

APPENDIX 2

Noise and Vibration Addendum

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Noise and Vibration Assessment Addendum Number 1

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1 INTRODUCTION

This addendum report reviews and addresses the comments and concerns related to noise and vibration issues raised in the submissions received following public exhibition of the project.

2 PUBLIC SUBMISSIONS

The submissions containing comments regarding noise and vibration are summarised below along with our response.

2.1 BEVERLEY BOWDEN

Comment

This submission expresses a general concern regarding the impacts on the surrounding residential area of noise and vibration associated with the works.

Response

The noise and vibration assessment assessed the potential impacts of the proposal, with DECCW and City of Sydney guidelines used to assess potential impacts from noise and vibration emissions. A Preliminary Noise and Vibration Management Plan was developed (and included in the project commitments) that will be used to address any potential impacts identified in the assessment.

The assessment identified the potentially most impacted sensitive receivers around the site, reported ambient noise levels at the receivers, and developed noise and vibration management levels and limits based on the prevailing ambient noise level at the receivers and the DECCW Interim Construction Noise Guideline.

For residential receivers two goals were set – a noise affected management level, and a highly noise affected management level. The DECCW and the proposed Management Plan outlines the responses to be undertaken where noise levels exceed these levels. Where noise levels exceed the noise affected management level (NAML) then all feasible and reasonable measures are taken to minimise noise emissions. Where, after the application of these measures, noise levels exceed the highly affected management level (HNAML) then additional measures such as time management need to be introduced.

The purpose of the assessment was to identify those activities that may produce noise/vibration that may exceed the management goals. Appropriate mitigation of these sources or the investigation of alternative methods would then be determined during the detailed project development phase using the framework established in the Management Plan. **Consequently, the noise and vibration levels presented in the assessment should not be taken as the levels that will occur after detailed design and noise management.**

There is a clear commitment and procedure established in the Management Plan to minimise impacts to surrounding receivers.

The Management Plan recommends that mitigation should be applied to all sources exceeding the NAML to the extent that it is reasonable and feasible, and that further management of those sources exceeding the HNAML should occur.

The Management Plan also recommends that monitoring be undertaken to verify predictions and to respond to complaints, and that extensive consultation with the local community occurs.

A broad summary of the worst case potential impacts prior to mitigation being applied are:

- The residences in Merriman and Bettington Streets would be most impacted because of their proximity to the works and the lower ambient noise level at this location.

Without mitigation, many of the proposed activities could exceed the NAML, but would not exceed the HNAML. The use of excavator rock hammers in a worst case situation would exceed the HNAML. This is not to say that noise from rock hammering will always exceed the HNAML. At some locations on the site, this equipment will be highly screened from these residences by the headland and much lower noise levels will be produced.

For example, noise monitoring was recently undertaken to assess noise emissions from the Stage 1 works (See attached Barangaroo Headland Park - Early Works Noise and Vibration Monitoring Report, reference 2010539.5/2312A/R0/YK). Noise from hammering, which was occurring at the base of the rock face below Merriman Street, was 64 dB(A), well below the HNAML of 70 dB(A).

Further, it was noted that hammering was not continuous and generally did not exceed 5 minutes duration with a respite of at least 5 minutes.

- Dalgety Road residences. Noise levels will mostly be below the NAML, but there will be instances where this will be exceeded, but will not exceed the HNAML at any time.
- Towns Place. Most activities will not exceed the NAML. The exception is excavation of rock closer to Towns Place, where both the NAML and HNAML would be exceeded without mitigation being applied.
- Argyle Place. Activities associated with receipt of fill from Stage 1 can exceed the NAML and hammering may exceed the HNAML when these activities are located on the site this equipment is most exposed to this receiver. Activities associated with sandstone excavation and construction will be less than the NAML at all times.
- Balmain. All activities will not exceed the HNAML. The noise level will generally not exceed the NAML except when excavator mounted rock hammers are used.

In summary, with the exception of the residences in Merriman Street, and noise generated from rock hammering, noise emissions will largely remain within the NAML. Those activities exceeding the NAML will be addressed in accordance with the Management Plan.

An assessment of vibration was undertaken which concluded that vibration would not be sufficient to present a risk of damage to residential structures. The only residential receivers where there potentially may be low level but perceptible vibration are the residences along High Street opposite the site where Stage 1 fill will be compacted. Mitigation and monitoring of this vibration is recommended in the Management Plan to ensure any perceptible vibration is minimised.

2.2 DYNAMIC PROPERTY SERVICES (OBO OWNERS CORP. SP76902 TOWNS PLACE – MIXED USE BUILDING)

Comment

“The use of Gate 3 by heavy vehicles, particularly heavy vehicles and articulated vehicles, as a vibration and noise nuisance to residents.”

Response

Most heavy vehicle movements generated by the proposal will occur via access points other than Gate 3. There would be some movements through Gate 3 and the impact of these movements has been assessed.

The traffic assessment undertaken by Halcrow assumes that the typical heavy vehicle movement in Towns Place will equivalent to that generated by the transportation of extracted sandstone. Up to 10 movements per day are expected to be generated with a maximum hourly generation of 7 movements per hour. Noise from 7 heavy vehicle movements per hour would still be less than generated by existing peak hour vehicle movements through Towns Place. Consequently, no adverse impact is expected.

Considering the expected low vehicle speed within Towns Place, the limited number of movements, and that the previous use of the site would have generated heavy vehicle movements, vibration levels generated by these heavy vehicles would not present damage risk to buildings, nor would they result in perceptible vibration within dwellings.

Comment

“Potential structural damage and nuisance from vibration due to sandstone excavation and truck movements associated with fill transport”

Response

Most of the heavy vehicle movements associated with fill transport would occur between Gate 4 and the southern part of the Barangaroo site. Consequently, these vehicles will not impact Towns Place.

Noise from heavy vehicles along Hickson Road was assessed in Section 9 of the Noise and Vibration Assessment. It was concluded that any increase in existing traffic noise levels would be small and within DECCW guidelines, notwithstanding this ignores the former use of the site which would have generated significant heavy vehicle movements.

Vibrations from excavation activities are unlikely to be perceptible within Towns Place given the significant distance separation. Additionally, there are other, closer vibration sensitive structures between the sandstone excavation site and Towns Place, so as vibration levels will be managed at these receivers, the Towns Place vibrations levels will be correspondingly lower due to the additional distance separation.

Vibration monitoring was recently undertaken to assess emissions from the Stage 1 works (See attached Barangaroo Headland Park - Early Works Noise and Vibration Monitoring Report, reference 2010539.5/2312A/R0/YK). Vibration from hydraulic hammering, which was occurring at the based of the rock face below Merriman Street, was measured in Merriman Street (i.e. closer than Towns Place). The levels were well below structural damage criteria even for delicate structures, and within the preferred DECCW amenity goals.

Comment

The submission also makes comment regarding the extended period of works and the effect any extended period of ground vibration may have on the structures in Towns Place and the amenity of occupants.

Response

As indicated above the vibration levels in Towns place will be well below the building damage and amenity criteria, and would not cause adverse impacts even if occurring over an extended period.

Comment

The submission acknowledges and agrees with the proposed establishment of a noise complaints register, and requests that they be included in any direct communication including any liaison forum.

Response

The Management Plan recognises the importance of communication with the local community and recommends the establishment of direct lines on communication, including a liaison forum. It would be expected that any landowner or resident (or a representative) would be permitted to attend a liaison group.

2.3 ELIZABETH LOWRIE SUBMISSIONS

Comment

Objects to the carpark entrance being located on the corner of Towns Place and Dalgety Road due to area already being "overloaded" with traffic noise.

Response

The Halcrow traffic assessment report indicates that the existing peak traffic flows through Towns Place will increase from 331 vehicles to 349 in the morning peak and from 286 to 406 in the afternoon peak. This will produce a noise increase of less than 1 dB(A) which would be imperceptible. This ignores any effect from the proposed traffic calming measures, which would mitigate any increased noise due to additional traffic.

While it is acknowledged that the relocation of the carpark to the southern end of the site would reduce noise impacts, it is understood this is not possible without replanning the scheme.

2.4 GRANT LOGAN

Comment

Objects to the carpark entrance being located on the corner of Towns Place and Dalgety Road due to traffic noise.

Response

Refer response to Elizabeth Lowrie submission.

2.5 INGRID WEBSTER

Comment

Objects to the carpark entrance being located on the corner of Towns Place and Dalgety Road due to traffic noise.

Response

Refer response to Elizabeth Lowrie submission.

2.6 IRENE DOUTNEY

Comment

Objects to the carpark entrance being located on the corner of Towns Place and Dalgety Road due to traffic noise.

Response

Refer response to Elizabeth Lowrie submission.

2.7 KENT STREET RESIDENTS GROUP

Comment

Excessive noise from the proposed uses of the park and cultural centre.

Response

Noise impacts associated with the use of the parkland for passive open space purposes are not anticipated to be significant. The exact nature of other future uses, such as the proposed cultural facility, is not known at this stage therefore it is not possible to undertake an assessment of any associated noise impacts. Such uses would be subject to separate applications as required.

Comment

Noise from the carpark.

Response

Refer response to Elizabeth Lowrie submission.

Comment

Noise levels from all construction activities will be extreme and therefore object to works being undertaken on Saturdays.

Response

Both DECCW and City of Sydney permit work on Saturday. DECCW normally permit works to 1pm and Council to 5pm. In this case a compromise position has been sought where work is permitted up to 3pm however the louder activities such as hammering will not be permitted after 1pm.

The Group argues that Saturday should be an additional respite day. However, this ignores the fact that the Management Plan requires the mitigation of noise levels throughout the week, not just on Saturdays.

At the High Street residences the noise predictions indicate that the only activity that may exceed the HNAML is rock hammering. Of the remaining equipment, exceedences of the NAML would generally only occur from large items of earthmoving equipment. The remainder of the equipment would comply with the NAML. Given this, it is clearly incorrect to state that extreme noise levels would occur at all times, and makes no allowance for any mitigation that would be applied.

The process of assessing mitigation that would be applied to exceedences of the management levels, is a procedure clearly established in the DECCW Interim Construction Noise Guideline, and it recognises that it is not always feasible or reasonable to meet even the HNAML, and in such cases other measures should be used such as respite periods.

2.8 PENELOPE MORRIS

Comment

This submission expresses a general concern regarding the impacts on the surrounding residential area of noise and vibration associated with the works.

Response

Refer response to Beverley Bowden.

Comment

Noise from the carpark.

Response

Refer response to Elizabeth Lowrie submission.

Comment

Noise from uses of cultural centre.

Response

The uses of the cultural centre are subject to future application and approval and for this reason have not been assessed.

3 SYDNEY PORTS CORPORATION

Comment

Noise goals are non-binding. Assessments of mitigation treatment should be undertaken and noise monitoring of the Moores Wharf Building, HCT and interim CPT should be undertaken.

Response

The use of “non-binding” noise goals, or management levels, is a cornerstone of the DECCW Interim Construction Noise Guideline, in recognition that it is not always feasible or possible to meet strict noise levels. Noise management levels are set according to the receiver type, which act as noise goals which should be achieved where reasonable and feasible. Any exceedences of the management levels must be justified. Thus, while the noise management levels are generally “non-binding” the process outlined in the Guideline of minimising and exceedences and justifying any exceedences is binding.

Notwithstanding the above, because of the nature of the HCT and the CPT, we have applied noise limits to these two locations, and the statement that the noise levels are not binding is incorrect.

Noise level limits (i.e. noise levels that cannot be exceeded) have been recommended for the HCT, and the CPT when being used to process passengers. Additionally, lower management goals have been recommended. That is, for these two buildings, noise levels should meet the management goals where feasible and reasonable, but should never exceed the noise limits. For the Moores Wharf building, management limits have been recommended as for the other commercial buildings in the vicinity.

It would be expected that the proponent review with Sydney Ports Corporation the out come of any analysis, recommendations and monitoring and obtain feedback in order to achieve an optimal outcome.

The Preliminary Noise and Vibration Management Plan already requires continuous vibration monitoring at the base of the HCT. The monitor would be fitted with alarms and notification by SMS. Other locations are less likely to impacted by vibration, so continuous monitoring is not likely to be required. Notwithstanding, the need for additional permanent monitoring would be established if predictions or initial, attended measurements (conducted on site to establish safe working distances and to verify actual levels with the equipment being used, sub-soil conditions, etc) indicate vibration levels might approach the recommended limits.

Periodic attended noise monitoring has been recommended in the PNVMP. Additional monitoring, which might include specific attended monitoring or permanent, unattended monitoring would be installed where warranted, subject to final predicted noise levels (following application of mitigation strategies) or in response to specific concerns.

Comment

Vibration will affect amenity of Moores Wharf Building and the HCT.

Response

The proposed works would not exceed the amenity criteria in the HCT.

For the Moores Wharf Building, vibration levels at the upper end of the predicted range may exceed the DECCW amenity goals. Notwithstanding this, even vibration at the higher end of the predicted range is still considered to be at a relatively low level that will be barely perceptible. Even if these levels are not able to be mitigated, amenity would not be significantly impacted.

Comment

Vibration from the construction of the new wharf on the Western Side of the Moores Wharf Building not assessed.

Response

It is proposed to construct the wharf using non-impact driven piles. Therefore, the construction of the wharf is not expected to resulting significant ground vibration at the Moores Wharf Building over and above those indicated in the assessment.

4 DECCW

4.1 SUMMARY – PAGE 2

DECCW has recommended restrictions on rock hammering within in the approval conditions to provide respite periods.

DECCW has recommended vibration dose monitoring at locations at nearby sensitive receivers.

These issues are addressed below.

4.2 NOISE AND VIBRATION IMPACT ASSESSMENT (PAGE 3)

Noted that Large amount of Data is Weather Affected

Due to the prevailing weather conditions it is difficult to obtain complete days that are not totally weather unaffected.

It is noted that the data obtained from the unattended monitors has been supplemented with attended measurements undertaken over an extended period including data obtained:

- From the demolition application.
- During the demolition works.
- As part of this application.

We are therefore confident the background noise levels obtained are representative.

Noise During Extended Hours on Saturday Afternoon - DECCW noted that the additional construction hours sought (over and above standard ICNG hours) is reasonable. However, it has requested that, due to the “potential for significant impacts” during the 1-3pm period that these additional hours should be reduced in the event of “unresolved, community concern”.

The NVMP (Section 3) has already addressed this issue by precluding the carrying of the louder activities (such as rock hammering) during the 1-3pm period. Therefore, additional restrictions are not seen as necessary.

Noise From Dewatering Pump is noted by the DECCW without further comment.

No comment required.

Comments Relating to the Preliminary Noise and Vibration Management Plan

- *Plan needs to be updated as detailed design progresses.* The plan submitted is a preliminary plan and there is already a commitment to develop this plan during detailed design.
- *Measures such as training, site induction, tool box talks, etc should be including in the plan.* Section 5.2.10 of the Preliminary NVMP already recommends training of employees and subcontractors. The details of such training can be expanded in the final plan.
- *The NVMP should include access to independent acoustic expertise provided by the proponent.* By this we understand that a specialist acoustic consultant should be employed by the proponent to advise on the development and implementation of the management plan. This is reasonable on a project of this size.

DECCW has recommended restrictions on rock hammering within in the approval conditions to provide respite periods.

The intention is to limit the extent of rock hammering in any case by using rock sawing and only using the hammering to break the cut rock free. Therefore, the anticipated methodology will provide some respite periods. Secondly, it is stressed that the noise levels presented in the assessment from hammering are worst case noise levels, and there will be significant periods when operating close to the base of the cliff when noise levels will be significantly reduced.

The NVMP already provides for time management of activities when there are no other reasonable or feasible methods to mitigate levels and these will be recommended as the project planning proceeds in accordance with the NVMP. The application of blanket time restrictions suggested may unnecessarily restrict activities and is not recommended.

DECCW has recommended vibration dose monitoring at locations at nearby sensitive receivers.

A vibration monitoring regime has been recommended in the Preliminary NVMP which includes monitoring of vibration levels. This can be expanded upon as the development of the plan occurs during design.

No Assessment of Operational Noise

Operational matters for Headland Park and Northern Cove will be further developed during the detailed design phase. Once these details are finalised, operational management planning will then be undertaken. Operational noise management would form an element of the operational management planning process

4.3 PROPOSED CONDITIONS

1. No comment.
2. No comment.
3. No comment.
4. The suggested conditions referred to are repeated below.
 31. The Proponent must ensure that public address systems used at any Construction site are not used outside the Construction hours detailed in these Conditions of Approval unless otherwise approved through the Construction Noise and Vibration Management Sub Plan. Public address systems must be designed to minimise noise spillage off-site.
 32. The Proponent must schedule rock breaking, rock hammering, sheet piling, pile driving and any similar activity only between the following hours unless otherwise approved in the Construction Noise and Vibration Management Sub Plan:
 - (a) 9 am to 12 pm and 2 pm to 5 pm, Monday to Friday; and
 - (b) 9 am to 12 pm, Saturday.

Where these activities are undertaken for a continuous three hour period and are audible to noise sensitive receptors, a minimum respite period of at least one hour must be scheduled before activities re-commence.
 33. The Proponent must use only dampened rock hammers and/or "city" rock hammers to minimise the impacts associated with rock-breaking works.
 34. The Proponent must take reasonable steps to control noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks. Examples of appropriate noise control could include efficient silencers, low noise mufflers and alternatives to reversing alarms.

We have no comment except for Condition 32. As stated previously, a blanket time restriction is not appropriate for this site given that the use of rock hammers may be intermittent in any case and, due to the site topography, there will be locations where the use of hammers will not cause significant impacts.

5. No comment.

5 CITY OF SYDNEY

5.1 RECOMMENDATION 17

Consideration of noise and vibration impacts to the areas noted is included in the proposed Noise and Vibration Management Plan included in the submission.

5.2 RECOMMENDATION 32

The uses of the cultural centre are subject to future application and approval and for this reason have not been assessed.

6 HOUSING NSW SUBMISSION

Comment

Requests that a telephone hotline for residents be established to enable them to make complaints and obtain information.

Response

A single point of contact on the site for any complaints should be made available to interested parties and be displayed on the site hoardings. Such complaints should be recorded and acted upon in accordance with the provisions in the Management Plan.

Comment

Requests conditions of consent requiring mitigation of noise, including reduced hours of construction or provision of respite from noise, vibration intensive activities.

Response

The noise and vibration assessment highlighted that the residences in Merriman Street would be the location most impacted by noise emissions and outlines measures and commitments to minimise noise impacts. These measures include respite periods in the event that the HNAML (of 70 dB(A)) is exceeded.

The prescription of blanket controls such as restricting hours prior to the detailed planning of the works risks prolonging the works unnecessarily, and therefore prolonging disruption to the local community from these activities.

For example, noise generated hydraulic rock hammering (the loudest activity) will vary significantly depending on the location of the hammering on the site. Recent noise monitoring (refer response to Beverley Bowden submission) indicates that hammering would only marginally exceed the NAML when this occurs at the base of the rock face. Higher noise levels would be expected when operating away from the rock face due to the reduction in acoustic screening. Further, it may be possible to erect a temporary screen along the Merriman Street boundary to further reduce noise levels. Also, the Management Plan requires that the use of hammering be limited to the extent possible. If blanket restrictions are applied now, then this restricts works in areas of the site that may cause minimal impacts, or fail to take into account additional mitigation works such as a barrier. As a consequence any benefit from respite periods and the like may be negated by the prolongation of the works.

As it stands, the Management Plan provides flexibility in the assessing the effect on noise emissions from alternative processes, mitigation and minimisation of loud activities. Once this has been done, the need for any additional measures such as respite periods, exclusion of hammering during 7am to 8am period, etc can be assessed. In this way, controls are targeted and address impacts without unnecessarily restricting the works and extending construction periods.