



# Construction Noise and Vibration Management Plan

For

**CONTRACT NO: 7307**

**PROJECT NAME: AUSTRALIAN INSTITUTE OF  
POLICE MANAGEMENT**

**MANLY**

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## Construction Noise and Vibration Management Plan

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### Revision History

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# Construction Noise and Vibration Management Plan

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## 1. INTRODUCTION

This plan has been developed to address construction noise and vibration control and mitigation measures to be implemented during site activities to manage noise and vibration issues associated with site workers, the surrounding community and infrastructure.

The following plan contains details on the management procedures to be used to control noise and vibration levels during site works.

## 2. IMPACT/S

Excessive noise and vibration levels can result in a serious nuisance and loss of amenity for site and surrounding occupants including surrounding residents, site workers, the sensitive fauna population (long nose bandicoot and little penguin) etc.

Occupational health risks to site workforce including:

- 1) Noise induced hearing loss, tinnitus, etc;
- 2) Communication problems including safety instructions;
- 3) Stress.

Vibration may also cause damage to the site and surrounding buildings and infrastructure.

## 3. RISK

Moderate

## 4. OPERATIONAL POLICY/ MANAGEMENT OBJECTIVE

To avoid and/or minimise adverse noise/vibration impacts associated with the operation of any plan, machinery or other equipment on site at all times through implementation of construction methodology and appropriate management measures.

To comply with relevant EPA (NSW DECCW) Construction Noise Level Objectives (LA10) targets.

To minimise the potential impact of construction works on heritage structures within the works site.

To minimise the potential for disruption of long nose bandicoot and little penguin activities in the vicinity of the site, particularly during the penguin moulting and breeding periods.

## 5. TARGET / GOAL

To minimize the occurrence of noise complaints associated with site works from nearby residents (sensitive receptors).

No damage to heritage structures at the site associated with site works involving vibration generations activities undertaken at the site.

No disruption to fauna populations (as sensitive receptors) as a result of site works.

The noise criteria to be adopted for the site comprises the following at the three project noise monitoring locations (as outlined below):

- o airborne noise contribution from construction, measured over at least a 15 minute interval will not exceed the established background noise levels at each location by more than or 10dB(A) during standard demolition/construction works;
- o No excess or un-necessary noise generation during site works;
- o Noise complaints received from nearby receptors are promptly and appropriately responded to by Broad project staff.

Where two successive monitoring events identify LA(10) values above the adopted criteria, corrective action will be required.

Vibration assessment criteria will be established as part of the geotechnical assessment of proposed construction works. These assessment criteria will be agreed with THINC project managers in regard to the activities required to be

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completed, giving consideration to the location of the works, the levels produced and the proximity of existing buildings, infrastructure and flora and fauna.

Where site monitoring identifies potential exceedances of acceptable noise/vibration levels, site practices shall be reviewed as per the contingency plan outlined below and may include implementation of additional mitigation measures as noted below.

### 6. STANDARDS

The plan has been prepared with consideration of the following standards, guidelines and legislation:

- NSW Industrial Noise Policy (DEC 2000)
- Assessing Vibration: A Technical Guideline (DEC 2006)
- Protection of the Environment Operations Act 1997 (NSW)
- Protection of the Environment Operations (Noise Control) Regulation 2008 (NSW).
- Australian Standard AS2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites*.

In addition, consideration has been given to the requirements outlined in the approved CEMP (Gondwana 2009) EP06 – Noise and Vibration.

### 7. ACTIVITY/S

All site works activities, particularly earthworks, pavement removal, demolition and construction activities.

Noise/vibration generation activities that will occur during construction works include:

- Movement and reversing alarms of construction equipment, plant, trucks, site vehicles;
- Materials and equipment loading and unloading;
- Excavator/piling rig hammering/ sandstone cutting activities potentially associated with bulk excavation works and/or construction of foundations;
- Use of concrete cutter, circular saws, nail guns;
- Use of excavation equipment, jackhammer, hand tools, welding equipment;
- Crane operations;
- Operation of generators and air compressors;
- Operation of mobile concrete/grout, plant/mixer, concrete pump, asphalt paving equipment; and
- Smooth/vibratory drum roller for pavement construction.

### 8. APPROVED WORKS HOURS AND RESTRICTED ACTIVITIES

In accordance with the Conditions of Approval, all construction activities, including materials delivery, must be restricted to the approved hours of:

- 7:00am to 6:00pm Monday to Friday;
- 8:00am to 2:00pm Saturday;
- At no time on Sunday or public holidays;

Works outside these hours may be undertaken where

1. The delivery of materials is required outside these hours by the police or other authorities;
2. It is required to prevent environmental harm;  
and
3. The works are approved by the Director of Strategic Assessments (DSA).

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### 9. STANDARD MITIGATION MEASURES

The following noise mitigation measures will be adopted during site project activities:

- Staging of site works to maximise use of the existing site features/facilities as acoustic barriers where possible. This will include retention of the former accommodation buildings in the northern section of the site until the final site works to provide an acoustic barrier between construction works at the remainder of the site and the penguin colony and the bandicoot foraging areas at, and beyond the north extent of the site.
- All site personnel must adhere to the site OH&S requirements in relation to use of appropriate personal protective equipment (PPE) when operating, or in the vicinity of noise generating plant/equipment.
- Noise and vibration awareness training for all site staff including subcontractors as part of general site induction and tool-box talk activities.
- Strict adherence to approved works times. In the event that out of hours delivery activities are required, the approval process will be completed via consultation with the THINC Project Managers office, and the approval of the DSA. Any specific additional mitigation measures requested by THINC and/or the DSA will also be adhered to.
- Works will be scheduled, where practical, to avoid simultaneous noisy activities occurring on site.
- Vehicles will not be left turned on or idling at the site for longer than minimum amount of time required to complete site activities. In addition, machines/equipment used intermittently during construction activities (ie. cranes, excavators, bobcats, lifting equipment, etc) will be shut down, as practicably achievable, in the period between works activities rather than allowed to idle.
- The duration of noise-intensive works will be minimised through a regular review of the program and construction methodologies during project team meetings.
- In addition to retention of existing buildings for noise screening capability, the site layout (including plant, equipment, waste, materials etc loading/unloading areas, location of fixed noise generating equipment including generators, etc) design process has considered the potential for minimisation of movement of plant and equipment within the construction site where possible.
- Piling works will be undertaken using non-percussive piling methods where achievable given the subsurface conditions. Reference will be made to the existing geotechnical site assessment report for advice on suitable protection distances from heritage structures for the use of moderate to heavy impact machinery.
- Regular and effective plant/equipment maintenance will be completed and documented throughout the project period and documentation will be maintained on site demonstrating completion of maintenance logs and associated checklists in order to ensure all machinery is in good working order and use does not generate excess noise/vibration.
- Plant, equipment and vehicles will not be operated in the event that excessive noise is produced at start up as a result of maintenance being required.
- All plant, machinery and works vehicles will have an efficient muffler design in accordance with the manufacturer's specifications. The mufflers will be well maintained and regularly tested with the results documented in the maintenance logs.
- Care will be taken by site personnel to ensure materials will not be dropped from a height either onto or from vehicles or from the roof, overhead bridge or other raised location.

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- Where high noise generating hand held or relatively small equipment (ie. power drills, saws, planers, nail guns etc) will be used inside where possible to achieve acoustic muffling or where possible, to the south of buildings to provide shielding between the user and sensitive receptors.
- Radio/music audible in areas external to the building/vehicles will not be permitted on site.
- Where monitoring of site conditions and activities indicates the potential or actual occurrence of noise exceedances at nearby sensitive receptors, the effectiveness of installation of temporary shielding options, including portable noise walls in the form of timber hoarding, compressed fibre board panels, steel sheeting etc (with no gaps between panels) will be evaluated prior to ongoing noise generation activities, etc.
- The quietest suitable plant reasonably available will be selected for each works activity. This will include review of documentation provided by manufacturers, suppliers, hire companies in relation to equipment prior to delivery to site.

### 10. CONTINGENCY (ADDITIONAL MITIGATION) MEASURES

Where noise/vibration levels at the sensitive receiver/receptor location exceed the nominated goals at two successive monitoring events; where monitoring of penguin and/or bandicoot populations indicates impact to the sensitive fauna; or where significant community complaints are recorded with respect to site noise, the relevant noise source will be identified and any additional feasible and reasonable measures available will be implemented to either reduce noise emissions or reduce the impact on receptors.

This may include:

- evaluation of the works activity and subsequent use of alternative methodologies and/or equipment;
- installation of equipment silencing devices such as shrouding, industrial silences fitted to exhaust systems etc.
- installation of temporary sound barriers / shielding. This may comprise shielding of plant/equipment in the vicinity of non-mobile equipment where this is the source, or alternatively shielding at the site boundaries where the noise source is mobile (ie, pavement removal equipment, or the source activity based).

The intent of shielding/barrier installation is to block the line of site and so the noise transmission pathway between the receiver and the source. The effectiveness of the attenuation measures will also be dependent upon the ability of the shielding to reduce noise levels. As such, appropriate materials should be installed to achieve suitable noise reduction levels.

Reference will be made to AS2436-1981 in the design of suitable shielding/barrier and construction/implementation.

### 11. MONITORING

*Noise*

In order to provide baseline noise levels for comparison of construction works monitoring data, an acoustic assessment will be undertaken to provide background noise data prior to the commencement of site project activities. The following representative noise monitoring locations will be established during the pre-works background noise assessment and these locations will be used as representative monitoring locations during site construction activities:

- East end of Stuart Street, Little Manly Point;
- At the centre (rear) of Spring Cove Beach; and
- South-west boundary of Manly Hospital.

as shown on the attached site location map.

The following initial background noise surveys will be undertaken (as a minimum) at

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the following times for a period of three consecutive weeks prior to commencement:

- between 8:00am and 9:00am on a weekday and on a Sunday;
- between 3pm and 4pm on a weekday and on a Sunday.

Background noise levels will be recorded in the form of adjusted decibels levels (dB[A]) using a calibrated hand held noise meter.

During construction works the contractor will measure noise levels at the locations nominated above at least every 2 months for the duration of the demolition/construction works using a hand held noise meter.

In addition, monitoring will be undertaken on an as needed basis at these locations during identified high noise generation activities and in response to community and/or stakeholder concerns with respect to noise levels.

At receptor monitoring may be carried out periodically by Broad project staff as required using a hand held noise meter to provide additional data in relation to site noise levels.

### *Vibration*

Prior to the site activities a dilapidation report will be completed by qualified staff who will record the location of existing buildings and infrastructure (services, footpaths, roads, etc), significant trees and landscape items, and other civil works or significant items. This report will include identification of potential damage associated with vibration and/or earthworks impacts including cracks and other indicators of settlement.

During site activities that may pose a risk to heritage buildings at the site (demolition, excavation within 25m radius of the buildings, internal refurbishment works on the buildings, etc), a visual inspection of building condition will be taken at least twice daily. In the event that impacts are observed (structural cracking, paint flaking/damage, glass breakage, dust fall etc) as an indicator of structure movement, all current site works in the vicinity of the building(s) will be ceased. Broad site project staff will assess and document the potential requirements of remedial/corrective works to the building, attenuative measures or alternative site activity methodology for the completion of ceased works to the approval of the THINC project manager prior to works continuing in this area of the site.

## 12. RESPONSIBILITY

Project Manager  
Site Manager  
Project Environmental Management Representative  
Geotechnical Engineering Consultant

## 13. TRAINING

All site personnel will be inducted into the site and the CEMP.

The induction is to specifically address the following:

- The location of identified sensitive receptors
- Awareness of the requirement to operate machinery, complete works with consideration to the local community, sensitive ecological communities and site heritage structures.
- That work hours in relation to noise generating activities are to be strictly adhered to.
- That all workers have an obligation to comply with personal noise in addition to works activities noise.

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### 14. REPORTING

The daily site diary will be used to record any auditory observations during site works.

Notes relating to community complaints will also be recorded in the daily site diary in addition to resulting actions.

Where required, noise and/or vibration monitoring results will be reviewed by the Broad project manager and kept on file on site.

Monitoring results will be checked on a regular basis by the Environmental Management Representative (EMR) and recorded on the weekly environmental check list in addition to periodic reporting to THINC project managers.

In addition, photo monitoring points will be established at the noise monitoring locations (Stuart Street, Spring Cove Beach and Manly Hospital) to provide pre-commencement photographs looking toward the works site to provide a pre-works visual record of the site presence when viewed from beyond the site boundary. Photos will be obtained in digital format at 50-55m aperture (to approximate the naked view).

In the event of receipt of a noise complaint the following timeframes for response will be provided:

- The complaints register will be updated within the same work day with timeframe for response/action noted:
- Responses to resident complaints will be completed within 2 business days.
- Complaints from Manly Hospital will be addressed the same day (or if occurs after 4pm, by midday the following work day)
- The complaints register will be updated within 2 working days indicating the nature of the response and, where required, details of implementation of mitigation measures to address the complaint.

All investigations and/or corrective actions will be documented and compiled within the Environmental Complaints, Non-conformances and Corrective Actions Register to be maintained by Broad and THINC projects.

### 15. AUDITING REQUIREMENTS

Internal audits aimed at evaluating the conformance of the system, process or product, as appropriate, shall be carried out as detailed in *Procedure CSPO2 'Audits'* by the Health Safety and Environmental (HSE) Manager who is independent of the project staff.

An internal audit will be completed at least once during the project. An audit report will be issued within one week of completion of audit. Any deficiencies identified will be identified in the audit report. The management personnel responsible for the area shall take timely corrective action on the deficiencies found.

### 16. CORRECTIVE ACTION

A non-conformance resulting from the receipt of a complaint and/or the recording of 2 successive exceedences of noise criteria may result in the following corrective actions being implemented by the project site staff:

- an evaluation of the non-conformance to improve management strategies to prevent recurrence;
- address complaint and respond to complainant with proposed mitigation measures;
- undertake additional training of the site staff in respect to implementation of mitigation measures for the management of noise and vibration; and
- notification of relevant government authorities, if required.

Specifically, additional mitigation measures, outlined above will be considered in

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the event of a non-conformance. Subsequently additional monitoring activities will be completed as appropriate to demonstrate attenuation of noise levels following recommencement of noise generating activities.

In addition:

- Broad site staff will investigate and organise/order the repair/removal excessively/unusually noisy plant, machinery, equipment including that operated by sub-contractors;

Where vibrations result in damage to heritage structures at the site, temporary protection/rectification works will be completed prior to recommencement of site works as appropriate. In addition work practices will be reviewed and modified as appropriate to ensure ongoing damage is minimised. Longer term management/repairs will be discussed as applicable with THINC Project managers.

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### APPENDIX 1

#### Glossary:

- dB      Abbreviation for 'decibel', which is the standard unit of measurement of sound pressure level
- dB[A]    The "A" donates that the sound pressure level has been "A-weighted" so that the scale approximates the response of the human ear.
- $L_{A10(15min)}$     Noise level in dB(A) of the "Average maximum noise level" during construction activities. This is the main parameter used to assess the construction noise impacts and is measured over a 15 minute period;
- $L_{A90}$       Noise level in dB(A) in the absence of construction activities. This parameter represents the average minimum noise level during the daytime, evening and night-time periods respectively. The  $L_{A10(15min)}$  construction noise objectives are based on an allowance margin above the  $L_{A90}$  background noise levels.
- $L_{Aeq}$       Average noise level during a measurement period.



# Construction Noise and Vibration Management Plan

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## APPENDIX 2

### Noise Monitoring Location Plan



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