Planning, Industry & Environment

Mr Scott Lawrence
Environmental Manager
Transport for NSW – Northern Project Office
PO Box 576
Grafton NSW 2460

18/08/2021

Dear Mr Lawrence

Coffs Harbour Bypass (SSI-7666)
Out of Hours Works Protocol

I refer to your submission dated 3 August 2021, of the Out of Hours Works Protocol (the Protocol), Revision 5, dated 3 August 2021 under condition E40 of SSI 7666. I also acknowledge your responses to the Department's review and comments.

The Department has carefully reviewed the document and notes that the Protocol:

- has been reviewed by Transport for NSW and no issues were raised,
- has been reviewed by the Environmental Representative and Acoustic Advisor, and
- contains the information required by the conditions of approval.

As nominee of the Planning Secretary, I approve the Out of Hours Works Protocol (Rev 5, dated 3 August 2021) under condition E40 of SSI 7666. Please ensure that the approved plan is placed on the project website at the earliest convenience.

Please note, if there are any inconsistencies between the approved documents and the conditions of approval, then the requirements of the conditions of approval prevail.

If you wish to discuss the matter further, please contact Lee McCourt at Lee.McCourt@planning.nsw.gov.au.

Yours sincerely

Jake Shackleton
Director – Infrastructure Management

As nominee of the Planning Secretary

Coffs Harbour Bypass

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

Transport for NSW | August 2021

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Coffs Harbour Bypass

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

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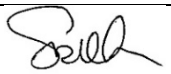
Document controls

File name	
Report name	CHB OOHW Protocol

Approval and authorisation

Prepared by:	Reviewed by:	Reviewed by:	Reviewed by:
Name: M Browne	Name:	Name: Simon Williams	Name:
Signature: M Browne	Signature:	Signature: 	Signature:
TfNSW Environmental Officer	TfNSW Environmental Manger	CHB Environmental Representative	CHB Acoustic Advisor

Revision history

Revision	Date	Description
0	10/02/21	TfNSW review
1	16/02/21	EPA, TfNSW, AA and ER review
2	10/03/21	Issue to DPIE for review and approval
3	29/04/21	Reissue following updates from DPIE review
4	31/05/21	Reissue following updates from DPIE review
5	03/08/21	Reissue following updates from DPIE review

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Attachments

Definitions

Term	Expanded text
AA	The Acoustics Advisor for the CSSI approved by the Planning Secretary
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
CCS	Community Communication Strategy
CHB	Coffs Harbour Bypass (the Project)
CoA	Conditions of Approval (issued for the project by the Department of Planning, Industry and Environment)
Construction *(as defined by CoA Table 1)*	Includes all work required to build the CSSI as described in the documents listed in Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI and site demobilisation, but excluding the following low impact work which is completed prior to approval of the CEMP: a) survey work 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; *b)* investigations including investigative drilling, contamination investigations and excavation*;* c) site establishment work approved under an Ancillary Site Establishment Management Plan; operation of ancillary facilities d) operation of ancillary facilities if the ER has determined the operational activities will have minimal impact on the environment and community; e) minor clearing and relocation of native vegetation (including translocation of threatened species in accordance with a plan required by the conditions of this approval), as identified in the documents listed in Condition A1; f) installation of mitigation measures including erosion and sediment controls, temporary exclusion fencing for sensitive areas and acoustic treatments; g) property acquisition adjustment work including installation of property fencing, and relocation and adjustments of utilities to property including water supply and electricity; h) relocation and connection of utilities where the relocation or connection has a minor impact to the environment as determined by the ER; i) 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)]-[(h)] above to ensure that there is no impact on heritage items; j) archaeological and cultural salvage undertaken in accordance with a strategy or salvage operation required by the conditions of this approval; k) maintenance of existing buildings and structures required to facilitate the carrying out of the CSSI; and l) other activities determined by the ER to have minimal environmental impact which may include but not be limited to construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access. However, where heritage items (excluding those impacted by activities (i) and (j) above), or threatened species (excluding translocation of threatened species in accordance with a translocation plan developed in consultation with EESG) or threatened ecological communities (within the meaning of the *Biodiversity Conservation Act 2016 or Environment Protection and Biodiversity Conservation Act 1999*) are affected or potentially affected by any low impact work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with Heritage NSW, EESG (and DPI Fisheries in the case of impact upon fish, aquatic invertebrates or marine vegetation).

Term	Expanded text
	***Note**: The low impact work described in this definition becomes Construction with the approval of a Construction Environmental Management Plan. Where low impact work has already commenced, this is considered to remain as low impact work and is managed in accordance with the framework under which it commenced.*
CNVG	*Construction Noise and Vibration Guideline* (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)
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 *Interim Construction Noise Guideline* (DECC, 2009)
Highly noise intensive works / particularly annoying	Works which are defined as annoying under the Interim Construction Noise Guideline (DECC, 2009) including: (a) use of power saws, such as used for cutting timber, rail lines, masonry, road pavement or steel work (b) grinding metal, concrete or masonry (c) rock drilling (d) line drilling (e) vibratory rolling (f) bitumen milling or profiling (g) jackhammering, rock hammering or rock breaking (h) impact piling
ICNG	*Interim Construction Noise Guideline* (DECC, 2009)
$LAeq_{(15min)}$	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
$LA_{(max)}$	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 *Interim Construction Noise Guideline* (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

Term	Expanded text
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
SPL	Sound Pressure Level
SWP	Sound Power Level
Sensitive land uses	Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres and passive recreation areas (including outdoor grounds used for teaching). Receivers that may be considered to be sensitive include 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 industrial premises as identified by the Planning Secretary
Works *(as defined by MCoA Table 1)*	All physical activities to construct or facilitate the construction of the CSSI, including environmental management measures and utility works. However, does not include work that informs or enables the detailed design of the CSSI and generates noise that is no more than 5 dB(A) above the rating background level (RBL) at any sensitive land use

1. Introduction

1.1 Purpose and scope

The Coffs Harbour Bypass (the CHB Project) was approved by the Minister for Planning and Public Spaces under Section 5.19 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 2 November 2020, and approved by the Federal Minister for the Environment under EPBC Act conditions 130(1), 133(1) and 134(1A), subject to a number of Conditions of Approval (CoA).

CoA E40 identifies the process for the consideration, management and approval of work which are outside of the standard construction hours defined in CoA E32. Transport for NSW (TfNSW) has identified the potential requirement for OOHW in carrying out low impact preconstruction activities excluded from the construction definition in the Project Approval:

(*a*) *survey work 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;*

(b) investigations including investigative drilling, contamination investigations and excavation;

(c) site establishment work approved under an Ancillary Site Establishment Management Plan;

(d) operation of ancillary facilities if the ER has determined the operational activities will have minimal impact on the environment and community;

(e) minor clearing and relocation of native vegetation (including translocation of threatened species in accordance with a plan required by the conditions of this approval), as identified in the documents listed in Condition A1;

(f) installation of mitigation measures including erosion and sediment controls, temporary exclusion fencing for sensitive areas and acoustic treatments;

(g) property acquisition adjustment work including installation of property fencing, and relocation and adjustments of utilities to property including water supply and electricity;

(h) relocation and connection of utilities where the relocation or connection has a minor impact to the environment as determined by the ER;

(i) 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)]-[(h)] above to ensure that there is no impact on heritage items;

(j) archaeological and cultural salvage undertaken in accordance with a strategy or salvage operation required by the conditions of this approval;

(k) maintenance of existing buildings and structures required to facilitate the carrying out of the CSSI; and

(l) other activities determined by the ER to have minimal environmental impact which may include but not be limited to construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access.

However, where heritage items (excluding those impacted by activities (i) and (j) above), or threatened species (excluding translocation of threatened species in accordance with a translocation plan developed in consultation with EESG) or threatened ecological communities (within the meaning of the Biodiversity Conservation Act 2016 or Environment Protection and Biodiversity Conservation Act 1999) are affected or potentially affected by any low impact work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with Heritage NSW, EESG (and DPI Fisheries in the case of impact upon fish, aquatic invertebrates or marine vegetation).

***Note**: The low impact work described in this definition becomes Construction with the approval of a Construction Environmental Management Plan. Where low impact work has already commenced, this is considered to remain as low impact work and is managed in accordance with the framework under which it commenced.*

TfNSW 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. Tunnelling works and tunnel fit out within an acoustic shed are permitted to be carried out 24 hours a day, seven days a week in accordance with MCoA E33 and are not subject to this protocol.

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
E32	**Construction Hours** Work must only be undertaken during the following construction hours: (a) 7:00 am to 6:00 pm Mondays to Fridays, inclusive; (b) 8:00 am to 1:00 pm Saturdays; and (c) at no time on Sundays or public holidays.	Section 3
E36	**Variation to Works Hours** Notwithstanding Conditions E32 and E38, work may be undertaken outside the hours specified, in the following circumstances: (a) for the delivery of materials required by the NSW Police Force or other authority for safety reasons; or (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 (c) where different construction hours are permitted or required under an EPL in force in respect of the CSSI; or (d) work not subject to an EPL that are approved under an **Out-of-Hours Work Protocol** as required by **Condition E40**; or (e) construction that causes $L_{Aeq(15\ minute)}$ noise levels:	Sections 3, 6 & 7

	(i) no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), or (ii) no more than the 'Noise affected' noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) at other sensitive land uses, or (f) continuous or impulsive vibration values, measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.2 of *Assessing Vibration: a technical guideline* (DEC, 2006), or (g) intermittent vibration values measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of *Assessing Vibration: a technical guideline* (DEC, 2006); or (h) negotiated agreements with directly affected residents and sensitive land uses. ***Note**: Section 5.24(1)(e) of the EP&A Act requires that an EPL be substantially consistent with this approval.*	
E37	**Emergency Works** On becoming aware of the need for emergency work in accordance with **Condition E36 (b)**, the Proponent must notify the **AA**, the **ER,** the Planning Secretary 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 work.	Sections 3 & 6
E38	**Highly Noise Intensive Work** Except as permitted by an EPL, highly noise intensive work that result in an exceedance of the applicable NML at the same receiver must only be undertaken: (a) between the hours of 8:00am to 6:00pm Monday to Friday; (b) between the hours of 8:00am to 1:00pm Saturday; and (c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one (1) hour. For the purposes of this condition, 'continuously' includes any period during which there is less than one (1) hour between ceasing and recommencing any of the work	Section 2
E39	**Out-of-Hours Works – Community Consultation on Respite** In order to undertake work outside hours specified in **Condition E32**, the Proponent must identify appropriate respite periods for the out-of-hours work in consultation with the community at each affected location on a regular basis. This consultation must include (but not be limited to) providing the community with: (a) a schedule of likely out-of-hours work for a period of no less than three (3) months; (b) a description of the potential work, location and duration of the out-of-hours work; (c) the noise characteristics and likely noise levels of the work; and (d) likely mitigation and management measures to be implemented. The outcomes of the community consultation, the identified respite periods and the scheduling of the likely out-of-hour work must be provided to the **ER, AA,** EPA, Council and the Planning Secretary.	Section 4 & 6

	This condition does not apply where works are no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009).	
E40	**Out-of-Hours Work Protocol – Work not subject to an EPL** An **Out-of-Hours Work Protocol** must be prepared to identify a process for the consideration, management and approval of work which are outside the hours defined in **Conditions E32**, and that are not subject to an EPL. The Protocol must be approved by the Planning Secretary before commencement of the work. The Protocol must be prepared in consultation with the **ER**, **AA** and EPA. The Protocol must provide: (a) identification of low and high-risk activities and an approval process that considers the risk of activities, proposed mitigation, management, and coordination, including where: (i) the **ER** and **AA** review all proposed out-of-hours activities and confirm their risk levels, (ii) low risk activities can be approved by the **ER** in consultation with the **AA**, and (iii) high risk activities that are approved by the Planning Secretary; (b) a process for the consideration of out-of-hours work against the relevant noise management level (NML) and vibration criteria; (c) a process for selecting and implementing mitigation measures for residual impacts in consultation with the community at each affected location, including respite periods consistent with the requirements of **Condition E39.** The measures must take into account the predicted noise levels and the likely frequency and duration of the out-of-hours works that sensitive receivers would be exposed to, including the number of noise awakening events; (d) procedures to facilitate the coordination of out-of-hours work including those approved by an EPL or undertaken by a third party, to ensure appropriate respite is provided; and (e) notification arrangements for affected receivers and the EPA for all approved out-of-hours works and notification to the Planning Secretary of approved low risk out-of-hours works. This condition does not apply if the requirements of **Condition E36(e)** are met.	This Protocol
E41	**Noise and Vibration Mitigation** Mitigation measures must be implemented with the aim of achieving the following construction noise management levels and vibration criteria: (a) construction 'Noise affected' noise management levels established using the *Interim Construction Noise Guideline* (DECC, 2009); (b) vibration criteria established using the *Assessing vibration: a technical guideline* (DEC, 2006) (for human exposure); (c) Australian Standard AS 2187.2 - 2006 "*Explosives - Storage and Use - Use of Explosives*"; (d) BS 7385 Part 2-1993 "*Evaluation and measurement for vibration in buildings Part 2*" as they are "applicable to Australian conditions"; and (e) the vibration limits set out in the *German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures* (for structural damage); and	Section 5

	Any work identified as exceeding the noise management levels and/or vibration criteria must be managed in accordance with the **Noise and Vibration CEMP Sub-plan.** ***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 (NML).*	

1.3 Revised Environmental Management Measures

The Revised Environmental Management Measures identified in the EIS Submission Report include the requirement below relating to preparation of an OOHW Protocol.

Table 1.2 – Applicable Revised Environmental Management Measures

REMM	Management Measure
NV06	An Out of Hours Work Procedure will be included as part of the Noise and Vibration Management Plan to manage any variations to the standard construction hours. The procedure will follow the approach in Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) *and the Interim Construction Noise Guideline (DECC 2009b).* The procedure will include, but not be limited to: • Scheduling of noise intensive or high noise impact work to evening periods where feasible • Use of alternative plant and equipment and/or construction techniques to minimise noise • Notification and consultation requirements including preparation of a six- month 'look ahead' program for likely out of hours work • Use of temporary noise barriers • Acoustic sheds will be included around tunnel portals to shield noise from within the tunnel during evening and night periods • Respite periods • Representative noise monitoring • Offers of reasonable and temporary alternative accommodation or an act of good will • Use of negotiated agreements.

2. Overview of 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 by the delegate, note that the AA and ER are to review all completed applications. Figure 2-1 illustrates the step-by-step process from justification to approval.

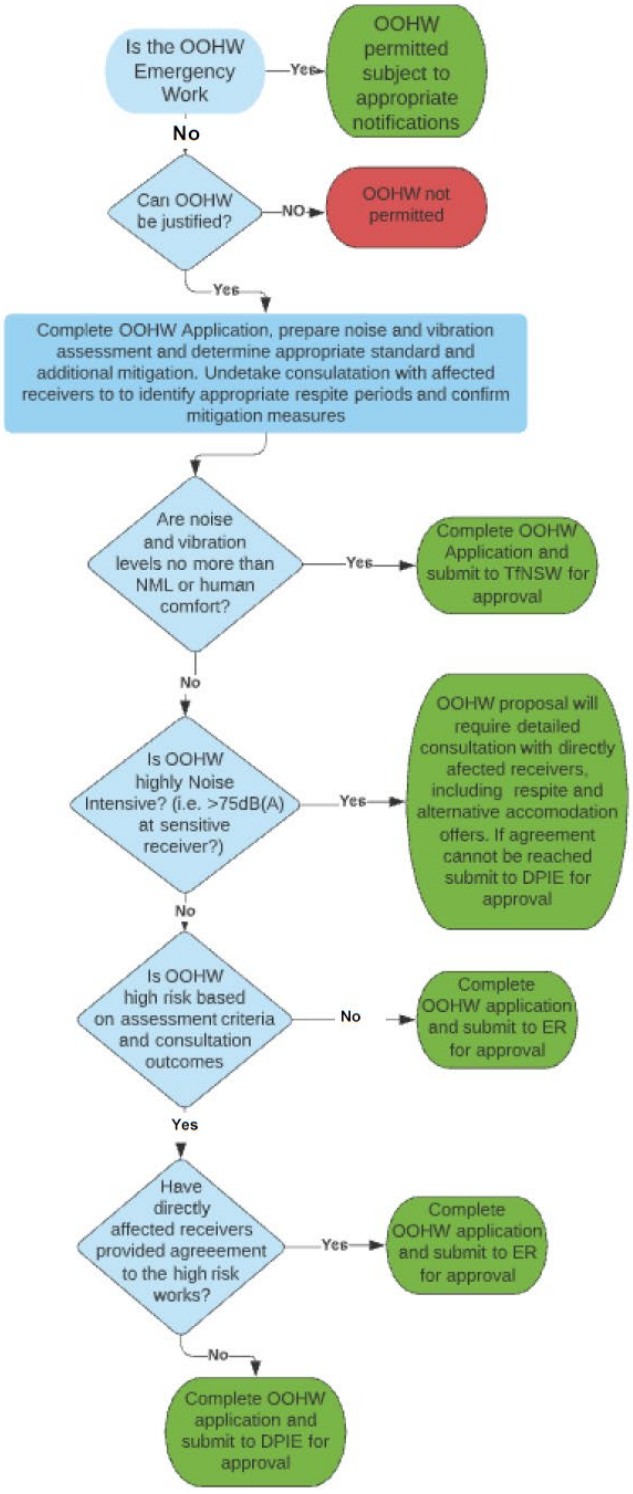

Figure 2.1 OOHW Approval Process Flow Chart

3. Justification for OOHW

3.1 Standard Construction Hours

Delivery of the CHB Project may require some work to be carried out outside of approved standard construction hours. Standard construction hours defined by CoA E32 and not requiring OOHW assessment are:

- 7:00 am to 6:00 pm Mondays to Fridays, inclusive
- 8:00am to 1:00pm Saturdays
- At no time on Sundays or public holidays

All activities carried during standard hours are assessed and managed in accordance with the Construction Noise and Vibration Management Plan. OOHW assessment and approval is required for all construction activities outside of these times within the periods specified below:

OOHW Period 1:
Monday–Friday: 6 pm – 10 pm
Saturday: 7 am - 8 am & 1 pm – 10 pm
Sunday and Public Holidays: 8 am – 6 pm

OOHW Period 2:
Monday– Friday: 10 pm – 7 am
Saturday: 10 pm - 8 am
Sunday and Public Holidays: 6 pm – 7 am

Sections 3.3 and 3.4 provide further information on what constitutes emergency or other work and justified OOHW that can take place with approval.

3.2 Variation to Standard Construction Work Hours

Condition E36 states that notwithstanding Conditions E32 and E38, work may be undertaken outside the hours specified, in the following circumstances:

(a) for the delivery of materials required by the NSW Police Force or other authority for safety reasons; or
(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
(c) where different construction hours are permitted or required under an EPL in force in respect of the CSSI; or
(d) work not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition E40; or
(e) construction that causes $L_{Aeq(15\ minute)}$ noise levels:
  (i) no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), or
  (ii) no more than the 'Noise affected' noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) at other sensitive land uses, or
(f) continuous or impulsive vibration values, measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.2 of *Assessing Vibration: a technical guideline* (DEC, 2006), or
(g) intermittent vibration values measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of *Assessing Vibration: a technical guideline* (DEC, 2006); or

(h) negotiated agreements with directly affected residents and sensitive land uses.

***Note**: Section 5.24(1)(e) of the EP&A Act requires that an EPL be substantially consistent with this approval.*

3.3 Emergency works and Police escorted deliveries

CoA E36 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 E37, on becoming aware of the need for emergency work in accordance with CoA E36 (b) above, the TfNSW Environmental Manager (or delegate) will notify the project ER, AA and the EPA of the reasons for such work. TfNSW must then endeavour to notify all noise and/or vibration affected sensitive receivers of the likely impact and duration of those works.

3.4 Other OOHW requiring justification and approval

Work associated with the CHB Project will be undertaken generally in accordance with the assessment and management approach outlined in the Interim Construction Noise Guideline (ICNG) and within the conditions prescribed 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 work 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 CHB 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 CHB 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
- Technical and/or engineering justification that requires the work to be undertaken outside standard work hours e.g. deck pours, concrete curing requirements, etc.

4. OOHW impact assessment and approval

4.1 Noise and vibration assessment criteria

4.1.1 Adopted guidelines and standards

CoA E41 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 CHB Project include:

(a) construction 'Noise affected' noise management levels established using the *Interim Construction Noise Guideline* (DECC, 2009);

(b) vibration criteria established using the *Assessing vibration: a technical guideline* (DEC, 2006) (for human exposure);

(c) BS 7385 Part 2-1993 "*Evaluation and measurement for vibration in buildings Part 2*" as they are "applicable to Australian conditions";

(d) the vibration limits set out in the *German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures* (for structural damage); and

(e) RMS Construction Noise and Vibration Guideline – Version 1, 2016.

***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 (NML).*

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 Project area and are summarised in Attachment 2. Construction NML criteria for non-residential, commercial and industrial receivers have also been defined. Mitigation measures will be applied with regard to relevant thresholds as described in Section 5.

4.1.3 Vibration criteria

Vibration criteria has been adopted directly from the standards outlined in section 4.1.1 as applicable to Australian conditions, the British Standard BS 7385 Part 2-1993 "*Evaluation and measurement for vibration in buildings Part 2*" forms the basis of vibration assessment criteria for the Project. German Standard DIN 4150-3*: Structural Vibration- effects of vibration on structures* would be considered in assessment of vibration where a heritage listed structure is present in poor condition. An adaptive approach to mitigation will be applied to vibration from OOHW including plant selection, plant substitution and consultation with affected receivers. Vibration criteria adopted for the CHB project are summarised in Attachment 2.

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 for all planned OOHW using an appropriately detailed noise prediction tool (the RMS Construction Noise Estimator is to be used for pre-construction assessments). 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 CHB Project specific NCAs.

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

Quantitative noise assessments conducted 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:

1) Details of the nature and scope of each activity, including details of times, location of works, distance to nearest receivers, duration, vehicles, plant and equipment to be used
2) Justification of the selected construction and work methods, plant and equipment compared to alternatives taking into consideration noise and vibration impacts
3) 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 $L_{Aeq\ (15\ min)}$ noise level, incorporating any 5 dB correction for particularly annoying activities as listed in the ICNG
    - assessment of sleep disturbance against EIS construction noise assessment criteria (refer to Attachment 2)
    - The cumulative impact of other OOHW activities approved under an EPL,CNG separate OOHW application or work undertaken by a third party occurring concurrently need so to be investigated and included in noise assessments to ensure that appropriate respite and mitigation measures are implemented for sensitive receivers.
4) The potential noise impacts for highly noise intensive works described in COA E38 need to be considered in the assessment of OOHW proposals, highly noise intensive works are defined as the following:
    - use of power saws, such as used for cutting timber, rail lines, masonry, road pavement or steel work;
    - grinding metal, concrete or masonry;
    - rock drilling;
    - line drilling;
    - vibratory rolling;
    - bitumen milling or profiling;
    - jackhammering, rock hammering or rock breaking; and
    - impact piling
5) Assessment against MCoA E38 which requires that highly noise intensive works that result in an exceedance of the applicable NML at the same receiver must only be undertaken:

    a) between the hours of 8:00am to 6:00pm Monday to Friday;

    b) between the hours of 8:00am to 1:00pm Saturday; and

    c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one (1) hour.

    (For the purposes of this condition, 'continuously' includes any period during which there is less than one (1) hour between ceasing and recommencing any of the work)

    In assessing the potential impacts of highly noise intensive works as an activity, in addition to the requirements of E38, the highly noise affected NML criteria of 75dB(A) is also applicable. The use of

equipment that generates noise impacts in the highly noise intensive works category in OOH periods should be undertaken in accordance with the following measures:

- the equipment will be used before 10 pm where reasonable and feasible;
- where the above cannot be achieved the equipment will be used before midnight where reasonable and feasible; and;
- The project team do not propose to apply a three hour on and one hour off respite approach to ensure that the use of such equipment is completed as early in the night as possible.

6) Additional consideration is required to assess compliance of the proposed OOHW against MCoA E42, which requires that mitigation measures must be applied when the residential ground-borne noise levels listed below are exceeded: (Mitigation measures detailed in section 5.2 and 5.3 are to be implemented for the corresponding OOHW period and predicted noise level to comply with this condition, as a minimum the standard mitigation measures are to be applied.)

(a) evening (6:00 pm to 10:00 pm) — internal LAeq(15 minute): 40 dB(A); and

(b) night (10:00 pm to 7:00 am) — internal LAeq(15 minute): 35 dB(A).

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 work. The proposed out of hours work activities will be assessed for compliance with safe working distances for:

1) Cosmetic and/or structural impacts (including safe working distances), in accordance with MCoA e44, vibration testing must be conducted before and during vibration generating activities that have the potential to impact on heritage items to identify minimum working distances to prevent cosmetic damage. In the event that the vibration testing and monitoring shows that the preferred values for vibration are likely to be exceeded, the construction methodology must be reviewed, and, if necessary, additional mitigation measures implemented.
2) Human comfort impacts due to vibration. 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 proposal risk classification and approval

4.4.1 Preparation of OOHW Application

All planned works outside of standard construction hours can only proceed 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 CHB Project specific criteria
- Review and endorsement of all OOHW applications by the Project AA, and concurrence on the 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.

4.4.2 Risk classification and approval delegation

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 MCoA E40 (a).
The approval process for OOHW application follow the simplified steps detailed below:

1. The Engineer responsible for the works will prepare and submit an application form detailing the scope, need and justification for the works to the wider project team.
2. The Environmental Team will undertake a noise and vibration assessment for the proposed activity.
3. The completed application form and supporting information is then provided to the ER and AA for review and concurrence on the risk classification and proposed reasonable and feasible mitigation and management measures.
4. Consultation with will be held with the following stakeholders, as appropriate:
    - Potentially affected sensitive receivers
    - Coffs Harbour City Council
    - NSW EPA
5. The complete endorsed and signed application form is then forwarded to the approval delegate based on the risk classification in Table 4.1
6. Management and mitigation measures are to be planned for implementation and monitoring undertaken as required during the activity

The overarching OOHW approval process is also captured in the flow chart in Section 2.

Following assessment of the risk category classification of the proposed OOHW, Justified OOHW applications will be reviewed by the ER and AA to confirm assessment and risk classification, and will then be referred to the approval delegate indicated below in in Table 4-1.

4.4.3 Low risk OOHW activities

The ER has the authority to approve low risk OOHW activities in consultation with the AA, following impact assessment described in Section 4.2 and classification as specified in Table 4.1, in accordance with the one of the following requirements:

1. OOHW assessed to meet the perception classification of Noticeable; OR
2. OOHW assessed to meet the perception classification of Clearly Audible and above at any one residential receiver for a maximum of:
    a. Two consecutive evenings or nights, in a calendar week
    b. Three evenings or nights in a calendar week
    c. A maximum of 10 evenings or nights in a calendar month.

The effect of the above facilitates two nights in a row and at least one period off before the third period that week; OR

3. Where negotiated agreements with directly affected residents and sensitive land uses have agreed to the OOHW and mitigation measures proposed.

4.4.4 High risk OOHW activities

OOHW are considered high risk when the duration limitations outlined above cannot be achieved. In this instance, the OOHW assessment and application for high risk OOHW activities will be issued to the Planning Secretary for review and approval.

Table 4-1: OOHW approval delegation

Approval delegate	OOHW risk category
Transport for NSW Environment Manager or delegate (in consultation with the AA).	Justified OOHW where it is demonstrated that noise is not predicted to exceed the NML at the nearest worst effected receiver
CHB Project ER (in consultation with the AA)	Justified OOHW where it is demonstrated the OOHW is low risk
Planning Secretary	Justified OOHW where it is demonstrated the OOHW is high risk

4.4 Key OOHW application submission timeframes

In order to obtain approval for justified OOHW, a number of submissions might be required. Table 4.2 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. Note that community and affected resident notification and consultation will be completed prior to the OOHW application submission in accordance with the CCS.

Table 4-2: 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 (in consultation with the AA).	7
Low risk	Transport for NSW Environment Manager or delegate (in consultation with the AA).	14
	Environmental Representative in consultation with the AA).	14
High risk	Transport for NSW Environment Manager or delegate (in consultation with the AA).	14
	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
- Switching off plant and machinery when not in use
- 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, resulting in potential sleep disturbance or impacts from longer duration activities, additional mitigation measures will be implemented in consultation with affected sensitive receivers. Table 5-1 outlines the CNVG approach for the application of additional mitigation measures to minimise impacts of OOHW generated air-borne and noise.

Table 5-1: Triggers for Additional Mitigation Measures - Airborne Noise (CNVG Table C-1)

Predicted airborne $L_{Aeq(15min)}$ noise level at receiver			Additional mitigation measures	
Perception	dB(A) above RBL	dB(A) above NML	type[1]:	Mitigation Levels[2]:
All hours				
75dBA or greater			N, V, PC, RO	HA
Standard Hours: Mon - Fri (7am – 6pm), Sat (8am – 1pm), Sun/Pub Hol (Nil)				
Noticeable	5 to 10	0	-	NML
Clearly Audible	10 to 20	< 10	-	NML
Moderately intrusive	20 to 30	10 to 20	N, V	NML+10
Highly intrusive	> 30	> 20	N, V	NML+20
OOHW Period 1: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Pub Hol (8am – 6pm)				
Noticeable	5 to 10	< 5	-	NML
Clearly Audible	10 to 20	5 to 15	N, R1, DR	NML+5
Moderately intrusive	20 to 30	15 to 25	V, N, R1, DR	NML+15
Highly intrusive	> 30	> 25	V, IB, N, R1, DR, PC, SN	NML+25
OOHW Period 2: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Pub Hol (6pm – 7am)				
Noticeable	5 to 10	< 5	N	NML
Clearly Audible	10 to 20	5 to 15	V, N, R2, DR	NML+5
Moderately intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML+15
Highly intrusive	> 30	> 25	AA, V, IB, N, PC, SN, R2, DR	NML+25

Notes (refer to detailed descriptions):

1 AA = Alternative Accommodation
V = Verification
IB = Individual briefings
N = Notification
R2 = Respite Period 2
DR = Duration Respite
R1 = Respite Period 1
PC = Phone calls
SN = Specific notifications
Perception = relates to level above RBL

2 NML = Noise Management Level (see Appendix D)
HA = Highly Affected (> 75 dB(A) - applies to residences only)

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 receivers

Noise generating work in the vicinity of sensitive receivers (including community, religious, educational institutions and noise and vibration-sensitive businesses and medical facilities) 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.

6. Consultation and Notification

6.1 Project stakeholder notification

In accordance with CoA E40(e), The EPA and Planning Secretary are to be notified of all approved OOHW, including low impact works approved by the ER, approved application forms are to be issued to EPA and the Planning Secretary by appropriate means (Via DPIE Submissions Portal and nominated EPA Representative email) and detailed in the monthly AA Project Reports.

6.2 Emergency work notification

On becoming aware of the need for emergency work in accordance with CoA E36 (a) or (b), TfNSW Environmental Manager (or delegate) will notify the project ER, AA and the EPA of the reasons for such work. TfNSW will use best endeavours to notify all noise and/or vibration affected sensitive receivers of the likely impact and duration of those works.

6.3 Community consultation

Prior to carrying out all OOHW, consultation will be held with the following stakeholders, as appropriate:

- Potentially affected sensitive receivers
- TfNSW Project Manager
- TfNSW Environmental Manager (or delegate)
- Coffs Harbour City Council (as applicable).

As required by the CHB Community Communication Strategy (CCS) and CoA E39, consultation with the community at each location affected by OOHW will occur on a regular 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
- Explaining reasons for the work to be done OOH
- Providing proposed respite periods
- Discussing noise characteristics and likely noise and vibration levels
- Discussing likely mitigation and management measures to be implemented

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, AA, EPA, Council and the Planning Secretary by TfNSW with the application.

6.4 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, TfNSW may enter into individual voluntary agreements with potentially affected sensitive receivers. The ER, in consultation with the AA, 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 community consultation (refer 6.3), but also:

- Advise of the level and extent of the potential impact of the proposed OOHW
- Identify any unique measures or requirements agreed to by both parties (e.g. 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 annually and/or revise the agreement where circumstances might have changed.

In these situations, the ER (in consultation with the AA) can only consider an application for OOHW to be categorised as a low risk activity if agreement with directly affected residents and land uses has been reached.

For clarity, directly affected resident and land uses would be predicted to experience noise impacts in the "clearly audible", "moderately intrusive" and "highly intrusive" range as defined in the CNVG, Table C-1 (reproduced as Table 5.1 in Section 5 of this Protocol)

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 CHB Project representative in attendance and an electronic copy retained. Details of identified receiver properties that have been deemed vacant or unoccupied are to be included in the consultation records.

All agreements would be recorded in accordance with the processes outlined in the CHB 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.

6.5 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 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
- 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, including contingency for wet weather, cancellation of works and unforeseen delays
- 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 CHB Project website address.

In accordance with CoA E39, the 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, landowners and occupiers are to 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.

7. Monitoring and auditing

7.1 Monitoring of OOHW

The 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 (as defined in the CVNG, 20 to 30 dB(A) above RBL)
- Attended vibration monitoring at representative sensitive receivers in the first instance of work where vibration generating plant are within safe working distances for cosmetic damage
- 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 CHB Project Complaints Management System (CMS). On receipt of any complaints, an investigation will be undertaken and where feasible and reasonable, changes to the works implemented 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 E36 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, this is to be undertaken in accordance with the requirements of the Construction Noise and Vibration Management Sub Plan.

7.4 Records

Accurate records of all OOHW applications and noise and vibration monitoring undertaken during OOHW will be maintained for the duration of the works.

Attachment 1 - CHB Project OOHW application form

CHB Project OOHW application form

Out of hours work approval request form			
No:	**Notification date:**	**Approval date:**	**Project:**
A. Contact details	**Name**	**Mobile number**	**Email**
TfNSW Environmental Site Representative			
TfNSW Project Manager			
Contractor Project Manager			
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? **(attach support information as required)**		
Select OOHW Category as defined by MCoA E36	Select ☐ ☐	(a) for the delivery of materials required by the NSW Police Force or other authority for safety reasons; or (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

	☐	(c) where different construction hours are permitted or required under an EPL in force in respect of the CSSI; or
	☐	(d) work not subject to an EPL that are approved under an **Out-of-Hours Work Protocol** as required by **Condition E40**; or
	☐ ☐	(e) construction that causes $L_{Aeq(15\ minute)}$ noise levels: (i) no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), or (ii) no more than the 'Noise affected' noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) at other sensitive land uses, or
	☐	(f) continuous or impulsive vibration values, measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.2 of *Assessing Vibration: a technical guideline* (DEC, 2006), or
	☐	(g) intermittent vibration values measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of *Assessing Vibration: a technical guideline* (DEC, 2006); or
	☐	(h) negotiated agreements with directly affected residents and sensitive land uses.
C. Risk assessment		
NML (refer Table 3-2 of OOHW protocol)		
Is the work highly noise intensive? (above 75dB($A_)$ $L_{Aeq\ (15\ minute)}$)	*If yes, the work cannot proceed out of hours unless permitted by an EPL*	

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 E39)?			
Has the outcome of community consultation, the identified respite periods and scheduling of likely OOHW been provided to the ER, AA and Planning Secretary as required?			
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 or third party works been considered during the development of appropriate respite?			
H. Details of non-residential sensitive 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 (CNVG minimum distances for vibration intensive plant) safe working distance for plant) for cosmetic damage?			
Comments:			
I. Review / Endorsements			
Transport for NSW Community Liaison Representative	Community notified		Date:
	Additional consultation requirements:		
	Have the works been reviewed and endorsed?		Yes / No
	Name:	Signature:	Date:
	Comments:		
Transport for NSW Environmental Manager (or delegate)	Agreed mitigation measures:		
	Have the works been reviewed and endorsed? Have the works been approved where neither low nor high risk (predicted to be <NML and below cosmetic damage vibration screening criteria)?		Yes / No Yes / No
	Name:	Signature:	Date:
	Comments:		
Project Acoustic Advisor	Agreed mitigation measures:		
	Have the works been reviewed and endorsed? Have the works been approved where neither low nor high risk (predicted to be <NML and below cosmetic damage vibration screening criteria)?		Yes / No Yes / No
	Name:	Signature:	Date:
	Comments:		
Transport for NSW Project Manager	Have the works been reviewed and endorsed? Have the works been approved where neither low nor high risk (predicted to be <NML and below cosmetic damage vibration screening criteria)?		Yes / No Yes / No
	Name:	Signature:	Date:
	Comments:		

ER approval (low risk activities)	Are the works approved?		Yes / No
	Name:	Signature:	Date:
	Comments:		
Planning Secretary approval (high risk activities)	Are the works approved?		Yes / No
	Name:	Signature:	Date:
	Comments:		

Attachment 2 - Noise and vibration criteria

Noise and vibration criteria

CHB Project specific RBL and NML for residential receivers

Location	Logger ID	RBL, dB(A) (Refer to Section2.2)1			Construction NMLs, $dBL_{Aeq\ 15minute}$					Sleep Disturbance, $dBL_{Amax\ (external)}$	
					Standard Hours		Outside of Standard Hours				
		Daytime	Evening	Night-time	Highly noise affected	Noise affected (RBL + 10 dB)	Noise affected (RBL + 5dB)			Screening criterion RBL + 15	Max
					Standard Hours - Day[3]	Standard Hours – Day[3]	OOSH – Day[4]	OOSH – Evening[5]	OOSH – Night-time[6]		
Residential											
NCA 1	11	58	51	39	75	68	63	56	44	54	65
NCA 2	1	47	45	39	75	57	52	50	44	54	65
NCA 3	1	47	45	39	75	57	52	50	44	54	65
NCA 4	1	47	45	39	75	57	52	50	44	54	65
NCA 5	2	35	32	31	75	45	40	37	36	46	65
NCA 6	2	35	32	31	75	45	40	37	36	46	65
NCA 7	3	35	34	36	75	45	40	39	41	51	65
NCA 8	3	35	34	36	75	45	40	39	41	51	65
NCA 9	20	35	30	30	75	45	40	35	35	45	65
NCA 10	20	35	30	30	75	45	40	35	35	45	65
NCA 11	4	39	32	30	75	49	44	37	35	45	65
NCA 12	5	37	31	30	75	47	42	36	35	45	65
NCA 13	4	39	32	30	75	49	44	37	35	45	65
NCA 14	12	35	30	30	75	45	40	35	35	45	65

Location	Logger ID	RBL, dB(A) (Refer to Section2.2)1			Construction NMLs, $dBL_{Aeq\ 15minute}$					Sleep Disturbance, $dBL_{Amax\ (External)}$	
					Standard Hours		Outside of Standard Hours				
		Daytime	Evening	Night-time	Highly noise affected	Noise affected (RBL + 10 dB)	Noise affected (RBL + 5dB)			Screening criterion RBL + 15	Max
					Standard Hours - Day[3]	Standard Hours – Day[3]	OOSH – Day[4]	OOSH – Evening[5]	OOSH – Night-time[6]		
NCA 15	6	35	30	30	75	45	40	35	35	45	65
NCA 16	16	35	30	30	75	45	40	35	35	45	65
NCA 17	19	35	30	30	75	45	40	35	35	45	65
NCA 18	13-72	35	31	30	75	45	40	36	35	45	65
NCA 19	19	35	30	30	75	45	40	35	35	45	65
NCA 20	13-72	35	31	30	75	45	40	36	35	45	65
NCA 21	8	65	53	38	75	75	70	58	43	53	65
NCA 22	8	65	53	38	75	75	70	58	43	53	65
NCA 23	18	43	38	34	75	53	48	43	39	49	65
NCA 24	9	48	40	34	75	58	53	45	39	49	65
NCA 25	9	48	40	34	75	58	53	45	39	49	65
NCA 26	15	52	46	37	75	62	57	51	42	52	65
NCA 27	14	56	47	38	75	66	61	52	43	53	65
NCA 28	10	60	50	42	75	70	65	55	47	57	65
NCA29	14	56	47	38	75	66	61	52	43	53	65
Commercial	-	Use hours			-	70				-	-
Educational	-	Use hours			-	55				-	-

Hospital	-	Use hours	-	45	-	-
Place of worship	-	Use hours	-	55	-	-
Child care facilities	-	Use hours	-	45	-	-

Note 1: The RBLs have been adjusted in accordance with the NPI definition of minimum RBLs (daytime – 35 dB(A), Evening – 30 dB(A), Night-time – 30 dB(A)) Note 2: Minimum of monitoring location 7 and 13
Note 3 - 07:00-18:00 Monday to Friday, 08:00-13:00 Saturday
Note 4 - Outside Standard hours – Day 13:00-18:00 Saturday, 08:00-18:00
Sunday Note 5 - Outside Standard hours – Evening: 18:00-22:00 Monday to
Sunday
Note 6 - Outside Standard hours – Night: 22:00-07:00 Monday to Saturday and 22:00-08:00 Sundays & Public Holidays

CNVG recommended minimum working distances for vibration intensive plant

Plant Item	Rating/Description	Safe Working Distance	
		Cosmetic Damage (BS 7385)	Human Response (NSW EPA Vibration Guideline)
Vibratory Roller	< 50 kN (Typically 1-2t)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4t)	6 m	20 m
	< 200 kN (Typically 4-6t)	12 m	40 m
	< 300 kN (Typically 7-13t)	15 m	100 m
	> 300 kN (Typically 13-18t)	20 m	100 m
	> 300 kN (Typically > 18t)	25 m	100 m
Small Hydraulic Hammer	300 kg - 5 to 12t excavator	2 m	7 m
Medium Hydraulic Hammer	900 kg - 12 to 18t excavator	7 m	23 m
Large Hydraulic Hammer	1600 kg - 18 to 34t excavator	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	4 m
Jackhammer	Hand held	1 m (nominal)	2 m

German Standard DIN 4150-3*: Structural Vibration- effects of vibration on structures* (to be considered in assessment of vibration where a heritage listed structure is present in poor condition). Estimated safe working distances (m)

Activity	Structural damage	
	Heritage structure DIN 4150-3 criteria (3.0 mm/s)	Standard dwellings DIN 4150-3 criteria (5.0 mm/s)
Roller	24	13
15 tonne vibratory roller	35	18
Loader breaking kerbs	30	16
7 tonne compactor	24	13
Pavement Breaker	24	13
Dozer	15	8
Backhoe	3	2
Jackhammer	2	1
Excavator	7	4
Piling (bored/CFA)	35	17

Notes:

1 *Based on levels derived from BS5228-2. Bored piling through stones or other obstruction.*

2 *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$^{1.75}$)

Location	Daytime[1]		Night-time[1]	
	Preferred Value	Maximum Value	Preferred Value	Maximum Value
Critical areas[2]	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[P1] (mm/s)		
			4 – 15 Hz	15 – 40Hz	≥40Hz
1	Reinforced or framed structures Industrial and heavy commercial buildings	Cosmetic	50	50	50
		Minor[P2]	100	100	100
		Major[P2]	200	200	200
2	Un-reinforced or light framed structures Residential or light commercial type buildings	Cosmetic	15 - 20	20 - 50	50
		Minor[P2]	30 - 40	40 - 100	100
		Major[P2]	60 - 80	80 - 200	200

Notes:

[P1] - 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.

[P2] - Minor and major damage criteria established based on BS 7385 Part 2 (1993) Section 7.4.2

Attachment 3 - Mitigation measure definitions

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 Community Liaison Representative'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).

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)

Specific notifications

Specific notifications will be provided in the form of letterbox drops (or equivalent) to identified stakeholders no later than five 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 and no less than 48 hours prior to 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 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

Transport for NSW 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. Modifications to 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.

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.
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.

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 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 CHB CCS.

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

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 undertake in accordance with Section 7.1 of this protocol and applying the methodology documented in the Transport for NSW CNVG.