSESSMENT

Arup

NSW GOVERNMENT

Your ref
Our ref
File ref PHM-ARP-LET-AC-0001

ARUP

Level 5
151 Clarence Street
Sydney NSW 2000
Australia

t +61 2 9320 9320
d +61 2 9320 9736
f +61 2 9320 9321

mathew.simon@arup.com
www.arup.com

Tom Kennedy
Infrastructure NSW
Level 27/201 Kent St
Sydney NSW 2000

26 August 2020

Dear Tom,

Powerhouse Parramatta SSDA Acoustic Response to Submissions

This letter is in response to submissions raised as part of the public exhibition of the Powerhouse Parramatta State Significant Development Application relevant to the Noise and Vibration Impact Assessment PHM-ARP-REP-AC-0001 v4 NVIA (Arup, April 2020).

Comment:
That further detail of acoustic impacts and mitigation measures for the construction phase be provided by the selected construction contractor in a Construction Noise and Vibration Management Plan.

Response:
A final list of construction equipment, methodologies and activity locations will be confirmed by the contractor as outlined in Appendix Z- Noise and Vibration Impact Assessment of the EIS.

Noise and vibration mitigation measures which are considered feasible and reasonable have been recommended in Section 3.8 and 3.9 of Appendix Z to the EIS, and are to be reviewed and further developed by the contractor and documented in a Construction Noise and Vibration Management Plan (CNVMP), recommended as the first item in Table 24.

A detailed community consultation plan is recommended to be incorporated into this CNVMP, with community liaison actions outlined in Table 24.

These measures are committed to as part of the Mitigation Measures for the project.

Comment:
There are a number of inconsistencies between the NVIA and the CMP in respect of equipment. Notably, the CMP foreshadows the use of rock breakers (excavator mounted hydraulic hammers) during demolition, and rock saws and rock removal during the excavation phase. These are excluded from the NVIA. The CMP proposes a number of noise and vibration management measures that are not detailed in the NVIA.

Acoustic logic were not able to verify the numbers of equipment assumed in the NVIA, nor the location on site used as there does not appear to be any corresponding advice in the CMP as to numbers, nor is there information in the NVIA as to the locations of the sources used to assess noise levels.

The NVIA predicts a worst case noise level of 82 dB(A) during the works, except for the Bulk/Detailed Excavation Phase where a noise level of 83 dB(A) is predicted. These noise levels exceed the NML for 32 Phillip Street by 12-13 dB(A), which are significant exceedances. (A noise level increase of 10 dB(A) is considered to be a subjective doubling of loudness.)

Using the noise emission levels used in the NVIA, and assuming the piling works could occur as close as 10m from the Phillip Street norther façade and around 25m from the eastern façade, the resultant façade noise level from this activity would be up to 90 dB(A) outside the nearest commercial tenancies (ground level eastern façade and level 5 northern façade). This is well above the 83 dB(A) predicted as a worst case in the NVIA. The resultant internal noise level predicted in the NVIA would be around 53 dB(A) and our predictions indicate impact piling may produce up to 60 dB(A). Noise at these levels (particularly at 60 dB(A)) would impact amenity.

Given that impact piling is likely to generate higher noise levels than assumed in the NVIA, noise levels in the commercial spaces may exceed 70 dB(A) which would have a serious impact on amenity.

Response:
The loudest anticipated construction equipment sound power levels (L_w) which have been assessed in the NVIA include concrete saws (L_w 122dBA), excavators (L_w 117dBA) and piling (impact L_w 129 intermittently, bored L_w 111dBA continuously)

The total combined L_w for the site establishment & demolition, is 124dBA. This assumes:

- Besides impact piling & concrete sawing, all equipment is operating concurrently and constantly
- Impact piling noise is generated 20% of the worst 15 min period, likely to be much less in reality due to the short 'impulsive' nature of impact piling noise
- Concrete sawing assumed to operate 50% of worst 15 min period.

Based on these assumptions, the use of a rock breaker (L_w 118) would potentially increase the total site sound power level by 1dB to 125dBA.

Instantaneous or intermittent construction noise levels above 83dBA are likely, however predicted levels represent $dBL_{Aeq(15min)}$ levels in accordance with the ICNG. Considering the above assumptions are conservative, $L_{Aeq(15min)}$ levels above 83dBA are not anticipated outside of isolated occurrences, and internal $L_{Aeq(15min)}$ levels exceeding 60dBA are unlikely.

Nonetheless, significant exceedances of NML are predicted and all feasible and reasonable mitigation measures should be implemented. As per Mitigation Measure CM-NV1 the Construction Noise and Vibration Management Plan will include final details of plant to be used and updated estimates of the likely levels of noise and the scheduling of activities.

Comment:
The use of hydraulic hammers to demolish the carpark may generate similar noise levels to piling, i.e. around 85 dB(A). This is not addressed in the NVIA as it states that demolition will be undertaken using pulverisers only. Given the CMP contradicts this, the potential impact of this activity should be assessed.

Modelling of construction noise impacts has been undertaken for the NVIA. However, the NVIA does not indicate where the noise sources have been placed on the site to obtain the predicted levels. The analysis presented above indicates the assessment undertaken does not adequately assess impact at 32 Phillip Street. While a "typical" location of plant may be adequate to predict impacts to more distant receivers, the proximity of 32 Phillip Street to the site demands a more detailed assessment of impacts.

In response to the prediction of the NML the NVIA presents only very generalised and non-site specific recommendations in respect of the management of construction noise, nor does it recommend any real commitments to be adhered to by the proponents. The NVIA does recommend that the constructors develop a detailed Construction Noise and Vibration Management Sub Plan, but provides no recommendation as to the contents of the plan nor the desired outcomes.

The CMP promulgates the use of respite periods to mitigate noise from louder operations, whereas the NVIA is silent on this. It is noted that the CMP proposes a respite period between 7am and 8am and no loud works on Saturday. While this addresses residential and hotel receivers, this will concentrate louder activities to periods when the building is occupied, and away from periods when the building is unoccupied or lightly occupied.

In respect of vibration, the only activity that is likely to adversely impact the subject site is impact piling. The NVIA indicates a separation of 20m is typically required to prevent adverse impacts on amenity. It is noted that piling appears likely to be needed within that distance.

The NVIA likely under-predicts potential noise and vibration impacts at the subject site by adopting base noise emission levels that are lower than those that might potentially occur, and by not assessing activities that might occur close to the boundary with the subject site.

The PPM project team should be requested to provide independent auditing and monitoring of, or the establishment of a noise logger to monitor the implementation of controls and mitigation measures to ensure compliance with conditions of consent to mitigate adverse acoustic impacts on the subject site.

It is requested that contractors be required to consult with Australia Unity prior to the preparation of detailed CMP.

Response:
As outlined in above, the potential increase in impacts due to the use of a hammer above those predicted is anticipated to be 1dB.

A number of conservative assumptions listed above lend to the conservative nature of predicted noise levels. The location of a hammer at the nearest boundary to 32 Phillip St is not anticipated to exceed the overall $dBL_{Aeq(15min)}$ noise predictions due to the intermittent nature of hammering events, however will be refined once the construction methodology is further developed.

The noise and vibration mitigation measures recommended in Appendix Z- Noise and Vibration Impact Assessment (NVIA) of the EIS would be implemented or improved upon in the Construction Noise and Vibration Management Sub Plan (CNVMSP) as per typical procedures. Inconsistencies between the NVIA and CMP will be resolved in the CNVMSP by adopting the more stringent mitigation measures of the two.

The restriction of loud equipment to only standard hours is shown in Table 19 which states the loudest equipment (excavators, piling rigs and concrete saws) shall not be used outside of standard hours.

The reason the use of loud construction equipment is limited to standard hours is because the noise sensitivity of commercial premises is considered lower than residential receivers. The concentration of louder activities during standard hours is standard practice to avoid more sensitive periods for residents.

Regarding vibration, the Appendix Z- Noise and Vibration Impact Assessment of the EIS outlines a procedure for conducting piling within the minimum required working distance Section 3.9, which recommends dilapidation surveys and on-going monitoring.

A noise monitoring plan is recommended to be developed as part of the CNVMSP.

Yours sincerely

Mathew Simon
Senior Acoustician