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CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

Moorebank Precinct East Stage 2 -SSD 7628



Moorebank Intermodal Precinct – Precinct East Stage 2

SSD 7628

Construction Noise and Vibration Management Plan

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003	02/03/2018	Additional ER comments addressed
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		 RfMA 02A - Additional construction compounds to support warehouse construction
		 RfMA 07 – Update to compliance and non-compliance definitions and inclusion of cumulative impacts required by EPBC CoA (2011/6029)
010		 RfMA 008 – MAUW construction compound
010	20/10/19	RfMA 011 – OOHW Protocol
		 RfMA 012 – Additional temporary construction access points
		RfMA 014 – Suitable spoil importation
		RfMA 015 – Moorebank Precinct EPL
		 RfMA 019 – Clarification of definitions for Early Works and Construction Phase A activities
		 RfMA 021 – New parking area

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	Revision	Date	Description
			 RfMA 024 – MPW EPBC (2011/6086) and MPE EPBC (2011/9229) approval requirements for DotEE review and approval
_	011	21/11/19	Update to address ER comments, removal of Construction Phase A updates associated with RfMA 019 and minor updates associated with RfMA 016 – Temporary access time extension.
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_	016	19/03/2021	 Updates associated with: RfMA-039 – Corrections and update to Extended Hours Works Plan, and revision to construction program RfMA-040 – Additional compound for light vehicle parking and break facilities SSD 7268 – MOD3 SSD 7628 – MOD4
_	017	11/07/2022	Updates associated with: • SSD 7628 – MOD1 • WH 6&7 amended layout
_	018	04/12/2024	 Updates associated with: SSD 7628 MOD5 RfMA-043 – Early works for MARW on MPE S2 Site

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Revision	Date	Description		Prepared by	Approved by
		Administrative updates to a development status	reflect		

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Acronyms and Definitions

Acronym / Term	Meaning
Assessment period	The period in a day over which assessments are made
Background noise	Background noise is the term used to describe the underlying noise level present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level metre and is measured statistically as the A-weighted noise level exceeded for 90% of a sample period. This is represented as the L90 noise level (see below).
CEMP	Construction Environmental Management Plan
СММ	Commonwealth Mitigation Measures
CNVIS	Construction Noise and Vibration Impact Statement
CNVMP	Construction Noise and Vibration Management Plan
CoC	Conditions of Consent
Contractor	Principal Contractor
Contractor's EM	Contractor's Environmental Manager
СТАМР	Construction Traffic, and Access Management Plan
dBA	A-weighted decibels. The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the 'A' filter. A sound level measured with this filter switched on is denoted as dBA. Practically all noise is measured using the A filter.
DECC	Department of Environment and Climate Change (now EPA (see below))
DM (Communication)	Development Manager (Communication)
Development, the	Stage 2 of the MPE Concept Approval (MP 10_0193) approved as the MPE Stage 2 Development (SSD 7628) as consolidated. It involves the construction and operation of warehousing and distribution facilities on the MPE Site and upgrades to approximately 1.5 kilometres of Moorebank Avenue.
DNSDC	Defence National Storage and Distribution Centre
DP&E	Department of Planning and Environment (now DPIE)
DPHI	Department of Planning Housing and Infrastructure (formerly DPIE)
EHW	Extended Hours Works. EHW for the project are available through the development of an EHW Plan (Appendix B). The EHW are defined in CoC B69 as:



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Acronym / Term	Meaning
	• Early Works and Construction (not including high noise impact, piling, spoil placement, rock breaking, concrete batching) and relate to the following hours:
	 6am to 7am, Monday – Friday
	 6pm to 10pm, Monday – Friday
	 1pm to 5pm, Saturday
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ER	Environmental Representative
ESR	the Developer
FCMM	Final Compilation of Mitigation Measures
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz (Hz).
ICNG	NSW Department of Environment and Climate Change – NSW Interim Construction Noise Guideline, July 2009.
INP	NSW Environment Protection Agency, Industrial Noise Policy, 2000
Intermittent	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
LA90	Background Noise Level. The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
LAeq	Equivalent Continuous Sound Level. The 'equivalent noise level' is the summation of noise events and integrated over a selected period of time.
LAeq,15min	Equivalent Continuous Sound Level, over a period of 15 minutes
LP or SPL	Sound Pressure Level
LW or SWL	Sound Power Level
MARW	Moorebank Avenue Realignment Works
MAUW	Moorebank Avenue Upgrade Works



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Acronym / Term	Meaning
Minister, the	NSW Minister for Planning
mm/s	Millimetres per second
Moorebank Precinct	Refers to the whole Moorebank intermodal precinct, i.e. the MPE Site and the MPW site.
MPE	Moorebank Precinct East
MPW	Moorebank Precinct West
NCA	Noise Catchment Area
NML	Noise Management Level
Non-compliance	An occurrence, set of circumstances, or development that results in a non- compliance or is non-compliant with Development Consent SSD 7628 Conditions of Consent or EPBC Act Approval (EPBC 2011/6229) Conditions of Approval but is not an incident
Non-conformance	Observations or actions that are not in strict accordance with the CEMP and the aspect specific sub-plan
NSW Vibration Guideline, the	NSW Department of Environment and Conservation – NSW Environmental Noise Management – Assessing Vibration: a Technical Guideline (the NSW Vibration Guideline), February 2006.
NVIA	Noise and Vibration Impact Assessment
OOHW	Out of Hours Works. Works that are not captured within standard construction hours or approved under the EHW Plan.
Project site / Project footprint	The subject of the MPE Stage 2 EIS, the part of the MPE Site which includes all areas to be disturbed by the Project (including the operational area and construction area).
RBL	Rating Background Level, is the overall single figure background noise level representing each assessment period – day, evening and night – over the whole monitoring period. The RBL is determined by taking the median of the assessment background levels (ABLs) for each day, evening and night period (see ABL for definition), as set out in EPA policies.
RNP	NSW Department of Environment, Climate Change and Water – NSW Road Noise Policy, March 2011.
RSoC	Revised Statement of Commitments
SSD	State significant development
Suitably qualified/ experienced person	A person who has formal qualifications and/or relevant experience and competency to perform a particular task.
VDV	Vibration Dose Value (in m/s1.75)



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1. Background

Approval for the construction and operation of Stage 2 of the Moorebank Precinct East (MPE) Development, operated by ESR Australia & NZ (formerly LOGOS), which comprises the second stage of development under the MPE Concept Approval (MP10_0193) was received 31 January 2018 (State significant development (SSD) 7628)), as consolidated.

This Construction Noise and Vibration Management Plan (CNVMP) has been developed to manage noise and vibration impacts during the construction phase of Stage 2 of the Moorebank Precinct East (MPE) Development (hereafter, 'the Development').

Within this plan, a strategy has been established to demonstrate the construction contractor's approach to the management of noise and vibration impacts. This CNVMP addresses the relevant requirements of the Development approvals, including the Environmental Impact Statement (EIS), Response to Submissions (RtS) and Minister's Conditions of Consent (CoCs), and all applicable guidelines and standards specific to the management of noise and vibration during construction phases of the Development.

1.1. Development Ownership

In 2022, LOGOS joined the ESR group of companies and since August 2024, the LOGOS and ESR operations have been integrated to now operate under the name ESR Australia & NZ (ESR). The applicant/ approval holder entity remains unchanged at this stage until further notice and references to LOGOS and LOGOS authored documents and/or plans may continue and remains relevant where LOGOS and ESR are used interchangeably.

1.2. Introduction

The MPE Site, including the Development site, is located approximately 27km south-west of the Sydney Central Business District and approximately 26km west of Port Botany and includes the former Defence National Storage and Distribution Centre site. The MPE Site is situated within the Liverpool Local Government Area, in Sydney's south-west subregion, approximately 2.5km from the Liverpool City Centre.

The Development involves the development of an intermodal facility including warehouse and distribution facilities, freight village (ancillary site and operational services), stormwater, landscaping, servicing and associated works on the eastern side of Moorebank Avenue, Moorebank.

Key components of the Development include:

- Earthworks including the importation of 600,000m³ of fill and vegetation clearing
- Importation, stockpiling and placement of up to 250,000m³ of suitable spoil (separate to the 600,000m³ of imported clean general fill permitted for bulk earthworks)
- Approximately 300,000m² gross floor area of warehousing and ancillary offices
- Freight village, 8,000m² gross floor area of ancillary retail, commercial and light industrial land uses
- Warehouse fit-out
- Internal road network and hardstand across the site
- Ancillary supporting infrastructure within the site, including:



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- Stormwater, drainage and flooding infrastructure
- Utilities relocation/installation
- Fencing, signage, lighting, remediation, and landscaping
- An upgrade to Moorebank Avenue comprising the following key components:
 - Raising by about two metres and some widening
 - Embankments and tie-ins to existing Moorebank Avenue road levels
 - Signalling and intersection works
- Upgrading existing intersections along Moorebank Avenue, including:
 - Moorebank Avenue / MPE Stage 2 access
 - Moorebank Avenue / MPE Stage 1 northern access
 - Moorebank Avenue / MPE Stage 2 central access
 - Moorebank Precinct West (MPW) Southern Access/MPE Stage 2 southern emergency access.

The location of the Development site is shown in Figure 1-1.

Moorebank Avenue Realignment Works (MARW) was approved by the NSW Minister for Planning on 14 October 2021 as State Significant Infrastructure (SSI-10053) (Infrastructure Approval) under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act). It is also a controlled action under Section 130(1) and 133(1) of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and was approved by the Minister for the Environment on 7 December 2021 (EPBC Approval 2020-8839).

The footprint of MARW, which generally runs along the northern and eastern boundary of the MPE Site, interfaces and encroaches on the MPE Site. In order to allow for progression of construction works for MARW (in particular, the northern carriageway), some early preparatory works are required that are located within the MPE Site (where the project boundaries overlap). These works are undertaken under the MPE CEMP, with the MARW CEMP not being relevant to these works.



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Construction Flood Emergency Management Plan



Figure 1-1 Site Location



1.3. Development Consent

The Development was assessed by the Department of Planning and Environment (DP&E) under Part 4.1 (now Division 4.7 as of 1 March 2018) of the EP&A Act as State significant development (SSD). The Planning Assessment Commission (PAC) granted Approval for the MPE Stage 2 Project on 31 January 2018 and is subject to the Minister's CoCs (SSD 7628) as consolidated. The Development, including its potential impacts, consultation and proposed mitigation and management, is documented in the following suite of documents:

- SSD consent SSD 7628, as consolidated
- SSD partial consent (subdivision) SSD 7628, as consolidated
- Moorebank Precinct East Stage 2 Environmental Impact Statement (Arcadis Australia Pacific Pty Limited, December 2016)
- Moorebank Precinct East Stage 2 Response to Submissions (Arcadis Australia Pacific Pty Limited, July 2017)
- Consolidated assessment clarification responses issued on 10 November 2017. Consultation.

1.4. Development Delivery Phase

The Development construction period is anticipated to be up to five years, which is generally divided into three works phases.

The terminology for the Development phases was developed from the EIS and RtS documentation in response to the requirements of the CoCs and the need to stage the delivery of the environmental management documentation required by the CoC. Current terminology, and the equivalent terminology from the CoC and RtS are included in Table 1-1.

Development Delivery Phase	CoC A18 Phase Equivalent	MPE Stage 2 RtS Works Period Equivalent
Farly Works	Early works	Works Period A: Pre-construction
Early Works	Fill importation (to 60,000m ³)	Works Period B: Site preparation
	Fill importation	Works Period B: Site preparation
	Construction	Works Period E: Bulk earthworks, drainage and utilities
Construction Phase A		Works Period F: Construction and internal fit out of warehousing
		Works Period G: Miscellaneous construction works
	Fill importation	Works Period C: Construction of Moorebank
Construction Phase B	Construction	Avenue Diversion Road
		Works Period D: Pavement and intersection works along Moorebank Avenue

Table 1-1 Development Delivery Phase Terminology



Development Delivery CoC A18 Phase Equivalent MPE Stage 2 RtS Works Period Equivalent Phase

Works Period E: Bulk earthworks, drainage and utilities

Additional detail of the Development delivery phases is included in the CEMP.

1.4.1. Construction Hours

Construction hours are divided into three scenarios:

- 1. Standard construction hours
- 2. Extended Hours Works (EHW)
- 3. Out of Hours Works (OOHW).

The standard construction hours for the Development (subject to different hours being permitted or required under an Environment Protection Licence (EPL)) are defined by CoC B65 as:

- 7am to 6pm, Monday Friday
- 7am to 1pm, Saturday

EHW for the Development is available through the development of an EHW Plan (Appendix A). The EHW are defined in CoC B69 as:

- Early Works and Construction (not including high noise impact, piling, spoil placement, rock breaking, concrete batching) and relate to the following hours:
 - 6am to 7am, Monday Friday
 - 6pm to 10pm, Monday Friday
 - 1pm to 5pm, Saturday.

Works that are not captured within standard construction hours or approved under the EHW Plan may be undertaken through the Out of Hours Work Protocol (Appendix A) developed in accordance with CoC B67.



Table 1-2 Depiction of Construction Hours

Day/ Time	12 am-1 am	1 am-2 am	2 am-3 am	3 am-4 am	4 am-5 am	5 am-6 am	6 am-7 am	7 am-8 am	8 am-9 am	9 am-10 am	10am-11am	11am-12pm	12 pm-1 pm	1 pm-2 pm	2 pm-3 pm	3 pm-4 pm	4 pm-5 pm	5 pm-6 pm	6 pm-7 pm	7 pm-8 pm	8 pm-9 pm	9 pm-10 pm	10pm-11pm	11pm-12am
Mon																								
Tue																								
Wed																								
Thur																								
Fri																								
Sat																								
Sun or Public Holiday																								

Note: Red – OOHW, Yellow – EHW, Green – Standard construction hours.

The OOH work (OOHW) construction period is divided further into the periods detailed in Table 1-3. Additional OOHW periods may be determined during the construction process, however any works will be subject to the OOHW Protocol.

Table 1-3 OOHW Periods

OOHW Period	Time	Day
OOH Period 1	6.00am – 7.00am	Monday- Friday*
OOH Period 2	6.00pm – 10.00pm	Monday- Friday**
OOH Period 3	7.00am – 8.00am	Saturday
OOH Period 4	1.00pm – 5.00pm	Saturday***

*Referred to as EHW Period 1

** Referred to as EHW Period 2

*** Referred to as EHW Period 3

1.5. Purpose and Application

This CNVMP has been developed to address the CoCs and the FCMM's and is based on the noise and vibration impact assessment presented in the EIS, prepared by Wilkinson Murray (WM Report No. 12186-S2 Version C, dated November 2016). This plan details how noise and vibration impacts are to be managed during construction of the Development.

This plan provides methods to measure and reduce the noise and vibration impacts by the contractor during construction activities, including all contractor and consultant partners.

The specific requirements of the CoCs for compilation of the CNVMP, as specified in the CoCs and FCMMs, are specified in Section 2.1.2 of this plan.

The most recent, approved version of this plan is to be implemented to manage the Development activities.



1.6. Objectives and Targets

Table 1-4 outlines the objectives and targets for the Development for the management of noise and vibration impacts during construction.

Table 1-4 Objectives and Targets

Objective	Target	Timeframe	Accountability
Reduce the risk of construction noise and vibration impacts on community, commercial stakeholders and structures are minimised	100% compliance with approved hours of work. No exceedances of noise or vibration criteria. No structural or cosmetic damage to nearby buildings or structures due to vibration relating to works.	Duration of Early Works and Construction	Contractor's CM
No non-compliance with relevant CoCs, applicable legislative and other requirements	No written warnings or infringement notices	Duration of Early Works and Construction	Environmental Manager (Contractor's EM)
Reasonable and feasible mitigation measures are implemented to manage impacts on surrounding residents and commercial stakeholders	No exceedances of noise or vibration criteria	Duration of Early Works and Construction	Environmental Manager (Contractor's EM)
Affected residents and other stakeholders are kept informed of upcoming works, extended hours, out of hours works (if required) and mitigation measures	Website updated, and information distributed to nominated areas	Duration of Early Works and Construction	Contractor's Community Liaison Manager (DM Communication)
Avoid the exceedance of construction phase noise goals/criteria	Zero incidents of noise goal/criteria being exceeded during the construction phase	Construction	Contractor's CM
Avoid the exceedance of construction phase vibration goals/criteria	Zero incidents of vibration goals/criteria being exceeded during the construction phase	Construction	Contractor's CM



1.7. Consultation

This CNVMP was prepared in consultation with the NSW EPA as outlined in Table 1-5. Supplementary information to support the consultation undertaken is included in Table 1-5.

Table 1-5 Consultation Summary

Agency	Date	Person Contacted	Comment	Status
	First contacted 5 March 2018	EPA Representative	Request for consultation	Closed
NSW EPA	12 March 2018	SIMTA	EPA contacted SIMTA stating that they will not provide comment on the CNVMP.	Closed
	19 March 2018	EPA Representative	EPA contacted to confirm that they will not be providing further comment	Closed



2. Environmental Management

2.1. Legal and Other Obligations

Table 2-1 details the legislation, planning instruments and guidelines considered during development of this strategy.

Table 2-1 Legislation, Policy, Standards and Guidelines

Legislation	Description	Relevance to this CNVMP
Environmental Planning and Assessment Act 1979	Establishes a system of environmental planning and assessment of development proposals for the State	The CoC and associated obligations are incorporated into this plan
Protection of the Environment Operations Act 1997	Aims to achieve the protection, restoration and enhancement of the quality of the NSW environment	All plant to be operated in a proper and efficient manner such that noise is minimised during construction.
Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change 2009	Current NSW guideline for the assessment and management of construction noise.	Noise management levels (NMLs) have been established in accordance with this guideline.
NSW Road Noise Policy (RNP), Department of Environment, Climate Change and Water 2011	Defines criteria to be used in assessing the impact of road traffic noise.	Assists the establishment of criteria for construction-related road traffic noise.
Assessing Vibration – a technical guideline (AVTG), Department of Environment and Conservation 2006	Based on BS6472–1992, Evaluation of human exposure to vibration in buildings. Presents	Used for the assessment of vibration (disturbance to building occupants).
	preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques	CoC B72(b) requires the vibration criteria to be met.
Australian Standard AS/NZS 2107:2000 Acoustics – Recommended design sound levels and reverberation times for building interiors	Recommends design criteria for conditions affecting the acoustic environment within occupied spaces.	Supporting technical standard.
Australian Standard AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites	Provides guidance for noise control on construction, maintenance and demolition sites.	Supporting technical standard.
German Standard DIN4150-2016 Structural vibration Part 3: Effects of vibration on structures	Used for the assessment of vibration (structural damage to buried services)	Supporting technical standard. CoC B72(c) requires the vibration limits to be observed.



Legislation	Description	Relevance to this CNVMP
NSW Industrial Noise Policy (INP), Environment Protection Agency 2000	Directed towards industry, acoustic practitioners and consent authorities that require a degree of technical detail to assess impacts properly and develop mitigation methods	Supporting technical standard CoC B62 requires use in developing RBLs for closest sensitive receivers

2.1.1. Requirements of the ICNG

The aim of the ICNG is to provide guidance on managing construction works to minimise noise, with an emphasis on communication and cooperation with all involved in, or affected by, construction noise.

The ICNG states there is no single approach to minimise noise from all types of construction. The level of effort and sophistication needed to assess impacts and identify ways to minimise noise will be guided by factors such as the duration of works and the extent of the noise. Noise levels that meet Noise Management Levels, short-term works or low noise level works will be typically easier to assess and manage.

Section 1.5 of the ICNG identifies the key steps for managing noise impacts from construction. These steps are outlined in Table 2-2 with references to where in this CNVMP the requirements have been addressed.

Table 2-2 ICNG Key Requirements

Requirement	Reference	How Addressed
Identify sensitive land uses that may be affected.	Section 3.1.1	Residential and non-residential receivers most potentially affected by noise from the construction of the Development have been specified.
Identify hours for the proposed construction works.	Section 1.4.1	A number of periods have been specified where construction works are proposed for the Development.
	Section 3.1.2	Background noise levels established at residential receivers for the Development of NML.
Identify noise impacts at sensitive land uses.	Section 3.2.1	NML established for residential and non- residential land use.
	Section 3.3.3	Construction plant items and noise levels established for a number of scenarios. Noise levels at sensitive receivers predicted and compared to NML.
Select and apply the best work practices to minimise noise impacts.	Section 3.5	Management measures have been specified and developed in consideration of the ICNG, Development Consent and Final Compilation of Mitigation Measures from the RtS.



2.1.2. Development Consent Compliance Matrices

Development consent compliance matrices are included in Appendix E.

2.2. Roles and Responsibilities

Relevant roles and responsibilities associated with this CNVMP are presented in Table 2-3.

Table 2-3 Roles and Responsibilities

Role	Responsibilities
	Include environmental consideration into all aspects of Project planning
	Communicate Project responsibilities and authorities
	 Attend audit meetings and action results of any audit findings
	Allocate Project resources to handle environmental issues
	Oversee the implementation and maintenance of the CNVMP
	 Appoint / nominate and provide support for the Contractor's Environmental Manager (Contractor's EM)
	 Report to senior management and the Principal's Representative on the performance of the system and environmental breaches
Contractor's Works package	Take action to resolve environmental non-conformances and incidents
Manager	 Sign off on all environment and sustainability inspections
(Contractor's WM)	Enforce environmental requirements for suppliers and sub-contractors
,	Report environmental incidents to the Principal's Representative
	 Authorise expenditure to implement environmental management requirements within limits of authority as defined in the Principal's Representatives Project requirements
	Undertake ICAM investigations
	Review audit corrective actions and take action as necessary to close out issues
	Be contactable 24 hours a day
	 Direct works to be performed in a more environmental responsible manner that reduces impacts or stop works if there is a risk of environmental harm
	 Communicate with all personnel and sub-contractors regarding compliance and non-conformance with the CEMP and site specific environmental issues / EWMS
	 Identify resources required for implementation of the CEMP
Contractor's	Allocate sufficient resources for the implementation of this CNVMP
Construction	Organise and manage site plant, labour and temporary materials
Manager (Contractor's CM)	 Coordinate the implementation and maintenance of site environmental controls and provide support for the Contractor's EM
	• Report all environmental incidents in accordance with the incident reporting protocol
	Undertake ICAM investigations
	 Take action to resolve non-conformances and incidents

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Role	Responsibilities
	Be contactable 24 hours a day
	 Direct works to be performed in a more environmentally responsible manner that reduces impacts or stop works if there is a risk of environmental harm
	Oversee the overall implementation of this CNVMP
	 Consider and advise senior management on compliance and conformance obligations
	 Evaluate the outcomes of compliance monitoring / incident reporting as part of ongoing management of construction activities
	 Inspect and confirm all reasonable and practical noise and vibration mitigation measures are implemented
	• Where standard mitigation measures are deemed insufficient, undertake reasonable steps to manage adverse impacts and implement all additional measures
	Authorise cessation of construction activities on-site if exceedances are identified
	 Maintain on-site all construction activity records / monitoring records/ incident reports
Contractor's Environmental Manager (Contractor's	 Assist with audits of construction site activity records / monitoring records/ incident reports undertaken as needed, findings to be shared with relevant site personnel and corrective actions are implemented
EM)	 To assist relevant personnel with understand of the relevant requirements, provide them with the most up-to-date copy of this CNVMP
	 Inspect site to confirm that all reasonable and practical requirements of this CNVMP are effectively implemented
	 Make relevant personnel aware of required actions arising from incident investigation processes during compliance construction monitoring for further action and implementation
	Coordinate the implementation of monitoring requirements and corrective actions
	 Engage experienced, trained or qualified personnel to conduct the noise (or vibration) monitoring
	 Acts as a primary site contact for any valid complaints received via the DM Communication
	Authorise all monitoring reports
	Oversee the implementation of this CNVMP
	Oversee that works are undertaken during permitted hours
Site Supervisors	 Inspect to confirm that all reasonable and practical noise and vibration mitigation measures are implemented
	Where standard mitigation measures are deemed insufficient, undertake reasonable steps to manage adverse impacts and implement all additional measures

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Role	Responsibilities
	Implement the Community Consultation Strategy
Development	Assist the Contractor's EM in consulting regulatory agencies and community
Manager (Communication)	 Communicate potential environmental impacts to the community and all stakeholders
Communication)	Manage the resolution of environmental complaints
	• Act as a 24-hour contact (if other staff as outlined above are not available).
Construction contractors /	 Understand and implement mitigation as required in the CNVMP and any additional required measures identified during construction
sub-contractors / site personnel	 Participate (or conduct if authorised) relevant training to implement the requirements of this CNVMP
Noise and	Undertake relevant training to implement the requirements of this CNVMP
Vibration Monitoring	 Undertake all monitoring activities in accordance with this CNVMP
Personnel	Regularly maintain monitoring equipment
(contractors)	• Effectively implement all relevant monitoring quality control / assurance procedures

2.3. Training

All site personnel, contractors and sub-contractors are to undergo site specific induction training, which is to include noise and vibration management training developed with an emphasis on understanding and managing noise impacts from the work activities being undertaken.

This site-specific induction training is to include:

- The location of potentially sensitive receptors
- Relevant noise and vibration mitigation measures, including noise screens and temporary barriers where feasible
- Site hours of operation i.e. the permissible hours of work, including deliveries
- A summary of relevant licence and approval conditions
- Any limitations on high noise generating activities
- Construction employee parking areas
- Designated loading/unloading areas and procedures
- Emphasis that there should be no swearing, shouting or loud stereos/radios on site
- Details of the complaints handling procedure
- Details of the environmental incident procedures
- · Limiting the clustering of noisy plant / processes
- Communication, including a notification process to inform residents of respite times



- Non-conformance, preventative and corrective action procedures
- Outline the consequences of not complying with these measures.

Toolbox meetings are to be undertaken as required covering specific environmental issues and are to include noise and vibration control measures where required, including but not limited to:

- Verifying work occurs within approved construction hours
- Locating noisy equipment away from sensitive receptors
- Verifying plant and equipment is well maintained and not making excessive noise
- Operating vehicles to minimise noise and vibration impacts, i.e. use of designated haulage routes, use of non-tonal reversing beepers, turning off plant, equipment and vehicles when not in use.

Toolbox training on noise and vibration management requirements and measures are to be completed by the Contractor's EM (or nominated authority) during the Development.

Personnel directly involved in implementing noise and vibration control measures on site are to be given specific training in the various measures to be implemented. Records of all training is to be filed in the Development document control system.



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3. Implementation

3.1. Existing Environment

The existing noise environment in the vicinity of the Project is best described as 'urban', being an area with an acoustical environment that:

- Is dominated by 'urban hum' or industrial source noise
- Has through traffic with characteristically heavy and continuous traffic flows during peak periods
- Is near commercial districts or industrial districts
- Has any combination of the above, where 'urban hum' means the aggregate sound of many unidentifiable, mostly traffic-related sound sources.

3.1.1. Sensitive Receivers

The potentially most affected residential receivers in the vicinity of the Development site are located in the suburbs of Casula, Glenfield and Wattle Grove. In addition to residential receivers, a number of potentially affected non-residential receivers have been identified near the Project site, including All Saints Senior College and the Casula Powerhouse, located to the west of the Project site, across the Georges River. The nearest industrial receivers consist of MPW, ABB and the Defence Joint Logistics Unit (DJLU) (Figure 3-1). Table 3-1 presents a summary of the potentially most affected receivers near the Project site.

Receiver/Suburb	Category	Distance (m) from Stage 2 Construction Area
Wattle Grove		390
Wattle Grove North		350
Casula		760
Glenfield		1,580
All Saints Senior College (S1)	Educational	1,250
Casula Powerhouse (S2)		890
MPW (I1)		Boundary
DJLU (I2)	Industrial	Boundary
ABB (I3)	_	495

Table 3-1 Sensitive Receivers



Kitchener House is located at 208 Moorebank Avenue and is of heritage significance. Kitchener House is vacant and is therefore not considered as a noise sensitive receptor, however it is to be considered as a sensitive receiver for potential construction vibration impacts which could cause damage to the heritage structure. Moorebank Intermodal Precinct

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Figure 3-1: Sensitive Receivers

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Figure 3-1 Sensitive Receivers



3.1.2. Background Noise Levels

Background noise monitoring to satisfy CoC B62 and B63 has been conducted (in December 2017) and is presented in the Wilkinson Murray 12186-M2 Report VerC, dated January 2018.

The noise monitoring required to satisfy conditions B62 and B63 concluded that Rating Background Levels (RBLs) from December 2017 monitoring data are generally consistent with those identified in the MPE Concept Plan which were used to inform the noise management levels for the MPE 2 Stage EIS. Therefore, no change to the NMLs were required.

The RBLs at sensitive receiver locations considered representative of each of the four areas are presented in Table 3-2.

Table 3-2 Rating Background (Noise Levels)

NCA	Rating Background Levels (RBL) in dB(A)			
	Daytime (7am to 6pm)	Evening (6pm to 10pm)	Night-time (10pm to 7am)	
Wattle Grove	42	37	37	
Wattle Grove North	36	36	36	
Casula	41	37	34	
Glenfield	44	44	37	

3.2. Noise and Vibration Levels

3.2.1. Noise Management Levels

The policies and standards outlined in Table 3-3 have been used to establish construction noise management levels for MPE Stage 2.

Table 3-3 Construction Noise Policies and Standards

Environment impact	Relevant policy/ standard used to establish noise and vibration management level		
Airborne noise	 NSW Interim Construction Noise Guideline (ICNG) Conditions of Consent 		
Sleep disturbance and maximum noise events	Construction noise – INP Application Notes		
Construction-related road traffic noise	• No specific guidelines, but guidance taken from the NSW Interim Construction Noise Guideline (ICNG) and the NSW Road Noise Policy (RNP).		

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3.2.1.1. Airborne Noise

Table 3-4 (reproduced from Table 2 of the ICNG) sets out the NMLs and how they are to be applied to residential receivers.

Table 3-4 ICNG Construction Noise Management Levels

Time of Day	Noise Management Level LAeq(15min)	How to Apply			
Standard hours ¹ : Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm	RBL + 10dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.			
No work on Sundays or public holidays		The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.			
Standard hours	Highly noise affected 75dBA	 The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, considering: times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences) if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times 			
Outside recommended standard hours	Noise affected RBL + 5dBA	A strong justification will typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community. Where practical, noisy construction work will be undertaken during the less sensitive 6pm to 10pm evening period. For guidance on negotiating agreements see section 7.2.2 of the ICNG.			

Note 1: CoC B65 defines standard hours of work on Saturday to be 7am to 1.

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Within the DJLU there are a number of offices and warehouses, some of which may be sensitive to construction noise. The ICNG NML for commercial/ industrial and school receivers are shown in Table 3-5.

Table 3-5 ICNG Airborne Construction Noise Management Levels at Other Noise Sensitive Land Uses

Land Use	Noise Management Level LAeq(15min)	Where NML Applies
Classrooms at schools and other educational institutions	45dBA	Internal noise level
Industrial premises	75dBA	External noise level

Note: Outdoor noise level based on recommended maximum internal noise level in AS 2107 and assumes 10 dB loss through an open window.

Similar to the establishment of external amenity criteria for S1 and S2, the NML for S1 and S2 are set to 10dBA above the internal NML.

Table 3-6 shows relevant construction noise goals for standard construction hours based on the measured RBL values shown in Table 3-2. The majority of construction is expected to occur during standard construction hours.

Table 3-6 NML for Standard Construction Hours

Receivers	Acceptable L _{Aeq, 15min} Noise Level (RBL + 10 (dBA))
Wattle Grove	52
Wattle Grove North	46
Casula	51
Glenfield	54
S1, S2	55
11, 12, 13	75

Table 3-7 presents construction NML for the Project for each of the OOH works periods specified in Table 1-3.

Table 3-7 Construction Noise Management Levels by OOH Work Period

Receiver	NMLs (dBA)			
OOH Period	1	2	3	4
Wattle Grove	42	42	47	47



Receiver	NMLs (dBA)			
Wattle Grove North	41	41	41	41
Casula	39	42	46	46
Glenfield	42	49	49	49
S1, S2	55	55	55	55
11, 12, 13	75	75	75	75

3.2.1.2. Sleep Disturbance

For residential receptors, it is also important to consider potential sleep disturbance impacts associated with OOHW conducted during the nighttime (10pm to 7am) period.

Screening levels for maximum noise levels during the night time period (10:00pm – 7:00am) were established in accordance with the INP Application Notes (www.epa.nsw.gov.au/noise/applicnotesindustnoise.htm) and are presented in Table 3-8.

Table 3-8 Sleep Disturbance Screening Levels

Catchment	Sleep Disturbance Screening Level (L _{A,1min} / L _{Amax})
Wattle Grove	52
Wattle Grove North	51
Casula	49
Glenfield	52

This method (RBL + 15dB) is widely accepted as the appropriate method for assessing and managing sleep disturbance impacts (using the $L_{A1, 1min}$ or L_{Amax} noise descriptors) and is adopted here to establish criteria for use in the CNVMP.

Where there are noise events found to exceed the initial screening level, further analysis is made to identify:

- The likely number of events that might occur during the night assessment period
- Whether events exceed an 'awakening reaction' level of 55dBA L_{Amax} (internal), which equates to an external L_{Amax} NML of 65dBA (assuming open windows).

3.2.1.3. Construction Traffic Noise Criteria

The ICNG does not include any criteria to assess off-site traffic noise associated with construction of the Project.

Criteria for off-site road traffic noise applicable to existing residences affected by additional traffic on existing local roads generated by land use developments are specified in the NSW Road Noise Policy (RNP). Whilst these criteria do not specifically apply to

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construction traffic movements, they have been conservatively considered and are summarised in Table 3-9.

Table 3-9 RNP Criteria for Road Traffic Noise

Road	Category	Assessment Criteria - dBA		
		Day (L _{Aeq, 15 hour}) (7am – 10pm)	Night (L _{Aeq, 9 hour}) (10pm – 7am)	
M5 Motorway	Freeway	60 (external)	55 (external)	
Moorebank Avenue, Anzac Road	Arterial Road	60 (external)	55 (external)	

Note: The specified criteria do not apply to vehicle movements within the Project Site. For the purpose of assessment, any noise generated by on-site vehicle movements is considered as construction noise and assessed holistically with on-site mobile plant in accordance with the *ICNG*.

Additionally, it is typically recognised that for existing residences and other sensitive land uses affected by additional traffic on existing roads, any increase in the total traffic noise level should preferably be limited to 2dB above the existing road traffic noise levels. A 2dB increase is typically considered not noticeable.

3.2.2. Vibration Management Levels

The policies and standards outlined in Table 3-10 have been used to establish vibration management levels for the Development.

Table 3-10 Vibration Standards

Environment impact	Relevant policy/ standard used to establish noise and vibration management level	
Vibration (structural damage to buildings and buried services)	 German Standard DIN 4150:2016 – Part 3 Structural vibration in buildings – Effects on structures 	
Vibration impact on	Assessing Vibration: A Technical Guideline (DECC, 2006)	
humans	 British Standard BS 6472-1992 and 2008 'Guide to evaluation of human exposure to vibration in buildings (1-80Hz)' 	

3.2.2.1. Disturbance to Buildings Occupants

Assessment of potential disturbance from construction vibration on human occupants of buildings is made in accordance with the guideline Assessing Vibration: A Technical Guideline (DECC, 2006). The guideline provides criteria which are based on the British Standard BS 6472-1992 'Guide to Evaluation of Human Exposure to Vibration in Buildings (1-80Hz)'.

BS6472-1992 nominates guideline values for various categories of disturbance, the most stringent of which are the levels of building vibration associated with a "low probability of adverse comment" from occupants.

BS 6472-1992 was amended in 2008 to extend the use of the Vibration Dose Values (VDV) to all types of vibration (i.e. continuous, impulsive and intermittent). The vibration dose value is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the daytime or night-time period.

The vibration dose values recommended in BS 6472-1992 for which various levels of adverse comment from occupants may be expected are presented in Table 3-11.

Place and Time	Low probability of adverse comment (m/s ^{1.75})	Adverse comment possible (m/s ^{1.75})	Adverse comment probable (m/s ^{1.75})
Critical areas (day or night)	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Residential buildings 16 hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Offices, schools, educational institutions and places of worship (day or night)	0.4 to 0.8	0.8 to 1.6	1.6 to 2.4
Workshops (day or night)	0.8 to 1.6	1.6 to 3.2	3.2 to 6.4

Table 3-11 Vibration Dose Value ranges which might result in various probabilities of adverse comment within buildings

To assess the potential for vibration impact on human comfort, initial screening criteria based on *Assessing Vibration; a technical guideline* (DECC, 2006) have been adopted based on peak velocity units, as this metric is also used for the cosmetic damage vibration assessment. The screening criteria are conservative because they are based on the continuous vibration velocity criteria (i.e. vibration that continues uninterrupted for a defined assessment period) while construction works are mostly intermittent. The screening criteria are based on the preferred peak values, as shown in

Table 3-12, for pseudo-continuous work activities and on maximum peak values for surface construction works, which are intermittent in nature.

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Table	3-12	Construction	Vibration	Distance .	- Initial	Screening	Criteria
Iable	5-12	Construction	VIDIALION	Distance .	- muai	Scieering	Uniteria

Place and Time	Preferred peak velocity, mm/s (>8Hz)	Maximum peak velocity, mm/s (>8Hz)
Critical areas (day or night)	0.14	0.28
Residential buildings 16 hr day	0.28	0.56
Residential buildings 8 hr night	0.20	0.40
Offices, schools, educational institutions and places of worship (day or night)	0.56	1.10
Workshops (day or night)	1.10	2.20

3.2.2.2. Structural Damage to Buildings

Potential structural damage of buildings caused by vibration is typically managed by ensuring vibration induced into the structure does not exceed certain limits and standards.

For this project, German Standard DIN 4150 – 2016 – Structural vibration: Part 3: Effects of vibration on structures, (DIN 4150-3) is referenced by CoC 72.

DIN4150-3 suggests levels at which damage might occur. Damage is defined as any permanent effects of vibration that reduces the serviceability of a structure or one of its components.

Table 3-13 sets out the recommended limits from DIN4150 for short-term vibration to minimise the risk of damage.

Table 3-13 Vibration Guide Values - minimal risk of cosmetic damage (DIN 4150-3) - peak particle velocity

Guideline Values for Velocity – mm/s (peak component particle velocity)								
Type of Structure	At F	Top Storey (Horizontal)						
-	1 to 10 Hz	10 to 50Hz	50 to 100 Hz ¹	All Frequencies				
Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40				
Dwellings and buildings of similar design and/or occupancy ²	5	5 to 15	15 to 20	15				
Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (eg. Listed buildings under preservation order)	3	3 to 8	8 to 10	8				



Note 1: At frequencies above 100Hz, the values given in this column may be used as minimum values. Note 2: Type of structure considered to be representative of a residential building.

For this project, the guideline values taken at the foundation have been used because the buildings are typically low level.

Furthermore, DIN 4150-3 states that exceeding these values does not necessarily result in structural damage. If the criteria are significantly exceeded, further investigation will be conducted.

3.2.2.3. Structural Buried Pipework and Infrastructure

Table 3-14 provides guideline values for evaluating the effects of vibration on buried pipework and infrastructure. It is assumed that the pipes have been manufactured and laid using current technology; if this is not the case, special considerations will have to be made.

 Pipe Material
 Guideline Values for Velocity – mm/s (peak component particle velocity)

 Pipes (including welded pipes)
 100

 Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with and without flange).
 80

 Masonry, plastic
 50

Table 3-14 Vibration Guide Values - minimal risk of cosmetic damage (DIN 4150-3) - peak component particle velocity – pipes and infrastructure

3.2.2.4. General Vibration Screening Criteria

DIN4150-3 states that the guide values in Table 3-13 relate predominantly to short-term vibration, which does not give rise to fatigue in structures.

For most construction activities involving short term vibration sources such as rock breakers, piling rigs, vibratory rollers, excavators and the like, the predominant vibration energy occurs at frequencies greater than 10Hz (and usually in the 20Hz to 100Hz range). On this basis, a conservative vibration damage screening level per receiver type is given below:

- Buildings used for commercial purposes, industrial buildings, and buildings of similar design: 20.0mm/s
- Dwellings and buildings of similar design and/or occupancy: 5.0mm/s
- Pipework and infrastructure: 50mm/s
- Heritage buildings: 3mm/s

At locations where the predicted and/or measured vibration levels are greater than shown above (peak component particle velocity), a more detailed analysis of the building structure, vibration source, dominant frequencies and dynamic characteristics of the structure will be conducted to determine the applicable safe vibration level.


3.2.2.5. Heritage

A building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive.

If required, the advice of a heritage specialist on methods and locations for installing equipment used for vibration, movement and noise monitoring of heritage-listed structures is to be sought.

Unless otherwise advised, heritage buildings and structures are to be assessed as per the screening criteria presented in the Section above as they should not be assumed to be more sensitive to vibration unless they are found to be structurally unsound. If a heritage building or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage objectives of 3 mm/s peak component particle velocity (from DIN 4150-3) will be applied.

The approach to manage potential vibration impact is to:

- 1. Identify heritage items where the 3mm/s peak component particle velocity objective may be exceeded during specific construction activities
- 2. Structural engineering report to be undertaken on any identified heritage items were exceedances of 3 mm/s peak component particle velocity are expected, to confirm structural integrity of the building and confirm if item is 'structurally sound'
- 3. If item confirmed as 'structurally sound', adopt the screening criteria, or
- 4. If item confirmed as 'structurally unsound' or no structural engineering report conducted, adopt *the more* conservative cosmetic damage objectives of 3mm/s peak component particle velocity.

3.3. Environmental Impacts

3.3.1. Construction Activities

3.3.1.1. Standard Construction Hours

A summary of the indicative construction works and associated activities to be undertaken during each of these works periods is provided in Table 3-15. No blasting activities are permitted or proposed for the construction of the Development.

Table 3-15 Construction activities to be Undertaken Within Each Construction Works Period

Delivery Phase	Works Periods	Activity
Early Works	Works Period B: Site preparation activities	• Geotechnical and utilities investigation works including potholing to confirm the location of existing services, disconnection of non- critical services (with retention in place), grout filling of disconnected draining lines, adjustment and relocation where applicable, and demolition of buildings and structures where required to enable safe and secure access to utilities.
		• Clearing of non-native vegetation, stripping of topsoil and stockpiling of topsoil on site for later re-use within site landscaping



Delivery Phase	Works Periods	Activity
		• Stabilisation of areas where topsoil has been stripped with imported clean hard fill or by other methods determined by the Environmental Representative to have minimal environmental impact
		• Establishment of an interim access road to existing warehousing in the north-east portion of the MPE Stage 2 site, utilising existing paved areas with minor pavement extensions as required
		• Removal of asbestos from heating equipment and fire resistant building elements (e.g. fire doors) by a licenced asbestos removalist followed by clearance by a certified occupational hygienist
		 Hazardous material cleaning and decontamination in Buildings 67, 69, 81 and 83
		 Heritage salvage works in Buildings 37, 75 and 80 on the Project site to recover architectural elements for adaptive re-use
		 Importation, stockpiling and placement of up to 60,000m³ (not exceeding a total of 22,000m³ of material per day) of imported clean general fill material by truck-and-dog and / or semi-trailer
		• Establishment of a site access point at the existing MPE Site northern access and construction of associated access road to provide for access and manoeuvrability of vehicles into and through the site in accordance with CoC B10
		• Establishment of temporary site fencing, a site compound(s) and temporary car parking areas to support Early Works and construction of the Project in accordance with CoC B10, B11 and B12
		• Other activities determined by the Environmental Representative to have minimal environmental impact.
		Demolition of existing structures
	Works Period B:	Clearing of vegetation
	Completion of Site preparation activities	 Adjusting the building formation of the site (to final operational levels) within which the Main Warehousing Compound will be located
		• Establishment of temporary batch plant and materials crushing plant
Construction Phase A		• Importation, stockpiling and placement of up to 600,000m ³ (not exceeding a total of 22,000m ³ of material per day) of imported clean general fill for bulk earthworks
	Works Period E: Bulk earthworks,	• Importation, stockpiling and placement of up to 250,000m ³ of suitable spoil (separate to the 600,000m ³ of imported clean general fill permitted for bulk earthworks)
	drainage and utilities	 Installation of on-site detention (OSD) and drainage infrastructure within the MPE Stage 2 site
		Construction of retaining walls
		 Creation of internal road formation by general earthworks (by constructing fill embankments)



Delivery Phase	Works Periods	Activity
		• Bulk earthworks and adjusting the building formation of the Project site to final level, including the terminal hardstand
		Utilities relocation and installation
		Establishment of hardstand areas.
		Foundation and floor slab installation
	Works Period F:	 Erection of framework and structural walls
and out o ware	Construction and internal fit-	Installation of roof
	out of	 Internal fit-out of warehouses (racking and associated services).
	warehousing	Helicopter assisted installation of solar panels, air conditioning units and other plant
		• Pavement construction (internal transfer roads and perimeter road), including forming of new kerbs, gutters, medians (where required) and other structures
		 Line marking, lighting and sign posting
	Works Period G:	 Installation of road furniture, including traffic signs and pavement markers.
N C f	Miscellaneous construction and	Miscellaneous structural construction
	finishing works	 Finishing works, including landscaping and general site rehabilitation, where required
		Commissioning of the Project
		 Decommissioning/demobilisation of the Project site, including removal of construction compound(s) and temporary construction environmental controls.
		Stripping of topsoil within footprint of temporary diversion road
		Installation of temporary drainage
	Works Period C:	 Placement of fill and temporary road pavement (e.g. gravel)
	the Moorebank Avenue	 Construction of interface between temporary diversion road and existing Moorebank Avenue
Construction	diversion road	Installation of temporary road signage, street lighting and signalling
Works Phase B		 Transfer of traffic onto temporary diversion road from Moorebank Avenue.
	Works Period E: Bulk earthworks, drainage and utilities	Removal of existing pavement and stripping of topsoil within Moorebank Avenue
		 Importation, stockpiling and placement of approximately 600,000m³ (not exceeding a total of 22,000m³ of material per day) of imported clean fill



Delivery Phase	Works Periods	Activity
		 Importation, stockpiling and placement of up to 250,000m³ of suitable spoil (separate to the 600,000m³ of imported clean general fill permitted for bulk earthworks)
		• Creation of a road formation by general earthworks (by constructing fill embankments)
		Utilities relocation and installation
		Placement of select layer of earthworks material on top of the road formation
	Works Period D:	 Placing and compacting the pavement later (concrete, or concrete and asphalt) over the select layer (consisting of a sub-base and base) and potential sealing with bitumen
	Pavement works along Moorebank	Traffic switching from diversion road onto final, raised Moorebank Avenue
	Avenue	 Removal of construction traffic management and progressive opening of the internal road and warehouse access roads to traffic
		• Removal of road surface, road signage, street lighting and signalling from temporary diversion road
		Commissioning of Moorebank Avenue.

3.3.1.2. Extended Hours

CoC B69 allows works to be undertaken during extended hours. Activities to be undertaken during extended hours are all those *"not including high noise impact, piling, spoil placement, rock breaking, concrete batching*".

Approval for extended hours works is via the Out of Hours Works Protocol (Appendix A) and the works are to be managed under the Extended Hours Work Plan (Appendix B).

3.3.1.3. Out of Hours

Works outside of standard hours can occur under CoC B67 in the following circumstances:

- For the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons
- Where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm
- Where different construction hours are permitted, or required under an EPL in force in respect of construction, in which case these construction hours must be complied with
- Where they are undertaken in accordance with the OOHW Protocol (Appendix A) detailing the assessment, management and monitoring of noise.

For activities to be undertaken during OOH (and not including extended hours detailed above) the OOHW Protocol (Appendix A) is to be applied.

An Out of Hours Work Protocol is provided in Appendix A and makes provision for out of hours works, including:



- Where works are shown to be inaudible at the nearest sensitive receivers and vibration levels do not exceed those stipulated by Table 2.2 and Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006)
- Where a negotiated agreement has been arranged with affected receivers
- Where noise can be shown to satisfy the noise management levels specified in the Interim Construction Noise Guideline (ICNG, DECC, 2009) at non-residential land uses
- Where works are undertaken as part of an Extended Hours Work Plan approved as part of the Out-Of-Hours Work Protocol.

3.3.2. Construction Compounds

Temporary construction compounds are required to support construction of the Development as follows:

- The Moorebank Avenue Compound A.
- The Moorebank Avenue Compound B

Some additional satellite compounds will be required during the construction of each individual warehouse on the Development site, however, the Warehousing Compound will be used for the majority of construction works.

The location and layout of the construction compounds are shown in Figure 3-2.





Figure 3-2 Overview of Construction Compound



3.3.3. Plant and Equipment

A range of plant and equipment is required for the construction of the Development. A summary of plant and equipment likely to be utilised is provided in Table 3-16 for standard hours.

Table 3-16 Indicative Construction Plant and equipment Required for Construction

	Early Works		C	Construc	tion Pha	se A	Const	Construction Phase B		
Equipment	Site preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit- out of warehousing	Miscellaneous construction and finishing works	Material Delivery	Stockpiling	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and utilities	Pavement works along Moorebank Avenue
Truck and Dog	\checkmark	\checkmark	\checkmark	-	-	\checkmark	-	-	\checkmark	-
Loaders	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-
Static and vibratory rollers, and high energy impact compaction ^{1,2}	\checkmark	V	✓	V	-	-	\checkmark	✓	√	~
Mobile cranes	\checkmark	\checkmark	\checkmark	\checkmark	-	-	-	-	\checkmark	-
Excavators	\checkmark	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	\checkmark	\checkmark
Excavators with hammers ¹	✓	\checkmark	\checkmark	-	-	-	-	-	\checkmark	-
Backhoes	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-
825 Compactor	-	-	-	-	-	-	\checkmark	\checkmark	-	\checkmark
Crushing plant	-	\checkmark	\checkmark	-	-	-	-	-	\checkmark	-
Concrete Batch plant	-	-	\checkmark	\checkmark	-	-	-	-	\checkmark	-
Concrete agitators (or similar)	-	\checkmark	\checkmark	\checkmark	\checkmark		-	-	\checkmark	-
Concrete pumps	-	\checkmark	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-



	Early Works				tion Pha	Construction Phase B				
Equipment	Site preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit- out of warehousing	Miscellaneous construction and finishing works	Material Delivery	Stockpiling	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and utilities	Pavement works along Moorebank Avenue
Concrete saws	-	-	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-
Air compressors	-	-	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-
Jackhammers ¹	-	-	-	\checkmark	\checkmark	-	-	-	-	-
Dozers	-	\checkmark	\checkmark	-	-	-	\checkmark	\checkmark	\checkmark	\checkmark
Mulchers	-	\checkmark	-	-	-	-	-	-	-	-
20-40 tonne articulated tipper trucks	√	\checkmark	\checkmark	-	-	-		-	\checkmark	-
Scrapers	-	\checkmark	\checkmark	-	-	-		-	\checkmark	-
Graders	-	\checkmark	\checkmark	\checkmark	-	\checkmark		\checkmark	\checkmark	\checkmark
Water trucks	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Piling rigs	-	-	\checkmark	\checkmark	-	-	-	-	\checkmark	-
Forklifts	-	-	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-
Small earthmoving equipment	\checkmark	-	\checkmark	\checkmark	\checkmark	-	-	-	✓	-
Welder	-	-	\checkmark	\checkmark	\checkmark	-	-	-	\checkmark	-
Road Sweeper	-	-	-	-	-	\checkmark	-	-	-	-
Road profiler ¹	-	-	-	-	-	-	-	\checkmark	-	\checkmark
Rubber roller	-	-	-	-	-	-	-	\checkmark	-	\checkmark
Lighting towers	-	-	-	-	-	\checkmark	\checkmark	-	-	-



	Early Works		Construction Phase A					Construction Phase B			
Equipment	Site preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit- out of warehousing	Miscellaneous construction and finishing works	Material Delivery	Stockpiling	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and utilities	Pavement works along Moorebank Avenue	
Generators	-	-	-	-	-	\checkmark	-	-	-	-	
Helicopter, Airbus AS350D1 or Bell 206L4	-	-	-	\checkmark	-	-	-	-	-	-	

Note 1: 5 dB modification factors applied.

Note 2: Data supplied by Day Design (ref: 6033-7.1L REV C)

3.3.3.1. Sound Power Levels of Plant and Equipment

Sound Power Levels (SWLs) associated with typical construction plant to be used throughout the construction of the Proposal are specified in Table 3-17. These SWLs have recently been measured at other similar construction sites. The table gives both SWL and Sound Pressure Levels (SPL) at 7m for the equipment. SWL is independent of measurement position.

Table 3-17 Typical Construction Plant Sound Levels - dBA

Plant	Sound Power Level	Sound Pressure Level at 7m
Truck and Dog	103	78
Loaders	112	87
Static and vibratory rollers and high energy impact compaction ^{1,2}	110	85
Mobile cranes	110	85
Excavators	110	85
Excavators with hammers ¹	122	97
Backhoes	105	80
825 Compactor	112	87

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Plant	Sound Power Level	Sound Pressure Level at 7m
Crushing plant	118	93
Concrete batch plant	113	88
Concrete agitators (or similar)	105	80
Concrete pumps	103	78
Concrete saws	112*	87
Air compressors	100	75
Jackhammers ¹	113*	88
Dozers	118	93
Mulchers	118	93
20-40 tonne articulated tipper trucks	110	85
Scrapers	110	85
Graders	109	84
Water trucks	105	80
Piling rigs	121*	96
Forklifts	106	81
Small earthmoving equipment	95	70
Rail tamper	118	93
Welder	90	65
Road Sweeper	105	80
Road profiler ¹	116*	91
Rubber roller	108	83
Lighting Towers	85	60
Helicopter, Airbus AS350D1 or Bell 206L4	130	102
Generators	85	60

Note 1: 5 dB modification factors applied. Note 2: Data supplied by Day Design (ref: 6033-7.1L REV C)



A number of activities have proven to be particularly annoying to nearby residents:

- Use of 'beeper' style reversing or movement alarms
- Grinding metal
- Concrete or masonry rock drilling
- Vibratory rolling
- Bitumen milling or profiling
- Jackhammering
- Rock hammering or rock breaking
- Impact piling.

These activities have had a 5dB modification factor added to the predicted levels.

3.3.3.2. Plant Numbers

The indicative plant numbers likely to be utilised for the Development is presented in Table 3-18.

Table 3-18 Works Periods, Plant Numbers and Estimated Total SWL

		Early W	orks	С	onstruct	tion Pha	se A	Construction Phase B		
Equipment	Site Preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit- out of warehousing	Miscellaneous construction and finishing works	Material Delivery	Stockpiling	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and utilities	Pavement works along Moorebank Avenue
Truck and Dog	4	10	10	-	-	10	-	-	10	-
Loaders	-	2	2	4	2	-	-	-	2	-
Static and vibratory rollers, and high energy impact compaction	2	4	4	3	-	-	1	3	4	3
Mobile cranes	2	2	5	8	-	-	-		5	
Excavators	3	4	5	4	-	-	-	4	5	4
Excavators with hammers	-	1	2	-	-	-	-	-	2	-
Backhoes	-	4	4	6	4	-	-	-	4	-



		Early W	orks	С	Construction Phase A				Construction Phase B		
Equipment	Site Preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit- out of warehousing	Miscellaneous construction and finishing works	Material Delivery	Stockpiling	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and utilities	Pavement works along Moorebank Avenue	
825 Compactor	-	-	-	-	-	-	1	2	-	2	
Crushing plant	-	1	1	-	-	-	-	-	1	-	
Concrete Batch plant	-	1	1	1	-	-	-	-	1	-	
Concrete agitators (or similar)	-	5	5	10	3	-	-	-	5	-	
Concrete pumps	-	4	4	10	3	-	-	-	4	-	
Concrete saws	-	4	2	6	2	-	-	-	2	-	
Air compressors	-	3	4	20	4	-	-	-	4	-	
Jackhammers	-	-	-	6	3	-	-	-	-	-	
Dozers	-	3	4	-	-	-	1	2	4	2	
Mulchers	-	3	-	-	-	-	-	-	-	-	
20-40 tonne articulated tipper trucks	4	10	10	-	-	-	-	-	10	-	
Scrapers	-	5	6	-	-	-	-	-	6	-	
Graders	4	4	4	2	-	1	-	4	4	4	
Water trucks	1	5	5	2	2	1	1	2	5	2	
Piling rigs	-	1	3	2	-	-	-	-	3	-	
Forklifts	-	3	3	20	3	-	-	-	3	-	
Small earthmoving equipment	3	6	20	20	6	-	-	-	20	-	



		Early W	orks	C	Construction Phase A				Construction Phase B		
Equipment	Site Preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit- out of warehousing	Miscellaneous construction and finishing works	Material Delivery	Stockpiling	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and utilities	Pavement works along Moorebank Avenue	
Welder	-	10	10	20	5	-	-	-	10	-	
Road Sweeper	-	-	-	-	-	-	-	-	-	-	
Road profiler	-	-	-	-	-	-	-	1	-	1	
Rubber roller	-	-	-	-	-	-	-	1	-	1	
Lighting towers	-	-	-	-	-	4	4	-	-	-	
Generators	-	-	-	-	-	2	4	-	-	-	
Helicopter, Airbus AS350D1 or Bell 206L4	-	-	-	1	-	-	-	-	-	-	
Combined SWL for Works Period (dBA)	117	127	129	124*	118	108	110	122	129	122	

* Note: The combined SWLs provided in Table 3-18 are based on a conservative worst-case scenario (derived from the EIS) reflective of the concurrent operation of all plant. The operation of a helicopter is not included in the combined SWL for the relevant works period as the helicopter will not be used concurrently with all other plant and equipment depicted in Table 3-18.

3.3.4. Assessment of Construction Noise during Standard Hours

Consistent with the requirements of the ICNG, construction noise impacts are considered based on a worst-case assessment corresponding to plant and equipment operating on part of the site nearest to sensitive receivers.

The ICNG recommends that realistic worst case or conservative noise levels should be predicted for assessment locations representing the most noise exposed residential or other sensitive land uses. For the construction site, residential or other sensitive land uses have been grouped into receiver areas or "catchments" which comprise those receivers which would experience a similar level of construction noise. For each receiver area, the noise levels are predicted at the most noise exposed location. For most construction activities, it is expected that the actual construction noise levels may be lower than predicted at the most exposed receiver or location – as the noise levels presented in this document are based on a realistic worst-case assessment.



The predicted L_{Aeq, 15min} noise levels at sensitive receivers during standard hours for each specified works category is presented in Table 3-19. A cumulative noise level impact assessment for construction is presented in Section 3.4. The cumulative noise level impact assessment for construction undertaken during preparation of this plan did not consider use of a helicopter. Notwithstanding, a separate construction noise and vibration impact statement (CNVIS) has been undertaken to consider potential noise and vibration impacts of a helicopter (see Appendix D).

Table 3-19 indicates that predicted $L_{Aeq,15min}$ construction noise levels comply with the established NML at all receivers.



Table 3-19 Predicted Construction Noise Levels During Standard Hours

Early Works L _{Aeq,15min}			Construction Phase A L _{Aeq,15min}			Construction Phase B L _{Aeq,15min}					
Equipment	Site Preparation activities	Completion of Site Preparation activities	Bulk earthworks, drainage and utilities	Construction and internal fit-out of warehousing	*Miscellaneous construction and finishing works	Worst Case Cumulative	Construction of the Moorebank Avenue diversion road	Bulk earthworks, drainage and	Pavement works along Moorebank Avenue Works	Cumulative	Noise Management Level (NML) L _{Aeq,15min}
Wattle Grove	39	49	51	46	41	52	38	51	38	51	52
Wattle Grove North	34	45	41	41	36	44	35	46	35	46	46
Casula	36	47	49	43	38	50	41	49	41	50	51
Glenfield	25	35	37	28	26	38	30	37	30	38	54
S1	34	44	46	41	35	47	39	45	39	46	55
S2	32	42	44	39	34	45	37	44	37	45	55
l1	61	72	74	68	63	75	66	74	66	75	75
12	62	72	74	69	63	75	57	74	57	75	75
13	40	51	49	47	42	54	41	53	41	53	75



*Note: The cumulative assessments are based on conservative worst-case scenario noise assessments (derived from the EIS). The operation of a helicopter is not included in the calculation of the cumulative assessment for the relevant works period as the helicopter will not be used concurrently with other plant and equipment depicted in Table 3-19



3.3.5. Potential Construction Traffic Noise Impacts

3.3.5.1. Construction Traffic Generation

During the construction of the Project, all heavy vehicles, and the majority of light vehicles, will travel to and from the site via the M5 Motorway and Moorebank Avenue. Additionally, a small number of light vehicles will travel along Anzac Road, east of Moorebank Avenue, and along Moorebank Avenue, north of the M5 Motorway. No heavy vehicles, associated with the construction of the Project, will travel along Anzac Road, or along Moorebank Avenue, Avenue, north of the M5 Motorway.

The existing and projected daily traffic volumes, and percentage heavy vehicles, along the specified roads, for the construction of the Project, are presented in Table 3-20. It is not yet known whether heavy construction vehicles will travel to the site, along the M5 Motorway, from the east or the west. This will depend upon factors such as the construction contractor, and the source(s) of fill. Therefore, the projected construction traffic volumes along the M5 Motorway, presented in Table 3-20, are based on all heavy construction vehicles travelling along the M5 Motorway both east and west of Moorebank Avenue. Such a scenario may not eventuate in practice, and therefore, the assessment of construction traffic noise along the M5 Motorway is conservative.

A Driver's Code of Conduct has been prepared as an Appendix to the Construction Traffic Access Management Plan (CTAMP) to assist in the management of potential traffic and traffic noise related impacts.

Location	Time ¹	E: no De)	xisting velopment)	Future (with Development)		
		Volume	%Heavy	Volume	%Heavy	
M5 Motorway	Day	106,344	9.7	107,370	10.5	
- East of Moorebank Avenue	Night	21,060	13.2	21,201	13.5	
M5 Motorway West of Moorebank Avenue	Day	124,264	10.2	125,290	10.8	
	Night	24,036	11.5	24,177	11.8	
Moorebank Avenue	Day	26,892	10.0	26,953	10.0	
- North of M3 Motor way	Night	6,308	10.0	6,345	9.9	
Anzac Road	Day	8,991	4.6	9,018	4.6	
	Night	2,109	4.6	2,125	4.6	

Table 3-20 Construction Traffic Volume and % Heavy Vehicles

Source: Arcadis

1. Day = 7.00am - 10.00pm, Night = 10.00pm - 7.00am



3.3.5.2. Predicted Increases in Road Noise Levels

Using the data in Table 3-21, the increases in road noise levels along the M5 Motorway, Moorebank Avenue and Anzac Road, during the construction of the Project, have been calculated. The calculations have been conducted using the Calculation of Road Traffic Noise (CORTN) algorithm, and are based upon the following assumptions:

- Vehicle speeds are 100km/h along the M5 Motorway and 60km/h along Moorebank Avenue and Anzac Road.
- Typical receiver setbacks are approximately 25 metres along the M5 Motorway and approximately 12 metres along Moorebank Avenue and Anzac Road. It is important to highlight that receiver setbacks are important when calculating absolute road noise levels, however setbacks are not important when calculating increases in road noise levels due to changes in traffic volume and mix.

The predicted increases in road noise levels, due to the construction of the Project, are shown in Table 3-21.

Location	Predicted Increase (dBA)			
	Day ¹	Night ¹		
M5 Motorway – East of Moorebank Avenue	0.1	0.0		
M5 Motorway – West of Moorebank Avenue	0.2	0.1		
Moorebank Avenue – North of M5 Motorway	0.0	0.1		
Anzac Road – East of Moorebank Avenue	0.0	0.0		

Table 3-21 Increases in Road Noise Levels During Construction

1. Day = 7.00am – 10.00pm, Night = 10.00pm – 7.00am

Table 3-21 shows that increases in road noise levels along the M5 Motorway, Moorebank Avenue, and Anzac Road are considerably less than 2dB. Therefore, no mitigation of traffic noise levels, due to the construction of the Project, has been considered.

3.3.6. Potential Construction Vibration Impacts

Vibration-intensive plant to be used during construction includes:

- Vibratory rollers
- High-energy impact compaction equipment
- Jack-hammering.

3.3.6.1. Vibration Safe Working Distances

Table 3-22 defines typical safe working distances for vibration intensive activities. These safe working distances are defined for damage (DIN 4150-3) and human comfort (the NSW Vibration Guideline). The safe working distances for cosmetic damage will be complied with at all times.



Table 3-22 Safe Working Distances

		Safe Working Distance (m)						
Plant Item	Rating/Description	Pipework and Infrastructure (DIN 4150-3)	Buildings used for commercial purposes, industrial buildings, and buildings of similar design (DIN 4150-3)	Dwellings and buildings of similar design and/or occupancy (DIN 4150-3)	Human Comfort (the NSW Vibration Guideline)			
	< 50 kN (Typically 1- 2 tonnes)	1m	2m	6m	15m to 20m			
	< 100 kN (Typically 2-4 tonnes)	1m	2m	8m	20m			
Vibratory	< 200 kN (Typically 4-6 tonnes)	1m	3m	15m	40 m			
Roller	< 300 kN (Typically 7-13 tonnes)	1m	4m	19m	100m			
	> 300 kN (Typically 13-18 tonnes)	1m	4m	25m	100m			
	> 300 kN (> 18 tonnes)	1m	1m	31m	100m			
High Energy Impact Compaction ¹	100 kW Tractor (Towing Equipment)	2m	3m	10m	50m			
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	1m	1m	3m	7m			



		Safe Working Distance (m)						
Plant Item	Rating/Description	Pipework and Infrastructure (DIN 4150-3)	Buildings used for commercial purposes, industrial buildings, and buildings of similar design (DIN 4150-3)	Dwellings and buildings of similar design and/or occupancy (DIN 4150-3)	Human Comfort (the NSW Vibration Guideline)			
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	1m	2m	9m	23m			
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	1m	4m	24m	73m			
Vibratory Pile Driver	Sheet piles	1m	1m to 4m	2m to 20m	20m			
Pile Boring	≤ 800 mm	1m	1m	2m	n/a			
Jackhammer	Hand held	1m	1m	1m	Avoid contact with structure			

Note 1: Data supplied by Day Design (ref: 6033-7.1L REV C)

For general construction and roadworks, it is not expected that the cosmetic damage and human comfort criteria will be exceeded as the safe working distances specified in Table 3-22 will be able to be maintained.

In areas where residential buildings and or commercial buildings are located less than 100m from areas where vibratory rollers are proposed, all feasible and reasonable mitigation measures will be implemented including:

- Selection of an appropriate-sized vibratory roller
- The use of lower vibration settings or static rolling
- Verification of vibration levels via monitoring.

In relation to human comfort, the safe working distances above relate to continuous vibration. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods may be allowed. A targeted assessment may be undertaken during works to evaluate any decrease in human comfort safe work distance offsets and to determine if any other mitigation or management measures are required to minimise the potential impacts.

3.3.6.2. Heritage Listed Structures

Kitchener House is located at 208 Moorebank Avenue and is of heritage significance. Vibration generating works associated with the Moorebank Avenue /M5 Motorway Intersection would potentially occur within 100m of Kitchener House.

If works are within 100m of Kitchener House, the following approach to manage potential vibration impacts shall be conducted prior to the commencement of those works:

- 1. Undertake pre-construction dilapidation surveys of Kitchener House (to be conducted by suitably qualified person).
- 2. Obtain a structural engineering report to confirm structural integrity of the building and confirm if item is 'structurally sound' (or alternatively adopt the more stringent criteria specified in (5) below).
- 3. Seek advice of a heritage specialist on methods and locations for installing equipment used for vibration and movement of heritage-listed structures.
- 4. If Kitchener House is 'structurally sound', the screening criteria will apply.
- 5. If Kitchener House is 'structurally unsound' or if a structural engineering report is not conducted, the conservative cosmetic damage objectives of 3mm/s peak component particle velocity will be adopted.
- 6. Conduct continuous vibration monitoring for the period where construction works occur within 100m.

3.4. Cumulative Impacts

Assessment of potential cumulative noise and vibration impacts was undertaken by Wilkinson Murray as part of the preparation of the EIS (Refer to Section 19 and Appendix L of the MPE Stage 2 EIS).

The cumulative construction noise scenario accounted for the cumulative predicted noise impacts associated with Project construction activities, MPW Early Works activities, MPE Stage 1 and MPW Stage 2 construction works. The highest predicted L_{Aeq,15min} construction noise levels at sensitive receivers during relevant phases for each concurrent

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project were used for the assessment to attain a worst-case construction cumulative scenario to assess against the NMLs established for the Project.

The worst-case cumulative construction noise levels for each of the selected receivers are presented in Table 3-23. The results show that cumulative construction noise levels are predicted to comply with the NML at all receivers, except for the most sensitive receivers in Casula, where cumulative construction noise levels may exceed NML by up to 2dB. This is considered a negligible exceedance.

	Predicted LAeq,15min Noise Levels							
Receiver	MPE Stage 2 Proposal	MPW Early Works	MPW Stage 2	MPE Stage 1	Cumulative	NML	Exceedance	
Wattle Grove	49	38	37	40	50	52	0 dB	
Wattle Grove North	45	38	37	27	46	46	0 dB	
Casula	47	44	50	40	53	51	2 dB	
Glenfield	35	40	36	32	43	54	0 dB	
S1	44	49	49	39	53	55	0 dB	
S2	42	49	48	37	52	55	0 dB	

Table 3-23 Worst-case cumulative construction noise levels

Due to the large separation distances between the Project and nearby sensitive receivers, construction vibration impacts are considered negligible.

Management measures (See Section 3.5) are to be implemented prior to and during construction to avoid and minimise impact on noise and vibration on surrounding sensitive receivers. Appropriate implementation of these controls would reduce the risk of noise and vibration impacts during the construction phase of the Development.

3.5. Management Measures

This section describes the overall approach to managing and mitigating noise and vibration impacts as a result of the Development based on the predicted impacts as summarised in this CNVMP.

The management measures discussed in this section are based on the applicable EIS, RtS, NVIA, CoC, the ICNG as well as the requirements and standards of ESR and its contractors.

The noise predictions in this CNVMP were developed to address the assessment requirements documented in the ICNG (Section 2.1.1). It also identifies the thresholds by which impacts can be quantified and the level of mitigation and management that is required for each stage of works.

The mitigation and management measures are consistent with the intent and recommendations of the ICNG for own best-practice techniques to be developed for managing construction noise and vibration and implementing feasible and reasonable mitigation measures.



The noise assessment and mitigation approach has been adopted, in conjunction with the requirements of the ICNG, for the measured described in this CNVMP.

Table includes the Final Compilation of Mitigation Measures (FCMMs) related to noise and vibration that were established as part of the MPE Stage 2 RtS. These mitigation measures have been included in Table 3-24 and references to where the FCMMs are addressed have also been included.

The mitigation measures that are to be adopted during the Development are described in Table 3-24 and are to be implemented for the works to manage and potentially reduce construction noise and vibration impacts.



Table 3-24 Management Measures

ID	Management Measure	Timing	Responsibility	Reference
NV1	The approved hours of work, the name of the site/project manager, the responsible managing company, its address and 24 hour contact phone number for any inquiries, including construction/noise complaints is to be displayed at the site, typically near site entrance points.	Pre-construction and during construction	DM Communication	MPW C'th CoA 6 (c)
	Notification of potentially affected people and the relevant council about construction commencement, out-of-hours works and high noise works (impacted sensitive receivers only) is to occur in accordance with the Construction Community Communication Strategy and is to detail the following at least 7 days prior to commencement of relevant works:			CoC B77
NV2	Nature of the construction stages	Pre-construction and during construction	DM Communication	CoC B155
	Hours of work			FCMM 2A
	Duration of noisier activities			MPW C'th CoA 6 (c)
	Measures to minimise noise impacts			
	The Development website, information and response lines, email distribution list and any applicable community based forums is to be utilised for this purpose.			
NV3	In the event of any noise or vibration related complaint or adverse comment from the community, noise and ground vibration levels (as relevant) is to be investigated. Remedial	Construction	DM Communication	CoC B76



ID	Management Measure	Timing	Responsibility	Reference
	action is to be implemented where feasible and reasonable.			CoC B155
	The procedure for managing complaints is provided within the Construction Community Communication Strategy.			FCMM 2D
NV4	A site-specific induction is to be provided to all site personnel, contractors and sub-contractors with an emphasis on understanding and managing noise impacts from the work activities being undertaken. This is to include the location of noise sensitive receptors, specific mitigation measures, site hours of operation, noise complaints procedure, etc. as well as the consequences of not complying with these mitigation measures.	Pre-construction	Contractor's Environmental Manager (Contractor's EM)	This plan FCMM 2A MPW C'th CoA 6 (c)
NV5	 All general construction works and activity is to be scheduled to occur during the following periods, unless authorised as out-of-hours works or as otherwise specified in an environment protection licence: 7:00am to 6:00pm Mondays to Fridays, inclusive; 7:00am to 1:00pm Saturdays; and at no time on Sundays or public holidays. 	d During construction	Contractor's EM Site Supervisor	CoC B65 FCMM 2A MPW C'th CoA 6 (c)
NV6	Construction works and activity with the potential to generate high noise impact (including impulsive or tonal noise emissions) is to be scheduled to occur during the following periods: • between the hours of 8:00am to 5:00pm Monday to Friday;	e During construction	Contractor's EM Site Supervisor	CoC B66 MPW C'th CoA 6 (c)



ID	Management Measure	Timing	Responsibility	Reference
	• between the hours of 8:00am to 1:00pm Saturday; and			
	• in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.			
	Blasting is not permitted at any time.			
NV7	Out-of-hours works is to only be undertaken in the following circumstances:			
	 for the delivery or despatch of materials as requested by the NSW Police Force or other public authorities for safety reasons 	During construction	Contractor's EM Site Supervisor	CoC B67
	 where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm 			
	• where they are undertaken in accordance with the Out-Of- Hours Work Protocol			
	Where feasible and reasonable, plant and equipment is to be selected, operated and maintained to be minimise noise and vibration, including:	9		CoC A32
NV8	 Select plant and equipment based on least noise and vibration emission levels 	During construction	Contractor's EM Site Supervisor	CoC B77 (i)
	 Use of low-vibration generating equipment/vibration dampeners or alternative construction methodology where necessary 			FCMM 2A MPW C'th CoA 6 (c)



ID	Management Measure	Timing	Responsibility	Reference
	• Use of noise source controls, such as the use of residential class mufflers and engine covers, to reduce noise from all plant and equipment including excavators and trucks			
	• Maintenance, repair or replacement of plant and equipment if it becomes noisy			
	 Use of quietest suitable and available construction equipment 			
	Use of silenced generators and compressors			
	 Shut down of equipment when not in use for extended periods of time 			
	• Ensuring road plates are properly installed and maintained.			
	 Use of non-tonal movement alarms in place of reversing beepers, or alternatives such as reversing cameras and proximity alarms, unless tonal alarms are mandated by legislation. 			
	All plant and equipment used at the site or to monitor the performance of the Development is to be:			
	 maintained in a proper and efficient condition; and 			
	• operated in a proper and efficient manner.			
NV9	Where feasible and reasonable, plant and equipment is to be selected to have operating Sound Power Levels compliant with the values presented in Table 3-17 of this Plan in the first instance, Table 2 in the Transport for NSW <i>Construction Noise Strategy</i> or AS 2436-1981 2010 <i>Guide to noise and vibration control on construction, demolition and maintenance sites.</i>	Pre-construction	Contractor's EM	FCMM 2A



ID	Management Measure	Timing	Responsibility	Reference
	Attended monitoring is to be conducted within 28 days of significant new plant / equipment arriving at the site.			
	Where feasible and reasonable, the following work practices are to be adopted to minimise noise and vibration:			
	 Where practical, undertake the noisiest works during standard hours. 			
	Avoid simultaneous operation of noisy plant.			
	 Maximise the offset distance between noisy plant and adjacent sensitive receptors 			
	Throttle down or switch off plant when not in use			B72 (b) (c)
	• Examine, and implement where feasible and reasonable,			B77 (i)
NV10	alternative work practices that generate less noise.	Pre-construction	Contractor's EM	FCMM 2A
	 Noise-emitting (including directional noise emitting) plant and equipment to be directed away from sensitive receivers, 			MPW C'th CoA 6 (c)
	or behind barriers. To be effective for ground level noise, the screens is to be lined with acoustic absorptive material, be a least 2m in height and installed within 5m of the noise source	t		MPW Stage 1 REMM 5S
	"Clustering" of noisy plant or processes is to be limited.			
	 Adhere to the safe working distances identified in the CNVMP for vibration intensive plant 			
	 Select materials which require fewer vibration intensive activities to occur (such as materials requiring less compaction). 			



ID	Management Measure	Timing	Responsibility	Reference
	 Arrange the work site to minimise the use of movement alarms on vehicles and mobile plant. 			
	• Where there are no overriding project constraints, program works so as to not affect any sensitive receiver for more than a total of six nights in any four week period.	l		
	 Avoid dropping materials from a height, dropping or dragging road plates. 	3		
	• Talk to workers about noise from the works and how it can be reduced.			
	Use radios and stereos indoors rather than outdoors.			
	 Contact potentially noise affected receivers at the earliest possible time before any site work begins. 			
	 Inform potentially noise affected receivers about the nature of the construction stages and the duration of noisier activities – for example, excavation and rock-breaking. 			
	 Describe to potentially affected receivers any noise controls, such as temporary noise walls or use of silenced equipment. 			
	 Keep potentially noise affected receivers up to date on progress. 			
	 Provide contact details on a site board at the front of the site and maintain a complaints register suited to the scale of works. 			
	 Ask about any concerns that potentially affected receivers may have and discuss possible solutions. 			



ID	Management Measure	Timing	Responsibility	Reference
	 Provide potentially affected receivers with access to the latest copy of the CNVMP. 			
	 Keep staff who receive complaints informed regarding current and upcoming works and the relevant contacts for these works. 			
	Handle complaints in a prompt and responsive manner.			
	• Where there are complaints about noise from an identified work activity, review and implement, where feasible and reasonable, actions additional to those described above to minimise noise output.			
	Construction vehicles are to be operated so as to minimise any construction noise impacts from the construction site. To achieve this the following is to occur:			
	Toolbox talks for drivers and operators			
	 No use of compression brakes on the site or on nearby roads 	During construction		CoC 75
NI\/11	• Loading and unloading of materials/deliveries is to occur as		Contractor's EM Site Supervisor	CoC 76
	far as possible from receptors.			
	 Selection of site access points and roads which are as far as possible away from noise sensitive receptors. 			MPW C'th CoA 6 (c)
	 Shielding of dedicated loading/unloading areas to be shielded if close to noise sensitive receptors (such that exceedance of NMLs is expected) 			
	• Fitting of delivery vehicles with straps rather than chains for unloading, wherever feasible and reasonable.			



ID	Management Measure	Timing	Responsibility	Reference
	 Make delivery personnel and truck drivers aware of approved haulage routes and access in and out of the construction site. 			
	 Prevent vehicles and plant queuing and idling outside the site prior to the morning start time. 			
	• Prevent vehicles and plant associated with the works idling in nearby streets and residential areas			
	 Traffic speeds are to be sign-posted, and drivers made aware of appropriate speeds and driving practices 			
	 Issue pre-determined delivery times to suppliers and use radio communication to confirm status of the delivery. 			
	 Contracts to include provisions to deal with any unsatisfactory noise performance for specific vehicles and/or operators and require the use of non-tonal reversing alarms 			
	The Truck Drivers Protocol presented in the CTAMP must be adhered to			
NV12	If noise management levels are likely to be exceeded, stationary noise sources are to be enclosed or shielded whilst ensuring that the work health and safety of workers is maintained.	During construction	Contractor's EM	CoC B73
NV13	If noise management levels are likely to be exceeded, structures are to be used to shield residential receptors from noise. This may include site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where	Pre-construction and during construction	Contractor's EM	CoC B73 MPW C'th CoA 6 (c)



ID	Management Measure	Timing	Responsibility	Reference
	practicable) and consideration of site topography when situating plant.			
NV14	A targeted assessment is to be undertaken during works to evaluate any proposed decrease in damage or human comfort safe work distance offsets and to determine if any other mitigation or management measures are required to address the potential impacts.	Construction	Contractor's EM	This plan
NV15	 In areas where residential buildings and or commercial buildings are located less than 100m from areas where vibratory rollers are proposed, all feasible and reasonable mitigation measures are to be implemented including: Selection of an appropriate-sized vibratory roller; The use of lower vibration settings or static rolling; and/or Verification of vibration levels via monitoring. 	Construction	Contractor's EM	CoC B77 (i) This plan
NV16	 If works are within 50m of Kitchener House, the following approach to manage potential vibration impacts is to be conducted prior to the commencement of those works: 1. Undertake pre-construction dilapidation surveys of Kitchener House (to be conducted by suitably qualified person); 2. Obtain a structural engineering report to confirm structural integrity of the building and confirm if item is 	Construction	Contractor's EM	CoC B77 (i) This plan



D	Manag	gement Measure	Timing	Responsibility	Reference
		'structurally sound' (or alternatively adopt the more stringent criteria specified in (5) below).			
	3.	Seek advice of a heritage specialist on methods and locations for installing equipment used for vibration and movement of heritage-listed structures.			
	4.	If Kitchener House is 'structurally sound', the screening criteria will apply, or			
	5.	If Kitchener House is 'structurally unsound' or if a structural engineering report is not conducted, the conservative cosmetic damage objectives of 3mm/s peak component particle velocity will be adopted.			
	6.	Conduct continuous vibration monitoring for the period where construction works occur within 100m.			
	7.	Undertake post-construction dilapidation surveys (to be conducted by suitably qualified person)			
	In the e does o	event an exceedance of established vibration criteria ccur, surveys is to be undertaken immediately.			



4. Monitoring and Reporting

4.1. Monitoring

Noise and vibration monitoring is to be conducted as per the requirements of this CNVMP. Noise measurements are to be undertaken consistent with the procedures documented in AS1055.1-1997 Acoustics - Description and Measurement of Environmental Noise – General Procedures. Vibration measurements shall be undertaken in accordance with the procedures documented in the EPA's Assessing Vibration - a technical guideline (2006), DIN4150 Structural Vibration – Part 3 Effects of Vibration on Structures and BS7385 Part 2 Evaluation and measurement for vibration in buildings. Monitoring during extended hours is described in Section B.5.

4.1.1. Maximum Noise Levels for Plant and Equipment

Attended noise measurements are to be undertaken within a period of 28 days of significant equipment arriving on site to establish the Sound Levels and to confirm that the operating noise levels comply with the values presented in Table 3-17 of this Plan.

Plant and equipment noise monitoring is to record the L_{Aeq} , and L_{A90} parameters as a minimum, with $L_{Aeq. 15min}$ values inferred by extrapolation or calculation as necessary. The L_{Amax} and $L_{A1, 15min}$ parameter should also be recorded for each measurement. The time and location of the monitoring is to be noted.

The plant and equipment measurement sample height is to be 1.5m above ground level, unless an alternate height is specified by the operator that more accurately captures emissions data for the item being considered. All measurements are to be completed with the sound level meter mounted to a tripod (if possible, hand held measurements are acceptable if the assessment height or position cannot be achieved using a tripod) and with a windscreen fitted.

The duration of each plant and equipment measurement sample is to be selected by the operator to adequately record the noise emission form the item being considered. To avoid misunderstanding, a shorter duration less than 15 minutes may be adopted for plant and equipment noise level tests.

4.1.2. Attended Community Noise Monitoring

4.1.2.1. Triggers for Attended Community Noise Monitoring

Attended noise monitoring is to be undertaken in the community in the following circumstances:

- In response to a complaint
- Where OOHW is approved and attended monitoring is determined as being required
- During EHW and attended monitoring is determined as being required.

4.1.2.2. Attended Noise Monitoring Locations

The attended measurements are to typically be conducted at the potentially most affected receivers in each NCA, as follows:

- NCA1: 15 Larra Court, Wattle Grove
- NCA2: 6 Namoi Court, Wattle grove



- NCA3: 2 Rushton Place, Casula
- NCA4: 14 Goodenough Street, Glenfield.

In addition to the locations above, attended noise measurements is to be conducted at an additional location in NCA3, at the corner of Blackwood Avenue and Canberra Avenue, Casula. This location has been added to account for the potential for complex topography to influence construction noise impacts in NCA3.

4.1.2.3. Attended Noise Monitoring Methodology

Community noise monitoring is to record the LAeq,15min and LA90,15min parameters as a minimum. The site noise level contribution (LAeq,15min) is to be determined in the absence of any influential source not associated with the Development works for direct comparison to the relevant criteria. The LAmax, LAmin, LA1 and LA10 parameters are to be recorded for each measurement with the LA1, 1minute parameter measured directly or calculated where possible and if applicable.

The community noise measurement sample height is to be 1.5m above ground level. The duration of each community noise measurement sample is 15 minutes. All measurements are to be completed with the sound level meter mounted to a tripod and with a windscreen fitted. The devices microphone is to be focused on the noise emission centre of the equipment being tested. No noise monitoring is to be completed during periods where wind speeds exceed 5m/s or during any rain events.

Unless monitoring locations are pre-determined, the sound level meter is to be located 3 metres to 5 metres away from walls, buildings and other reflecting surfaces where feasible. Noise monitoring is to be undertaken at the most affected point on or within the property boundary or at the most affected point within 30 metres of the property. Noise monitoring is to always be conducted when activities on-site are typical of normal works (i.e. not during respite periods for noisy works or where the measurements are likely to be influenced by noisy short term 'one off' activities).

If community noise monitoring identifies that predicted noise levels are being exceeded, the Construction Contractor is to revisit construction practices/sequencing etc. to reduce noise levels, minimise impacts and to enable provision of information on noise levels to surrounding and potentially affected residents should this be required (i.e. on request or following a complaint).

Where OOHW is approved and attended monitoring is determined to be required, attended noise measurements are to be conducted at the most affected receptors following the general and community monitoring requirements specified above.

4.1.3. Continuous Noise Monitoring

As required by CoC B64, continuous noise monitoring is to be undertaken during early works, fill importation, construction and for at least 12 months following occupation of the entire site at the locations specified above.

Following a noise compliant, the continuous noise monitoring data is used to determine the exceedance sources and whether they are attributable to construction activities. Meteorological conditions (average and maximum wind speeds, temperature, precipitation and cloud cover etc.) are to be noted during a review of any exceedances.

Site activity records are to be maintained during any noise or vibration monitoring events.

Moorebank Intermodal Precinct

4.1.4. Vibration Monitoring

Additional vibration monitoring of plant or equipment or in the community may be required. Circumstances where this may be required include:

- In response to vibration complaint
- Works occurring near or adjacent to retained heritage structures
- Use of vibration intensive plant needs to occur within the safe working distances specified in this CNVMP
- Attended monthly vibration monitoring during construction.

Vibration monitoring is to be conducted as per the requirements of this CNVMP and with due regard to EPA's Assessing Vibration - a technical guideline (2006), DIN4150 Structural Vibration – Part 3 Effects of Vibration on Structures and BS7385 Part 2 Evaluation and measurement for vibration in buildings.

Specific monitoring requirements and measures for heritage and other sensitive structures and residential receivers are described below:

- Should activities with the potential to generate significant vibration events in close proximity to heritage structures and other sensitive structures be identified, vibration testing is to be undertaken for the activity at a location away from sensitive buildings or structures.
- The safe working distances for human comfort specified in Table 3-22 are to be used to trigger this testing equipment.
- The vibration testing methodology is to be established by a suitably experienced person and/or in consultation with a qualified technical specialist.
- The outcomes of the vibration testing may require continuous unattended vibration monitoring to occur for select activities. The methodology for any ongoing vibration monitoring is to be established by a suitably experienced person and/or in consultation with a qualified technical specialist.
- Pre and post construction dilapidation surveys of sensitive structures where vibration is likely to result in damage to buildings and structures (including surveys being undertaken immediately following a monitored exceedance of the criteria).

A vibration monitoring report is to be developed following monitoring and include the following information:

- Relevant guideline or policy that has been applied
- Background vibration measurements that have been undertaken
- Instruments and methodology used for measurements (including reasons for settings and descriptors used and calibration details)
- A site map showing location of vibration sources, measurement locations and receivers (where appropriate)
- Vibration criteria applied
- Vibration measurement results


- A comparison of measured against vibration criteria
- A discussion of proposed mitigation measures, the vibration reduction likely, the feasibility and reasonableness of these measures and how compliance and conformance can be practically determined.

4.1.5. Monitoring Reports

The Contractor's EM is to compile a report for the construction noise and vibration compliance monitoring (attended monitoring) every month detailing the community noise monitoring results as well as any other noise and vibration monitoring that was conducted during the reporting period. The report is to include information about any exceedances detected and how non-compliances and non-conformances were addressed. Non-conformances, non-compliances and corrective and preventative actions are to be managed in accordance with the CEMP Section 4.4. This report is to be sent to the Principal's Representative.

Monitoring reports are to be used to maintain compliance and record the effectiveness of management measures against construction noise impacts. Measures evaluated as being ineffective are subject to review and trigger the implementation of additional environmental controls during an update of the CNVMP.

4.1.6. Exceedance of Noise and Vibration Management Levels

In the event of an exceedance of noise and vibration management levels, works are to cease or reduce immediately at the direction of the Contractor's CM/EM or Site Supervisor. Remedial measures are to be implemented prior to recommencing work, and monitoring undertaken to verify noise or vibration levels.

If high noise generating works are shown to exceed the required noise criteria, or if noise complaints are received related to the high noise work, additional mitigation is to be implemented for these activities (to assist with compliance with the required noise limits to the satisfaction of the ER), such as:

- Acoustic screening
- Alternate work methodologies
- Alternative plant with lower noise
- Plant and machinery will be checked and verified for noise levels and appropriate exhaust/fittings/noise attenuators.

In the event of appreciable vibration levels arising from construction activities, measures are to be put in place to reduce vibration to within acceptable levels. Such measures may include reducing equipment size, changing operational settings, using other plant in lieu of that which is generating the vibration or a combination of these.

4.2. Community Enquiry, Complaints and Incident Management

Community consultation is to be undertaken in accordance with the CEMP and Section 3.3.2 and Section 3.3.5 of the Construction Community Communication Strategy (CCCS). Prior to the commencement of high noise activities, notification is to be issued to the agreed distribution area specified in Appendix A of the CCCS; 7 days prior to works which may impact on the community or stakeholders.



The objective of the CCCS is to notify the community regarding works being undertaken for potentially affected neighbouring property owners and businesses before undertaking major activity or milestones. These may include:

- · Commencement and completion of works
- Noisy works
- Out of Hours
- Changes to traffic, parking or access.

Community notifications include all Community Updates, Out-of-Hours notices, project information flyers and other communications material. The notifications proactively notify the community and key stakeholders of current and forthcoming activities including those that have the potential to impact on the community. All notifications are to include the Development contact numbers, details of the Development website and an email address to refer any enquiries or complaints.

In the event of a noise or vibration incident or complaint, the response management process summarised in

Table 4-1 is to be implemented.

Complaints arising from the Development are to be treated sensitively and in a manner, that recognises the potential for noise and vibration to cause environmental impacts. Special consideration is to be given to complaints related to noise and vibration during highly intrusive works (particularly those activities when increased impacts are predicted) in order that additional mitigation can be implemented in a timely manner.

Various lines of communication are to be made available for enquiries and complaints during construction of the Development. This is to include a 24-hour telephone number for enquiries and complaints. Any complaints received during the works are to be dealt with in accordance with the Development Complaints management protocols outlined in the CCCS.

Incident Type	Response	Responsibility	
Noise levels from construction activities exceed noise goals and criteria	Noisy activities are to cease or reduce under direction of the Contractor's EM/CM or Site Supervisor. Remedial measures are to be implemented prior to recommencing work, and monitoring undertaken to verify noise levels. All plant and machinery is to be checked and verified for noise levels and appropriate exhaust/fittings/noise attenuators. Works methodologies are to be reviewed and amondod if required	Contractor's EM Site Supervisor	
Community complaint relating to noise or vibration	Any noise or vibration complaints received from the community or adjacent stakeholders are to be recorded and responded to within two hours in accordance with the complaints management	Contractor's EM DM Communication	

Table 4-1 Noise and Vibration Incident / Complaint Response Management



Incident Type	Response	Responsibility
	system for the Development. Attended noise or vibration monitoring is to be undertake if on review of the continuous monitoring data, the source of the noise or vibration complaint is a MPE 2 construction activity.	
	Noise or vibration intensive activities are to cease or reduce under direction of the Contractor's EM or Site Supervisor. Remedial measures are to be implemented prior to recommencing work, and monitoring undertaken to verify noise levels.	
	All plant and machinery is to be checked and verified for noise levels and appropriate exhaust/fittings/noise attenuators.	
	Works methodologies are to be reviewed and amended if required.	
Negotiations with specific Receptors	Additional noise and vibration mitigation measures may be negotiated with sensitive receptors if requested or as required to address complaints (if received).	DM Communication
Vibration causing structural damage	Activities causing significant vibration at off site buildings (however unlikely) are to cease under direction of the Contractor's EM or Site Supervisor. Any occupants of buildings may be evacuated with due consideration to safety, and the area secured to prevent unauthorised access. A structural assessment is to be undertaken and the results compared with any previous condition survey; and if any damage is associated with construction, rectification work is to be implemented or compensation agreed.	Contractor's EM Site Supervisor

4.3. Review and Improvement

Any amendments to the CNVMP and associated documentation is to be undertaken in accordance with Section 1.2.7 of the CEMP.

Management reviews are to be undertaken as part of the continual improvement process. The reviews are to be initiated by the Contractor's EM and include relevant Development team members and stakeholders and are to be undertaken in accordance with Section 4.5 of the CEMP.

The review of the CNVMP is to include:

- Consideration of the general progress of work, significant changes in construction activities and the level of overall environmental risk
- Consideration of monitoring, inspection and audit results
- Consideration of recent and relevant incidents and any lessons learnt
- Consideration of any new regulatory obligations



- Consideration of any recorded noise complaints
- A review of the effectiveness of environmental controls, including management measures
- Consideration of changes in operational needs such as resourcing
- Feedback from relevant stakeholders.

The outcomes of the environmental reviews may trigger amendments to this CNVMP and related documentation, revision to the Development environmental management system, review of the risk assessment, re-evaluation of the Development objectives and targets as well as input into other project documents.

Noise and vibration monitoring results are to be reviewed by the Contractor's EM to evaluate the effectiveness of noise management measures and to analyse results against impacts detailed in Section 3.3. If additional noise management measures are identified, this plan is to be reviewed and amended where required.

Where amendments require changes to the Truck Driver Protocol, the relevant sections of the Construction Traffic and Access Management Plan must also be updated.

4.4. Non-compliances, Non-conformances and Actions

It is the responsibility of all personnel to report non-compliances and non-conformances to their Site Supervisor and/or the Contractor's EM.

Non-compliances, non-conformances and corrective and preventative actions are to be conducted in accordance with Section 4.4 of the CEMP.



APPENDIX A OUT OF HOURS WORKS PROTOCOL



<u>Preamble</u>

This Out of Hours Works (OOHW) Protocol has been developed to assist with compliance of environmental legislation, project obligations and to effectively manage potential environmental impacts associated with noise during in the course of construction of the Project. It has been prepared in accordance with CoC B68 and CoC B77(e).

Objectives

This Protocol outlines the project requirements for construction working hours and documents a process to be implemented when work outside of standard hours is required.

The key objective of the Protocol is to minimise, and where possible avoid impacts to the local community, and the requirements of CoC B68 and CoC B77(e) are met. Specific objectives include:

- Minimising potential adverse noise impacts to the community
- Identify sensitive receivers and implement appropriate noise control measures during out of hours construction activities
- Implement appropriate measures to comply with relevant legislation and other requirements.

Compliance Matrix

Table A-1 shows the requirements for the OOHW in CoC B68 and CoC B77(e) and where the condition has been responded to in this Protocol.

Table A-1 Compliance Matrix OOHW Protocol

Condition Number	Condition	Document Reference	How Addressed
B68	The Applicant must prepare an Out-of-Hours Work Protocol for any work undertaken outside the hours specified in condition B65 or outside the circumstances specified unde condition B67. An Out-of-Hours Work Protocol must provide for the assessment, management and monitoring of out of hours work, including:	Appendix A	The Out-of-Hours Work Protocol is included in Appendix A and addresses the requirements of CoC B68.
	a) Where works are shown to be inaudible at the nearest sensitive receivers and vibration levels do not exceed those stipulated by Table 2.2 and Table 2.4 of Assessing Vibration: a technical guide (DEC, 2006);	Table A-2, Number 4	Table A-2, Number 4
	b) Where a negotiated agreement has been arranged with affected receivers;	Table A-2, Numbers 6 and 7	Table A-2, Numbers 6 and 7
	c) Where noise can be shown to satisfy the noise management levels specified in the Interim Construction Noise Guideline	e Table A-2, Number 5 e	Table A-2, Number 5



Condition Number	Condition	Document Reference	How Addressed
	(ICNG, DECC, 2009) at non-residential land uses; or,		
	d) Where works are undertaken as part of an <i>Extended</i> Hours Work Plan approved as part of the Out-of-Hours Work Protocol.	Table A-2, Number 8	Table A-2, Number 8
B77 (e)	An Out-of-Hours Work Protocol as referenced in condition B68 for the assessment, management and approva of works outside standard construction hours, for the Secretary's approval. The Out-of-Hours Work Protocol must:	I	
	i. Detail assessment of out-of-hours work against the relevant noise and vibration criteria;	Table A-2	Table A-2
	 Provide detailed mitigation measures fo any residual impacts (that is, additional to general mitigation measures), including extent of at-receiver treatments; 	Table A-2 and Appendix A	Table A-2 and Appendix A
	iii. Include proposed notification arrangements; and	Table A-2, Number 9	Table A-2, Number 9
	iv. Include an Extended Hours Work Plan as required by condition B69.	Appendix B	Appendix B

Out of Hours Work Protocol

Exclusions to this Protocol: with due regard to CoC B67 OOHW will be undertaken without further assessment in the following circumstances:

- For the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons;
- Where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; and
- Where different construction hours are permitted or required under an EPL in force in respect of construction, in which case these construction hours must be complied with.

The Contractor's EM must submit an OOH works request to the Principal's Representative at least two weeks prior to works being undertaken (except in emergency circumstances) for endorsement. The Principal's Representative must submit the OOH request to the ER for information. OOHW periods are detailed in Table 1-3 of the CNVMP.



Where possible, OOHW will be avoided and scheduled to occur during the approved hours for construction. Where OOHW are needed for the safe and efficient implementation of the Project, or due to exceptional circumstances the level of impacts of OOHW will be considered.

A Construction Noise and Vibration Impact Statement (CNVIS) will be utilised to identify risk of the proposed OOH activity, and whether the application is required to be approved by the Contractor's or Project Manager's EM and/or the Environmental Representative (ER), or referred to DP&E.

Table A-2 OOHW Protocol

No.	Step	Detail
1.		• Identify work activities requiring OOH and when the work will occur.
		 Identify the reason why OOHW are needed; does the work proposed need to be completed outside the approved hours of construction or can it be rescheduled for standard working hours.
	Work Identification	 If the OOHW are essential to the Project, or are required due to exceptional circumstances, prepare and document a justification for the works.
		• If works fall into the categories identified in the EHWP, then the works are to be carried out under the EHWP.
		Assess alternate options that may allow construction to be undertaken within approved hours such as:
		Using alternate equipment
		Different construction methods, or
2	Assess Alternatives	Postponing scheduled works.
Ζ.		If no other options are considered practical, consult the PM's Environmental Manager and document, using an Out of Hours form (developed by the Construction Contractor) to provide a description of the works, the expected duration, a list of all noise generating plant, equipment and machinery in use, activities to be undertaken, and all potential mitigation and management measures considered.
3.		If no alternate options are available / viable, the activity is to be assessed for noise and vibration impacts on the surrounding receptors via a Construction Noise and Vibration Impact Statement (CNVIS) prepared by suitably qualified personnel, taking into account all proposed noise and vibration mitigation measures. The CNVIS will:
	Undertake CNVIS	 Identify the closest and/or potentially most affected receptors situated within the potential area of influence of the works;
		 Predict noise and vibration levels based on the NVIA scenarios or via modelling (or spreadsheet calculation) for new scenarios;
		 Compare the predicted values to the noise and vibration management levels;



No.	Step	Detail
		• Provide a list of necessary mitigation and management measures that will be required to be implemented.
		Predictions will account for particularly annoying (tonal, low frequency content or impulsive) work activities by applying a 5dB(A) penalty to the values for particularly annoying activities.
		Predictions will account for all potential noise and vibration mitigation and management measures by applying a deduction to the values assessed above for the noise reducing measures that will be implemented.
		Predictions will be provided to assess potential sleep disturbance impacts, if anticipated.
		General activities which are inaudible at receptors, including (but not limited to), security operations, monitoring, survey, refuelling, low noise plant maintenance, general site maintenance will not require a CNVIS.
4.	Negligible Impact Works	If the CNVIS shows that construction works will <u>not</u> generate L _{Aeq,15minute} noise levels more than the rating background level at sensitive receivers, the activity will be considered inaudible. Where works are <u>inaudible at the nearest</u> <u>sensitive receivers and vibration levels will not exceed those stipulated by</u> <u>Table 2.2 and Table 2.4 of Assessing Vibration: A Technical Guide (DECC</u> <u>2006), the works will be considered to have negligible impact</u> and referred to the Contractor's EM for review and approval. The Contractor's Works package Manager (Contractor's WM), Principal's Representative and the ER will be provided with the OOHW approval for information.
		If the CNVIS shows that construction works <u>will generate L_{Aeq.15minute} noise</u> <u>levels between the rating background level and 5dB above the rating</u> <u>background level and comply with the Vibration Management Level (VML),</u> the activity will be considered low impact and referred to the ER for review and approval.
		In referring the approval to the ER, the Construction Contractor will:
5.	Low Impact Works	 Demonstrate the requirement for activities to be conducted outside the approved standard construction hours
		Summarise the findings of the CNVIS assessment, and
		• Detail the mitigation measures to be implemented for the specific OOHW.
		Where the nature of the activity, the likely impacts and the proposed management measures are considered acceptable by the ER, the works may proceed when ER and Principal's Representative approval is received.
	High Impact Works	If the CNVIS shows that construction works <u>will</u> exceed NML and/or VML, the activity will be considered high impact and, if negotiated agreements have been reached with affected receivers, referred to ER for review and approval.
6.	Negotiated agreements achieved	Where practical, noisy construction work will be undertaken during the less sensitive 6pm to 10pm evening period.
	with the community	In referring the approval to ER, the Construction Contractor will:
		 Demonstrate the requirement for activities to be conducted outside the approved standard construction hours;



No.	Step	Detail
		Summarise the findings of the CNVIS assessment;
		 Detail the mitigation measures to be implemented for the specific OOHW; and
		 Detail the negotiated agreements agreed with the community.
		Where the nature of the activity, the likely impacts and the proposed management measures are considered acceptable, by works may proceed when ER and Principal's Representative approval is received.
		If the CNVIS shows that construction works <u>will</u> exceed NML and/or VML, the activity will be considered high impact and, if negotiated agreements have not been reached with affected receivers, an updated Out of Hours Works Protocol will be developed and referred to DP&E, for review and approval.
		Where practical, noisy construction work will be undertaken during the less sensitive 6pm to 10pm evening period.
		In referring the approval to DP&E, the contractor will:
	High Impact Works Negotiated	 Demonstrate the requirement for activities to be conducted outside the approved standard construction hours
7.	agreements <u>not</u> achieved with the	 Summarise the findings of the CNVIS assessment;
	community	 Detail the mitigation measures to be implemented for the specific OOHW; and
		 Detail why the negotiated agreements were not agreed with the community.
		When referring the application to DP&E, the ER will provide a summary of the issues and provide a recommendation to be considered by DP&E.
		Up to 4 weeks (20 business days) will be allowed for DP&E to review the updated OOHW Protocol.
8.	OOH Works Approval	OOHW will not commence until approval is granted in accordance with items 4, 5, 6 or 7 (whichever is applicable)
9.	Community	Community notification will be undertaken in accordance with the Community Communication Strategy. All OOHW (both low and high impact) will require notification to be distributed to receptors potentially affected by the works. A notification boundary will be established on a case by case basis in consultation with the Principal's Representative.
	NULLICATION	Notification will be issued to the agreed area at least 7 days prior to works which may impact the community or stakeholders. The Project website will be updated with relevant information to further notify the community and stakeholders.
10.	Mitigation and Monitoring	All reasonable and feasible mitigation measures will be implemented in both standard approved hours and OOHW for the duration of the Project.



No.	Step	Detail
		Attended noise monitoring will be undertaken during OOHW and in accordance with other project or environment protection licence requirements.
		Monitoring will provide comparison the applicable CNVIS to confirm noise levels are consistent with those predicted in the CNVIS. Where noise (or vibration) levels are observed to continually exceed those outlined in the activity specific CNVIS, works shall stop and alternate methods and mitigation measures investigated and implemented.
		Noise and vibration monitoring will be undertaken by suitably qualified personnel, including professionally trained and experienced environmental staff and noise consultants where deemed necessary.

Noise Mitigation to be Considered for OOHW

Noise and vibration mitigation measures for OOHW in addition to the general management measures detailed in Section 3.5 the CNVMP will be considered. These will be considered on a case by case basis and nominated where reasonable and feasible, dependent upon the outcomes of the CNVIS:

- All plant to be well maintained and fitted with noise mufflers, engine hoods etc
- Timetabling noisiest activities to occur at the least sensitive times i.e. in the evening as opposed to night, or mid-morning as opposed to first thing in the morning
- Using spotters, closed circuit television monitors, "smart" reversing alarms, or "squawker" type reversing alarms in place of traditional reversing alarms;
- Mitigation of specific noise sources using portable temporary screens or enclosures, where practicable and safe
- Turning off plant and equipment when not in use
- Carrying out loading and unloading away from sensitive receivers, where practicable
- Avoid dropping materials from a height
- Timetabling OOHW at locations with the furthest distance from sensitive receivers
- Substituting noisy/vibration intensive equipment with less intrusive types
- Maximising the offset distance between noisy plant items and sensitive receivers
- Avoiding using noisy plant simultaneously and / or close together, adjacent to sensitive receivers, where practicable
- Orienting equipment away from sensitive receivers, where practicable;
- Using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including cranes, graders, excavators and trucks
- Selecting plant and equipment based on noise emission levels.

In extreme circumstances where the CNVIS deems the works to be of high impact, and they cannot be planned to occur during standard construction hours, at-receiver treatments may be required. They may include but not be limited to:



- Temporary acoustic shielding
- Offer of respite to residents

Following the application of all feasible and reasonable mitigation measures, if proposed OOHW are anticipated to result in residual impacts, defined as an exceedance of NML or VML, due consideration should be given to conducting these works during standard construction hours instead of OOH.

The potential noise reduction that can be achieved by noise mitigation measures are shown in Table A-3.

Table A-3 Noise Mitigation Measures

Management Measure	Anticipated Noise Reduction, dBA
Administrative Controls	
Operate during approved hours	N/A
Undertake regular noise monitoring to determine the impact of operating plant on sensitive receivers	g N/A
Appropriate training of onsite staff	N/A
Undertake community consultation and respond to complaints in accordance with established project procedures	n N/A
Turning off machinery when not in use	0-5
Respite periods for pile drivers and rock breakers	N/A
Engineering Controls	
Portable temporary screens	5-10
Screen or enclosure for stationary equipment	10-15
Maximising the offset distance between noisy plant items and sensitive receivers	e 3-6
Avoiding using noisy plant simultaneously and / or close together adjacent to sensitive receivers	-, 2-3
Orienting equipment away from sensitive receivers	3-5
Carrying out loading and unloading away from sensitive receivers	3-5
Using dampened tips on rock breakers	3-6
Using noise source controls, such as the use of residential clas mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	s g 5-10



Management Measure	Anticipated Noise Reduction, dBA
Selecting site access points and roads as far as reasonably practicable away from sensitive receivers	3-6
Using spotters, closed circuit television monitors, "smart" reversing alarms, or "squawker" type reversing alarms in place of traditiona reversing alarms	2-5
Employ non-noise generating structures such as site offices, storage sheds, stockpiles and tanks as noise barriers	, 5-10



APPENDIX B NOISE MITIGATION TO BE CONSIDERED FOR OOHW



Introduction

This Extended Hours Work Plan (EHWP) has been developed for the Project to comply with the requirements of CoC B68(d) and B69 and other relevant conditions, as listed in Table B-1. The EHWP presents the assessment, management and approval process for works to occur during EHW.

All works conducted under this EHWP will be conducted consistently with the CNVMP.

Table B-1 EHWP Compliance Matrix

CoC	Re	tequirement EHWP Reference How Addressed		
B69	An pre dur Ta l The pro	Extended Hours Work Plan will be epared for any construction undertaken ring the extended hours detailed in ble 3 as required by condition B68(d). e Extended Hours Work Plan must ovide for:		
	a)	A three month assessment period, commending at the start of extended hours construction work;	Section 4.	Continuous noise monitoring results to be reviewed during first week of EHW and monthly thereafter for the three month assessment period, with a final report issued to the Secretary.
	b)	Implementation of the Construction Noise and Vibration Management Plan;	CNVMP	This EHWP has been prepared in a manner consistent with the CNVMP and refers to relevant sections of the CNVMP. Any relevant updates to the CNVMP will be incorporated into the EHWP via the EWHP review process.
	c)	Noise monitoring at a representative number of sensitive receivers (including closest and furthest) to confirm the predicted noise levels;	Section 4.	Monitoring to be conducted per the processes outlined in Section 4 of the CNVMP. Additional monitoring location added in NCA3 to confirm the predicted noise levels.
	d)	Targeted consultation with the noise affected sensitive receivers;	Section 0	Consultation with potentially affected receivers included in Section 0.
	e)	Notification of the relevant Council, local residents and other affected stakeholders and sensitive receivers of the timing and duration at least 48 hours prior to the commencement of the works;	Section 4.2.	Council and stakeholder notification requirements specified in Section 4.2.



CoC	Re	quirement	EHWP Reference	How Addressed
	f)	Construction work timeframes and methods for investigation of noise complaints;	Section 1.4.1.	EHW periods and duration of works described in Section 1.4.1.
			Section 4.2	Complaints handling process outlined in Section 4.2.
	g)	Submission of monthly complaints reports to the Department for the life of extended hours activities;	Section 4.1.5	Reporting processes, outlined in Section 4.1.5, to include monthly reports to DPHI.
	h)	Continual refinement of mitigation measures based on consultation with the noise affected sensitive receivers;	Section B.4	Review process, outlined in Section B.4, to include consultation with relevant stakeholders.
	i)	Implementation of work practices set out in section 5.2 of the ICNG;	Section B.4	Management and mitigation during EHW to be consistent with Section B.4 of the CNVMP and includes ICNG work practices.
	j)	A final summary report submitted to the Secretary at the end of the assessment period in sub-condition (a), detailing the outcomes of the assessment period, the resolution of complaints during the assessment period, and demonstrate the acceptability of works outside standard hours.	Section B.5.4	Reporting processes, outlined in Section B.5.4, to include final report to DPHI.

Table 3: Extended Hours of Work

Activity	Day	Time
Early works and Construction (not including high noise impact, piling, spoil placement, rock breaking, concrete batching).	Monday – Friday	6am to 7am 6pm to 10pm 1pm to 5pm
	Saturday	1pm to 5pm



B.1.1 Description of Works

The following section identifies the EHW activities. CoC B69 allows extended hours for construction works "not including high noise impact, piling, spoil placement, rock breaking, concrete batching".

A summary of the EHW periods, and associated activities proposed to be undertaken is provided in Table B-2.

Construction works period	Activity
6:00am – 7:00am Weekdays	 Starting of EHW equipment for servicing and maintenance Material delivery Stockpiling
6:00pm – 10:00pm Weekdays 1:00pm – 5:00pm Saturday	Material deliveryStockpiling

Table B-2 Construction activities to be undertaken within EHW periods

B.1.2 Construction Compounds

Works during extended hours will make use of the construction compounds described in Section 3.3.2 of the CNVMP.

B.1.3 Timing and Duration

The proposed EHW will be conducted in Works Period B "Bulk Earthworks, Drainage and Utilities" which is to occur within Construction Phase A. As outlined in Section 1.3.3 of the CNVMP, these works will be undertaken in stages beginning in Q2 of 2018 and would have a duration of up to three years.

B.2 Identification of Receivers

The potentially most affected residential receivers in the vicinity of the Project site are specified in Section 3.1.1 of the CNVMP and, for convenience, are summarised below in Table B-3.

Receiver/Suburb	Category	Distance (m) from Stage 2 Construction Area			
Wattle Grove		390			
Wattle Grove North	 Residential	350			
Casula		760			
Glenfield		390 350 760 1,580			

Table B-3 Sensitive Receivers



Receiver/Suburb	Category	Distance (m) from Stage 2 Construction Area		
All Saints Senior College (S1)	Educational	1,250		
Casula Powerhouse (S2)		890		
MPW (I1)		Boundary		
DJLU (I2)	Industrial	Boundary		
ABB (I3)		495		

Kitchener House is located at 208 Moorebank Avenue and is of heritage significance. Kitchener House is vacant and is therefore not considered as a noise sensitive receptor, however it is to be considered as a sensitive receiver for potential construction vibration impacts which could cause damage to the heritage structure.

B.3 Noise and Vibration Management Levels

B.3.1 Noise Management Levels

In accordance with the ICNG, construction noise management levels (NML) outside of standard construction hours are set at 5dBA above the rating background noise level (RBL) for residential land uses. NML for the EHW periods permissible under CoC 69 have been developed using the RBL presented in Section 3.1.2 of the CNVMP and are presented below in Table B-4.

Table B-4 also presents NML for non-residential land uses, which are independent of the RBL.

NCA	Noise Management Level (NML) in dB(A)			
	6am to 7am Weekdays	6pm to 10pm Weekdays	1pm to 5pm Saturday	
Wattle Grove	42	42	47	
Wattle Grove North	41	41	41	
Casula	39	42	46	
Glenfield	42	49	49	
S1, S2	55	55	55	
DJLU	75	75	75	

Table B-4 Extended Hours NML

B.3.2 Construction Traffic Noise Criteria

The ICNG does not include any criteria to assess off-site traffic noise associated with construction of the Project.



Criteria for off-site road traffic noise applicable to existing residences affected by additional traffic on existing local roads generated by land use developments are specified in the NSW Road Noise Policy (RNP). Whilst these criteria do not specifically apply to construction traffic movements, they have been conservatively considered and are summarised in Table B-6 Table B-5.

Table B-2 RNP Criteria for Road Traffic Noise

Road	Category	Assessment Criteria - dBA	
		Day (7am – 10pm)	Night (10pm – 7am)
M5 Motorway	Freeway	L _{Aeq, 15 hour} 60 (external)	L _{Aeq, 9 hour} 55 (external)
Moorebank Avenue, Anzac Road	Arterial Road	L _{Aeq, 15 hour} 60 (external)	L _{Aeq, 9 hour} 55 (external)

Note: The specified criteria do not apply to vehicle movements within the Project Site. For the purpose of assessment, any noise generated by on-site vehicle movements is considered as construction noise and assessed holistically with on-site mobile plant in accordance with the *ICNG*.

Additionally, it is typically recognised that for existing residences and other sensitive land uses affected by additional traffic on existing roads, any increase in the total traffic noise level should preferably be limited to 2dB above the existing road traffic noise levels. A 2dB increase is typically considered not noticeable.

B.3.3 Vibration Management Levels

B.3.3.1 Disturbance to Buildings Occupants

Assessment of potential disturbance from construction vibration on human occupants of buildings is made in accordance with the guideline Assessing Vibration; a technical guideline (DECC, 2006). The guideline provides criteria which are based on the British Standard BS 6472-1992 'Guide to evaluation of human exposure to vibration in buildings (1-80Hz)'.

BS6472-1992 nominates guideline values for various categories of disturbance, the most stringent of which are the levels of building vibration associated with a "low probability of adverse comment" from occupants.

BS 6472-1992 was amended in 2008 to extend the use of the Vibration Dose Values (VDV) to all types of vibration (i.e. continuous, impulsive and intermittent). The vibration dose value is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the daytime or night-time period.

The vibration dose values recommended in BS 6472-1992 for which various levels of adverse comment from occupants may be expected are presented in Table B-6.

Moorebank Intermodal Precinct

Table B-3 Vibration Dose Value ranges which might result in various probabilities of adverse comment within buildings

Place and Time	Low probability of adverse comment (m/s ^{1.75})	Adverse comment possible (m/s ^{1.75})	Adverse comment probable (m/s ^{1.75})
Critical areas (day or night)	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Residential buildings 16 hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Offices, schools, educationa institutions and places of worship (day or night)	I 0.4 to 0.8	0.8 to 1.6	1.6 to 2.4
Workshops (day or night)	0.8 to 1.6	1.6 to 3.2	3.2 to 6.4

To assess the potential for vibration impact on human comfort, initial screening criteria based on Assessing Vibration; a technical guideline (DECC, 2006) have been adopted based on peak velocity units, as this metric is also used for the cosmetic damage vibration assessment. The screening criteria are conservative because they are based on the continuous vibration velocity criteria (i.e. vibration that continues uninterrupted for a defined assessment period) while construction works are mostly intermittent. The screening criteria are based on the preferred peak values, as shown in Table B 7, for pseudo-continuous work activities and on maximum peak values for surface construction works, which are intermittent in nature.

Table B-4 Construction Vibration Distance - Initial Screening Criteria

Place and Time	Preferred peak velocity, mm/s (>8Hz)	Maximum peak velocity, mm/s (>8Hz)
Critical areas (day or night)	0.14	0.28
Residential buildings 16 hr day	0.28	0.56
Residential buildings 8 hr night	0.20	0.40
Offices, schools, educational institutions and places of worship (day or night)	0.56	1.10
Workshops (day or night)	1.10	2.20



B.3.3.2 Damage to Infrastructure and Heritage

Potential structural damage of buildings, services or heritage structures caused by vibration is typically managed by ensuring vibration induced into the structure does not exceed certain limits and standards. The management criteria is not time affected; therefore the management of vibration in relation to structural damage should be undertaken in accordance with the CNVMP Section 3.2.2.2 to 3.2.2.5.

B.3.4 Construction Equipment and Activities

A range of construction equipment will be required during extended hours. A summary of the indicative equipment likely to be utilised is provided in Table B-8. Sound Power Levels (SWLs) associated with typical construction plant to be used during extended hours are also specified in Table B-8. These SWLs have recently been measured at other similar construction sites. The table gives both SWL and Sound Pressure Levels (SPL) at 7m for the equipment. SWL is independent of measurement position.

	Equipment Qty Per EHW Activity		Noise Levels (dBA)	
Equipment	Material Delivery	Stockpiling	Sound Power Level	Sound Pressure Level at 7 m
Truck and Dog	\checkmark		103	78
Static and vibratory rollers, and high energy impact compaction ^{1,2}		\checkmark	110	85
825 Compactor		\checkmark	112	87
Dozers		\checkmark	118	93
Graders	\checkmark		109	84
Water trucks	\checkmark	\checkmark	105	80
Road Sweeper	\checkmark		90	65
Lighting towers	\checkmark	\checkmark	108	83
Generators	\checkmark	\checkmark	85	60

Table B-5 Indicative construction equipment and noise levels for EHW

Note 1: 5 dB modification factors applied.



Note 2: Data supplied by Day Design (ref: 6033-7.1L REV C)

It is commonplace for construction equipment to be started for servicing prior to normal use. The noise emissions associated with starting equipment for servicing are typically lower than those during normal use. Accordingly, the noise levels presented in Table B-8 conservatively represent noise emissions associated with servicing construction equipment.

B.3.5 Predicted Noise Levels

During the EHW period between 6.00am – 7.00am weekdays, LAeq,15min noise levels at sensitive receivers have been predicted and are presented in Table B-9. Table B-9 indicates that construction noise levels are not predicted to exceed the applicable NML at sensitive receivers during the extended hours construction between 6.00am – 7.00am weekdays.

Receiver	Predicted L _{Aeq, 15min} Noise Level	NML	Exceedance
Wattle Grove	28	42	0dB
Wattle Grove North	35	41	0dB
Casula	37	39	0dB
Glenfield	<20	42	0dB

Table B-6 Predicted Construction Noise Levels during extended hours of 6am and 7am weekdays

Materials delivery and stockpiling are proposed activities during the EHW periods of 6.00pm - 10.00pm weekdays and 1.00pm - 5.00pm Saturday.

 $L_{Aeq,15min}$ noise levels at sensitive receivers have been predicted and are presented in Table B-7. Table B-7 indicates that construction noise levels are not predicted to exceed the applicable NML at sensitive receivers during the EHW periods of 6.00pm – 10.00pm weekdays and 1.00pm – 5.00pm Saturday.

Table B-7 Predicted Construction Noise Levels during extended hours of 6.00pm – 10.00pm weekdays and 1.00pm – 5.00pm Saturday

Receiver	Predicted L _{Aeq, 15min} Noise Level	NML	Exceedance
Wattle Grove	34	42	0dB
Wattle Grove North	30	41	0dB
Casula	28	39	0dB
Glenfield	21	42	0dB





B.3.6 Potential Construction Traffic Noise Impacts

B.3.6.1 Damage to Infrastructure and Heritage

During the EHW, all heavy vehicles, and the majority of light vehicles, will travel to and from the site via the M5 Motorway and Moorebank Avenue. Additionally, a small number of light vehicles will travel along Anzac Road, east of Moorebank Avenue, and along Moorebank Avenue, north of the M5 Motorway. No heavy vehicles, associated with the construction of the Project, will travel along Anzac Road, or along Moorebank Avenue, north of the M5 Motorway.

The existing and projected daily traffic volumes, and percentage heavy vehicles, along the identified roads, for the construction of the Project, are presented in Table B-11. It is not yet known whether heavy construction vehicles would travel to the site, along the M5 Motorway, from the east or the west. This would depend upon factors such as the construction contractor, and the source(s) of fill. Therefore, the projected construction traffic volumes along the M5 Motorway, presented in Table B-11, are based on all heavy construction vehicles travelling along the M5 Motorway both east and west of Moorebank Avenue. Such a scenario may not eventuate in practice, and therefore, the assessment of construction traffic noise along the M5 Motorway is conservative.

Location	Time ¹	Existing (no Development)		Future (with Development)	
		Volume	%Heavy	Volume	%Heavy
M5 Motorway	Day	106,344	9.7	107,370	10.5
- East of Moorebank Avenue	Night	21,060	13.2	21,201	13.5
M5 Motorway	Day	124,264	10.2	125,290	10.8
- West of Moorebank Avenue	Night	24,036	11.5	24,177	11.8
Moorebank Avenue	Day	26,892	10.0	26,953	10.0
- North of M5 Motor way	Night	6,308	10.0	6,345	9.9
Anzac Road – East of Moorebank Avenue	Day	8,991	4.6	9,018	4.6
	Night	2,109	4.6	2,125	4.6

Table B-8 Construction Traffic Volume and % Heavy Vehicles

Source: Arcadis

1. Day = 7.00am - 10.00pm, Night = 10.00pm - 7.00am

B.3.6.2 Damage to Infrastructure and Heritage

Using the data in Table B-11, the increases in road noise levels along the M5 Motorway, Moorebank Avenue and Anzac Road, during the construction of the Project, have been calculated. The calculations have been conducted using the Calculation of Road Traffic Noise (CORTN) algorithm, and are based upon the following assumptions:



- Vehicle speeds are 100km/h along the M5 Motorway and 60km/h along Moorebank Avenue and Anzac Road.
- Typical receiver setbacks are approximately 25 metres along the M5 Motorway and approximately 12 metres along Moorebank Avenue and Anzac Road. It is important to highlight that receiver setbacks are important when calculating absolute road noise levels, however setbacks are not important when calculating increases in road noise levels due to changes in traffic volume and mix.

The predicted increases in road noise levels, due to the construction of the Project, are shown in Table B-12.

Location	Predicted Increase (dBA)		
	Day ¹	Night ¹	
M5 Motorway – East of Moorebank Avenue	0.1	0.0	
M5 Motorway – West of Moorebank Avenue	0.2	0.1	
Moorebank Avenue – North of M5 Motorway	0.0	0.1	
Anzac Road – East of Moorebank Avenue	0.0	0.0	

Table B-9 Increases in Road Noise Levels During EHW

1. Day = 7.00am – 10.00pm, Night = 10.00pm – 7.00am

Table B-9 shows that increases in road noise levels along the M5 Motorway, Moorebank Avenue, and Anzac Road are considerably less than 2dB. Therefore, no mitigation of traffic noise levels, due to EHW, has been considered.

B.3.7 Potential Vibration Impacts During Extended Hours

B.3.7.1 Vibration Intensive Activities and Equipment

Vibration-intensive plant that will be used during EHW will be limited to vibratory rollers used during stockpiling.

B.3.7.2 Vibration Safe Working Distances

Table B-13 defines typical safe working distances for vibration intensive activities relevant to EHW. These safe working distances are defined for damage (DIN 4150-3) and human comfort (the NSW Vibration Guideline). The safe working distances for cosmetic damage will be complied with at all times.



Table B-10 Safe Working Distances

Safe Working Distance (m) Buildings used for Human Comfort **Rating/Description** Plant Item commercial purposes, Dwellings and buildings of similar **Pipework and** (the NSW Infrastructure industrial buildings, and design and/or occupancy Vibration buildings of similar design (DIN 4150-3) (DIN 4150-3) Guideline) (DIN 4150-3) < 50 kN (Typically 1-1m 6m 15m to 20m 2m 2 tonnes) 20m < 100 kN (Typically 1m 2m 8m 2-4 tonnes) < 200 kN (Typically 1m 3m 15m 40m 4-6 tonnes) Vibratory Roller < 300 kN (Typically 1m 4m 19m 100m 7-13 tonnes) > 300 kN (Typically 1m 25m 100m 4m 13-18 tonnes) > 300 kN (> 18 1m 1m 31m 100m tonnes)



For EHW, it is not expected that the cosmetic damage and human comfort criteria will be exceeded as the safe working distances specified in Table B-13 will be able to be maintained.

In areas where residential buildings and or commercial buildings are located less than 100m from areas where vibratory rollers are proposed, all feasible and reasonable mitigation measures will be implemented including:

- Selection of an appropriate-sized vibratory roller;
- The use of lower vibration settings or static rolling; and/or
- Verification of vibration levels via monitoring.

In relation to human comfort, the safe working distances above relate to continuous vibration. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods may be allowed. A targeted assessment may be undertaken during works to evaluate any decrease in human comfort safe work distance offsets and to determine if any other mitigation or management measures are required to minimise the potential impacts.

B.3.7.3 Heritage Listed Structures

Kitchener House is located at 208 Moorebank Avenue, and is of heritage significance. Vibration generating activities during EHW are unlikely to occur within 100m of Kitchener House. However, if EHW are to occur within 100m of Kitchener House, management as per the CNVMP Section 3.2.2.5 will be required.

B.4 Management Measures

All reasonable and feasible mitigation measures will be implemented consistent with Section 5.2 of the ICNG and Section 3.4 of the CNVMP as well as Section A.4 of the OOHW Protocol. Refinement of the management measures will be undertaken in consultation with noise affected receivers through the Community Consultative Committee and in response to noise and/or vibration complaints.

B.5 Monitoring and Reporting

Monitoring and reporting during EHW will be consistent with Section 4 of the CNVMP, except where noted in the sections below.

B.5.1 Maximum Noise Levels for Plant and Equipment

Noise levels of plant used during EHW will be measured in accordance with the process outlined in Section 4.1.1 of the CNVMP.

B.5.2 Noise Monitoring

Attended community noise monitoring will be undertaken during EHW in accordance with Section 4.1.2 of the CNVMP. Attended noise measurements will be undertaken at all locations prescribed in Section 4.1.2.2 of the CNVMP following a noise complaint that has been attributed to MPE 2 construction activities.



During EHW, the results of continuous noise monitoring, conducted in accordance with Section 4.1.3 of the CNVMP, will be reviewed following a noise complaint to confirm compliance with the NML.

B.5.3 Vibration Monitoring

Where required, vibration monitoring during EHW will be conducted in accordance with Section 4.1.4 of the CNVMP.

B.5.4 Monitoring and Assessment Reports

During EHW, the Contractor's EM will compile a monthly report for the construction noise and vibration compliance monitoring detailing the community noise monitoring results as well as any other noise and vibration monitoring that was conducted during the reporting period. The report will include information about any exceedances detected and how noncompliances were addressed. This report will be sent to the Principal's Representative and to DPHI.

A final summary report will be provided to the Secretary at the end of the assessment period (3 months) detailing the outcomes of the assessment period, the resolution of complaints during the assessment period, and demonstrate the acceptability of works outside standard hours. The EHWP will be updated in accordance with any recommendations made by DP&E on the summary report. All written directions will be complied with.

B.6 Stakeholder Consultation and Notification

All EHW will require targeted consultation and notification to be distributed to receptors potentially affected by the works between 5 and 14 days prior to commencement. A notification boundary will be established on a case by case basis. See the Community Consultation Strategy for further detail.

Liverpool City Council will be notified of EHW a minimum of 48 hours prior to commencement.

Notification will be conducted in accordance with the processes established in the Community Communication Strategy. All notification will advise both the timing and duration of the relevant works.

B.7 Complaints

Enquiries, complaints and incident management relating to EHW will be undertaken as per the Project CEMP and Community Communication Strategy.

Complaints arising from EHW will be treated sensitively and in a manner, that recognises the potential for noise and vibration to cause environmental impacts. Special consideration will be given to complaints related to noise and vibration in order that additional mitigation can be implemented in a timely manner.

Various lines of communication will be made available for enquiries and complaints during construction of the Project. This will include a 24 hour telephone number for enquiries and complaints. Any complaints received during the works will be dealt with in accordance with



the Strategy for the Project. Complaints management protocols are outlined in the Community Liaison Plan. The outcomes of the environmental reviews may trigger the amendments to this EHWP. Any amendments to the EHWP and associated documentation will be undertaken in accordance with Section 1.2.7 of the CEMP.

Construction of the project during extended hours will be undertaken in accordance with the most recent, approved version of the EHWP.



APPENDIX C EVIDENCE OF CONSULTATION



APPENDIX D HELICOPTER ASSISTED INSTALLATION WORKS CONSTRUCTION NOISE AND VIBRATION IMPACT STATEMENT



APPENDIX E DEVELOPMENT CONSENT COMPLIANCE MATRICES



State Approvals

The Project is being delivered under Part 4, Division 4.1 (now Division 4.7 as of 1 March 2018) of the EP&A Act. The CoCs include requirements to be addressed in this plan and delivered during the Project. These requirements and how they are addressed is provided within Table E-1.

Table E-1 Conditions of Consent

CoC	Requirement	Document Reference	How Addressed
A1	In addition to meeting the specific performance measures and criteria established under this consent all reasonable measures must be implemented to prevent, and if prevention is not reasonable, minimise, any harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	This plan	Section 3.5 of this CNVMP identifies the management measures to be implemented to prevent and minimise environmental harm. Additional management measures have been included within the Out of Hours protocol in Appendix A.
A2	 The development may only be carried out: a) in compliance with the conditions of this consent; b) in accordance with all written directions of the Secretary in relation to this consent; c) in accordance with the EIS, Submissions Report, Consolidated assessment clarification responses and updated Biodiversity Assessment Report; d) in accordance with the amended Development Layout Plans and Design Plans, amended WSUD plans and amended architectural plans to be submitted for the Secretary's approval as part of this consent; and 	/ This plan	This CNVMP has been developed to comply with the CoCs, written directions of the Secretary, amended development layout and management and mitigation measures outlined in Appendix B of the CoCs
	in accordance with the management and mitigation measures at APPENDIX B of this consent.		
A20	All licences, permits, approvals and consents as required by law must be obtained and maintained as required for the	CEMP Section 2.6.2	All applicable licences, permits and approvals will be obtained as required.



CoC	Requirement	Document Reference	How Addressed	
	development. No condition of this consent removes the obligation for the Applicant to obtain, renew or comply with	Section 2.1	Approvals, permits and licences required for the Project are discussed in the CEMP in Section 2.6.2.	
	such licences, permits, approvals and consents.		An Environmental Protection Licence (EPL) (No. 21054) was issued by the EPA on 4 June 2018. The Licence applies to the Moorebank Precinct areas identified in condition A2.2. Scheduled activities include crushing, grinding or separating, and contaminated soil treatment. The Licence enables the importation of material classified under a Resource Recovery Order where the onsite use (approved land use) is consistent with the applicable Resource Recovery Exemption.	
	All plant and equipment used at the site or to monitor the performance of the development must be:	Section 3.5	All plant and equipment will be maintained and operated in a proper and efficient manner.	
A32	a) maintained in a proper and efficient condition; andb) operated in a proper and efficient manner.	Table 3-24 NV8		
	The Applicant must:			
	 a) prepare each plan, program and other documents in consultation with the specified stakeholders; b) not commence each phase of the project until the plans, programs and other documents required under this consent are approved by or, where not required to be approved, submitted to the Secretary specified within the timeframes; and 		This CNVMP has been prepared in consultation with the EPA.	
B1		, Section 4.2	Construction of the Project will not commence until this CNVMP and other plans are approved by the Secretary.	
		Sections 1.5 and 4.3.	A Staging Report has been prepared and approved for Construction Phases A and B.	
	implement the most recent version of the required plans and programs approved by the Secretary for the duration of the development.	1	The most recent, approved version of the CNVMP will be implemented.	



CoC	Requirement			Document Reference	How Addressed
B62	Prior to early works, the Applicant must undertake noise monitoring in accordance with the INP to verify RBLs for the closest sensitive receivers.		e Section 4.1.	Monitoring conducted and is presented in the Wilkinson Murray 12186-M2 Report VerC, dated January 2018.	
B63	Prior to early works and fill importation, the Applicant must submit a Noise Monitoring Report detailing the results of background noise monitoring, any resulting adjustment of NMLs for the development and any additional noise mitigation measures to be included in the CEMP required under condition C1.			Section 4.1.5.	Monitoring was conducted and is presented in the Wilkinson Murray 12186-M2 Report VerC, dated January 2018.
					No additional management measures nor adjustments to the NMLs were required.
B64	Continuous noise undertaken durir and for at least 1 site.	e monitoring a ng early works 2 months follo	t sensitive receivers must be , fill importation, construction wing occupation of the entire	Section 4.1.3	Continuous noise monitoring is proposed.
	The construction hours detailed in Table 2 must be complied with, except where they may be undertaken under condition B66.				
	Table 2: Hours of Work				
	Activity	Day	Time	Section 1.4.1.	Construction hours to be complied with unless works
B65	Early works and Monday – Friday 7am to 6pm		Section 3.5; Table 3-24 NV5	outside these hours are permitted by other conditions of consent.	
	Construction	Saturday	7am to 1pm		
	Moorebank	Monday – Fr	iday 7am to 6pm		
	Avenue upgrade	Saturday	7am to 1pm		



CoC	Requirement	Document Reference	How Addressed
	Except as permitted by an EPL, activities resulting in high noise impact (including impulsive or tonal noise emissions) must only be undertaken:		Addressed by NV6 in Section 3.5
B66	 a) Between the hours of 8:00am to 5:00pm Monday to Friday; b) Between the hours of 8:00am to 1:00pm Saturday; and, c) In continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. 	Section 3.5; Table 3-24 NV6	
	Note: For the purposes of this condition, 'continuous' included any period during which there is less than a one hour respite between ceasing and recommencing any of the work that is the subject of this condition.	,	
	Works may be undertaken outside the hours detailed in Table 2 in the following circumstances:		
B67	 a) For the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; b) Where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; c) Where different construction hours are permitted or required under an EPL in force in respect of construction, in which case these construction hours must be complied with; 	Section 1.4.1 and 3.5; Table 3-24 NV7 Appendix A	Circumstances in which Out-Of-Hours works may be undertaken is explained in Section 1.4.1 and 3.5.
	Where they are undertaken in accordance with an Out-of- Hours Work Protocol detailing the assessment, management and monitoring of noise as part of the Construction Noise and Vibration Management Plan.		



CoC	Requirement	Document Reference	How Addressed
B68	The Applicant must prepare an Out-of-Hours Work Protocol for any work undertaken outside the hours specified in condition B65 or outside the circumstances specified under condition B67. An Out-of-Hours Work Protocol must provide for the assessment, management and monitoring of out of hours work, including:	Section Appendix A	The Out-of-Hours Work Protocol is included in Appendix A and addresses the requirements of CoC B68.
	a) Where works are shown to be inaudible at the nearest sensitive receivers and vibration levels do not exceed those stipulated by Table 2.2 and Table 2.4 of Assessing Vibration: a technical guide (DEC, 2006);	Table A-1, Number 4	Table A-1, Number 4
	b) Where a negotiated agreement has been arranged with affected receivers;	Table A-1, Numbers 6 and 7	Table A-1, Numbers 6 and 7
	c) Where noise can be shown to satisfy the noise management levels specified in the <i>Interim Construction</i> <i>Noise Guideline</i> (ICNG, DECC, 2009) at non-residential land uses; or,	Table A-1, Number 5	Table A-1, Number 5
	Where works are undertaken as part of an Extended Hours Work Plan approved as part of the Out-of-Hours Work Protocol.	Table A-1, Number 8	Table A-1, Number 8
B69	An Extended Hours Work Plan will be prepared for any construction undertaken during the extended hours detailed in Table 3 as required by condition B68(d). The Extended Hours Work Plan must provide for:		
	a. A three month assessment period, commending at the start of extended hours construction work;	Section Appendix A	Continuous noise monitoring results to be reviewed during first week of EHW and monthly thereafter for the


CoC	Requi	rement	Document Reference	How Addressed
				three-month assessment period, with a final report issued to the Secretary.
	b.	Implementation of the Construction Noise and Vibration Management Plan;	CNVMP	This EHWP has been prepared in a manner consistent with the CNVMP and refers to relevant sections of the CNVMP. Any relevant updates to the CNVMP will be incorporated into the EHWP via the EWHP review process.
	C.	Noise monitoring at a representative number of sensitive receivers (including closest and furthest) to confirm the predicted noise levels;	Section B.5	Monitoring to be conducted per the processes outlined in Section 4.1 and Section B.5 of the CNVMP. Additional monitoring location added in NCA3 to confirm the predicted noise levels.
	d.	Targeted consultation with the noise affected sensitive receivers;	Section B.6	Consultation with potentially affected receivers included in Section B.6
	e.	Notification of the relevant Council, local residents and other affected stakeholders and sensitive receivers of the timing and duration at least 48 hours prior to the commencement of the works;	Section B.6	Council and stakeholder notification requirements specified in Section B.6.
	f		Section B.1.3	EHW periods and duration of works described in Section B 1.3
	1.	investigation of noise complaints;	Section B.7	Complaints handling process outlined in Section B.7
	g.	Submission of monthly complaints reports to the Department for the life of extended hours activities;	Section 4.1.5	Reporting processes, outlined in Section 4.1.5, to include monthly reports to DP&E.



CoC	Requirement		Document Reference	How Addressed
	 h. Continual refinement of mitigation on consultation with the noise afformation receivers; 	n measures based ected sensitive	Section B.4	Review process, outlined in Section B.4, to include consultation with relevant stakeholders.
	i. Implementation of work practices 5.2 of the ICNG;	set out in section	Section B.4	Management and mitigation during EHW to be consistent with Section B.4 of the CNVMP and includes ICNG work practices.
	j. A final summary report submitted to the Secretary at the end of the assessment period in sub- condition (a), detailing the outcomes of the assessment period, the resolution of complaints during the assessment period, and demonstrate the acceptability of works outside standard hours.		Section B.5.4	Reporting processes, outlined in Section B.5.4, to include final report to DP&E.
	Table 3: Extended Hours of Work			
	Activity	Day	Time	
	Early works and Construction (not including high noise impact, piling, spoil placement, rock breaking, concrete	Monday – Friday	6am to 7am 6pm to 10pm	
	batching).	Saturday	1pm to 5pm	
B70	The Applicant must comply with all writter Secretary arising from the review of the fi report required under condition B69.	n directions of the nal summary	Section B.5.4	The EHWP will be updated in accordance with any recommendations made by DPHI on the summary report. All written directions will be complied with.
B71	Construction must be carried out in accor construction noise management levels ar detailed in the <i>ICNG</i> (DECC, 2009).	dance with the nd requirements	Section 3.2	Section 2.1.1 of this document details the requirements of Section 1.5 of the ICNG, entitled "Applying the



CoC	Requirement	Document Reference	How Addressed
			Guideline" which shows the high level steps for managing noise from construction.
			As per the requirements of the ICNG, closest sensitive receivers have been specified, NMLs specified, NMLs compared with predicted noise levels and mitigation select commensurate with the noise impacts (i.e. exceedance of the NML).
			Table 3-3 identifies the ICNG as a relevant policy that establishes noise and vibration management levels.
			Table 3-4 identifies how construction noise management levels from the ICNG are to be applied to residential receivers.
			Table 3-19 indicates that predicated L _{Aeq,15min} will comply with ICNG NMLs at all sensitive receivers.
			Measures NV12 and NV13 require the implementation of additional noise mitigation where noise management levels are likely to be exceeded.
	All reasonable and feasible noise mitigation measures must be implemented in addition to the management and mitigation measures in APPENDIX B with the aim of achieving the following construction Noise Management Levels (NMLs) and vibration criteria:	Section 3.5; Table 3-24	Table 3-24 NV12 and NV13 require the implementation of additional noise mitigation where noise management levels are likely to be exceeded.
B72			Measure NV10 addresses construction vibration including adherence to safe working distances for vibration intensive plant
	a) Construction noise management levels established using	Section 3.2.1; Table 3-4 and	Section 3.5, Table 3-4 identifies how construction noise management levels from the ICNG are to be applied to residential receivers.
			Table 3-5 identifies how construction noise management levels from the ICNG are to be applied at



CoC	Requirement	Document Reference	How Addressed
			other sensitive receivers including educational institutions and industrial premises.
			Section 3.2.2, Table 3-11 and
	b) Vibration criteria established using the Assessing	Section 3.2.2; Table 3-11 and	Table 3-12 establishes vibration criteria in line withAssessing Vibration; a technical guideline.
	exposure); and,	Section 3.5; Table 3-24	Measure NV10 addresses construction vibration including adherence to safe working distances for vibration intensive plant
			Section 3.2.2; Table 3-13 and 3.3.6 establishes recommended vibration limits in line with DIN4150.
	c) Vibration limits set out in the German Standard <i>DIN</i> 4150-3: Structural Vibration – effects of vibration on	Section 3.2.2; Table 3-13 and 3.2.2. Section 3.3.6; Table 3-22 Section 3.5; Table 3-24	Section 3.3.6, Table 3-22 establishes safe working distances for damage to buildings in line with vibration limits set out in DIN 4150-3.
			Measure NV10 addresses construction vibration including adherence to safe working distances for vibration intensive plant
	Any construction activities identified as exceeding the construction noise management levels and/or vibration	Section 3.3.4; Table 3-19	Assessments of construction activities undertaken in Sections 3.3.4, and 3.3.5 indicate that the Project will not exceed identified construction NMLs.
	criteria must be managed in accordance with the Construction Noise and Vibration Management Plan	Section 3.3.5; Table 3-11	Assessments of construction activities undertaken in
B73	(CNVMP) required by condition B76. All feasible and	Section 3.2.2;	Section 3.2.2 indicates that the Project will not exceed specified vibration criteria during construction.
	must be implemented and any activities that could exceed	Table 3-12	In the unlikely event that construction activities exceed
	the construction NMLs must be identified and managed in accordance with the CNVMP.	Section 3.5	specified NMLs mitigation measures NV12 and NV13 will be implemented. Section 3.5 includes mitigation measures that could be applied in the event that



CoC	Requirement	Document Reference	How Addressed
	Note: the ICNG identifies 'particularly annoying' activities that require the addition of 5 dB(A) to the predicted level before comparing to the construction NML.		construction activities exceed established vibration criteria.
B74	Where feasible and reasonable, construction traffic movements on public roads should aim to limit any increase in existing road traffic noise levels to no more than 2 dB L _{Aeq,period} , where 'period' is defined in the EPA's <i>Road Noise</i> <i>Policy</i> (RNP) for both day and night.	Section 3.2.1.3 and 3.3.5 Table 3-21	Section 3.2.1.3 and 3.3.5, and Table 3-21 demonstrates that $L_{Aeq, period}$ road traffic noise will not increase by more than 2dB.
B75	The Applicant is to ensure the construction contractor's vehicles operate as to minimise impacts. Measures that could be used include:	Section 2.3 Section 3.5; Table 3-24 NV11	Section 2.3 addresses site-specific induction training that will include toolbox talks being undertaken.
	a) Toolbox talks;		NV11 addresses the requirements of this condition.
	b) Contracts that include provisions to deal with unsatisfactory noise performance for the vehicle and/or the operator; and	Section 3.5; Table 3-24 NV11	NV11 addresses the requirements of this condition.
	c) Specifying non-tonal movement alarms in place of reversing beepers or alternative such as reversing cameras and proximity alarms, or a combination of these, where tonal alarms are not mandated by legislation.	Section 2.3	Section 2.3 addresses site-specific induction training that will include operation of vehicles that use non-tonal reversing beepers.
		and NV8	NV8 and NV11 addresses the requirements of this condition.
B76	Use of compression brakes for construction vehicles associated with the project that are on site or on nearby roads is not permitted (e.g. Anzac Avenue).	Section 3.5	Addressed by NV11 in Section 3.5



CoC	Requirement	Document Reference	How Addressed
	A Construction Noise and Vibration Management Plan (CNVMP) must be prepared for the development to the satisfaction of the Secretary. The plan must form part of the CEMP required under C1 and detail how construction noise and vibration impacts will be minimised and managed. The Plan must be consistent with the guidelines contained in the ICNC (DECC. 2000). The plan must be developed in	Section 0; Appendix C Section 2.1.1 Table 8, Table 17 Section 3.5; Table 3-4 Section 3.3.4; Table 3-19	Section 0 and Appendix C provides evidence of consultation with EPA. Table 8, Table 3-3, Table 3-4 and Table 3-19 indicates how the Project is consistent with ICNG guidelines. Section 3.5, Table 3-24 detail how construction noise
	consultation with the EPA and include:	Section 3.5; Table 3-24	and vibration impacts will be minimised and managed.
	a) Identification of the work areas, site compounds and access points;	Figure 3-2	work areas.
	b) Identification of the type and number of plant and equipment expected on site at the same time;	Section 3.3.3; Table 3-18	Table 3-18 identifies the types and amount of construction plant and equipment that will be used during each phase of construction.
B77	c) Identification of sensitive receivers (including heritage	Figure 3-1	Figure 3-1 visually identifies the location of sensitive receivers of the Project.
	vibration goals applicable to the project as stipulated in	Section 3.1.1; Table 3-1	Table 3-1 lists all sensitive receivers of the Project
	condition B71;	Section 3.2.1; Table 3-4	Table 3-4 demonstrates how ICNG NMLs are applied to sensitive receivers of the Project.
		Section 1.3.4	
	d) Details of construction activities and an indicative schedule for construction works, including the identification of key noise and/or vibration generating construction activities (based on representative construction scenarios)	Section 3.3.1, Table 3-15 Construction activities to be	Section 1.3.4 provides an indicative schedule of the construction program for the Project.
		Undertaken Within Each Construction Works Period	A summary of the indicative construction works and associated activities to be undertaken during each of
	impacts on surrounding sensitive receivers, particularly	Section 3.3.1.1; Table 29	these works periods is provided in Table 3-15. No blasting activities are permitted or proposed for the
	residential areas;	Section 3.3.4; Table 3-19	construction of the Development.
		Section 3.3.6; Table 3-22	



CoC	Requirement	Document Reference	How Addressed
			Table 3-15 and Section 3.3.1 provides details on the construction activities that will be undertaken for the Project.
			Table 3-19 demonstrates that construction activities will not exceed specified NMLs and is unlikely to have any noise impacts on surrounding sensitive receivers.
			Table 3-22 demonstrates that construction activities will not exceed specified vibration criteria and is unlikely to have any vibration impacts on surrounding sensitive receivers.
	e) An Out-of-Hours Work Protocol as referenced in condition B68 for the assessment, management and approval of works outside standard construction hours, for the Secretary's approval. The Out-of-Hours Work Protocol must:		
	i. Detail assessment of out-of-hours work against the relevant noise and vibration criteria;	Table A-1	Table A-1
	 Provide detailed mitigation measures for any residual impacts (that is, additional to general mitigation measures), including extent of at-receiver treatments; 	Table A-1 and Section A.5	Table A-1 and Section A.5
	iii. Include proposed notification arrangements; and	Table A-1, Number 10	Table A-1, Number 108
	iv. Include an Extended Hours Work Plan as required by condition B69.	Appendix B	Appendix B



	Requirement	Document Reference	How Addressed
	f) Identification of feasible and reasonable measures to be implemented to minimise and manage construction noise impacts, including, but not limited to, acoustic enclosures, erection of noise walls (hoardings), respite periods;	Section 3.5; Table 3-24	Table 37 includes the requirements of the CoC, FCMM, ICNG and best practice management measures.
			Section 3.3.5 and Table 3-20 identifies the existing and project daily traffic volumes and the percentage of heavy vehicles along specified routes.
		Section 3.3.5 and Table 34 Figure 3-3. and Section 3.3 of	Specified routes are shown in Figure 3-3 of the CTAMP. Truck Driver Protocol Appendix B of the CTAMP details protocols for accessing site.
	g) Management of the number of trucks accessing the site;	the CTAMP Truck Driver Protocol in CTAMP Appendix B	Section 3.3 of the CTAMP describes how traffic and transport risks will be managed during construction of the Project.
		дррених в	Section 3.3.11, Table 3-10 includes mitigation measures (TA-12, TA-13, TA-17, TA-18, TA-33, TA-34) that will assist in the management of the number of trucks accessing the Project site.
	 h) A truck driver protocol addressing the designated routes, acceptable delivery hours, speed limits on site, no engine braking in the vicinity or on site, no extended periods of 	Section 3.3.5 Section 3.4 Table 37 NV11 Truck Driver Protocol in CTAMP	Section 3.3.5 indicates that a truck driver protocol has been prepared as part of the CTAMP to address the requirements of this condition.
	idling, avoiding queuing in or around the site and limiting the need for reversing on site	Appendix B Section 4.3	Section 4.3 details where updates to the CNVMP will require updates to the CTAMP.
	i) Identification of feasible and reasonable procedures and mitigation measures to ensure relevant vibration criteria are achieved, including applicable buffer distances for vibration	Section 3.2.2.4 Section	Section 3.2.2.4 details vibration management levels to be adhered to
	intensive works, use of low vibration generating equipment /vibration dampeners or alternative construction methodology, and pre and post-construction dilapidation	Section 3.5; Table 3-24 NV8, NV10, NV15 and NV16	Table 3-24 details feasible and reasonable mitigation measures that will be implemented to achieve vibration criteria, and includes the following mitigation measures



Requirement	Document Reference	How Addressed
surveys or sensitive structures where vibration is likely to result in damage to buildings and structures (including surveys being undertaken immediately following a monitored exceedance of the criteria);		(NV8, NV10, NV15 and NV16) that address the requirement of this condition.
j) A description of:		i) and ii) Section 4.1 details monitoring to be undertaken, and frequency, to determine the
measures would be monitored during the proposed works,	i) Section 4.1	iii) Monitoring locations described in Section 4.1.2
clearly indicating	II) Section 4.1	iv) Section 4.1.5 details reporting requirements
ii)how often this monitoring would be conducted,	III) Section 4.1.2	V) Section 4.1.5 details reporting requirements
iii) the locations where monitoring would take place,	iv) Section 4.1.5	v) In the unlikely event that construction activities exceed specified NMI s mitigation measures NV12 and
iv) how the results of this monitoring would be recorded and reported, and, if any exceedance is detected	v) Section 3.5 NV12 and NV13, Section 4.2 and 4.3	NV13 will be implemented. Section 3.5 includes mitigation measures that will be applied in the event
v) how any non-compliance would be rectified;		that construction activities exceed established vibration criteria.
	Section 4.1	Section 4.1 details noise and vibration monitoring procedures.
k) Noise and vibration monitoring procedures (routine and	Section 4.2;	
complaints inggered monitoring),	Table 4-1	Table 4-1 provides details on complaints triggered monitoring.
I) A community consultation and complaints handling	Section 3.3 of the Construction Community Communication Strategy	
procedure; and,	Section 4.2;	able 4-1 details the noise and vibration incident and complaint response management process.
	Table 4-1	· · · · · · · · · · · · · · · · · · ·



CoC	Requirement	Document Reference	How Addressed
			Community consultation will be undertaken in accordance with Section 3.3 of the Construction Community Communication Strategy.
	m) Mechanisms for the monitoring, review and amendment Se of this plan. Se	Section 4.3	Section 4.3 details the mechanisms for review and
		Section 4.5 of the CEMP	accordance with Section 4.5 of the CEMP.
B78	Blasting is not permitted on the site.	Section 3.3.1.1	No blasting activities are proposed or permitted.
	The Applicant must ensure that the environmental management plans required under this consent are		a) Section 3.1 details existing background noise levels
07	prepared in accordance with any relevant guidelines, and include:		b) Section 2.1 details legislative requirements, noise and vibration criteria are detailed in Section 3.2
	 (a) detailed baseline data; (b) a description of: the relevant statutory requirements (including any relevant approval, licence or lease conditions); any relevant limits or performance measures / criteria; and the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or 	a) Section 3.1	c) Section 3.4 details management measures
		b) Section 2.1, Section 3.2	d) Section 4.1 details monitoring requirements,
		c) Section 3.4	details the effectiveness of management measures
		d) Section 4.1 and Section 4.3	e) Section 4.2 details measures to be followed in the
07		e) Section 4.2	event of an exceedance or complaint
		f) Section 4.1 and 4.3	t) Section 4.1 details monitoring and reporting requirements. Section 4.3 details the mechanism to
	(c) a description of the management measures to be	g) Section 4.2 and Section 4.1.6	review and improve performance
	 implemented to comply with the relevant statutory requirements, limits or performance measures / criteria; (d) a program to monitor and report on the: i. impacts and environmental performance of the 	, h) Section 4.3	g) Section 4.2 details incident and complaints management. This is further detailed within the CEMP and Section 4.1.6 details the process for managing
			non-compliances
	ii. effectiveness of any management measures (see (c) above);		h) Section 4.3 details periodic review.



CoC	Requirement	Document Reference	How Addressed
	 (e) a contingency plan to manage any unpredicted impacts and their consequences; (f) a program to investigate and implement ways to improve the environmental performance of the development over time; (g) a protocol for managing and reporting any: i. incidents and non-compliances; ii. complaints; iii. non-compliances with statutory requirements; and 	S	
	Note: The Secretary may waive some of these requirement if they are unnecessary or unwarranted for a particular management plan.	s	

The Final Compilation of Mitigation Measures (FCMMs) were prepared as part of the MPE Stage 2 Submissions Report (Arcadis 2017). A list of the FCMMs as relevant to the Project and how they have been complied with in this plan are provided in Table E-2.

Table E-2 Final Compilation of Mitigation Measures (FCMM)

FCMM	Requirement	Document Reference
2A	A Construction Noise and Vibration Management Plan (CNVMP), or equivalent, would be prepared for the Amended Proposal in accordance with the <i>Interim Construction Noise Guideline</i> (DECC, 2009) (or equivalent), and will include the following:	Section 2.1
	Identification of nearby residences and other sensitive land uses	Figure 3-1
	Description of approved hours of work	Table 3-24 Management Measures



FCMM	Requirement	Document Reference	
	Description and identification of construction activities, including work areas, equipment and duration	Section 3; Table 3-24 NV5	
	Description of what work practices (generic and specific) will be applied to minimise noise and vibration	Table 3-24 NV10	
	Consider the selection of plant and processes with reduced noise emissions	Table 3-24 NV8 and NV9	
	A complaints handling process	Section 4.2	
	Noise and vibration monitoring procedures	Section 4.1	
	Overview of community consultation required for identified high impact works	Table 3-24 NV2	
	Induction and training will be provided to relevant staff and sub-contractors outlining their responsibilities with regard to noise	Table 3-24 NV4	
	Procedure for approval of any works undertaken outside of the following hours:	Appendix A. Note that the OOH Periods presented in FCMM 2A are inconsistent with CoC B69. Therefore, CoC B69 extended hours have been utilised.	
	- Standard hours of 07:00 am to 18:00 pm Monday to Friday, and 08:00am to 13:00 pm Saturday,		
	- Out of hours (OOH) work periods:		
	 OOH Period 1 is 6:00am – 7:00am weekdays; 		
	 OOH Period 2 is 6:00pm – 10:00pm weekdays 		
	 OOH Period 3 is 7:00am – 8:00am Saturday; and 		
	OOH Period 4 is 1:00pm – 6:00pm Saturday.		
2B	Any works undertaken outside of the hours prescribed in mitigation measure 2A would be undertaken in consultation with relevant authorities. Works outside these hours that may be permitted would include: Any works which would not result in audible noise emissions at any nearby sensitive receptors.	Appendix A Out of hours Protocol	
	The delivery of oversized plant and/or structures that police or other authorities determine require special arrangements to transport along public roads	-	



FCMM	Requirement	Document Reference	
	Emergency work to avoid the loss of lives, property and/or to prevent environmental harm		
	Maintenance and repair of public infrastructure where disruption to essential services and/or consideration of worker safety do not allow work within standard construction hours.		
	Public infrastructure works that shorten the length of the project and are supported by noise-sensitive receivers.		
	Construction works where it can be demonstrated and justified that these works are required to be undertaken outside of standard construction hours.		
	Any other work as approved through the CNVMP.	-	
2D	In the event of any noise or vibration related complaint or adverse comment from the community, noise and ground vibration levels (as relevant) would be investigated. Remedial action would be implemented where feasible and reasonable. The procedures for managing complaints would be provided within the Community Information and Awareness Strategy.	Section 4 and Table 3-24 NV3	



EPBC Approvals

The EPBC Act approval for the MPE Concept was granted by the Department of the Environment in March 2014 (No. 2011/6229). This approval was provided for the impact of the MPE Project on listed threatened species and communities (Sections 18 and 18A of the EPBC Act) and Commonwealth land (Sections 26 and 27A of the EPBC Act).

The EPBC Act approval for the MPW Concept was granted by the Commonwealth Department of Environment and Energy (DotEE) in September 2016 (No. 2011/6086). This approval was provided for the impact of the MPW Project on listed threatened species and communities (Sections 18 and 18A of the EPBC Act) and Commonwealth land (Sections 26 and 27A of the EPBC Act).

The Moorebank Avenue upgrade works will be performed under the MPE Stage 2 Consent as described in Section 1.1 and 1.3 of the CEMP. Since the western side of the Moorebank Avenue upgrade works construction footprint is located within the MPW site, the works must comply with the MPW Commonwealth Approval.

The construction and operation of the Project has been designed to be consistent with the EPBC Act Approval conditions, where relevant. EPBC Act Approval conditions for the Project include specific conditions and commitments that are required to be addressed in this plan. These conditions are specified within Table E-3 along with the where they have been addressed in preparing this plan.



Table E-3	Commonwealth	Conditions o	f Approval
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Condition	Re	equirement	Document Reference	
MPE EPBC	; Ар	proval (2011/6229)		
	Identification and quantification of all potential impacts associated with noise, vibration, air quality, traffic, light spill, hydrological changes, contamination, and indigenous heritage (including cumulative impacts associated with the DoF's proposed intermodal) upon Commonwealth land. Consideration must be given to people and communities at SME, DNSDC, Defence housing, and the environment more generally in neighbouring bushland areas.		Section 3.3.5 addresses potential construction noise impacts	
7(b)			The DNSDC has been relocated to the DJLU, to the north of the MPE Site, and is listed as a sensitive receiver in this plan and therefore relevant management measures within this plan are applicable.	
			been relocated from the MPW Site to the Holsworthy Barracks and are no longer sensitive receivers of the MPE Site.	
7(f)	Identification of the trigger values and criteria fo all matters mentioned in condition 7(b) (excluding light spill, land contamination and indigenous heritage) that will be adopted for monitoring and managing potential impacts to Commonwealth Land.		Section 3.3	
MPW EPBO	C Ap	oproval (2011/6086)		
Sectior noise a suitable		ections of the CEMP and OEMP relating to ise and vibration must be prepared by a itably qualified expert and must:		
	a)	be consistent with the Noise and Vibration Provisional Environmental Management Framework (2 July 2014), provided at Appendix 0 to the finalised EIS	This Plan	
6	b)	incorporate all measures 5A to 5T (CEMP only) and 5U to 5AJ (OEMP only) from Table 7.1 of the finalised EIS that are described as 'mandatory'	Section 3.5 addresses all 'mandatory' measures	
	c)	explain how all measures 5A to 5T (CEMP only) and 5U to 5AJ (OEMP only) from Table 7.1 of the finalised EIS that are described as 'subject to review' have been addressed	Section 3.5 addresses all measures described as 'subject to review'	
	d)	be approved by the Minister or a relevant New South Wales regulator.	This plan was approved by DP&E on 15 June 2018.	

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The MPE Commonwealth mitigation measures which are relevant to this plan are detailed in Table E-4. There are no additional mitigation measures for MPW.

Table E-4 MPE Commonwealth Mitigation Measures

Issue	Requirement	Document Reference	
Noise	A Construction Noise and Vibration Management Plan would be developed to implement best practice mitigation and management measures to minimise noise impacts on surrounding land uses and sensitive receivers, including Commonwealth Land during construction. The Construction Noise and Vibration Management Plan would address following noise issues:	This plan	
Noise	 Construction activities would have regard to the standard hours of 07:00 am to 18:00 pm Monday to Friday, and 08:00am to 13:00 pm Saturday (with approval from relevant authorities). Works outside of these hours that may be permitted would include (Wilkinson Murray 2013): Any works which do not cause noise emissions to be audible at any nearby sensitive receptors. The delivery of materials which is required outside of these hours as requested by Police or other authorities for safety reasons. Local residents would be informed of the timing and duration of approved works in accordance with the SIMTA's notification provisions. Emergency work to avoid the loss of lives, property and/or to prevent environmental harm. 	Section Appendix A	
Noise	Any other work as approved through the Construction Noise and Vibration Management Plan Process.		
Noise	 Training and awareness which would include the following: Site awareness training/environmental inductions to provide instruction on noise mitigation techniques/measures to be implemented during construction of the SIMTA proposal. Working within approved hours. Working with noisy equipment away from sensitive receivers. Using noise screens and temporary barriers Maintaining plant and equipment. Turning off machinery when not in use. Limiting the "clustering" of noisy plant / processes. 	Section 2.3	
	 Communication, including a notification process to inform residents of respite times. Incident and emergency response. Non-conformance, preventative and corrective action procedures. 		
СММ	Selection of quiet plant and processes wherever feasible and retrofitting reversing alarms that are quieter and display less annoying characteristics. Such alarms could include "smart alarms" and "quacker alarms".	Section 3.3.3	

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Issue Requirement

CMM

Document Reference

Where appropriate specific mitigation measures that may be considered would include:

- Portable temporary screens to mitigate specific noise sources.
- Respite periods (e.g. for extended periods of driven piling and use of rock breakers).
- Consideration of offset distances, orientation and position of noisy plant away from sensitive receptors, including SME and DNSDC operations.
 Section 3.5
- Completion of loading and unloading activities away from sensitive receivers.
- Use of spotters, closed circuit television monitors, "smart" reversing alarms or "squawker" type reversing alarms in place of traditional reversing alarms.

The anticipated effectiveness of some noise mitigation techniques in reducing construction noise impacts are presented in Table 84.

CMM Ground borne vibration levels would be measured and monitored to establish the minimum working separation between the equipment and nearby vibration sensitive receivers and buildings that have the potential to Section 4.1.4 be impacted when vibration-generating equipment is used during construction of the SIMTA proposal.

Revised Statement of Commitments

The Revised Statement of Commitments (RSoC) includes the most recent compilation of SIMTA commitments to mitigate the environmental impacts, monitor the environmental performance and/or achieve a positive environmentally sustainable outcome. These RSoCs (June 2017) were presented in the Moorebank Precinct East – Concept Plan Modification 2 Response to Submissions. The RSoC that are relevant to this plan are specified in Table E-5.

Table E-5 Revised Statement of Commitments

RSoC	Requirement	Document Reference
RSoC – Item 1.3	RSoC – Noise and Vibration Prior to undertaking demolition and construction on site, a Construction Noise and Vibration Management Plan should be prepared based on details of the proposed construction methodology, activities and equipment This should identify potential noise and vibration impacts and reasonable and feasible noise mitigation measures (such as those identified in this report) that may be implemented to minimise any potential impacts, including engineering and management controls.	This plan
RSoC – Item 1.3	 RSoC – Noise and Vibration All construction activities will have regard to the standard hours During construction of 7:00am to 6:00pm Monday to Friday and 8:00am to 1:00pm Saturday (with approval from relevant 	Section Appendix A



RSoC	Requirement
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Document Reference

authorities). Any works undertaken outside of these hours will be undertaken in consultation with relevant authorities.

- Works outside these hours that may be permitted will include:
 - Any works which do not cause noise emissions to be audible at any nearby sensitive receptors.
 - The delivery of materials which is required outside of these hours as requested by Police or other authorities for safety reasons. Local residents, commercial and industrial premises will be informed of the timing and duration of approved works in accordance with the notification provisions outlined in the CNMP.
 - Emergency work to avoid the loss of lives, property and/or to prevent environmental harm.

Any other work as approved through the CNMP Process.

MPE Concept Plan Conditions of Consent are not directly relevant to the development of this plan.