



# **Newcastle Inner City Bypass – Rankin Park to Jesmond**

**Out of Hours Work Protocol – Works not  
subject to an EPL**

Transport for NSW | September 2020



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# Document controls

|             |                    |
|-------------|--------------------|
| File name   |                    |
| Report name | RP2J OOHW Protocol |

## Approval and authorisation

|  |   |                              |
|--|---|------------------------------|
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| 4 September 2020                           | 11 September 2020                               | 11 September 2020            |
| Transport for NSW<br>Environmental Officer | Transport for NSW<br>Project / Contract Manager | Environmental Representative |

## Revision history

| Revision | Date       | Description   |
|----------|------------|---|
| 0        | 01/07/2019 | Draft for Roads and Maritime review   |
| 1        | 22/07/19   | Draft for PM review   |
| 2        | 08/08/19   | Draft for ER review   |
| 3        | 12/08/19   | For submission to Department of Planning, Industry and Environment for approval                                   |
| 4        | 01/11/19   | Updated following comments from Department of Planning, Industry and Environment<br><br>Re-submitted for approval |
| 5        | 21/07/20   | Revise to improve risk assessment and clarify of consultation processes   |
| 6        | 20/08/2020 | Updated following comments from Department of Planning, Industry and Environment                                  |
| 7        | 4/09/2020  | Updated following additional comments from Department of Planning, Industry and Environment                       |

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| Term                                     | Expanded text  |
|--|--|
| Ambient noise                            | The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far  |
| CCLP                                     | (Contractor's) Construction Community Liaison Plan   |
| CCS                                      | Community Communication Strategy   |
| CoA                                      | Conditions of Approval (issued for the project by the Department of Planning, Industry and Environment)  |
| Construction (as defined by CoA Table 1) | <p>Includes all works required to construct the SSI, including commissioning trials of equipment and temporary use of any part of the SSI, but excluding the following low impact work which is completed prior to approval of the CEMP:</p> <p>(a) survey works including carrying out general alignment survey, installing survey controls (including installation of global positioning systems (GPS)), installing repeater stations, carrying out surveys of existing and future utilities and building and road dilapidation surveys;</p> <p>(b) investigations including investigative drilling, contamination investigations and excavation;</p> <p>(c) operation of ancillary facilities if the ER has determined the operational activities will have minimal impact on the environment and community;</p> <p>(d) minor clearing and relocation of native vegetation, as identified in the documents listed in Condition A1;</p> <p>(e) installation of mitigation measures including erosion and sediment controls, exclusion fencing, hoardings and temporary or at property acoustic treatments;</p> <p>(f) property acquisition adjustment works including installation of property fencing, and relocation and adjustments of utilities to property including water supply and electricity;</p> <p>(g) relocation and connection of utilities where the relocation or connection has a minor impact to the environment and sensitive receivers as determined by the ER;</p> <p>(h) archaeological testing under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW, 2010) or archaeological monitoring undertaken in association with (a)-(g) and (i) to ensure that there is no impact on Aboriginal artefacts or objects, and archaeological salvage works in accordance with A1, E17 and E18;</p> <p>(i) other activities determined by the ER to have minimal environmental impact which may include construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access; and</p> <p>(j) maintenance of existing buildings and structures required to facilitate the carrying out of the SSI.</p> <p>However, where heritage items or threatened species or threatened ecological communities (within the meaning of the NSW <i>Threatened Species Conservation Act 1995</i> or <i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>) are affected or potentially affected by any low impact work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with the relevant heritage authority, OEH or DPI Fisheries (in the case of impact upon fish, aquatic invertebrates or marine vegetation)</p> |
| CNVG                                     | <i>Construction Noise and Vibration Guideline</i> (Roads and Maritime, 2016)   |
| CRM                                      | Community Relations Manager  |
| dB(A)                                    | Decibels using the A-weighted scale measured according to the frequency of the human ear   |
| DPIE                                     | Department of Planning, Industry and Environment   |
| EMM                                      | Environmental Management Measures (for the project)  |
| ER                                       | Environmental Representative (for the project)   |

| Term   | Expanded text  |
|--|--|
| Feasible and reasonable                              | Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account mitigation benefits and cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.   |
| Highly noise affected                                | As defined in the <i>Interim Construction Noise Guideline</i> (DECC, 2009)   |
| Highly noise intensive works / particularly annoying | Works which are defined as annoying under the <i>Interim Construction Noise Guideline</i> (DECC, 2009) including: <ul style="list-style-type: none"> <li>(a) use of power saws, such as used for cutting timber, rail lines, masonry, road pavement or steel work</li> <li>(b) grinding metal, concrete or masonry</li> <li>(c) rock drilling</li> <li>(d) line drilling</li> <li>(e) vibratory rolling</li> <li>(f) bitumen milling or profiling</li> <li>(g) jackhammering, rock hammering or rock breaking</li> <li>(h) impact piling</li> </ul>  |
| ICNG   | <i>Interim Construction Noise Guideline</i> (DECC, 2009)   |
| LA <sub>eq(15min)</sub>                              | The A-weighted equivalent continuous (energy average) A-weighted sound pressure level of the Construction works under consideration over a 15-minute period and excludes other noise sources such as from industry, road, rail and the community   |
| LA <sub>(max)</sub>                                  | The A-weighted maximum noise level only from the Construction works under consideration, measured using the fast time weighting on a sound level meter   |
| NCA  | Noise Catchment Area   |
| NML  | Noise Management Level as defined in the <i>Interim Construction Noise Guideline</i> (DECC, 2009)  |
| NVMP   | Noise and Vibration Management Plan  |
| OOHW   | Out of hours works   |
| RBL  | The Rating Background Level for each period is the medium value of the RBL values for the period over all of the days measured. There is therefore an RBL value for each period (day, evening and night)   |
| RNP  | NSW Road Noise Policy  |
| RP2J   | Rankin Park to Jesmond project (the project)   |
| Sensitive receiver                                   | Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres, passive recreation areas (including outdoor grounds used for teaching), commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation such as caravan parks and camping grounds, restaurants, office premises, and retail spaces), and others as identified by the Planning Secretary |
| SPB  | Shared Path Bridge   |
| SPL  | Sound Pressure Level   |
| SWP  | Sound Power Level  |
| Works (as defined by MCoA Table 1)                   | All physical activities to construct or facilitate the construction of the SSI, including environmental management measures and utility works. however, does not include work that informs or enables the detailed design of the SSI and generates noise that is no more than 5 dB(A) above the rating background level (RBL) at any residence   |

# 1. Introduction

## 1.1 Purpose and scope

The Newcastle Inner City Bypass – Rankin Park to Jesmond Project (the RP2J Project) was approved by the Minister for Planning under Section 5.19 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 15 February 2019 subject to a number of Conditions of Approval (CoA).

CoA E31 recognised that out of hours works not subject to an EPL may be required in advance of the main construction work and that it could take place subject to preparation and approval of an Out of Hours Work Protocol (OOHW protocol). Transport for NSW has defined the types of activities that might take place in advance of the main construction work and documented them in a Staging Report prepared and submitted under CoA A10 and A11. The Staging Report defines four stages including:

- Stage 1 – early works
- Stage 2 – shared path bridge (SPB) over Newcastle Road
- Stage 3 – southern interchange utilities works
- Stage 4 – main works.

Stages 1 to 3 will require some work to take place outside of standard working hours due to worker and community safety reasons, product quality, operational constraints imposed by utility and service providers, and traffic restrictions due to a need to maintain a sufficient level of service during high traffic demand in standard daytime working hours.

This OOHW protocol has been developed to:

- Provide a process to justify and assess the impact of OOHW against relevant noise and vibration criteria
- Define criteria to determine the risk of OOHW and who has the authority to approve the OOHW
- Determine the application of standard and additional noise and vibration mitigation measures based on defined criteria
- Outline community consultation and other notification requirements.

## 1.2 Conditions of Approval for OOHW

CoA relevant to OOHW and where they are addressed in this OOHW protocol are identified in Table 1-1.

Table 1-1: Conditions of approval relevant to OOHW

| CoA | Condition requirements  | Reference in this OOHW Protocol |
|-----|---|---------------------------------|
| E26 | <b>Construction Hours</b><br>Work must only be undertaken during the following construction hours:<br>(a) 7:00 am to 6:00 pm Mondays to Fridays, inclusive;<br>(b) 8:00 am to 5:00 pm Saturdays; and<br>(c) at no time on Sundays or public holidays. | Section 3                       |
| E27 | <b>Variation to Works Hours</b><br>Notwithstanding <b>Conditions E26</b> and <b>E30</b> , work may be undertaken outside the hours specified, in the following circumstances:   |                                 |

| CoA | Condition requirements   | Reference in this OOHW Protocol                                 |
|-----|--|---|
|     | <p>(a) for the delivery of materials where required by the NSW Police Force or other authority for safety reasons; or</p> <p>(b) where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm; or</p> <p>(c) where different construction hours are permitted or required under an EPL in force in respect of the SSI; or</p> <p>(d) work approved under an <b>Out-of-Hours Work Protocol</b> or an Out of Hours Work Management Process or equivalent (for work not subject to an EPL) under <b>Condition E31</b>; or</p> <p>(e) work that causes:</p> <ul style="list-style-type: none"> <li>(i) no more than 5 db(A) above the rating background level at any residence in accordance with the <i>Interim Construction Noise Guideline</i> (DECC, 2009), and</li> <li>(ii) no more than the 'Noise affected' noise management levels specified in Table 3 of the <i>Interim Construction Noise Guideline</i> (DECC, 2009) at other sensitive land uses, and</li> <li>(iii) continuous or impulsive vibration values, measured at the most affected residence are no more than the maximum values for human exposure to vibration, specified in Table 2.2 of <i>Assessing Vibration: a technical guideline</i> (DEC, 2006), and</li> <li>(iv) intermittent vibration values measured at the most affected residence are no more than the maximum values for human exposure to vibration, specified in Table 2.4 of <i>Assessing Vibration: a technical guideline</i> (DEC, 2006).</li> </ul> <p><i>Note: Section 5.24(1)(e) of the EP&amp;A Act requires that an EPL be substantially consistent with this approval.</i></p> | <p>Section 3.1</p> <p>This OOHW Protocol</p> <p>Section 4.1</p> |
| E28 | <p>On becoming aware of the need for emergency work in accordance with <b>Condition E27(b)</b>, the Proponent must notify the <b>ER</b> and the EPA of the reasons for such work. The Proponent must use best endeavours to notify all noise and/or vibration affected sensitive receivers of the likely impact and duration of those works.</p>   | Section 6.1   |
| E29 | <p>In order to undertake out-of-hours work, the Proponent must identify appropriate respite periods for the out-of-hours works in consultation with the community at each affected location on a monthly basis. This consultation must include (but not be limited to) providing the community with:</p> <ul style="list-style-type: none"> <li>(a) schedule of likely out-of-hours work for a period of no less than three (3) months in advance;</li> <li>(b) potential work, location and duration;</li> <li>(c) proposed respite periods;</li> <li>(d) noise characteristics and likely noise and vibration levels; and</li> <li>(e) likely mitigation and management measures.</li> </ul> <p>The outcomes of the community consultation, the identified respite periods and the scheduling of likely out-of-hour work must be provided to the <b>ER</b>, EPA and the Planning Secretary.</p>  | Section 6.2   |
| E30 | <p><b>Highly Noise Intensive Work</b></p> <p>Except as permitted by an EPL, highly noise intensive works exceeding 75 dB(A) <math>L_{Aeq(15\text{ minute})}</math> noise descriptor at a sensitive receiver must only be undertaken:</p> <ul style="list-style-type: none"> <li>(a) between 8:00 am to 6:00 pm Monday to Friday;</li> <li>(b) between 8:00 am to 1:00 pm Saturday; and</li> <li>(c) if continuously, then not exceeding three (3) hours, with a minimum respite from those activities and works of not less than one (1) hour.</li> </ul>  | Attachment 2 and 3  |

| CoA | Condition requirements   | Reference in this OOHW Protocol  |
|-----|--|--|
|     | For the purposes of this condition, 'continuous' includes any period during which there is less than one (1) hour between ceasing and recommencing any of the work.  |  |
| E31 | <p>An <b>Out-of-Hours Work Protocol</b> must be prepared to identify a process for the consideration, management and approval of work which are outside the hours defined in <b>Condition E26</b>, and that are <u>not</u> subject to an EPL. The Protocol must be approved by the Planning Secretary before the commencement of the work. The Protocol must be prepared in consultation with the EPA and the <b>ER</b>. The Protocol must:</p> <ul style="list-style-type: none"> <li>(a) provide a process for the consideration of out-of-hours work against the relevant noise and vibration criteria, including the determination of low and high-risk activities;</li> <li>(b) provide a process for the identification of mitigation measures for residual impacts, including respite periods in consultation with the community at each affected location, consistent with the requirements of <b>Condition E29</b>;</li> <li>(c) identify procedures to facilitate the coordination of out-of-hours work permitted by an EPL to ensure appropriate respite is provided;</li> <li>(d) undertake a risk analysis that considers the risk of activities, proposed mitigation, management, and coordination, including where: <ul style="list-style-type: none"> <li>◦ low risk activities can be approved by the <b>ER</b>, and</li> <li>◦ any other activity approved by the Planning Secretary; and</li> </ul> </li> <li>(e) identify Department, EPA and community notification arrangements for approved out of hours work, which may be detailed in the Communication Strategy.</li> </ul> <p>The Out-of-Hours Work Protocol is not required if the Proponent has an existing Out of Hours Work Management Process or equivalent that addresses Condition E31 (a) to (e) and has been approved by the Planning Secretary prior to the commencement of work.</p> | <p>This OOHW Protocol</p> <p>Section 4.3</p> <p>Section 6.2</p> <p>Section 5.5</p> <p>Section 4.3</p> <p>CCS, Section 6</p> <p>N/A</p> |
| E32 | <p><b>Utility Coordination and Respite</b></p> <p>All work undertaken for the delivery of the SSI, including that undertaken by third parties (such as utility relocation), must be coordinated to ensure respite periods are provided. The Proponent must:</p> <ul style="list-style-type: none"> <li>(a) schedule any work to provide respite to impacted noise sensitive receivers so that the respite is achieved in accordance with <b>Condition E29</b>; or</li> <li>(b) consider the provision of alternative respite or mitigation to impacted noise sensitive receivers; and</li> <li>(c) provide documentary evidence to the <b>ER</b> in support of any decision made by the Proponent in relation to respite or mitigation.</li> </ul>   | Section 5.4  |
| E33 | <p><b>Noise and Vibration Mitigation</b></p> <p>Noise generating work in the vicinity of sensitive receivers and landuses (including community, religious, educational institutions and noise and vibration-sensitive businesses, medical facilities, and the John Hunter Hospital) resulting in noise levels above the NMLs at critical working areas (such as operating theatres and precision laboratories) must not be timetabled within sensitive periods, unless other reasonable arrangements with the affected receivers are made at no cost to the affected receivers.</p>  | Section 5.3  |
| E34 | <p>Mitigation measures must be implemented with the aim of achieving the following construction noise management levels and vibration criteria:</p> <ul style="list-style-type: none"> <li>(a) construction 'Noise affected' noise management levels established using the <i>Interim Construction Noise Guideline</i> (DECC, 2009);</li> <li>(b) vibration criteria established using the <i>Assessing vibration: a technical guideline</i> (DEC, 2006) (for human exposure);</li> </ul>  | Section 4.1 and Section 5  |

| CoA               | Condition requirements   | Reference in this OOHW Protocol                          |
|-------------------|--|--|
|                   | <p>(c) Australian Standard AS 2187.2 - 2006 “Explosives - Storage and Use - Use of Explosives”;</p> <p>(d) BS 7385 Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2” as they are “applicable to Australian conditions”; and</p> <p>(e) The vibration limits set out in the <i>German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures</i> (for structural damage).</p> <p>Any work identified as exceeding the noise management levels and/or vibration criteria must be managed in accordance with the <b>Noise and Vibration CEMP Sub-plan</b>, including in any <b>Out- of-Hours Work Protocol</b> or <b>Out of Hours Work Management Process</b> or equivalent, required by Condition E31, and in relation to Bridge 7 the documents required by Condition A9.</p> <p><i>Note: The Interim Construction Noise Guideline identifies ‘particularly annoying’ activities that require the addition of 5 dB(A) to the predicted level before comparing to the construction Noise Management Level.</i></p>                                 |  |
| E35               | <p>Mitigation measures must be applied when the following residential ground-borne noise levels are exceeded:</p> <ul style="list-style-type: none"> <li>evening (6:00 pm to 10:00 pm) — internal <math>L_{Aeq(15\text{ minute})}</math>: 40 dB(A); and</li> <li>night (10:00 pm to 7:00 am) — internal <math>L_{Aeq(15\text{ minute})}</math>: 35 dB(A).</li> </ul> <p>The mitigation measures must be outlined in the <b>Noise and Vibration CEMP Sub-plan</b>, including in any <b>Out-of-Hours Work Protocol</b> or <b>Out of Hours Work Management Process</b> or equivalent, required by Condition E31, and in relation to Bridge 7 the documents required by Condition A9.</p>  | Section 5  |
| E36               | <p>Landowner(s) and occupier(s) of properties at risk of exceeding the screening criteria for cosmetic damage must be notified before works that generate vibration commences near those properties. If the potential exceedance is to occur more than once or extend over a period of 24 hours, landowner(s) and occupier(s) must be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the landowner and occupier. These properties must be identified and considered in the <b>Noise and Vibration CEMP Sub-plan</b>, including in any <b>Out-of-Hours Work Protocol</b> or <b>Out of Hours Work Management Process</b> or equivalent, required by Condition E31, and in relation to Bridge 7 the documents required by Condition A9.</p> <p><i>Note: Condition E54 requires <b>Pre-construction Building and Structure Condition Surveys</b> of buildings and structures of risk of damage to be undertaken prior to the commencement of work in the vicinity of the buildings or structures.</i></p> | Section 6.4  |
| Project EMM NV07* | <p>An out of hours work procedure (for work outside the proposed extended construction hours) will be developed and would include the following:</p> <ul style="list-style-type: none"> <li>Contact the local community potentially affected by the proposed work and inform them by letter of the proposed work, location, type of work, days and dates of work and hours involved. The contact will be made before the start of work</li> <li>A suitable advertisement will be placed in local papers including a reference to night-time noise impacts<br/>A 24-hour community liaison phone number and permanent site contact will be provided so that complaints can be received and addressed in a timely manner</li> <li>Measures to investigate and respond to any valid noise complaints.</li> </ul>  | <p>Section 6.4</p> <p>Section 6.4</p> <p>Section 7.2</p> |

## 2. The OOHW process

To undertake OOHW, the project team will be required to undertake a number of evaluation tasks, answer a series of questions and document these in an OOHW application for approval. Figure 2-1 illustrates the step-by-step process from justification to approval, and provides a cross-reference to sections of the protocol where a detailed explanation or further information can be found.

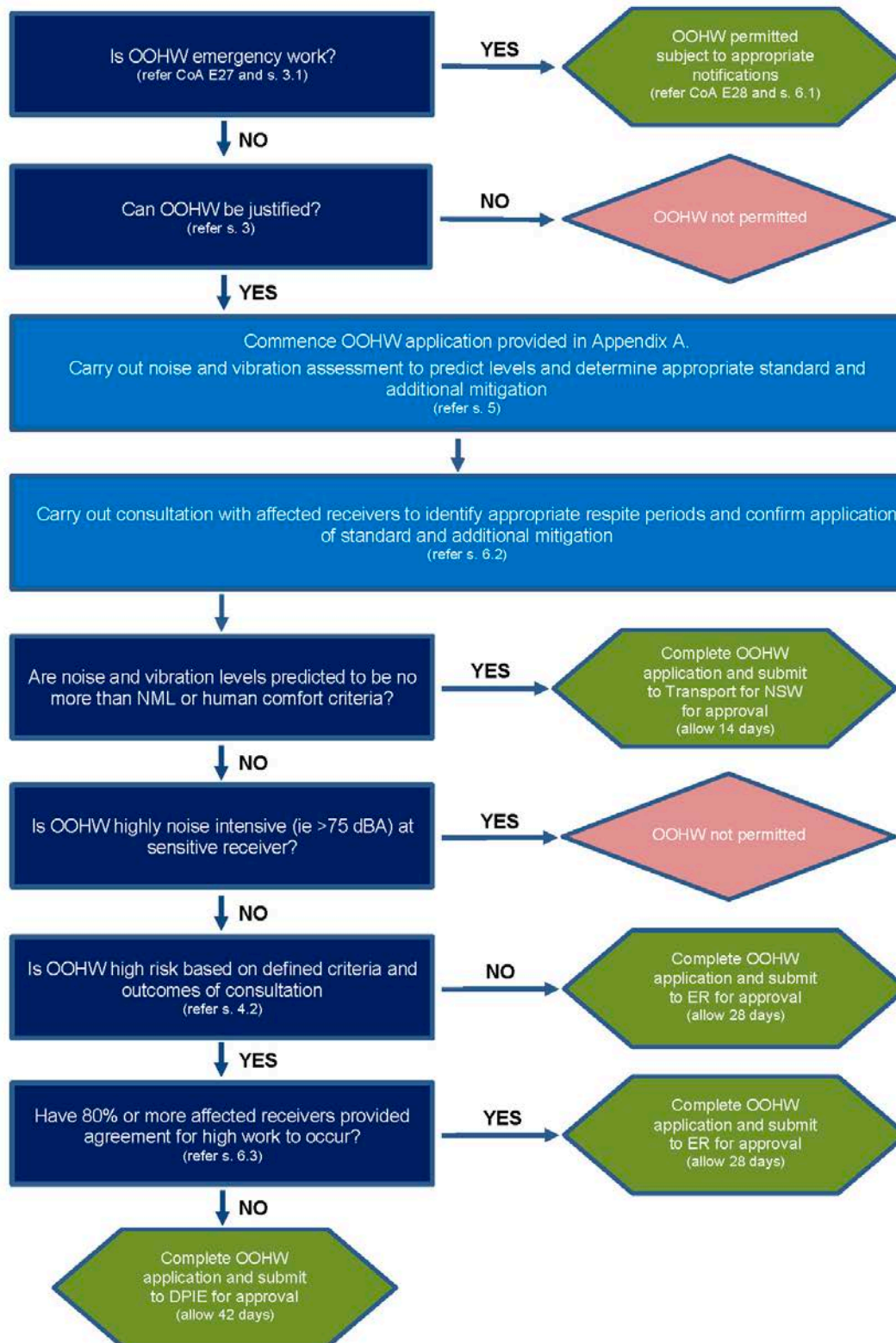


Figure 2-1 OOHW approval process flow chart

## 3. Justification for OOHW

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Delivery of the RP2J Project may require some work to be carried out outside of standard construction hours.

Standard construction hours defined by CoA E26 and adopted for the OOHW protocol are:

- 7:00 am to 6:00 pm Mondays to Fridays, inclusive
- 8:00 am to 5:00 pm Saturdays
- at no time on Sundays or public holidays.

Work outside of these standard working hours might include:

- Emergency or other work defined by CoA E27 (a) or (b)
- OOHW that is justified and approved.

Sections 3.1 and 3.2 provide further information on what constitutes emergency or other work and justified OOHW that can take place with approval.

### 3.1 Emergency works

CoA E27 allows for a variation to standard work hours for OOHW that can be carried out without further approval in the following circumstances:

- (a) for the delivery of materials where required by the NSW Police Force or other authority for safety reasons
- (b) where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm.

As required by CoA E28, on becoming aware of the need for emergency work in accordance with CoA E27(b) above, the Transport for NSW Environmental Manager (or delegate) will notify the project ER and the EPA of the reasons for such work. Transport for NSW and the Contractor must then endeavour to notify all noise and/or vibration affected sensitive receivers of the likely impact and duration of those works.

### 3.2 Other OOHW requiring justification and approval

Work associated with the RP2J Project will be undertaken generally in accordance with the assessment and management approach outlined in the Interim Construction Noise Guideline (ICNG) and within the limitations imposed by the CoA. The ICNG recommends standard construction hours and requires that OOHW has a strong justification. Where it is considered possible (safe, reasonable and not prevented by a road occupancy licence) for works to be undertaken during standard hours, OOHW proposals will not be considered justified and will not be considered further. These works would be undertaken during standard working hours.

In general, OOHW undertaken on public infrastructure projects such as road construction necessary to sustain the operational integrity of roads are considered justified in the ICNG.

In relation to the RP2J Project this OOHW protocol considers valid reasons for work to be undertaken out of hours to include, but not be limited to:

- Ensuring the safety of the public and RP2J Project personnel
- Minimising disruption to the existing road network and the network level of service
- Following directions by Traffic Management Centre and/or relevant roads authority

- Minimising disruption to road users / pedestrians
- Minimising disruptions to essential services and utilities for surrounding businesses and adjoining residential receivers
- Work that shortens the length of the project and where supported by the affected community
- Fulfilling engineering design requirements eg concrete curing requirements.

## 4. OOHW application and approval

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Work that is not emergency works and has been appropriately justified can only proceed outside of standard working hours where a comprehensive OOHW application has been prepared and approved. Attachment 1 of this OOHW protocol provides the application template to capture all necessary information for this process including:

- Relevant personnel details
- Detailed work description including location, activity, equipment required, duration etc
- Valid justification
- Noise and vibration assessment against RP2J Project specific criteria
- Determination of a risk category based on criteria in section 4.3
- Standard and additional mitigation measures to be adopted
- Details of community consultation including relevant feedback and how it has been addressed, and the status of any agreements.

This information will be reviewed by the relevant approval delegate when considering whether proposed OOHW can proceed as documented, proceed on a conditional basis, or not proceed at all.

The subsequent sections provide further detail of the above (where relevant) or cross-reference to where further detail can be found.

### 4.1 Noise and vibration assessment criteria

#### 4.1.1 Adopted guidelines and standards

CoA E34 lists the guidelines and standards for establishing project-specific noise and vibration criteria to guide the application of mitigation measures. The guidelines and standards adopted for the RP2J Project include:

- RP2J Project specific construction 'Noise affected' NMLs established using the ICNG
- For human exposure, the acceptable vibration values set out in *Assessing Vibration: A Technical Guideline* (DEC, 2006)
- Australian Standard AS 2187.2 - 2006 "Explosives - Storage and Use - Use of Explosives"
- For structural damage to heritage structures, the vibration limits set out in the German Standard *DIN 4150-3: Structural Vibration - effects of vibration on structures*
- For damage to other buildings and/or structures, the vibration limits set out in the BS 7385 Part 2-1993 "*Evaluation and measurement for vibration in buildings Part 2*" as they are "applicable to Australian conditions".

#### 4.1.2 Noise management levels

Project-specific noise management levels (NMLs) and sleep disturbance criteria have been calculated for each Noise Catchment Area (NCA) within the RP2J Project area and are summarised in Attachment 2. Construction NML criteria for non-residential, commercial and industrial receivers have also defined.

The RP2J Project specific NMLs by NCA and other technical criteria are listed and detailed in full in Attachment 2. Mitigation measures will be applied with regard to relevant thresholds as described in section 5.

### 4.1.3 Ground-borne noise criteria

Ground-borne noise is noise generated by vibration transmitted through the ground into a structure. CoA E35 recognises that ground-borne noise in some instances can be more noticeable than air-borne noise and specifies the following criteria for the application of mitigation measures for affected residential receivers. These include:

- Evening (6:00 pm to 10:00 pm) - internal  $L_{Aeq(15\text{ minute})}$ : 40 dB(A)
- Night (10:00 pm to 7:00 am) - internal  $L_{Aeq(15\text{ minute})}$ : 35 dB(A).

Section 5.2 outlines mitigation measures to be applied when ground-borne noise exceeds the thresholds outlined above.

### 4.1.4 Vibration criteria

Vibration criteria has been adopted directly from the standards outlined in section 4.1.1 as applicable to Australian conditions. Those adopted for the RP2J project are summarised in Attachment 2. An adaptive approach to mitigation will be applied to vibration from OOHW including plant selection, plant substitution and consultation with affected receivers.

## 4.2 Noise and vibration assessment

### 4.2.1 Noise assessment

A noise assessment to determine the noise impacts of the proposed OOHW will be undertaken in the case of all planned OOHW using an appropriately detailed noise prediction tool. The assessment will predict the level and extent of noise impact that OOHW activities will have on potentially affected sensitive receivers based on inputs including location, and the types and number of construction machinery operating at any one time under a worst case scenario in any of the defined RP2J Project specific NCAs.

As noted in section 4.1.2, NMLs have been established for each NCA based on the ICNG.

Quantitative noise assessments conducted by the Contractor for all OOHW will predict the potential exceedances of the OOHW scenario against the relevant NMLs and sleep disturbance screening criteria identified for potentially affected sensitive receivers. The assessment will include, but not be limited to:

- Details of the nature and scope of each activity, including details of times, duration, vehicles, plant and equipment to be used
- Justification of the selected construction and work methods, plant and equipment compared to alternatives taking into consideration noise and vibration impacts
- An evaluation of the worst case scenario for each affected NCA including:
  - the addresses of the most affected noise sensitive receivers
  - the background noise level for the NCA
  - NMLs for the NCA
  - the predicted  $L_{Aeq(15\text{ min})}$  noise level, incorporating any 5 dB correction for particularly annoying activities as listed in the ICNG
  - assessment of sleep disturbance.

Noise mitigation measures to be adopted based on the predicted noise levels include respite periods to minimise noise and vibration impacts on surrounding noise sensitive receivers in each locality and are detailed further in section 5.2 and section 5.3.

## 4.2.2 Vibration assessment

An assessment of vibration intensive activities that may impact sensitive receivers or structures will be required for out of hours vibration intensive works. The proposed OOHW activities will be assessed for compliance with safe working distances for:

- Cosmetic and/or structural impacts (including safe working distances)
- Human comfort impacts due to vibration and ground borne noise.

Assessments will be undertaken in accordance with the safe working distance guide in Attachment 2. The safe working distances provided in Attachment 2 are indicative and will vary depending on the item of plant (particularly its power rating) and local geotechnical conditions. Consideration to these factors will be undertaken during the assessment of all vibration generating OOHW.

Prior to undertaking an assessment, all other feasible and reasonable options to use less vibration intensive equipment will be investigated and exhausted.

## 4.3 OOHW risk determination and approval

The approval process for justified OOHW will be determined on a risk-based case-by-case basis to ensure that OOHW is approved by the appropriate delegate in accordance with CoA E31(d). Justified OOHW will be approved in one of three ways and is shown in Table 4-1.

Table 4-1: OOHW approval delegate

| Approval delegate                                   | OOHW risk category   |
|---|--|
| Transport for NSW environment manager (or delegate) | Justified OOHW where it is demonstrated that noise is not predicted to exceed the NML at the nearest worst effected receiver |
| RP2J Project ER                                     | Justified OOHW where it is demonstrated the OOHW is low risk   |
| Planning Secretary                                  | Justified OOHW where it is demonstrated the OOHW is high risk  |

The risk factors in determining low and high risk are outlined in Table 4-2 and are generally in accordance with the Construction Noise and Vibration Guide (Roads and Maritime, 2016).

Table 4-2: OOHW risk factors

| Low risk factors*   | High risk factors*  |
|---|---|
| <ul style="list-style-type: none"> <li>• Work predicted to generate air-borne noise levels 25dBA or less above RBL</li> <li>• 1800 – 2200 weekdays</li> <li>• 2200 - 0700 weekday nights</li> <li>• 1700 – 2200 Saturdays</li> <li>• 2200 - 0800 Saturday nights</li> <li>• 0800 – 1800 Sunday &amp; Public Holidays</li> <li>• 1800 – 0700 Sunday &amp; Public Holidays</li> <li>• Impulsive noise and vibration between 0800 – 2300 weekdays</li> </ul> | <ul style="list-style-type: none"> <li>• Work predicted to generate air-borne noise levels more than 25dBA above RBL</li> <li>• Work predicted to extend beyond defined OOHW respite period 1 and OOHW respite period 2</li> <li>• Impulsive noise and vibration likely after 2300 (eg vibratory rolling or rock breaking)</li> <li>• Activities predicted to generate noise that is more than 25dBA above the RBL for the period and where 80 per cent of receivers have not agreed to adjusted noise modelling and the application of appropriate mitigation measures.</li> </ul> |

| Low risk factors*  | High risk factors* |
|--|--------------------|
| <ul style="list-style-type: none"> <li>Activities predicted to generate noise that is more than 25dBA above the RBL for the period and where 80 per cent of receivers have agreed to adjusted noise modelling and the application of appropriate mitigation measures.</li> </ul> |                    |

\* Low and high risk factors are further defined below. The process for determining low and high risk has taken into consideration actual ambient noise monitoring on and around Newcastle Road which shows road traffic noise to be the predominant noise source and well above RBLs listed in Attachment 2.

### 4.3.1 Low risk activities

These activities generate noise that can range in character between noticeable and moderately intrusive (ie up to 25dBA above RBL). They may include impulsive noise and vibration during the evening and initial night time period weekdays (ie prior to 2300). They may also include activities that are highly intrusive, but at least 80 per cent of receivers have agreed to adjusted noise modelling and the application of appropriate mitigation measures. These activities may be assessed and approved by the ER due to the low risk of impact to receivers. Criteria considered by the ER in determining low risk would include:

- Any activities above the NML (ie 5 dBA  $L_{eq}(15minutes)$  above the RBL); and
- The efficacy of mitigation measures in minimising the magnitude of impacts on affected receivers; or
- Where written agreement has been obtained by 80 per cent or more of receivers impacted above NML who are also predicted likely to experience noise levels more than 25dBA above the RBL. Further detail on the collection and application of written agreements is provided in section 6.3.

### 4.3.2 High risk activities

These activities generate noise levels that are predicted to exceed the RBL at a sensitive receiver by more than 25dBA and include:

- Impulsive or vibratory impacts after 2300 on weekday.
- Activities where following consultation with the affected community at least 80 per cent of receivers have not agreed to the adjusted noise modelling and the application of appropriate mitigation measures.

These activities are to be assessed and approved by the Planning Secretary.

## 4.4 Key OOHW application submission timeframes

In order to obtain approval for justified OOHW, a number of submissions might be required. Table 4-3 identifies the number of days in advance of the OOHW an application is required, and who the submission must be made to based on the assessed risk category.

Table 4-3: OOHW submission timeframe

| OOHW risk category        | Application submission to                           | Days prior to OOHW |
|---------------------------|---|--------------------|
| Equal to or less than NML | Transport for NSW Environment Manager (or delegate) | 14                 |
| Low risk                  | Transport for NSW Environment Manager (or delegate) | 28                 |
|                           | Environmental Representative                        | 14                 |
| High risk                 | Transport for NSW Environment Manager (or delegate) | 42                 |
|                           | Planning Secretary                                  | 28                 |

## 5. Application of mitigation measures

### 5.1 Standard mitigation measures

Reasonable and feasible standard mitigation measures will be implemented for all OOHW where there is predicted to be impacts on sensitive receivers. These measures include, but are not limited to:

- Modifying behavioural practices on site
- Equipment selection / maintaining and monitoring plant
- Use and siting of plant and hoardings
- Site inductions
- Use of non-tonal reversing alarms
- Stakeholder notification
- Planning noisier work to be carried out earlier in the period.

### 5.2 Additional mitigation measures

Where construction noise and vibration levels are still predicted to exceed the noise or vibration objectives after the application of the standard mitigation measures, additional mitigation measures will be implemented in consultation with affected sensitive receivers. Table 5-1 and Table 5-2 outline the approach for the application of additional mitigation measures to minimise impacts of OOHW generated air-borne and ground-borne noise.

Table 5-1: Hierarchy for application additional mitigation for air-borne noise

| OOHW period  | dB(A)              | Mitigation measures  |  |
|--|--------------------|--|--|
| <b>OOHW period 1</b><br>Monday–Friday:<br>6 pm – 10 pm<br>Saturday:<br>7 am - 8 am and<br>5 pm – 10 pm<br>Sunday and Public Hol.:<br>8 am – 6 pm | 5-15 above<br>NML  | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Duration respite</li> </ul>   | <ul style="list-style-type: none"> <li>• Respite offer period 1</li> </ul>   |
|  | 15-25 above<br>NML | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Respite offer period 1</li> </ul>   | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Duration respite</li> </ul>   |
|  | >25 above<br>NML   | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Respite offer period 1</li> <li>• Phone calls</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Duration respite</li> <li>• Specific notifications</li> </ul>                                 |
| <b>OOHW period 2</b><br>Monday– Friday:<br>10 pm – 7 am<br>Saturday:<br>10 pm - 8 am<br>Sunday and Public Hol.<br>6 pm – 7 am                    | 5-15 above<br>NML  | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Respite offer period 1</li> </ul>   | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Duration respite</li> </ul>   |
|  | 15-25 above<br>NML | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Individual briefing</li> <li>• Duration respite</li> <li>• Specific notifications</li> </ul>  | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Respite offer period 2</li> <li>• Phone calls</li> </ul>                                      |
|  | >25 above<br>NML   | <ul style="list-style-type: none"> <li>• Notifications</li> <li>• Individual briefing</li> <li>• Duration respite</li> <li>• Specific notifications</li> </ul> | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Respite offer period 2</li> <li>• Phone calls</li> <li>• Alternative accommodation</li> </ul> |

Table 5-2: Hierarchy for application additional mitigation for ground-borne noise

| OOHW period  | dB(A)              | Mitigation measures  |  |
|--|--------------------|--|--|
| <b>OOHW period 1</b><br>Monday–Friday:<br>6 pm – 10 pm<br>Saturday:<br>7 am - 8 am and<br>5 pm – 10 pm<br>Sunday and Public Hol.:<br>8 am – 6 pm | 10-20 above<br>NML | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Specific notification</li> <li>• Duration respite</li> </ul>                                  | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Respite offer period 1</li> </ul>   |
|  | >20 above<br>NML   | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Individual briefing</li> <li>• Duration respite</li> <li>• Specific notifications</li> </ul>  | <ul style="list-style-type: none"> <li>• Notification</li> <li>• Respite offer period 1</li> <li>• Phone calls</li> </ul>                                      |
| <b>OOHW period 2</b><br>Monday– Friday:<br>10 pm – 7 am<br>Saturday:<br>10 pm - 8 am<br>Sunday and Public Hol.<br>6 pm – 7 am                    | 10-20 above<br>NML | <ul style="list-style-type: none"> <li>• Notifications</li> <li>• Individual briefing</li> <li>• Duration respite</li> <li>• Specific notifications</li> </ul> | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Respite offer period 2</li> <li>• Phone calls</li> <li>• Alternative accommodation</li> </ul> |
|  | >20 above<br>NML   | <ul style="list-style-type: none"> <li>• Notifications</li> <li>• Individual briefing</li> <li>• Duration respite</li> <li>• Specific notifications</li> </ul> | <ul style="list-style-type: none"> <li>• Verification</li> <li>• Respite offer period 2</li> <li>• Phone calls</li> <li>• Alternative accommodation</li> </ul> |

A definition of the standard and additional mitigation measures referred to in section 5.1 and section 5.2 is provided in Attachment 3.

### 5.3 Mitigation measures for other sensitive periods

Noise generating work in the vicinity of sensitive receivers and landuses (including community, religious, educational institutions and noise and vibration-sensitive businesses, medical facilities, and the John Hunter Hospital) resulting in noise levels above the NMLs at critical working areas (such as operating theatres and precision laboratories) will not be timetabled within sensitive periods, unless other reasonable arrangements with the affected receivers are made at no cost to the affected receivers.

### 5.4 Utility coordination and respite

As required by CoA E32, all OOH utility works carried out for the project (including those undertaken by third parties) will be coordinated to ensure respite periods are provided at noise affected locations, in accordance with the additional mitigation measures outlined in Section 5.2 and the CNVG. The Contractor will:

- Schedule any works to provide respite to impacted noise sensitive receivers so that the respite is achieved in accordance with CoA E29, or
- Consider the provision of alternative respite or mitigation to impacted noise sensitive receivers
- Provide documentary evidence to the ER in support of any decision made by Transport for NSW or its Contractors in relation to respite or mitigation.

All utility work undertaken on behalf of Transport for NSW will be assessed and approved, where appropriate, in accordance with the processes documented in this protocol.

## 5.5 Coordination of OOHW permitted by an EPL

To ensure the effective coordination of OOHW permitted by an EPL, the Transport for NSW Environment Manager (or delegate) will evaluate other EPL authorised OOHW when determining any OOHW application under this protocol. Consideration will be given to:

- The number of consecutive evenings or nights an individual receiver has or would be noise affected by OOHW
- Whether the total number of evenings or nights an individual receiver has or would be noise affected would exceed respite offer period 1 or respite offer period 2
- Whether any individual community agreements are in place.

Refer further detail in section 5.2 and section 6.3.

## 6. Consultation

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### 6.1 Emergency work notification

On becoming aware of the need for emergency work in accordance with CoA E27 (a) or (b), the Transport for NSW Environmental Manager (or delegate) will notify the project ER and the EPA of the reasons for such work. Transport for NSW and the Contractor will use best endeavours to notify all noise and/or vibration affected sensitive receivers of the likely impact and duration of those works.

### 6.2 Community consultation

Prior to undertaking all OOHW, the Contractor will consult with, as appropriate:

- Potentially affected sensitive receivers
- Transport for NSW Project Manager
- Transport for NSW Environmental Manager (or delegate)
- Newcastle City Council (as applicable).

As required by the RP2J Community Communication Strategy (CCS) and CoA E29, consultation with the community at each location affected by OOHW will occur on a monthly basis. The consultation will include, but not be limited to:

- Providing a schedule of likely OOHW for a period of no less than three months in advance
- Explaining potential work, location and duration
- Providing proposed respite periods
- Discussing noise characteristics and likely noise and vibration levels
- Discussing likely mitigation and management measures
- A request for detail around any sensitive periods specific to the receiver.

The Contractor will provide the Transport for NSW Project Manager and Transport for NSW Environmental Manager (or delegate) evidence of the consultation undertaken for the OOHW. The outcomes of the community consultation, the identified respite periods and the scheduling of likely OOHW will be included in the assessment and mitigation measures as part of the OOHW application and provided to the ER and the Planning Secretary by Transport for NSW with the application.

### 6.3 Community agreements

Where noise or vibration modelling for proposed OOHW shows that high risk factors and/or screening criteria is predicted to be exceeded, and the work would otherwise be subject to approval by the Planning Secretary, the Contractor (or Transport for NSW as necessary) may enter into individual voluntary agreements with potentially affected sensitive receivers. The ER may then consider and approve the OOHW application as a low risk activity subject to the following.

Community agreements must include all relevant information required for a community notification (refer 6.4), but also:

- Acknowledge that the OOHW in the absence of an agreement would be categorised as high risk (refer Table 4-1)
- Identify any unique measures or requirements agreed to by both parties (eg regular advice on the status of the OOHW by text message)
- Document the period in which the agreement remains in effect

- Provide a mechanism to review / revise the agreement where circumstances might have changed.

The ER can only consider an application for OOHW to be categorised as a low risk activity if agreement with at least 80 per cent of receivers is reached.

The ER would consider a number of circumstances in making a determination. Considerations might include, but not be limited to:

- Whether a sensitive receiver has not responded to multiple attempts and methods of engagement
- Whether a sensitive receiver does not want to sign a written agreement but has no objection to the OOHW
- Whether a sensitive receiver does not want to sign a written agreement because they object to the OOHW.

In circumstances where agreement with 80 per cent of sensitive receivers is unable to be obtained and is on the basis of non-responding parties, the ER can consider an agreement has been reached where three genuine attempts at consultation have been made and documented. This would include, but not be limited to, all or a combination of at least two, of the following methods:

- A personalised stakeholder notification (letter, email, text message)
- Telephone call
- Doorknock

In circumstances where a sensitive receiver has no objections to the OOHW, but has indicated they do not wish to sign a written agreement, the ER can consider a communication record (or file note) of the verbal agreement. The record must include the date, time and place of the conversation and those in attendance. It must also include any special circumstances under which the receiver has advised that they are in agreement with the OOHW. The record must be signed by the RP2J Project representative in attendance and an electronic copy retained.

All agreements would be recorded in accordance with the processes outlined in the RP2J Project CCS and captured in the Consultation Manager database. Any agreements made for the purposes of undertaking OOHW that might otherwise be categorised as a high risk activity would be made available to the ER and/or Planning Secretary on request.

## 6.4 Community notification

Community notifications will be used as a mitigation measure for receivers of potential noise and vibration impacts from OOHW.

Where OOHW have been scheduled, the Contractor's Community Liaison Representative will notify the potentially affected noise sensitive receivers of upcoming OOHW.

Specific notifications of OOHW events will be issued to potentially affected sensitive receivers at least five days, and not more than 14 working days, prior to the OOHW commencing.

OOHW notifications will be prepared generally in accordance with the CNVG. The notifications will:

- Be undertaken by letterbox drop or email
- Be suitably detailed in local papers including a reference to night-time noise impacts
- Clearly outline the reason that the work is required to be undertaken outside standard construction hours specified
- Include a diagram that clearly identifies the location of the proposed works in relation to nearby cross streets and local landmarks
- Include details of relevant time restrictions that apply to the proposed works

- Clearly outline in plain English, the location, nature, type of work, scope and days and dates and hours of the proposed works
- Detail the expected noise impact of the works on potentially affected noise sensitive receivers
- Detail mitigation and management measures and proposed respite periods
- Clearly state how complaints may be made and additional information obtained
- Include the number of the 24-hour telephone complaints line, site contact (where available and the RPJ2 Project website address).

In accordance with CoA E36, the Contractor's Community Liaison Representative will notify the landowners and occupiers of properties at risk of exceeding the screening criteria for cosmetic damage prior to OOHW that generate vibration commencing near those properties. If the potential exceedance is to occur more than once or extend over a period of 24 hours, the Contractor will provide the landowners and occupiers a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the landowner and occupier.

# 7. Monitoring and auditing

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## 7.1 Monitoring of OOHW

The Contractor's Environmental Site Representative will ensure the following OOHW noise and vibration monitoring is undertaken:

- Attended noise monitoring at representative sensitive receivers in the first instance of an activity predicted to be moderately intrusive or worse
- Attended vibration monitoring at representative sensitive receivers in the first instance of work where vibration levels are predicted to exceed maximum levels
- Additional noise and vibration monitoring and review if complaints about the activity are received
- Attended noise or vibration monitoring at appropriate representative stages of OOHW that has been determined by the ER to be low risk to verify predictions.

All OOHW monitoring will be carried out by an appropriately trained person in the measurement and assessment of construction noise and vibration.

## 7.2 Complaints management

Complaints received as a result of the OOHW will be managed in accordance with the RP2J Project Complaints Management System (CMS) and the Contractor's CCLP. On receipt of any complaints, the Contractor will carry out an investigation and where feasible and reasonable, make changes to the works to address the issue of concern. Where relevant to the detail of the complaint, monitoring will be undertaken to confirm compliance with the noise levels identified in CoA E27 and predicted vibration levels.

## 7.3 Exceedances / non-conformances

Where monitoring identifies any exceedances of the levels predicted in the OOHW assessment, a review of OOHW activities will be carried out to determine whether noise or vibration levels can be further reduced via additional feasible and reasonable measures.

## 7.4 Records

The Contractor will maintain accurate records of all OOHW applications and noise and vibration monitoring undertaken during OOHW for the duration of the works.

## Attachment 1

# RP2J Project OOHW application form

| Out of hours work approval request form  |  |                |          |
|--|--|----------------|----------|
| No:  | Notification date:   | Approval date: | Project: |
|  |  |                |          |
| A. Contact details   | Name   | Mobile number  | Email    |
| Contractor Environmental Site Representative   |  |                |          |
| Contractor Construction Manager  |  |                |          |
| Contractor Foreman   |  |                |          |
| Contractor Project Engineer  |  |                |          |
| B. Details of work:  |  |                |          |
| Include a map showing location of work extent and nearest sensitive receivers  |  |                |          |
| Location / chainages:  |  |                |          |
| NCA/s:   |  |                |          |
| Description of works – also include a brief description of the sequence of activities:   |  |                |          |
| Machinery/ plant to be used  |  |                |          |
| Traffic control measures required:   |  |                |          |
| Lighting required:   |  |                |          |
| Proposed dates:  |  |                |          |
| Proposed times:  |  |                |          |
| Justification - why does work need to occur outside of standard construction hours?:<br>(attach support information as required) |  |                |          |
| C. Risk assessment   |  |                |          |
| NML (refer Table 3-2 of OOHW protocol)   |  |                |          |
| Is the work highly noise intensive?<br>(above 75dB(A) $L_{Aeq}$ (15 minute))   | <i>If yes, the work cannot proceed out of hours unless permitted by an EPL</i> |                |          |

## Out of hours work approval request form

**Risk factor category**  
(refer section 4.3 of  
OOHW protocol):

*Other*

*Low*

*High*

*Comments:*

### D. Details of noise or vibration assessment completed:

*Comments:*

### E. Proposed mitigation measures, including respite

*Comments:*

### F. Community consultation

*Outline consultation undertaken for the proposed OOHW:*

*Has respite periods for OOHW been identified with the affected community on a monthly basis and a three-month schedule of likely OOHW provided (refer CoA E29)?*

*Has the outcome of community consultation, the identified respite periods and scheduling of likely OOHW been provided to the ER, EPA and Planning Secretary?*

### G. Respite framework

*Outline any previous respite within the last month and the status of community agreements (where relevant)?*

*Have cumulative impacts from OOHW permitted by an EPL been considered during the development appropriate respite?*

### H. Details of non-residential receivers (if any) and corresponding NMLs

*Comments:*

## Out of hours work approval request form

### I. Are there any properties at risk of exceeding the screening criteria for cosmetic damage?

Comments:

### I. Review/ Endorsements

|  |  |            |          |  |
|--|--|------------|----------|--|
| <b>Contractor Community Liaison Representative</b>           | Community notified   | Date:      |          |  |
|  | Additional consultation requirements:                        |            |          |  |
|  | Have the works been reviewed and endorsed?                   |            | Yes / No |  |
|  | Name:  | Signature: | Date:    |  |
|  |  |            |          |  |
|  | Comments:  |            |          |  |
| <b>Transport for NSW Environmental Manager (or delegate)</b> | Agreed mitigation measures:                                  |            |          |  |
|  | Have the works been reviewed and endorsed?                   |            | Yes / No |  |
|  | Have the works been approved where neither low or high risk? |            | Yes / No |  |
|  | Name:  | Signature: | Date:    |  |
|  |  |            |          |  |
| Comments:  |  |            |          |  |
| <b>Transport for NSW Project Manager</b>                     | Have the works been reviewed and endorsed?                   |            | Yes / No |  |
|  | Have the works been approved where neither low or high risk? |            | Yes / No |  |
|  | Name:  | Signature: | Date:    |  |
|  |  |            |          |  |
| Comments:  |  |            |          |  |
| <b>ER approval (low risk activities)</b>                     | Are the works approved?                                      |            | Yes / No |  |
|  | Name:  | Signature: | Date:    |  |
|  |  |            |          |  |
|  | Comments:  |            |          |  |
| <b>Planning Secretary approval (high risk activities)</b>    | Are the works approved?                                      |            | Yes / No |  |
|  | Name:  | Signature: | Date:    |  |
|  |  |            |          |  |

**Out of hours work approval request form**

Comments:

## Attachment 2

# Noise and vibration criteria

## RP2J Project specific RBL and NML for residential receivers

| NCA | Adopted background noise RBL $L_{A90}$ |         |       | NML ( $L_{Aeq(15min)}$ ) (dBA) |                             |                       |                      |                    |  |
|-----|--|---------|-------|--------------------------------|-----------------------------|-----------------------|----------------------|--------------------|--|
|     | Day                                    | Evening | Night | Standard working hours         |                             | Out of standard hours |                      |                    |  |
|     |  |         |       | Noise affected level           | Highly affected noise level | Day <sup>1</sup>      | Evening <sup>2</sup> | Night <sup>3</sup> |  |
| 1   | 45                                     | 39      | 33    | 55                             | 75                          | 50                    | 44                   | 38                 |  |
| 2   | 49                                     | 43      | 35    | 59                             | 75                          | 54                    | 48                   | 40                 |  |
| 3   | 37                                     | 37      | 30    | 47                             | 75                          | 42                    | 42                   | 35                 |  |
| 4   | 47                                     | 46      | 36    | 57                             | 75                          | 52                    | 51                   | 41                 |  |
| 5   | 55                                     | 51      | 41    | 65                             | 75                          | 60                    | 56                   | 46                 |  |
| 6   | 33                                     | 35      | 29    | 43                             | 75                          | 38                    | 40                   | 34                 |  |
| 7   | 39                                     | 36      | 34    | 49                             | 75                          | 44                    | 41                   | 39                 |  |
| 8   | 52                                     | 48      | 33    | 62                             | 75                          | 57                    | 53                   | 38                 |  |
| 9   | 34                                     | 32      | 25    | 44                             | 75                          | 39                    | 37                   | 30                 |  |
| 10  | 38                                     | 35      | 26    | 48                             | 75                          | 43                    | 30                   | 31                 |  |
| 11  | 50                                     | 42      | 33    | 60                             | 75                          | 55                    | 47                   | 38                 |  |
| 12  | 36                                     | 36      | 27    | 46                             | 75                          | 41                    | 41                   | 32                 |  |
| 13  | 56                                     | 49      | 33    | 66                             | 75                          | 61                    | 54                   | 38                 |  |
| 14  | 38                                     | 37      | 35    | 48                             | 75                          | 43                    | 42                   | 40                 |  |

1 OOHW Day = 7 am to 8 am and 5 pm to 6 pm Saturday, 8 am to 6 pm Sunday and public holidays

2 OOHW Evening = 6 pm to 10 pm, Monday to Sunday and public holidays

3 OOHW Night = 10 pm to 7 am, Monday to Saturday; 10 pm to 8 am Sunday and public holidays

**Additional notes:**

The ICNG Sleep disturbance screening criteria is that  $L_{Amax}$  (dBA) should not exceed the ambient  $L_{A90(15min)}$  noise level by more than 15 dB(A)

The source of Table 3-2 information is from Table 4-5 of the RP2J Project Submissions and Preferred Infrastructure Report.

## Construction NMLs for non-residential, commercial and industrial receivers

| Land use   | NML                                |
|--|------------------------------------|
|  | $L_{Aeq(15\text{ minute})}$ dB(A)* |
| Places of worship  | 45 (Internal)                      |
| Classrooms at schools and other educational institutions | 45 (Internal)                      |
| Hospital wards and operating theatres                    | 45 (Internal)                      |
| Active recreation areas                                  | 65 (External)                      |
| Passive recreation areas                                 | 60 (External)                      |
| Industrial premises                                      | 75 (External)                      |
| Commercial premises                                      | 70 (External)                      |

\* When in use

## Estimated safe working distances (m) for vibration inducing activities

| Activity                  | Human comfort                   | Structural damage      |                     |
|---------------------------|---------------------------------|------------------------|---------------------|
|                           | BS 5228-2 criteria <sup>1</sup> | Heritage structure DIN | Standard dwellings  |
|                           | (1.0 mm/s)                      | 4150-3 criteria        | DIN 4150-3 criteria |
|                           |                                 | (3.0 mm/s)             | (5.0 mm/s)          |
| Roller                    | 90                              | 24                     | 13                  |
| 15 tonne vibratory roller | 140                             | 35                     | 18                  |
| Loader breaking kerbs     | 120                             | 30                     | 16                  |
| 7 tonne compactor         | 90                              | 24                     | 13                  |
| Pavement Breaker          | 90                              | 24                     | 13                  |
| Dozer                     | 60                              | 15                     | 8                   |
| Backhoe                   | 10                              | 3                      | 2                   |
| Jackhammer                | 4                               | 2                      | 1                   |
| Excavator                 | 25                              | 7                      | 4                   |
| Piling (bored/CFA)        | 120                             | 35                     | 17                  |

Notes:

- <sup>1</sup> Based on levels derived from BS5228-2. Bored piling through stones or other obstruction.
- As stated in the RTA's Environmental Noise Management Manual, it can be assumed that the vibration level is inversely proportional to distance. Field variations show that the distance relationship generally varies between  $d^{-0.8}$  and  $d^{-1.6}$ , rather than  $d^{-1}$ . For prediction of approximate safe working distance for sensitive equipment the mid-value of  $d^{-1.2}$  has been used as a guide.

## Acceptable intermittent vibration does values (m/s<sup>1.75</sup>)

| Location   | Daytime <sup>1</sup> |               | Night-time <sup>1</sup> |               |
|--|----------------------|---------------|-------------------------|---------------|
|  | Preferred Value      | Maximum Value | Preferred Value         | Maximum Value |
| Critical areas <sup>2</sup>                                      | 0.10                 | 0.20          | 0.10                    | 0.02          |
| Residences   | 0.20                 | 0.40          | 0.13                    | 0.26          |
| Offices, schools, educational institutions and places of worship | 0.40                 | 0.80          | 0.40                    | 0.80          |
| Workshops  | 0.80                 | 1.60          | 0.80                    | 1.60          |

Notes:

- 1 Daytime is 7.00am to 10.00pm and night-time is 10.00pm to 7.00am
- 2 Includes operating theatres, precision laboratories and other areas where vibration sensitive activities may occur.

## BS 7385 structural damage criteria

| Group | Type of structure   | Damage level        | Peak component particle velocity <sup>P1</sup> (mm/s) |           |       |
|-------|---|---------------------|---|-----------|-------|
|       |   |                     | 4 – 15 Hz   | 15 – 40Hz | ≥40Hz |
| 1     | Reinforced or framed structures Industrial and heavy commercial buildings               | Cosmetic            | 50  | 50        | 50    |
|       |   | Minor <sup>P2</sup> | 100   | 100       | 100   |
|       |   | Major <sup>P2</sup> | 200   | 200       | 200   |
| 2     | Un-reinforced or light framed structures Residential or light commercial type buildings | Cosmetic            | 15 - 20   | 20 - 50   | 50    |
|       |   | Minor <sup>P2</sup> | 30 - 40   | 40 - 100  | 100   |
|       |   | Major <sup>P2</sup> | 60 - 80   | 80 - 200  | 200   |

Notes:

<sup>P1</sup> - Peak Component Particle Velocity is the maximum Peak particle velocity in any one direction (x, y, z) as measured by a tri-axial vibration transducer.

<sup>P2</sup> - Minor and major damage criteria established based on BS 7385 Part 2 (1993) Section 7.4.2

## Attachment 3

# Mitigation measure definitions

## Standard notification for OOHW

Standard notifications of OOHW will be issued to potentially affected sensitive receivers at least five days, and not more than 14 working days, prior to the OOHW commencing. The notification will include:

- potential work, location and duration
- proposed respite periods
- noise characteristics and likely noise and vibration levels
- likely mitigation and management measures
- the name and contact telephone number of the Contractor's representative to enable potentially affected sensitive receivers to lodge any concerns about extended working hours.

OOHW notifications will be prepared in accordance with the CNVG (Roads and Maritime, 2016).

## Specific notifications

Specific notifications will be provided in the form of letterbox drops (or equivalent) to identified stakeholders no later than seven calendar days ahead of OOHW that are predicted likely to exceed the noise objectives. The specific notification provides additional information when relevant and is informative to more highly affected receivers than what is covered by a standard notification.

## Phone calls

Phone calls to potentially affected sensitive receivers detailing relevant information will be made within five working days of the proposed OOHW. Phone calls provide potentially affected sensitive receivers with personalised contact and tailored advice, with the opportunity to provide comments on the proposed OOHW and specific needs. The responses of sensitive receivers will be addressed to ensure an optimum outcome is achieved regarding mitigation of OOHW impacts. Where the resident cannot be telephoned then an alternative form of engagement will be used.

## Individual briefings

Where required, individual briefings will be used to inform affected sensitive receivers about the impacts of OOHW and mitigation measures that will be implemented. Where required, the Contractor's Community Liaison Representative will visit potentially affected sensitive receivers at least 48 hours ahead of the proposed OOHW. Individual briefings provide potentially affected sensitive receivers with personalised contact and tailored advice. Contact with sensitive receivers will be documented and concerns addressed where feasible and reasonable.

Where there are many sensitive receivers predicted to be above the NML and it is not practical to discuss the proposed OOHW with every resident, or the resident cannot be met with individually, then an alternative form of engagement will be used.

## Respite Offers

Respite Offers will be considered where noise and/or vibration levels are predicted to be moderately or highly intrusive, or exceed maximum vibration levels, respectively, at affected sensitive receivers to provide residents with respite from an ongoing impact. As suggested in the CNVG (Roads and Maritime, 2016), work will be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite will be flexible to accommodate the usage of and amenity at nearby receivers. The purpose is to provide residents with respite from an ongoing impact. This measure will be evaluated on an event-by-event basis, and may not be applicable to all OOHW events.

## Respite Periods

The Contractor will identify appropriate respite periods for the OOHW in consultation with the community at each affected location. Scheduled respite periods determined in consultation with potentially affected sensitive receivers will be implemented to mitigate the impacts of ongoing periods of noise criteria exceedances at nearby receivers. Where reasonable and feasible, proposed OOHW will be coordinated to avoid the same sensitive receiver being affected over consecutive nights and OOHW will be staggered in order to maximise the respite period between OOHW. The Contractor will modify the scheduled construction activities to accommodate respite periods where necessary.

Respite periods will be flexible and determined on a case-by-case basis, taking into account predicted maximum exceedance levels, duration and timing of exceedances, surrounding land uses and community feedback. Indicative respite periods for OOHW, to be discussed during consultation are summarised below.

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### OOHW Period 1

Monday–Friday:

6 pm – 10 pm

Saturday:

7 am - 8 am & 5 pm – 10 pm

Sunday and Public Hol:

8 am – 6 pm

- Construction noise will be limited to no more than three consecutive evenings per week except where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and no more than six evenings per month.

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### OOHW Period 2

Monday– Friday

10 pm – 7 am

Saturday:

10 pm - 8 am

Sunday and Public Hol.

6 pm – 7 am

- Night time construction noise will be limited to two consecutive nights except for where there is a Duration Respite. For night work these periods of work will be separated by not less than one week and six nights per month. Where possible, high noise generating / particularly annoying activities will be completed before 11 pm.

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## Duration Respite

Respite Offers and Respite Periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration activities. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that construction can be completed more quickly.

The Contractor's Community Liaison Representative will engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite. Consultation will be undertaken in accordance with the RP2J CCS.

Where there are few receivers above the NML each of these receivers will be visited to gain support for Duration Respite.

## Utility coordination and respite

As required by CoA E32, all OOH utility works carried out for the project, (including those undertaken by third parties), will be coordinated to ensure respite periods are provided at noise affected locations, in accordance with the additional mitigation measures outlined in Attachment 2 and the CNVG. The Contractor will:

- schedule any works to provide respite to impacted noise sensitive receivers so that respite is achieved
- consider the provision of alternative respite or mitigation to impacted noise sensitive receivers
- provide documentary evidence in support of any decision made by Transport for NSW or its Contractors in relation to respite or mitigation.

All utility work undertaken on behalf of Transport for NSW will be assessed and approved, where appropriate, in accordance with the processes documented in this protocol.

## **Alternative accommodation**

Alternative accommodation options may be offered to residents living in close proximity to construction works who are likely to experience highly intrusive noise levels. Aspects for consideration include whether the highly intrusive activities occur throughout the night or before midnight.

## **Verification**

Verification should include measurement of the background noise level and construction noise (and vibration where considered a risk factor). Monitoring would be undertaken in accordance with Section 7.1 of this protocol and applying the methodology documented in the Transport for NSW CNVG.



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