

MANAGEMENT PLAN

Noise and Vibration Management Plan
Sydney Metro West – Station Package West

ISSUE DATE: 28/04/2026

Document Details

Document Title	Noise and Vibration Management Plan
Project Name	Sydney Metro West – Stations Package West
Client	Sydney Metro
Contract No.	SPW – SMC-25-1478
Document Reference No.	SMWSTSPW-GEA-SWD-EN-PLN-000007
Principal Contractor	Gamuda Engineering Pty. Ltd.
ABN	36 636 433 522

Document Authorisation

Jason Ambler	Kieran Kerr	Richard Petaccia
Environment Operations and Approvals Lead	Environment and Sustainability Manager	Project Director
		
Signature	Signature	Signature
28/04/2026	28/04/2026	28/04/2026
Date	Date	Date

TABLE OF CONTENTS

DOCUMENT CONTROL	6
Revision History	6
TERMS AND DEFINITIONS	7
1 INTRODUCTION	10
1.1 Purpose	10
1.2 Scope and Application	10
1.3 Background	11
1.4 Environmental Management System (EMS) Overview	11
1.5 Consultation, Endorsement and Approval Requirements	13
2 OBJECTIVES, TARGETS AND PERFORMANCE OUTCOMES	14
2.1 Objectives	14
2.2 Targets	14
2.3 Environmental Performance Outcomes	15
3 ENVIRONMENTAL REQUIREMENTS	16
3.1 Relevant Legislation, Specifications, Guidelines and Standards	16
3.2 CoA and REMMs	17
3.3 Hours of Work	17
3.4 Noise and Vibration Performance Criteria	21
4 NOISE AND VIBRATION RISK CONTEXT	29
4.1 Westmead Metro Station	29
4.2 North Strathfield Metro Station	32
4.3 Burwood North Station	35
4.4 Five Dock Station	37
4.5 The Bays Station	40
4.6 Heritage Buildings & Structures	42
4.7 Noise and Vibration Risk Summary	43
5 ENVIRONMENTAL MITIGATION MEASURES	45
5.1 Control Hierarchy and SMART Application	45
5.2 Standard Noise and Vibration Mitigation Measures	46
5.3 Additional Mitigation Measures	55
6 IMPLEMENTATION AND RESPONSIBILITIES	59
6.1 Roles and Responsibilities	59
6.2 Construction Planning and Work Authorisation	60
6.3 Training and Awareness	62
7 MONITORING AND VERIFICATION	64
7.1 Construction Noise and Vibration Monitoring Program Interface	64
7.2 Inspections and Verification	64
7.3 Reporting	65
8 COMPLAINTS, INCIDENTS AND NON-COMPLIANCES	66
8.1 Complaints Management	66

8.2 Incident and Non-Compliance Management	66
9 REVIEW AND CONTINUAL IMPROVEMENT	68
9.1 Continuous Improvement	68
9.2 Review Triggers	68
9.3 Plan Updates	68
APPENDICES	70
Appendix A – Construction Noise and Vibration Management Compliance Matrix	71
Appendix B – Consultation records	77
Appendix C – Out of Hours Works Protocol (Sydney Metro, 2025)	86
Appendix D – Construction Noise and Vibration Monitoring Program	87
Appendix E – Land Use Surveys	88

Figures

Figure 4-1: Westmead Noise Catchment Areas (NCAs), sensitive receiver locations and land use types	30
Figure 4-2: North Strathfield metro station NCAs, sensitive receiver locations and land use types	33
Figure 4-3: Burwood North NCAs, sensitive receiver locations and land use types	35
Figure 4-4: Five Dock NCAs, sensitive receiver locations and land use types	38
Figure 4-5: The Bays NCAs, sensitive receiver locations and land use types	40

Tables

Table 1-1: Construction Noise and Vibration – Station Traceability Matrix	11
Table 1-2: Key Document References	12
Table 2-1: Performance Outcomes of NVMP	15
Table 3-1: Relevant Legislation, Specifications, Guidelines and Standards	16
Table 3-2: Work Hours and Highly Noise Intensive Work	17
Table 3-3: Variation to Work Hours	18
Table 3-4: Indicative Application of Variation to Work Hours for SPW Construction Activities	19
Table 3-5: Construction NMLs for residential receivers	22
Table 3-6: Airborne Noise Residential NMLs	23
Table 3-7: Non-Residential NMLs	24
Table 3-8: Road Traffic Noise Management Levels	25
Table 3-9: Structural Vibration– Cosmetic Damage – BS 7385	25
Table 3-10: Human Comfort Vibration – Vibration Dose Values for Intermittent Vibration	26
Table 3-11: Indicative Vibration Limits for Buried Utilities	27
Table 3-12: Recommended Minimum Working Distances from Vibration Intensive Equipment	28
Table 3-13: Ground-borne Noise Management Level	28

Table 4-1: Proposed Construction Activities – Westmead	31
Table 4-2: Proposed Construction Activities – North Strathfield metro station	34
Table 4-3: Proposed Construction Activities – Burwood North	36
Table 4-4: Proposed Construction Activities – Five Dock	39
Table 4-5: Proposed Construction Activities – The Bays	41
Table 4-6: Heritage Properties and Structures that occur near the Project area	42
Table 4-7: Station Noise and Vibration Risk Summary	44
Table 5-1: Control Hierarchy and SMART Application	45
Table 5-2: Standard Noise and Vibration Mitigation Measures	46
Table 5-3: Additional Mitigation Measures	55
Table 5-4: Additional Mitigation Measures Matrix (AMMM) - Airborne Construction Noise	56
Table 5-5: Additional Mitigation Measures Matrix (AMMM) – Ground borne Construction Noise ...	56
Table 5-6: Additional Mitigation Measures Matrix (AMMM) – Vibration	58
Table 6-1: Noise and Vibration Responsibilities	59
Table 6-2: Training Responsibilities Relevant to this Plan	63
Table 7-1: Noise and Vibration Reporting Obligations	65

DOCUMENT CONTROL

The current document version number and date of revision are shown in the document footer. All changes made to the Management Plan during its implementation on a live project are to be recorded in the amendment tables below.

Revision History

Revision	Date	Description of changes	Prepared by	Approved by
00	16/02/2026	Initial Submission for Sydney Metro, ER, and AA review	S. Robertson	R. Petaccia
01	16/03/2026	Response to Sydney Metro, ER, and AA comments.	K. Kerr S. Robertson A. Burke J. Ambler	R. Petaccia
02	13/04/2026	Response to Sydney Metro, ER, and AA comments.	K. Kerr	R. Petaccia
03	28/04/2026	Updated in response to Stakeholder Consultation and Additional ER and AA Comments	A. Burke K. Kerr	R. Petaccia

TERMS AND DEFINITIONS

Acronyms/Abbreviations	Meaning
AA	The Acoustics Advisor for the CSSI approved by the Planning Secretary
AMP	Activity Management Plan
ATVG	NSW Assessing Vibration: A Technical Guideline
CCMS	Sydney Metro Construction Complaints Management System
CEMF	Sydney Metro Construction Environmental Management Framework Version 4.5 dated June 2022
CEMP	Construction Environmental Management Plan
CNVS	Sydney Metro Construction Noise and Vibration Standard Version 4.5 dated July 2022
CNVG	Construction Noise and Vibration Guideline, Roads and Maritime Services, 2016
CoA	Conditions of Approval
Construction	Includes all work required to construct Stage 3 of the CSSI as described in the documents listed in Condition A1 including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work
CSSI	Critical State Significant Infrastructure
dBA	A-weighted decibels.
DEC (2006)	NSW Department of Environment and Conservation (DEC) Assessing Vibration: A Technical Guideline (2006)
Deed	SPW Station Delivery Deed
(the) Department	NSW Department of Planning, Housing and Infrastructure
DNVIS	Detailed Noise and Vibration Impact Statement(s)
DPHI	NSW Department of Planning, Housing and Infrastructure
ECM	Environmental Control Maps
EINCRP	Sydney Metro Environmental Incident and Non-Compliance Reporting Procedure Version 1.0 dated 1 December 2025
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPA	NSW Environment Protection Authority
EMS	Environmental Management System
EPL	Environment Protection Licence under the POEO Act
ER	The Environmental Representative(s) for the CSSI approved by the Planning Secretary
Gamuda	Gamuda Engineering Australia
Heritage item	A place, building, work, relic, archaeological site, tree, movable object or precinct of heritage significance, that is listed under one or more of the following registers: the State Heritage Register under the Heritage Act 1977 (NSW), a state agency heritage and conservation register under section 170 of the Heritage Act 1977 (NSW), a Local Environmental Plan under the EP&A Act, the World, National or Commonwealth Heritage lists under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth), and an "Aboriginal object" or "Aboriginal place" as defined in section 5 of the National Parks and Wildlife Act 1974 (NSW)
Highly noise affected	As defined in the Interim Construction Noise Guideline (DECC, 2009) consistent with the ICNG definition (construction noise levels exceeding 75 dBA)
Highly noise intensive work	Work which is defined as annoying under the Interim Construction Noise Guideline (DECC, 2009) including: (a) use of power saws;

Acronyms/Abbreviations	Meaning
	(b) grinding metal, concrete or masonry; (c) rock drilling; (d) line drilling; (e) vibratory rolling; (f) bitumen milling or profiling; (g) jackhammering, rock hammering or rock breaking; (h) impact piling; and (i) rail tamping and regulating. Note: Power saws include those used for cutting timber, rail lines, masonry, road pavement or steel work
ICNG	Interim Construction Noise Guideline (DECC, 2009)
IMS	(Gamuda's) Integrated Management System
LAeq	A-weighted equivalent continuous sound level
LAFmax	A-weighted, Fast time-weighted maximum sound level.
LIW	Low Impact Work as defined by Planning Approval
MEPF	Mechanical, Electrical, Plumbing, Fire
NCA	Noise Catchment Area
NPfl	NSW Noise Policy for Industry (NPfl), NSW Environment Protection Authority, 2017
NML	Noise Management Level as defined in the ICNG
NVMoP	Noise and Vibration Monitoring Program
NVMP	Noise and Vibration Management Plan
NSW	New South Wales
OOHW	Out-of-Hours Work
OOHW Protocol	Sydney Metro Out-of-Hours Work Protocol – West Rail Infrastructure, stations, precincts and operations (Stage 3) SM-25-00123220 September 2025
Plan	(this) Noise and Vibration Management Plan
Planning Approval	Applicable SSI-22765520 and SSI-10038 conditions as described in the SPW Station Delivery Deed
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
(the) Project	Stations Package West
RBL	Rating background noise level
REMMs	Revised Environmental Management Measures
RNP	NSW Road Noise Policy, Department of Environment, Climate Change and Water, 2011
RtS	Response to Submissions Report
SEMP	Site Establishment Management Plans
Sensitive land use(s)	Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres and passive recreation areas (including outdoor grounds used for teaching). Receivers that may be considered to be sensitive include commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation, restaurants, office premises, and retail spaces) and industrial premises as identified by the Planning Secretary Note: For the purpose of determining appropriate mitigation, a multistorey residential flat building must not be counted as one sensitive receiver. Note: Temporary accommodation as set out in this definition includes caravan parks and camping grounds

Acronyms/Abbreviations	Meaning
SMART principles	Specific, Measurable, Achievable, Realistic, and Timely
SPW	Stations Package West
SHR	State Heritage Register
TfNSW	Transport for New South Wales

1 INTRODUCTION

1.1 Purpose

This Construction Noise and Vibration Management Plan (NVMP or Plan) forms part of the Construction Environmental Management Plan (SMWSTSPW-GEA-SWD-EN-PLN-000001) (CEMP) for the Sydney Metro Stations Package West (SPW) project (SPW or the Project).

The purpose of this NVMP is to describe the noise and vibration management measures that will be implemented during construction of the SPW works to ensure compliance with:

- The Planning Approval Conditions of Approval (CoA) applicable to SPW works including but not limited to Condition C5-C10
- Measures listed in the Environmental Impact Statement (EIS) as amended by the Response to Submissions (RtS) known as the Revised Environmental Management Measures (REMMs)
- Sydney Metro Phasing Report
- All applicable Legislation and Guidelines.

This NVMP gives effect to the Planning Approval and supporting environmental assessment documentation. It does not vary, replace or reinterpret the CoA or any other statutory requirement.

1.2 Scope and Application

This NVMP applies to all construction activities undertaken as part of the SPW works that have the potential to generate noise and/or vibration impacts.

The NVMP applies to construction works at the following SPW station sites:

- Westmead Metro Station
- North Strathfield Metro Station
- Burwood North Station
- Five Dock Station
- The Bays Station.

The NVMP applies to all phases of SPW construction, including enabling works, utility works, main works, temporary works and ancillary activities associated with construction of the new stations and precincts. These construction activities would be undertaken within the approved construction footprints, as well as the surrounding road reserves and public domain areas as described in the EIS and RtS Report but excluding Low Impact Work as defined by the Project Approval. A detailed scope summary at each SPW station is provided in Section 1.8 of the CEMP.

It is noted that some station construction activities assessed in the EIS are outside of the SPW scope and will be delivered as part of a separate package of works as detailed in Stage 3 Phasing Report.

This NVMP applies to all personnel, subcontractors and suppliers engaged in SPW works where their activities may influence noise or vibration outcomes.

1.3 Background

SPW works comprise of the construction of multiple geographically discrete station sites within highly urbanised environments. Construction activities associated will occur in proximity to established residential, commercial, transport and community infrastructure and interface with other Sydney Metro West packages, utilities works and third-party developments. As a result, construction noise and vibration impacts vary between station sites and are influenced by local land use, sensitive receiver characteristics, construction methodology and staging.

Construction noise and vibration impacts from SPW works have been identified and assessed through the EIS, EIS Technical Paper 4 Noise and Vibration, and the Response to Submissions (RtS) Report. Station-specific traceability to these assessment documents is summarised in Table 1-1. This table provides a high-level reference to the principal sections addressing construction noise and vibration for each station.

Table 1-1: Construction Noise and Vibration – Station Traceability Matrix

Station	EIS Part B	EIS Technical Paper 4	RtS Report	RtS Report Appendix E
Westmead Metro Station	Section 7.6	Section 5.2.1	Section 2.2.2, 6.10, 7.2.7, 9.8.23	Westmead metro station – construction
North Strathfield Metro Station	Section 10.6	Section 5.2.4	Sections 2.7, 7.5.10	N/A
Burwood North Station	Section 11.6	Section 5.2.5	Section 7.5.11, 9.8.22	N/A
Five Dock Station	Section 12.6	Section 5.2.6	Section 6.10, 7.5.12	N/A
The Bays Station	Section 13.6	Section 5.2.7	Section 9.8.22	N/A

The EIS assessed construction noise and vibration impacts using conservative, upper-bound assumptions, including scenarios where multiple items of plant operate simultaneously, at full load, in fixed orientations and at the closest practicable locations to sensitive receivers, without allowance for construction sequencing, plant movement, shielding, or directional effects. The assessment therefore represents a robust evaluation of potential maximum impacts.

In practice, construction activities will be staged, plant will not operate continuously at full load, equipment will be spatially distributed across work areas, and noise and vibration levels will vary as activities and plant locations change. Notwithstanding this, residual construction noise and vibration risks remain and require dedicated management during construction of the SPW works. Consistent with the approved EIS and RtS Report, this Plan does not re-assess construction noise and vibration impacts at a strategic level but establishes the framework for managing those impacts during delivery, with activity-specific assessment undertaken where required.

1.4 Environmental Management System (EMS) Overview

Environmental management for the SPW works is delivered through the application of Gamuda Engineering Australia's Integrated Management System (IMS), as implemented at Project level through the SPW CEMP.

The SPW CEMP establishes the overarching environmental management framework for the Project and defines the governance arrangements, responsibilities, procedures and controls used to identify, manage and monitor environmental risks during construction. The CEMP is implemented through a structured hierarchy of management plans, sub-plans and monitoring programs.

This NVMP forms part of that hierarchy and provides discipline-specific requirements for the management of construction noise and vibration risks associated with the SPW works. The NVMP supports the implementation of the SPW CEMP by detailing noise and vibration-specific objectives, requirements, risk context and mitigation measures applicable to construction activities

1.4.1 Relationship between this Plan and other Documents

The key document this Plan interfaces with to ensure Project CoA and REMMS are implemented are detailed in Table 1-2.

Table 1-2: Key Document References

Document	Document Reference	Interface
Construction Environment Management Plan (CEMP)	SMWSTSPW-GEA-SWD-EN-PLN-000001	Provides the overarching environmental management framework for the Project, including governance, roles and responsibilities, incident and non-compliance management, consultation, monitoring, training and document control requirements that apply to construction noise and vibration management
Heritage Management Plan (HMP)	SMWSTSPW-GEA-SWD-EN-PLN-000006	Details the procedures and controls for managing impacts to Aboriginal and non-Aboriginal heritage, including requirements for consultation with heritage specialists and the assessment and management of vibration impacts on heritage items.
Noise and Vibration Monitoring Program (NVMoP)	SMWSTSPW-GEA-SWD-EN-PRG-000002	Prepared in accordance with CoA C13(a), the NVMoP defines the monitoring framework for construction noise, vibration and ground-borne noise, including monitoring locations, methodology, instrumentation, frequency, trigger levels, data management, reporting and response actions. The NVMoP is used to verify compliance with the performance criteria and the effectiveness of mitigation measures established under this Plan
Detailed Noise and vibration impact statements (DNVIS),	N/A as these are site specific	Prepared in accordance with CoA E33 and E34, DNVIS provide activity- and location-specific assessment of construction noise, vibration and ground-borne noise impacts for works that may exceed applicable criteria or involve out-of-hours work. DNVIS identify tailored mitigation, management, respite and notification measures to be implemented prior to and for the duration of the relevant works.
OOHW Works Protocol	SM-25-00123220	Prepared in accordance with CoA E28, the OOHW Protocol establishes the governance, assessment, approval, mitigation, respite, and notification processes for out-of-hours work (OOHW)
Activity Management Plan (AMP),	N/A as these are activity specific	Detail site and activity specific construction methodologies, sequencing, plant and equipment and environmental controls (ECMs), including the implementation of noise and vibration mitigation measures identified in this Plan, the NVMoP and any applicable DNVIS.
OOHW Permits	N/A as these are activity specific	Provides the mechanism for assessing noise and vibration risk, justification for out-of-hours work, and confirmation that all required approvals, management, mitigation, and notification measures are implemented prior to works commencing.
Health and Safety Management Plan	SMWSTSPW-GEA-SWD-PM-PLN-000012	Detail the management measures for the occupational environment in relation to maximum noise generated and the required enclosures and/or shielding to ensure the occupational health and safety of workers is maintained in accordance with CoA E32 and CEMF NV24

Section 5 of the CEMP provides a full list of plans, procedures, and other documents that form part of the EMS.

1.5 Consultation, Endorsement and Approval Requirements

In accordance with CoA C5, this Plan has been prepared as part of the CEMP in consultation with the following agencies and councils:

- Place Management NSW
- Port Authority of NSW
- Relevant Council(s) including Inner West Council, City of Canada Bay, Burwood Council, and Cumberland City Council.

This Plan was provided to the above listed agencies and Councils from 18 March 2026 with final comments received on 15 April 2026. All comments received were considered and the Plan updated accordingly.

Appendix B provides a summary of the consultation undertaken for the development of this Plan and the key issues identified by the relevant stakeholder in accordance with CoA A6.

Ongoing consultation with relevant stakeholders, including any unique local receivers (e.g. childcare and education facilities, places of worship) may be undertaken for specific issues pertaining to noise and vibration management. Community feedback and complaints relating to noise and vibration impacts will be dealt with in accordance with the Communication Strategy and the Complaints Management System (see Section 8 of this Plan).

In accordance with CoA C5 and the Phasing Report, this Plan was endorsed by the Acoustic Advisor (AA) and Environmental Representative (ER) on 29 April 2026 and 30 April 2026 respectively, prior to submission to the Planning Secretary for approval no later than one month before the commencement of construction.

Construction will not commence until the CEMP (including this NVMP) is approved as detailed in Section 2.3 of the CEMP.

2 OBJECTIVES, TARGETS AND PERFORMANCE OUTCOMES

This section sets out the objectives, targets and environmental performance outcomes for the management of construction noise and vibration for the SPW works. The objectives define the intent and scope of noise and vibration management under this NVMP, the targets describe the standards against which implementation of the NVMP will be assessed, and the environmental performance outcomes reflect the externally defined outcomes established through the Secretary's Environmental Assessment Requirements (SEARs).

The controls and management measures used to achieve these are detailed in subsequent sections of this Plan.

2.1 Objectives

The objectives of this NVMP are to:

- Ensure construction noise and vibration associated with the SPW works are managed in accordance with the Conditions of Approval, including the Construction Environmental Management Framework, the Construction Noise and Vibration Standard, and the Revised Environmental Management Measures contained in the EIS and RtS Report.
- Protect the amenity of surrounding sensitive receivers, including residential, commercial, community and institutional land uses, from unreasonable construction noise and vibration impacts during all phases of construction.
- Minimise the risk of structural damage to buildings, heritage items and infrastructure arising from construction vibration.
- Provide a clear, consistent and auditable framework for identifying, assessing, monitoring and managing construction noise and vibration impacts across all SPW station sites.
- Ensure construction noise and vibration risks are managed in a proactive, transparent and responsive manner, including through monitoring, community notification, complaint management and adaptive management where required.

2.2 Targets

The noise and vibration management targets for the SPW works are to:

- Achieve compliance with the applicable construction noise management levels, vibration criteria and assessment requirements specified in the Sydney Metro Construction Noise and Vibration Standard (CNVS), the CoA and relevant New South Wales (NSW) guidelines, except where exceedances are permitted and managed in accordance with approved protocols.
- Ensure all construction activities with the potential to generate noise and/or vibration are assessed prior to commencement and managed in accordance with approved noise and vibration management documentation, including this NVMP and any required DNVIS.
- Implement monitoring programs that enable timely identification of construction noise and vibration exceedances, potential non-compliances or emerging risks, and support effective response and corrective action.
- Minimise the duration, frequency and intensity of construction noise and vibration impacts at sensitive receivers through appropriate planning, staging and management of works.

- Manage construction noise and vibration complaints in accordance with the Project Complaints Management System, including investigation, response and, where required, implementation of additional mitigation or management measures.

2.3 Environmental Performance Outcomes

The environmental performance outcomes for construction noise and vibration for the SPW works are defined by the SEARs and shown in Table 2-1. These outcomes are included in this NVMP to demonstrate alignment between the Project's noise and vibration management framework and the required environmental outcomes established through the environmental assessment and approval process. Achievement of these outcomes is supported through implementation of the CoA, REMMs and the management measures set out in this Plan and associated documents.

Table 2-1: Performance Outcomes of NVMP

No	Performance Outcome
1	Construction noise and vibration (including airborne noise, ground-borne noise) are effectively managed to minimise adverse impacts on acoustic amenity, and adverse impacts on the structural integrity of buildings and items.

3 ENVIRONMENTAL REQUIREMENTS

This following identifies the statutory, approval and project-specific requirements that apply to the management of construction noise and vibration for the SPW works. These requirements establish the framework within which construction noise and vibration must be assessed, managed and monitored during delivery of the Project.

The requirements set out in this section are derived from applicable legislation, the CoA, the REMMs, and Sydney Metro's environmental management framework and standards. Compliance with these requirements is mandatory and informs the development and implementation of the management measures described in subsequent sections of this NVMP.

3.1 Relevant Legislation, Specifications, Guidelines and Standards

Construction noise and vibration associated with the SPW works must be managed in accordance with the legislation, standards, specifications and guidelines listed in Table 3-1, as applicable. These instruments establish the statutory and technical framework for the assessment and management of construction noise and vibration impacts for the Project.

Where inconsistencies exist, statutory requirements and Planning Approval Conditions of Approval take precedence, followed by applicable contractual requirements and guidance documents

Table 3-1: Relevant Legislation, Specifications, Guidelines and Standards

Category	Instrument
Legislation	Environmental Planning and Assessment Act 1979 (NSW)
	Protection of the Environment Operations Act 1997 (NSW)
	Protection of the Environment Operations (Noise Control) Regulation 2008 (NSW)
	Work Health and Safety Act 2011 (NSW)
Sydney Metro Requirements	Sydney Metro Construction Environmental Management Framework (CEMF)
	Sydney Metro Construction Noise and Vibration Standard (CNVS)
Government Guidelines and Policies	NSW Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change, 2009
	NSW Assessing Vibration: A Technical Guideline (AVTG), Department of Environment and Conservation, 2006
	Approved Methods for the Measurement and Analysis of Environmental Noise in NSW, EPA, 2022
	NSW Noise Policy for Industry (NPfI), NSW Environment Protection Authority, 2017
	NSW Road Noise Policy (RNP), Department of Environment, Climate Change and Water, 2011
	RMS Construction Noise and Vibration Guideline (CNVG), Roads and Maritime Services, 2016
Australian and International Standards	AS 2436 2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites
	AS/NZS 2107 2016 Acoustics: Recommended Design Sound Levels and Reverberation Times for Building Interiors
	AS/NZS IEC 61672.1:2019 Electroacoustics – Sound level meters – Part 1: Specifications
	AS 1055:2018 Acoustics – Description and measurement of environmental noise
	AS 2659.1-1988 Guide to the use of sound measuring equipment – Part 1: Portable sound level meters
	British Standard BS 6472-1:1992 Evaluation of Human Exposure to Vibration in Buildings (1–80 Hz) (as reference in the Assessing Vibration: A Technical Guideline)

Category	Instrument
	British Standard BS 7385-2:1993 Evaluation and Measurement for Vibration in Buildings – Guide to Damage Levels from Ground-borne Vibration
	German Standard DIN 4150-3:2016 Structural Vibration – Effects of Vibration on Structures

3.2 CoA and REMMs

This NVMP has been prepared to satisfy the CoA that require the preparation and implementation of a Construction Noise and Vibration Management Plan for the SPW works, including CoA C5(a) and any other CoA that specifically apply to construction noise and vibration management. This NVMP also gives effect to the CEMF and REMMs relevant to construction noise and vibration, as identified in the EIS and RtS Report.

A consolidated register of all CoA, REMMs and CEMF requirements relevant to construction noise and vibration, including how each requirement is addressed by this NVMP or associated documents, is provided in Appendix A.

3.3 Hours of Work

3.3.1 Work Hours and Highly Noise Intensive Work

Work hours for the Project are defined by CoA E25. CoA E26 defines the restrictions applicable to highly noise intensive work during those Work Hours. Table 3-2 summarises both these CoA requirements.

Table 3-2: Work Hours and Highly Noise Intensive Work

CoA	Construction Activity	Working hours applicable to Condition		
		Monday to Friday	Saturday	Sunday / Public Holiday
Work Hours				
E25	Work must be undertaken during the following hours:	7:00 am to 6:00 pm	8:00 am to 6:00 pm	No work
Highly Noise Intensive Work				
E26	Except as permitted by an EPL, highly noise intensive work that results in an exceedance of the applicable NML at the same receiver must only be undertaken:	8:00 am to 6:00 pm AND	8:00 am to 1:00 pm AND	No work
		If continuously, then not exceeding three (3) hours, with a minimum cessation of highly noise intensive work of not less than one (1) hour.		

Notes:

1. Applicable NML refers to the relevant Noise Management Level for the receiver type defined in Table 3-5 to Table 3-7 of this Plan. For clarity, ICNG management categories such as the “highly noise affected” level (75 dBA) are not the applicable NML and are not used as the trigger for CoA E26.

3.3.2 Variation to Work Hours

Work may be undertaken outside the hours specified in Section 3.3.1 under the circumstances defined in Table 3-3 and in accordance with CoA E27. These circumstances include construction activities that may occur outside standard work hours, including activities permitted to be

undertaken on a 24-hour, 7-day-a-week basis, subject to the requirements specified in the CoA and as outlined in Table 3-4.

Table 3-3: Variation to Work Hours

CoA	Work Type	Details
E27(a)	Safety and Emergencies, including:	(i) For the delivery of materials required by the NSW Police Force or other authority for safety reasons; or (ii) Where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm. On becoming aware of the need for emergency work in accordance with (a)(ii) above, the AA, the ER, the Planning Secretary and the EPA where an EPL is in force must be notified of the reasons for such work. The Proponent must use best endeavours to notify all noise and / or vibration affected occupants of sensitive land use(s) of the likely impact and duration of those work.
E27(b)	Low noise or vibration impact construction, including:	(i) Construction that causes LAeq(15 minute) noise levels: ○ No more than 5 dB(A) above the rating background level (RBL) at any residence in accordance with the ICNG, and ○ No more than the 'Noise affected' NMLs specified in Table 3 of the ICNG at other sensitive land use(s); or (ii) Construction that causes LAFmax noise levels during the night time period of no more than 15 dB(A) above the RBL at any residence; or (iii) Construction that causes: ○ Continuous or impulsive vibration values, measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006), or ○ Intermittent vibration values measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006).
E27(c)	By Approval, including:	(i) Where different construction hours are permitted or required under an EPL in force in respect of the CSSI; or (ii) Works which are not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition E28; or (iii) Negotiated agreements with directly affected residents and occupants of sensitive land use(s).
E27(d)	By Prescribed Activity, including:	(i) Tunnel fit out works, underground fit out works and /or internal station fit out works; or (ii) Work that must be undertaken during rail possessions, including the delivery and removal of material to support those works; or (iii) Delivery of material that is required to occur outside the construction hours identified in Condition E25 to directly support: ○ Tunnel fit out works; ○ Underground and / or internal station fit out activities (excluding surface works); and ○ Work for the Clyde Stabling and Maintenance Facility and the Rosehill Services Facility, Except where doing so would result in noise levels above LAeq(15 minute) 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and / or LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater for residential receivers above the existing

CoA	Work Type	Details
		noise environment (as of the date of this approval), unless otherwise approved in accordance with (a) and (c) above; or
	(iv)	Haulage of spoil except between the hours of 10:00pm and 7:00am to / from Westmead construction site using any roads / streets, except as permitted by (d)(ii) above; or
	(v)	Works within an acoustic shed where there is no exceedance of the noise levels under 'Low noise or vibration impact construction' circumstances identified in (b) above, unless otherwise agreed by the Planning Secretary.

Table 3-4 provides indicative operational guidance on how typical SPW construction activities may align with the variation to work hours pathways under CoA E27. This table is provided to support construction planning only. Compliance with the CoA is governed by Table 3-3.

Table 3-4: Indicative Application of Variation to Work Hours for SPW Construction Activities

SPW construction activity (within approved scope)	Typical SPW context	Relevant CoA pathway	Typical hours / notes
Emergency works to make site safe (e.g. service strike, excavation instability, traffic incident, etc)	Any station site	E27(a) Safety and emergencies	May occur at any time; notification obligations apply
Minor inspections, surveys, finishing works, testing and commissioning with no NML exceedance	Station platforms, buildings, plant rooms	E27(b) Low noise or vibration impact	May occur outside work hours where ICNG / vibration criteria are met
Internal station fit-out works (architectural, services, finishes within enclosed structures)	Completed station boxes and buildings	E27(d)(i) Prescribed activity	May occur 24 hours / 7 days, subject to CoA limits
Underground or enclosed station works not involving surface construction	Subsurface station elements	E27(d)(i) Prescribed activity	May occur 24/7
Works undertaken during rail possessions	Interfaces with live rail corridor	E27(d)(ii) Prescribed activity	As required during possessions
Delivery or removal of materials directly supporting internal or underground station fit out	Night deliveries to stations	E27(d)(iii) Prescribed activity ²	Permitted outside E25 hours subject to noise limits
Works undertaken within approved acoustic sheds	Site-specific (where sheds are installed)	E27(d)(v) Prescribed activity	Permitted where low-impact criteria are met
Spoil haulage to / from Westmead metro station site	Westmead only	E27(d)(iv)	Not permitted between 10:00 pm and 7:00 am unless otherwise allowed
Tower crane installation, demobilisation and major lifts	Station sites requiring large cranes	E27(c)(ii) By approval (OOHW Protocol) or E27(c)(i) EPL ¹	Requires approval under Out-of-Hours Work Protocol (E28); DNVIS may be required
OSOM Deliveries	All Station Sites	E27(a)(i) Safety and emergencies	May occur out of hours as required by the NSW Police Force or other authorities for safety reasons; notification obligations apply.
Large concrete pours (>500 m ³) and associated overrun works	Station substructure and superstructure	E27(c)(ii) By approval	Requires approval under Out-of-Hours Work Protocol (E28); DNVIS may be required
Civil and utilities works requiring road closures or traffic management	Station access points and road interfaces	E27(c)(ii) By approval	Requires approval under Out-of-Hours Work Protocol (E28); DNVIS may be required

SPW construction activity (within approved scope)	Typical SPW context	Relevant CoA pathway	Typical hours / notes
Planned surface construction works outside work hours that do not meet low-impact criteria	Station structures, public domain works	E27(c)(ii) By approval	Requires approval under Out-of-Hours Work Protocol (E28); DNVIS may be required
Works subject to an EPL with different approved hours	Where applicable	E27(c)(i)	As permitted by the EPL. ¹
Works undertaken under negotiated agreement with directly affected receivers	Localised station works	E27(c)(iii)	Subject to the terms of the negotiated agreement.

Notes:

1. At time of issue of this Management Plan, the Project EPL will be limited to a Non-Scheduled Activity for miscellaneous licensed discharge to waters and will not prescribe different approved hours.
2. Where activities relying on the E27(d)(iii) pathway are predicted to exceed the noise limits specified in that condition, the activity must instead be assessed and approved under the E27(c)(ii) pathway.

3.3.3 Out of Hours Work

Out-of-hours work (OOHW) is defined as any construction activity undertaken outside the work hours specified in CoA E25 and, where applicable, the highly noise intensive work hours specified in CoA E26. OOHW for the Project may only be undertaken where it satisfies one of the pathways identified under CoA E27 of the Approval.

Where OOHW is proposed under CoA E27(c)(ii) (works not subject to an Environment Protection Licence), such work must be assessed, approved and implemented in accordance with the approved Sydney Metro Out-of-Hours Work Protocol West – Rail Infrastructure, stations, precincts and operation Stage 3 SM-25-00123220 September 2025 prepared for the Project in accordance with CoA E28.

The approved OOHW Protocol establishes the governance, assessment, approval, mitigation, respite and notification processes for OOHW and has been developed in consultation with the Environment Representative (ER) and Acoustic Advisor (AA) and approved by the Planning Secretary. The assessment of OOHW risk levels will include consideration of prolonged OOHW, cumulative impacts, and the potential for construction fatigue, as required by the OOHW Protocol.

The Sydney Metro OOHW Protocol does not apply to following OOHW pathways:

- Safety and Emergencies described under CoA E27(a)
- Low Impact Works that comply with CoA E27(b)
- Negotiated Agreements described under CoA E27(c)(iii)
- Prescribed Activities listed under CoA E27(d).

3.3.4 OOHW Negotiated Agreements

In accordance with CoA E27(c)(iii), OOHW may be undertaken through community consultation and negotiated agreements with directly affected residents and occupants of sensitive land uses. This section defines the Project-specific process for negotiated agreements under CoA E27(c)(iii). Any community consultation and agreement undertaken with respect to proposed OOHW must:

1. Include consultation with directly affected noise sensitive receivers, planned and implemented in accordance with the approved Sydney Metro Overarching Community Communications

Strategy (OCCS) and the contract-specific Community Communication Plan (CCP). Reasonable endeavours will be undertaken to contact directly affected sensitive receivers.

This will typically include up to three contact attempts using appropriate methods. Where contact is not achieved, Project contact information (e.g. 'sorry we missed you' cards or notification letters) will be provided, inviting the receiver to contact the Project. The number and method of contact attempts may be adjusted where reasonable, having regard to the nature, timing and potential impact of the works.

2. Ensure that the noise sensitive receivers understand the nature of the works and any predicted impacts, including ensuring that communication materials are accessible and appropriate for the needs of culturally and linguistically diverse receivers.
3. Make it clear to receivers that they can withdraw their agreement at any time during the proposed works

Once consultation is complete, the community response rate will be assessed. To account for receivers who do not respond to consultation attempts, the Project will apply the agreement threshold formally established in Table 8 of the DPHI-approved Sydney Metro West Stage 3 Out-of-Hours Work Protocol (SM-25-00123220).

OOHW will be authorised to proceed under this pathway where the agreement rate demonstrates a "substantial majority" (defined as more than 65% of respondents) agree to the proposed OOHW. Receivers who do not respond to the consultation process are not classified as "respondents" and therefore do not negatively impact the required agreement threshold.

3.4 Noise and Vibration Performance Criteria

3.4.1 Noise Management Levels (NMLs)

Construction noise management levels have been established in accordance with the Interim Construction Noise Guideline (ICNG), which defines noise impact categories based on the existing background noise environment and the time of day.

The NMLs represent the noise levels above which construction activities may result in adverse amenity impacts and therefore require the implementation of additional management and mitigation measures. Table 3-5 presents the applicable construction Noise Management Levels (NMLs) for residential receivers during and outside of work hours.

Table 3-6 Airborne Noise Residential Noise Management Levels summarises the background noise levels (RBLs), representative construction noise levels and the resulting Noise Management Levels (LAeq, 15 minutes) for residential receivers at each station location for the day, evening and night periods. These NMLs form the basis for assessing potential residential amenity impacts from construction noise and for determining the need for mitigation, respite and/or further assessment.

Table 3-7 presents the applicable airborne construction noise criteria for non-residential sensitive receivers, including commercial, educational, medical, recreational and community land uses. The noise management levels (NMLs) are primarily based on the Interim Construction Noise Guideline (ICNG) and are consistent with the methodology and criteria adopted in EIS Technical Paper 4 (Table 7) and the Sydney Metro Construction Noise and Vibration Standard (CNVS).

For certain receiver types not explicitly defined in ICNG or EIS Technical Paper 4 (e.g. courts and libraries), NMLs have been derived by reference to internal design sound level criteria in AS/NZS 2107:2016 and converted to external noise levels using standard façade attenuation assumptions (refer Notes).

Table 3-5: Construction NMLs for residential receivers

Period	Construction noise management criteria
Work Hours: - Monday to Friday 7am to 6pm - Saturday 8am to 6pm - No work on Sundays or public holidays	Noise affected RBL + 10dB
	Highly noise affected 75dB(A)
Outside Work Hours: - Day OOH: 8am to 6pm on Sundays or public holidays - Evening: 6pm to 10pm - Night: 10pm to 7am	Noise affected RBL + 5dB
Out-of-hours work criteria (refer CoA E27)	Low impact construction (CoA E27(b)(ii)) LAFmax 15 dB(A) above RBL Other works under CoA E27(d) LAeq (15 min) 40 dB(A) or RBL + 5 dB (whichever is greater), and/or LAFmax 52 dB(A) or RBL + 15 dB (whichever is greater)
Note: Sleep disturbance criteria are defined under CoA E27 and relate to maximum noise levels (LAFmax) and specific out-of-hours work pathways, rather than the LAeq (15 minute) Noise Management Levels presented for ICNG-based assessment. Low impact construction during the night-time period must not exceed LAFmax 15 dB(A) above the RBL in accordance with CoA E27(b)(ii). In addition, works undertaken in accordance with CoA E27(d) must comply with the LAeq (15 minute) and/or LAFmax criteria specified in CoA E27(d)(iii), unless otherwise approved.	

Table 3-6: Airborne Noise Residential NMLs

Location ID	Noise Catchment Area (NCA)	Noise Level (dBA)										
		Background noise (RBL)			Average noise level (LAeq)			Noise Management Level (LAeq 15 mins)				Sleep Disturbance (LAFmax)
		Day	Evening	Night	Day	Evening	Night	Day	Day OOHW	Evening	Night	
Westmead Metro Station												
B.01	NCA02	49	47	37	67	67	62	59	54	52	42	52
B.02	NCA01	48	46	41	58	53	51	58	53	51	46	56
North Strathfield Metro Station												
B.10	NCA10	47	47	44	60	60	55	57	52	52	49	59
B.11	NCA11	51	47	39	61	60	55	61	56	52	44	54
Burwood North Station												
B.12	NCA12	43	43 (47) ²	42	56	55	50	53	48	48	47	57
B.13	NCA13	48	48	44	57	56	55	58	53	53	49	59
Five Dock Station												
B.14	NCA14	42	41	33	58	56	51	52	47	46	38	52
B.15	NCA15	43	43 (44) ²	38	57	56	50	53	48	48	43	53
The Bays Station												
B.19	NCA21	43	43	35	56	54	47	53	48	48	40	52
B.20	NCA20	51	51	45	57	57	54	61	56	56	50	60
B.21	NCA22	48	47	39	59	58	51	58	53	52	44	54
Notes:												
1. These values may be subject to review and update pending the outcomes of additional baseline monitoring (refer Section 3.3 Additional Baseline Monitoring of the NVMoP). This Plan would be updated in accordance with the process outlined in Section 9.												
2. RBLs in brackets () demonstrated background noise in the evening above the day time RBL therefore the day RBL has been adopted.												
3. Sleep disturbance criteria are assessed in terms of LAFmax. For low impact construction during the night-time period, noise must not exceed RBL + 15 dB(A) in accordance with CoA E27(b)(ii). For works undertaken in accordance with CoA E27(d), noise must not exceed LAFmax 52 dB(A) or RBL + 15 dB(A), whichever is greater.												

Table 3-7: Non-Residential NMLs

Rec Name	Day	DOOH	Evening	Night	Sleep Disturbance
Commercial	70	70	70	70	-
Industrial	75	75	75	75	-
Café/Bar ⁵	70	70	70	70	-
Child care centres – sleeping areas ³	55	55	55	55	-
Child care centres – play areas	65	65	65	65	-
Educational	55	55	55	55	-
Court ³	60	60	60	60	-
Hotel ⁵	70	70	70	60	70 ⁴
Library ³	55	55	55	55	-
Medical ⁵	65	65	65	65	-
Active Recreation	65	65	65	65	-
Passive Recreation	60	60	60	60	-
Public Building	60	60	60	60	-
Place of Worship	55	55	55	55	-
Recording Studio ⁵	45	45	45	45	-
Stables	60	60	60	60	-
Theatre ⁵	50	50	50	50	-
Notes: 1. NMLs for non-residential receivers only apply when the respective premises are in use. 2. Unless otherwise stated, the NMLs presented in the table are external noise levels assessed as LAeq(15 minute). 3. For land uses not explicitly defined in the baseline ICNG or EIS Technical Paper 4 tables, external NMLs have been derived using an assumed façade attenuation of 10 dB, representing partially open windows. Specifically, the internal NMLs for Libraries (45 dBA) and Child care centres - sleeping areas (45 dBA) are sourced from the Sydney Metro Construction Noise and Vibration Standard (CNVS). The NML for Courts has been derived from AS/NZS 2107:2016 internal design sound levels, in accordance with the CNVS and ICNG methodology. 4. Sleep disturbance screening criteria for overnight accommodation utilise maximum noise level events (LAFmax). Because the ICNG and CNVS do not provide explicit LAFmax sleep disturbance criteria for hotels, this screening level has been conservatively adopted from the residential sleep disturbance criteria (e.g. Noise Policy for Industry) to provide a proxy for potential maximum noise events. This value is not a strict compliance criterion and is used for screening and management purposes only. 5. For specific receivers (Café/Bar, Hotel, Medical, Recording Studio, and Theatre), it is assumed that the buildings have fixed windows, which results in internal noise levels being approximately 20 dB lower than the external noise level, consistent with the methodology in EIS Technical Paper 4					

3.4.1.1 Construction Road Traffic Noise

In accordance with the NSW Road Noise Policy (RNP) and CNVS, construction traffic NMLs set at 2 dBA above the existing road traffic noise levels during the daytime and night-time periods are considered appropriate to identify the onset of potential noise impacts. Where the road traffic noise levels are predicted to increase by more than 2 dBA because of construction traffic, consideration would be given to applying feasible and reasonable noise mitigation measures to reduce the potential noise impacts and preserve acoustic amenity.

In considering feasible and reasonable mitigation measures where the relevant noise increase is greater than 2 dBA, consideration would also be given to the actual noise levels associated with total traffic (i.e. existing traffic + construction traffic) and whether these levels comply with the road traffic noise criteria in the RNP. Road traffic Noise Management Levels (NMLs) are provided in Table 3-8.

Table 3-8: Road Traffic Noise Management Levels

Road	Category	Management Level, dBA	
		Daytime	Night time
Freeway/ arterial/sub- arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	LAeq(15hour) 60 (external)	LAeq(9hour) 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	LAeq(1hour) 55 (external)	LAeq(1hour) 50 (external)

3.4.2 Vibration

Construction vibration criteria for the Project have been developed to manage the potential for both structural damage to buildings and disturbance to occupants. Vibration performance criteria have been adopted in accordance with relevant Australian and international standards and guidelines, reflecting the sensitivity of surrounding receivers and the nature of nearby structures.

3.4.2.1 Cosmetic and Structural Building Damage

Vibration criteria to manage the risk of cosmetic and structural damage to buildings have been established with reference to BS 7385-2:1993 – Evaluation and Measurement for Vibration in Buildings (Part 2) and DIN 4150-3: Structural Vibration – Effects of Vibration on Structures. In accordance with the CNVS, the values shown in Table 3-9 apply to transient vibrations and must be reduced by 50% for continuous vibrations. The criteria apply at the building foundation. Screening criteria of 7.5 mm/s (for unreinforced buildings and light frame structures) and 25 mm/s (for reinforced or frame structures) apply as the threshold for further investigation.

In accordance with CoA E29(d) and CoA E40, the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures apply specifically for structural damage of structurally unsound heritage items.

Table 3-9: Structural Vibration– Cosmetic Damage – BS 7385

Group	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

3.4.2.2 Heritage Structures

Heritage buildings and structures will be assessed as per the screening criteria in Table 3-9 on account building pre-condition surveys have not identified any heritage listed items adjacent to or affected by the project, as being structurally unsound.

If, however, a heritage building or structure is found to be structurally unsound (following inspection), a more conservative cosmetic damage criteria of 2.5 mm/s peak component particle velocity (from DIN 4150) would be applied.

In accordance with DIN 4150-3 the 2.5mm/s criterion applies at the location of the most vibration sensitive part of the structure, typically the topmost floor level. Where monitoring is undertaken at the foundation or ground level measured vibration levels would be interpreted conservatively or adjusted, where appropriate, to account for potential amplification within the structure to ensure that vibration levels at the upper floors remain below the applicable criteria.

3.4.2.3 Human Comfort

Vibration criteria for human comfort have been adopted from Assessing Vibration: A Technical Guideline (DEC, 2006) and the CNVS (where available) and are based on Vibration Dose Values (VDVs) relevant to building use, time of day, and occupant sensitivity. These criteria are intended to minimise adverse impacts on occupants from perceptible vibration during construction activities. The applicable human comfort vibration criteria are presented in Table 3-10.

VDVs are presented as preferred and maximum values. The preferred value represents the target vibration level for construction activities and should be achieved where feasible and reasonable through the implementation of mitigation measures and construction planning. The maximum value represents the upper limit above which vibration levels may give rise to increased likelihood of occupant disturbance. Where predicted or measured vibration levels exceed the preferred value, additional feasible and reasonable mitigation measures should be considered. Where vibration levels exceed the maximum value, this indicates a higher likelihood of adverse comment and requires further assessment and implementation of additional feasible and reasonable mitigation measures.

Table 3-10: Human Comfort Vibration – Vibration Dose Values for Intermittent Vibration

Building Type	Assessment Period	Vibration Dose Value (m/s ^{1.75})	
		Preferred	Maximum
Critical Working Areas (e.g. operating theatres or laboratories)	Day or night-time	0.10	0.20
Residential ¹	Daytime	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational institutions and places of worship	Day or night-time	0.40	0.80
Workshops	Day or night-time	0.80	1.60
Notes:			
1. Residential vibration dose values are consistent with the guidance in the Sydney Metro CNVS, which adopts BS 6472-1992 and defines levels corresponding to “low probability of adverse comment” (preferred) and “adverse comment possible” (maximum)			

3.4.2.4 Other Vibration Sensitive Structures and Utilities

Where structures and utilities are encountered which may be considered to be particularly sensitive to vibration, a vibration goal which is more stringent than structural damage goals presented in Section 3.4.2 may need to be adopted. Examples of such structures and utilities include:

- Tunnels
- Gas pipelines
- Fibre optic cables
- Buried utilities and services

In accordance with the Sydney Metro CNVS, buried services are generally resistant to vibration and can tolerate relatively high vibration levels unless they are in poor condition, therefore guidance derived from DIN 4150-3 provides indicative vibration limits for buried utilities and services as detailed in Table 3-11.

Table 3-11: Indicative Vibration Limits for Buried Utilities

Pipe Material	Guideline values for vibration velocity measured on the pipe (mm/s)
Steel (including welded pipes)	100
Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	80
Masonry, plastic	50
Notes: 1. Rock breaking/hammering and sheet piling activities are considered to have the potential to cause dynamic loading in some structures and it may therefore be appropriate to reduce the transient values by 50%.	

Notwithstanding these indicative values, specific vibration goals will be determined on a case-by-case basis considering the type, condition and operational sensitivity of the asset. An acoustic consultant would be engaged by the construction contractor and would liaise with the structure or utility's owner to determine acceptable vibration levels and any monitoring or mitigation requirements prior to undertaking vibration-generating works.

3.4.2.5 Safe Working Distances

Minimum working distances for typical vibration intensive construction equipment are provided in the TfNSW Construction Noise and Vibration Strategy and are shown in Table 3-12. The minimum working distances below are provided for both cosmetic damage (from BS 7385 and DIN 4150) and human comfort (AVTG). They are calculated from empirical data which suggests that where work is further from receivers than the quoted minimum distances, impacts are not considered likely.

Table 3-12: Recommended Minimum Working Distances from Vibration Intensive Equipment

Plant Item	Rating/Description	Minimum Distance		
		Cosmetic Damage		Human Response (AVTG)
		Residential and Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory Roller	<50 kN (1–2 tonne)	5 m	11 m	15 m to 20 m
	<100 kN (2–4 tonne)	6 m	13 m	20 m
	<200 kN (4–6 tonne)	12 m	25 m	40 m
	<300 kN (7–13 tonne)	15 m	31 m	100 m
	>300 kN (13–18 tonne)	20 m	40 m	100 m
	>300 kN (>18 tonne)	25 m	50 m	100 m
Small Hydraulic Hammer	300 kg (5 to 12 t excavator)	2 m	5 m	7 m
Medium Hydraulic Hammer	900 kg (12 to 18 t excavator)	7 m	15 m	23 m
Large Hydraulic Hammer	1,600 kg (18 to 34 t excavator)	22 m	44 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	5 m	4 m
Jackhammer	Hand held	1 m (nominal)	3 m	2 m
Notes:				
1. DIN 4150 minimum working distances need only be applied in the instance heritage structures that are structurally unsound are present.				

The minimum working distances are indicative and will vary depending on the particular item of equipment and local geotechnical conditions. The distances apply to cosmetic damage of typical buildings under typical geotechnical conditions. When assessing vibration impacts from construction activities safe working distances will be established in the DNVIS, in accordance with the above Table 3-12, based on the magnitude and risk of impact.

3.4.3 Ground Borne Noise

Ground borne noise (GBN) criteria have been established to manage noise transmitted through the ground and building structures as a result of underground vibration generating construction activities. The NMLs for GBN in Table 3-13 have been adopted in accordance with relevant NSW guidance and reflect the sensitivity of surrounding receivers during different assessment periods.

Table 3-13: Ground-borne Noise Management Level

Receiver Type	Noise Management Level (LAeq (15minute) – dBA)		
	Daytime ¹	Evening ²	Night-time ²
Residential	45	40	35
Commercial	50	n/a	n/a
Notes:			
1. Daytime ground-borne noise NMLs taken from preceding Sydney Metro planning applications for consistency. Daytime ground-borne noise NMLs are not specified in the ICNG or Sydney Metro CNVS.			
2. Specified in the Sydney Metro CNVS and ICNG.			

4 NOISE AND VIBRATION RISK CONTEXT

This section documents the noise and vibration risk context for construction of the Stations Package West (SPW) works at each station site. It provides the site-specific context required to inform construction planning and the preparation and application of Detailed Noise and Vibration Impact Statements (DNVIS), during delivery in accordance with CoA E33 and E44.

Construction noise and vibration impacts associated with the SPW works have been assessed at a strategic level through the Environmental Impact Statement (EIS), including EIS Technical Paper 4 (Noise and Vibration), as amended by the Response to Submissions (RtS) Report. Consistent with those approved assessments, this Plan does not re-assess construction noise and vibration impacts at a proposal-wide level.

For each station, this section summarises:

- The existing environment and sensitive receiver context, including Land Use Surveys.
- The types of construction activities anticipated to be undertaken
- The approach to detailed noise and vibration assessment and modelling.
- For each station, DNVIS, which are required for all works that may exceed the NMLs, are prepared and maintained to translate the approved assessment into site- and activity-specific predictions and controls during construction. The DNVIS consolidates detailed modelling outcomes and defines, as applicable:
 - The noise and vibration risk profile by activity and stage
 - Predicted exceedances and the scenarios under which they may occur
 - The mitigation measures to be implemented
 - Monitoring requirements and triggers for additional mitigation or changes to methodology
 - Assessment requirements to support construction planning, including consideration of Out-of-Hours Work (OOHW).

DNVIS are reviewed and updated as construction progresses where assumptions change or where monitoring results or complaint trends indicate that predicted outcomes no longer reflect actual conditions.

The outcomes of the DNVIS inform the mitigation measures and be implemented in the development of Activity Method Statements, and the implementation of the Construction Noise and Vibration Monitoring Program.

4.1 Westmead Metro Station

4.1.1 Existing Environment and Sensitive Receivers

The existing noise environment around Westmead metro station is typical of a suburban setting and is dominated by road traffic, rail operations along the existing Sydney Trains corridor, and general background activity. Surrounding land uses are predominantly residential, with the Westmead health and education precinct located to the north.

Baseline noise conditions were established through unattended and attended noise monitoring (undertaken between March and July 2019) at representative sensitive receiver locations. The results indicate that background noise levels are generally consistent with the residential character of the area, with elevated average levels reflecting existing transport-related noise sources. Potential vibration impacts to structures and builds heritage items in the Westmead metro station study area have been assessed and generally be neutral or negligible.

Sensitive receivers in the vicinity of Westmead Metro Station comprise predominantly residential dwellings, with additional medical, education and childcare facilities associated with the Westmead health and education precinct, as well as commercial buildings and public/open space areas within Noise Catchment Areas NCA01 and NCA02 (refer Figure 4-1)



Figure 4-1: Westmead Noise Catchment Areas (NCAs), sensitive receiver locations and land use types

4.1.1.1 Sensitive Land Uses

An assessment of sensitive land uses at Westmead has been undertaken in accordance with CoA E23. Appendix E Land Use Survey Maps detail sensitive land use(s) that have the potential to be impacted by noise and vibration.

4.1.2 Construction Activities

Table 4-1 identifies the construction activities at Westmead that have the potential to generate noise and/or vibration impacts. The activities are grouped by those proposed to be undertaken during approved construction hours and those that may be required to be undertaken outside work hours (OOHW).

Activities identified for approved construction hours represent the core construction works planned to be undertaken during the hours specified in CoA E25. Activities identified as potential out-of-hours work (OOHW) are those that may be required due to safety, traffic, logistical, program or interface constraints, or where they meet the eligibility pathways for out-of-hours work under CoA E27 (including low-noise activities, prescribed activities or works approved under an Out-of-Hours Work Protocol).

The Detailed Noise and Vibration Impact Statement (DNVIS) will be prepared and implemented in accordance with CoA E33 and E34, prior to the commencement of the relevant works at Westmead. The assessment and management of OOHV will also consider respite requirements under CoA E44 and applicable notification requirements.

Table 4-1: Proposed Construction Activities – Westmead

Approved Hours	Out of Hours
- Site Establishment - Site/Geotechnical Investigation - Temporary Utilities Connection - Site Logistics & Traffic - Dilapidation Survey - Construction Road Access Modification - Ground Anchor Destressing - Substructure (Excavation & sump, foundation, base slab construction i.e., concrete pours over 500m³, waterproofing) - Superstructure (Precast installation, concrete pours, steel fixing, tower/crawler crane assemble & lifts) - Surface Works (Demolition concrete slab, capping beam i.e.), Utilities, Civil works – drainage & earthworks) - Lifts & Escalators - Facade Installation	OOH Works (Evening) - Major plant and crane activities (e.g. tower crane installation and major lifts) - OSOM and large material deliveries (e.g. precast elements) - Large concrete pours and associated overrun works - Facade works and external finishing activities (where low noise criteria are met) - Station fitout works (architectural and Mechanical, Electrical, Plumbing, Fire (MEPF) installation) - Station testing and commissioning activities (safety-driven) OOH Works (Night) - Internal station works (MEPF installation, fitout, FRP preparation, waterproofing and formwork – excluding concreting) - OSOM and safety-critical deliveries (e.g. precast elements) - Civil and utilities works near road intersections (traffic-driven) OOH Works (Weekend) - Major deliveries and crane activities (e.g. precast elements, lifts, escalators, tower crane works) - Site establishment and demobilisation works (e.g. site offices) - Civil and utilities works (including drainage and roadworks)

Notes:

- Associated Plant lists will be included in the Detailed Noise and Vibration Impact Statement (DNVIS)

4.1.3 Noise and Vibration Assessment and Modelling

Noise and vibration impacts for construction works at Westmead Metro Station have been assessed using a staged, risk-based approach, building on the noise and vibration modelling undertaken for the tender phase. That assessment identified Westmead as a higher sensitivity location due to the proximity of residential receivers and the more stringent NMLs within NCA01 and NCA02.

For works undertaken during approved construction hours, noise assessment will focus on confirming compliance with the applicable NMLs (detailed in Section 3.3.4) through a combination of activity based and site-specific predictions and monitoring. Where required, targeted noise modelling will be undertaken to refine predicted impacts for specific activities or stages where receivers are in close proximity.

For OOHW, including substructure, superstructure and surface works, the potential for exceedances of NMLs has been identified at a strategic level. Accordingly, the DNVIS will be prepared in accordance with CoA E33 and E34 prior to commencement of relevant works. The DNVIS will provide activity- and stage specific noise predictions, identify exceedance scenarios, and define mitigation measures, respite, monitoring and notification requirements consistent with CoA E27 and E44.

Vibration impacts at Westmead are generally expected to be low, however, vibration risk will be assessed where works occur in proximity to sensitive receivers. Where required, attended monitoring will be undertaken to confirm compliance with applicable criteria.

4.2 North Strathfield Metro Station

4.2.1 Existing Environment and Sensitive Receivers

The existing noise environment around North Strathfield metro station is dominated by road traffic on surrounding streets and rail movements on the existing Main North and freight underpass rail line. The area has a suburban character with a mix of residential, commercial and educational land uses.

Sensitive receivers include low-density and low-rise residential dwellings, local shops along Queen Street, and educational and childcare facilities, The McDonald College, Our Lady of the Assumption Catholic Primary School, and the Papilio Early Learning Centre. Residential receivers are located to the east, north and south of the station. Construction at North Strathfield metro station would not involve major sources of vibration generating equipment. As such, potential vibration impacts are anticipated to be negligible.

The area is divided into two Noise Catchment Areas (NCA10 and NCA11). Baseline noise monitoring undertaken in 2019 indicates that background noise levels are generally consistent with the residential and commercial nature of the precinct, with rail and traffic noise being the primary contributors. Figure 4-2 shows the sensitive receivers and NCAs in the vicinity of the North Strathfield Metro Station.

4.2.1.1 Sensitive Land Uses

An assessment of sensitive land uses at North Strathfield has been undertaken in accordance with CoA E23. Appendix E Land Use Survey Maps detail sensitive land use(s) that have the potential to be impacted by noise and vibration.



Figure 4-2: North Strathfield metro station NCAs, sensitive receiver locations and land use types

4.2.2 Construction Activities

Table 4-2 identifies the construction activities at North Strathfield metro station that have the potential to generate noise and/or vibration impacts. The activities are grouped by those proposed to be undertaken during approved construction hours and those that may be required to be undertaken outside work hours (OOHW).

Activities identified for approved construction hours represent the core construction works planned to be undertaken during the hours specified in CoA E25. Activities identified as potential out-of-hours work (OOHW) are those that may be required due to safety, traffic, logistical, program or interface constraints, or where they meet the eligibility pathways for out-of-hours work under CoA E27 (including low-noise activities, prescribed activities or works approved under an Out-of-Hours Work Protocol).

The Detailed Noise and Vibration Impact Statement (DNVIS) will be prepared and implemented in accordance with CoA E33 and E34, prior to the commencement of the relevant works at North Strathfield metro station. The assessment and management of OOHW will also consider respite requirements under CoA E44 and applicable notification requirements.

Table 4-2: Proposed Construction Activities – North Strathfield metro station

Approved Hours	Out of Hours Works
- Site Establishment - Site/Geotechnical Investigation - Temporary Utilities Connection - Site Logistics & Traffic - Dilapidation Survey - Temporary Loading Platform/Turntable Installation - Construction Road Access Modification - Ground Anchor Destressing - Substructure (Excavation & sump, foundation, base slab construction i.e., concrete pours over 500m³, waterproofing) - Superstructure (Precast installation, concrete pours, steel fixing, tower/crawler crane assemble & lifts) - Surface Works (Demolition concrete slab, capping beam i.e.), Utilities, Civil works – drainage & earthworks) - Lifts & Escalators - Façade Installation	OOH Works (Evening) - Major crange and plant activities (e.g. tower crane installation) - OSOM and large precast deliveries (walls and beams) - Large concrete pours and associated overrun works - Façade works and external finishes (where low noise criteria are met) - Station fit out, testing and commissioning (architectural, MEPF and safety-driven activities) OOH Works (Night) - Internal station works (FRP preparation, waterproofing, formwork, MEPF installation and internal fit out – excluding concreting) - OSOM and safety-critical deliveries (precast elements) - Civil and utilities works (drainage, roadworks and relocations) OOHW Works (Weekend) - Major deliveries and crange activities (precast elements, lifts, escalators and tower crane works) - Site establishment and demobilisation works (e.g. site offices) - Civil and utilities works (including drainage and roadworks)
Notes: Associated Plant lists will be included in the Detailed Noise and Vibration Impact Statement (DNVIS)	

4.2.3 Noise and Vibration Assessment and Modelling

Noise and vibration impacts for construction works at North Strathfield metro station have been assessed using a targeted approach informed by the approved EIS and tender-phase modelling, which identified potential noise impacts to surrounding low-density residential receivers, particularly during OOHW.

For works undertaken during approved construction hours the construction assessment will focus on confirming compliance with the applicable NMLs (detailed in Section 3.3.4), through activity-based predictions and monitoring.

For OOHW, including substructure, superstructure and surface works, modelling indicates a potential for NML exceedances at nearby residential receivers. Where such works are proposed, a DNVIS will be prepared in accordance with CoA E33 and E34 to provide detailed noise predictions, identify exceedance risks, and define appropriate mitigation, respite and notification measures in accordance with CoA E27 and E44.

Vibration-generating activities are limited at North Strathfield metro station and significant vibration impacts are not anticipated. Vibration will be assessed where relevant and managed in accordance with applicable criteria (detailed in Section 3.3.4), with monitoring undertaken where required.

4.3 Burwood North Station

4.3.1 Existing Environment and Sensitive Receivers

The existing noise environment around Burwood North Station is dominated by road traffic noise, particularly from Parramatta Road, with additional contributions from surrounding local roads. The area is predominantly residential, with some commercial land uses, typically retail.

Sensitive receivers include low- and medium-density residential dwellings, retail and commercial premises, and a small number of education, medical and community facilities located within the surrounding precinct. Construction work at Burwood North Station would not involve major sources of vibration-generating equipment. As such, potential vibration impacts are anticipated to be negligible.

For construction noise assessment, the area is divided into two Noise Catchment Areas (NCA12 and NCA13). Baseline noise monitoring undertaken in 2019 indicates that background noise levels are generally consistent with the residential character of the area, with road traffic being the primary contributor. Figure 4-3 shows the sensitive receivers and NCAs in the vicinity of the Burwood North Station.

4.3.1.1 Sensitive Land Uses

An assessment of sensitive land uses at Burwood North has been undertaken in accordance with CoA E23. Appendix E Land Use Survey Maps detail sensitive land use(s) that have the potential to be impacted by noise and vibration.



Figure 4-3: Burwood North NCAs, sensitive receiver locations and land use types

4.3.2 Construction Activities

Table 4-3 identifies the construction activities at Burwood North that have the potential to generate noise and/or vibration impacts. The activities are grouped by those proposed to be undertaken during approved construction hours and those that may be required to be undertaken outside work hours (OOHW).

Activities identified for approved construction hours represent the core construction works planned to be undertaken during the hours specified in CoA E25. Activities identified as potential out-of-hours work (OOHW) are those that may be required due to safety, traffic, logistical, program or interface constraints, or where they meet the eligibility pathways for out-of-hours work under CoA E27 (including low-noise activities, prescribed activities or works approved under an Out-of-Hours Work Protocol).

The Detailed Noise and Vibration Impact Statement (DNVIS) will be prepared and implemented in accordance with CoA E33 and E34, prior to the commencement of the relevant works at Burwood North. The assessment and management of OOHW will also consider respite requirements under CoA E44 and applicable notification requirements.

Table 4-3: Proposed Construction Activities – Burwood North

Approved Hours	Out of Hours Works
- Site Establishment - Site/Geotechnical Investigation - Temporary Utilities Connection - Site Logistics & Traffic - Dilapidation Survey - Temporary Loading Platform/Turntable Installation - Parramatta Road Gate & Access Modification - Ground Anchor Destressing - Substructure (Excavation & sump, foundation, base slab construction i.e., concrete pours over 560m³, waterproofing) - Superstructure (Precast installation, concrete pours, steel fixing, tower/crawler crane assemble & lifts) - Surface Works (Demolition concrete slab capping beam i.e.), Utilities, Civil works – drainage & earthworks) - Lifts & Escalators - Façade Installation	OOH Works (Evening) - Major craneage and plant activities (e.g. tower crane installation) - OSOM and large precast deliveries (walls and beams) - Large concrete pours and associated overrun works - Façade works and external finishes (where low noise criteria are met) - Station fit out, testing and commissioning (architectural, MEPF and safety-driven activities) OOH Works (Night) - Internal station works (FRP preparation, waterproofing, formwork, MEPF installation and internal fit out – excluding concreting) - OSOM and safety-critical deliveries (precast elements) - Civil and utilities works near intersections (traffic-driven) OOH Works (Weekend) - Major deliveries and craneage activities (precast elements, lifts, escalators and tower crane works) - Site establishment and demobilisation works (e.g. site offices) - Programme-driven structural works (e.g. line-wide shaft FRP construction)

Notes:

- Associated Plant lists will be included in the Detailed Noise and Vibration Impact Statement (DNVIS)

4.3.3 Noise and Vibration Assessment and Modelling

Noise and vibration impacts for construction works at Burwood North Station have been assessed having regard to the predominantly residential setting and the proximity of receivers along Parramatta Road and Burton Street. Modelling undertaken for the tender phase identified potential noise impacts during both approved hours and OOHW, as well as the potential for ground-borne noise and vibration impacts when working in close proximity to Burton Street receivers.

For approved construction hours, noise assessment will focus on activity-based prediction and monitoring to confirm compliance with applicable NMLs (detailed in Section 3.4) and to inform mitigation where required.

For OOHW, strategic modelling indicates that exceedances of NMLs may occur for certain activities and stages. Where such works are proposed, a DNVIS will be prepared in accordance with CoA E33 and E34, providing detailed modelling, identification of exceedance scenarios, and proposed mitigation measures, respite and notification measures consistent with CoA E27 and E44.

Where works are undertaken in close proximity to sensitive receivers, vibration and ground-borne noise will be assessed in more detail through the DNVIS process, with attended monitoring implemented as required to confirm compliance with applicable criteria.

4.4 Five Dock Station

4.4.1 Existing Environment and Sensitive Receivers

The existing noise environment around Five Dock Station is primarily influenced by road traffic noise from the surrounding road network, particularly along Great North Road and nearby local streets. The area has an urban village character, comprising a mix of residential, commercial and other sensitive land uses.

Sensitive receivers include low-rise residential dwellings surrounding the station sites, commercial premises within the Five Dock town centre, and other sensitive uses such as places of worship. St Alban's Anglican Church is located immediately north of the western station site. Receivers are generally located close to the boundaries of both construction sites. Due to the close proximity of commercial and residential receivers there is potential for exceedance of the cosmetic and human comfort vibration screening criteria. Where vibration levels are predicted to exceed the screening criteria(s), a more detailed assessment of impacts and attended vibration monitoring would be carried out so that vibration levels remain below appropriate limits for that structure or receiver.

For construction noise assessment, the Five Dock precinct is divided into six Noise Catchment Areas (NCA14 to NCA19). Baseline noise monitoring undertaken in 2019 indicates that background noise levels are generally consistent with the mixed residential and commercial character of the area, with road traffic noise being the dominant contributor. Figure 4-4 shows the sensitive receivers and NCAs in the vicinity of the Five Dock Station.



Figure 4-4: Five Dock NCAs, sensitive receiver locations and land use types

4.4.1.1 Sensitive Land Uses

An assessment of sensitive land uses at Five Dock has been undertaken in accordance with CoA E23. Appendix E Land Use Survey Maps detail sensitive land use(s) that have the potential to be impacted by noise and vibration.

4.4.2 Construction Activities

Table 4-4 identifies the construction activities at Five Dock that have the potential to generate noise and/or vibration impacts. The activities are grouped by those proposed to be undertaken during approved construction hours and those that may be required to be undertaken outside work hours (OOHW).

Activities identified for approved construction hours represent the core construction works planned to be undertaken during the hours specified in CoA E25. Activities identified as potential out-of-hours work (OOHW) are those that may be required due to safety, traffic, logistical, program or interface constraints, or where they meet the eligibility pathways for out-of-hours work under CoA E27 (including low-noise activities, prescribed activities or works approved under an Out-of-Hours Work Protocol).

The Detailed Noise and Vibration Impact Statement (DNVIS) will be prepared and implemented in accordance with CoA E33 and E34, prior to the commencement of the relevant works at Five

Dock. The assessment and management of OOHW will also consider respite requirements under CoA E44 and applicable notification requirements

Table 4-4: Proposed Construction Activities – Five Dock

Approved Hours	Out of Hours Works
- Site Establishment - Site/Geotechnical Investigation - Temporary Utilities Connection - Site Logistics & Traffic - Dilapidation Survey - Temporary Loading Platform/Turntable Installation - Ground Anchor Destressing - Substructure (Excavation & sump, foundation, base slab construction i.e., concrete pours over 400m3, waterproofing) - Superstructure (Precast installation, concrete pours, steel fixing, tower/crawler crane assemble & lifts) - Surface Works (Demolition concrete slab, capping beam i.e.), Utilities, Civil works – drainage & earthworks) - Lifts & Escalators - Façade Installation	OOH Works (Evening) - Major crane and plant activities (e.g. tower crane installation) - OSOM and large precast deliveries (walls and beams) - Large concrete pours and associated overrun works - Façade works and external finishes (where low noise criteria are met) - Station fit out, testing and commissioning (architectural, MEPF and safety-driven activities) OOH Works (Night) - Internal station works (FRP preparation, waterproofing, formwork, MEPF installation and internal fit out – excluding concreting) - OSOM and safety-critical deliveries (precast elements) - Civil and utilities works near intersections (traffic-driven) OOH Works (Weekend) - Major deliveries and crane activities (precast elements, lifts, escalators and tower crane works) - Site establishment and demobilisation works (e.g. site offices) - Programme-driven rail systems works (e.g. platform and OTE installation)
Notes: 1. Associated Plant lists will be included in the Detailed Noise and Vibration Impact Statement (DNVIS)	

4.4.3 Noise and Vibration Assessment and Modelling

Noise and vibration impacts for construction works at Five Dock Station have been assessed in recognition of the close proximity of residential and commercial receivers, some of which are overlooking the site, and the mixed-use character of the precinct. Modelling undertaken for the tender phase identified Five Dock as a location with increased noise risk during OOHW and potential vibration and ground-borne noise impacts, particularly where works occur beneath or adjacent to sensitive structures along Great North Road.

For approved construction hours, noise assessment will be undertaken on an activity and stage specific basis to confirm compliance with the applicable NMLs and to inform mitigation planning.

For OOHW, including substructure, superstructure and surface works, modelling indicates a higher likelihood of NML exceedances. Accordingly, DNVIS will be prepared in accordance with CoA E33 and E34 prior to commencement of relevant works. The DNVIS will provide detailed predictions, identify exceedance scenarios, and define mitigation, respite, monitoring and notification measures in accordance with CoA E27 and E44.

Where vibration or ground-borne noise screening criteria are predicted to be exceeded, more detailed assessment and attended monitoring will be undertaken to ensure impacts remain within acceptable limits for affected receivers.

4.5 The Bays Station

4.5.1 Existing Environment and Sensitive Receivers

The existing noise environment around The Bays Station is dominated by road traffic on surrounding arterial roads and industrial noise associated with White Bay and Glebe Island. The precinct has a predominantly commercial and industrial character, with limited nearby residential land uses.

Sensitive receivers primarily comprise commercial, industrial and mixed-use premises located close to the site boundary. Residential receivers are located to the north and west of the station; however, these are generally shielded by existing buildings and infrastructure. Other sensitive land uses include educational, childcare, hospitality and medical facilities within the broader precinct. Construction work for this proposal at The Bays Station would not involve major sources of vibration generating equipment. As such, potential vibration impacts are anticipated to be negligible.

For construction noise assessment, the area is divided into three Noise Catchment Areas (NCA20 to NCA22). Baseline noise monitoring undertaken in 2019 indicates that background noise levels are generally consistent with a commercial and industrial environment, with road traffic and industrial activity being the primary contributors. Figure 4-5 shows the sensitive receivers and NCAs in the vicinity of The Bays Station.

4.5.1.1 Sensitive Land Uses

An assessment of sensitive land uses at The Bays has been undertaken in accordance with CoA E23. Appendix E Land Use Survey Maps detail sensitive land use(s) that have the potential to be impacted by noise and vibration.

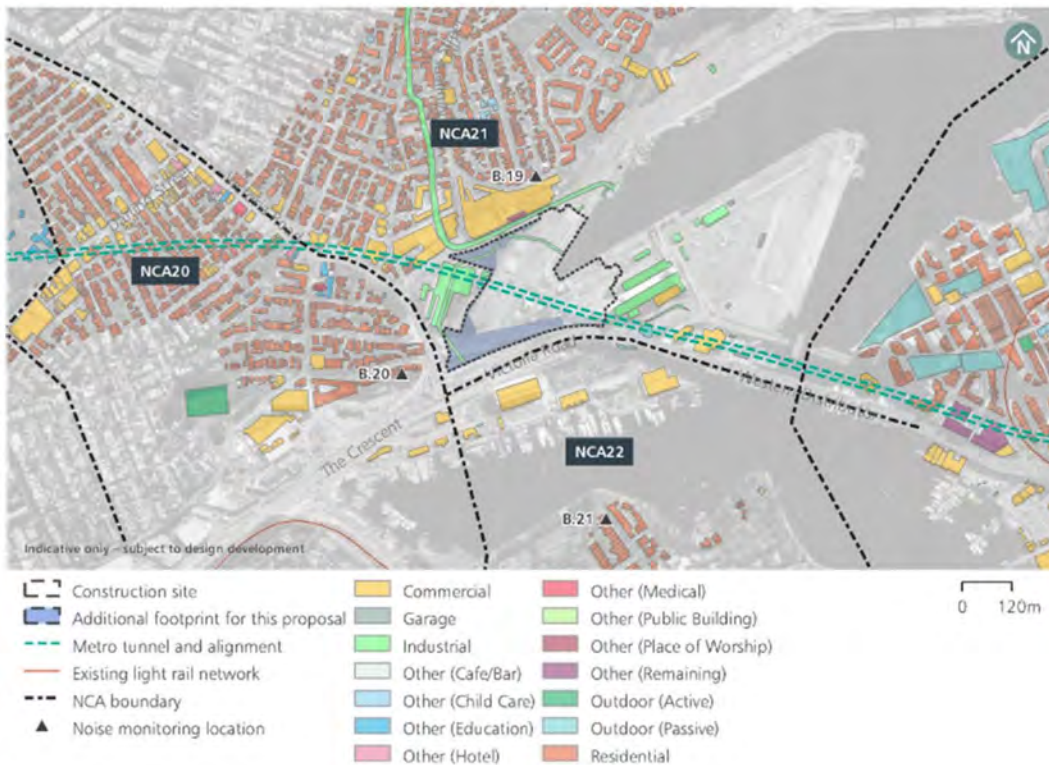


Figure 4-5: The Bays NCAs, sensitive receiver locations and land use types

4.5.2 Construction Activities

Table 4-5 identifies the construction activities at The Bays that have the potential to generate noise and/or vibration impacts. The activities are grouped by those proposed to be undertaken during approved construction hours and those that may be required to be undertaken outside work hours (OOHW).

Activities identified for approved construction hours represent the core construction works planned to be undertaken during the hours specified in CoA E25. Activities identified as potential out-of-hours work (OOHW) are those that may be required due to safety, traffic, logistical, program or interface constraints, or where they meet the eligibility pathways for out-of-hours work under CoA E27 (including low-noise activities, prescribed activities or works approved under an Out-of-Hours Work Protocol).

The Detailed Noise and Vibration Impact Statement (DNVIS) will be prepared and implemented in accordance with CoA E33 and E34, prior to the commencement of the relevant works at The Bays. The assessment and management of OOHW will also consider respite requirements under CoA E44 and applicable notification requirements.

Table 4-5: Proposed Construction Activities – The Bays

Approved Hours	Out of Hours Works
- Site Establishment - Site/Geotechnical Investigation - Temporary Utilities Connection - Site Logistics & Traffic - Dilapidation Survey - Temporary Loading Platform/Turntable Installation - Parramatta Road Gate & Access Modification - Ground Anchor Destressing - Piling Construction - Substructure (Excavation & sump, foundation, base slab construction i.e., concrete pours over 560m³, waterproofing) - Superstructure (Precast installation, concrete pours, steel fixing, tower/crawler crane assemble & lifts) - Surface Works (Demolition concrete slab capping beam i.e.), Utilities, Civil works – drainage & earthworks) - Lifts & Escalators - Façade Installation	OOH Works (Evening) - Major craneage and plant activities (e.g. tower crane installation) - OSOM and large precast deliveries (walls and beams) - Large concrete pours and associated overrun works - Façade works and external finishes (where low noise criteria are met) - Station fit out, testing and commissioning (architectural, MEPF and safety-driven activities) OOH Works (Night) - Internal station works (FRP preparation, waterproofing, formwork, MEPF installation and internal fit out – excluding concreting) - OSOM and safety-critical deliveries (precast elements) - Civil and utilities works near intersections (traffic-driven) OOH Works (Weekend) - Major deliveries and craneage activities (precast elements, lifts, escalators and tower crane works) - Site establishment and demobilisation works (e.g. site offices) - Programme-driven structural works (e.g. line-wide shaft FRP construction)

Notes:

- Associated Plant lists will be included in the Detailed Noise and Vibration Impact Statement (DNVIS)

4.5.3 Noise and Vibration Assessment and Modelling

Noise and vibration impacts for construction works at The Bays Station have and will continue to be assessed using a proportionate, risk-based approach that reflects the predominantly commercial and industrial character of the surrounding precinct and the limited number of nearby residential receivers. Modelling undertaken for tender phase indicates that noise impacts are generally lower at The Bays relative to other stations, with localised impacts potentially occurring along Buchanan Street during certain activities.

For approved construction hours, noise assessment will focus on confirming compliance with applicable NMLs (detailed in Section 3.3.4) through activity-based prediction and monitoring, considering existing industrial background noise levels and available screening.

For OOHW, including safety-driven crane activities, OSOM deliveries and fit out works, potential noise impacts will be assessed on a case-by-case basis. Where works are predicted to exceed applicable NMLs or where receivers may be highly noise affected, a DNVIS will be prepared in accordance with CoA E33 and E34 to provide detailed predictions and define mitigation, respite and notification requirements consistent with CoA E27 and E44.

Significant vibration impacts are not anticipated at The Bays Station; however, vibration will be assessed and managed where works occur near sensitive or heritage structures, with monitoring implemented as required.

4.6 Heritage Buildings & Structures

The Sydney Metro CNVS states that heritage buildings and structures should be assessed according to the cosmetic damage screening criteria and should not be assumed to be more sensitive to vibration unless found to be structurally unsound. Table 4-6 details heritage properties and structures that occur near the Project area, their significance and the maximum likely magnitude of impact assessed during the EIS.

Table 4-6: Heritage Properties and Structures that occur near the Project area

Item	Listing	Significance	Maximum Vibration Impact Magnitude
The Bays			
White Bay Power Station	SHR Listing No. 01015 Urban Growth NSW Development Corporation s170 4500460 SREP No. 26 – City West Part 3 No. 11	State	Negligible
White Bay Power station (inlet and outlet) canals	Port Authority of NSW s170 4560062 / 4560026	State	Minor
Sewage Pumping Station No 7	Sydney Water s170 4571705	Local	Neutral
Beattie Street Stormwater Channel No. 15	Sydney Water s170 4570329	Local	Neutral
Glebe Island Silos	Port Authority of NSW s170 4560016 SEPP (Precincts – Eastern Harbour City) 2021 Schedule 4 Part 3 No. 1	Local	Neutral
Five Dock			
St Alban's Anglican Church Hall and Shops, Rectory & Church	Canada Bay LEP Item No. I228 Canada Bay LEP Item No. I227 Canada Bay LEP Item No. I226	Local	Neutral

Item	Listing	Significance	Maximum Vibration Impact Magnitude
Police station	Canada Bay LEP Item No. I211; NSW Police Service s170 4180246	Local	Neutral
Burwood			
St Luke's Park gateway/entrance Gates and trees only	Canada Bay LEP Item No. I308	Local	Neutral
St Luke's Anglican Church and grounds	Canada Bay LEP Item No. I40	Local	Neutral
Bath Arms Hotel	Burwood LEP Item No. I94	Local	Neutral
North Strathfield			
North Strathfield Railway Station Group (including ornamental garden)	Transport Asset Holding Entity s170 (4801029)	Local	Neutral
Westmead			
Westmead Public School, c1917	Cumberland LEP Item No. I295	Local	Neutral
Western Sydney University	Parramatta LEP Item No. I628	Local	Neutral
Victorian residence (in University of Western Sydney grounds)	Parramatta LEP Item No. I629	Local	Neutral

The DNVIS will be utilised to further assess the likely magnitude of impact during construction as well as provide the required mitigation measures, survey and monitoring requirements.

In accordance with the CNVS, heritage buildings and structures are assessed against the cosmetic damage screening criteria unless they are identified as structurally unsound. Pre-construction dilapidation surveys, as described in Section 7.2.1.1 of this NVMP, will be undertaken for buildings and structures within the relevant minimum working distances. The outcomes of these surveys will be used to confirm the structural condition of heritage items and determine whether any structure should be considered structurally unsound and therefore subject to reduced vibration criteria or additional mitigation measures during construction.

Where the DNVIS identifies the need for additional mitigation measures at Heritage item(s), such as acoustic treatment, in accordance with CoA E10, the advice of a suitably qualified and experienced built heritage expert will be obtained to guide installation to minimise impact to the heritage significance of the item or fabric.

4.7 Noise and Vibration Risk Summary

This section provides a high-level summary of the key noise and vibration risks identified for each station location across the Project. The summary is intended to highlight site-specific sensitivities, the primary sources of potential impact, and the relative risk profile associated with construction activities, including out-of-hours work.

The risk summary is based on the surrounding land use context, proximity of sensitive receivers, applicable Noise Management Levels, and the nature and staging of proposed construction activities. The information presented in Table 4-7 is used to inform targeted mitigation, monitoring, stakeholder engagement and the preparation of site-specific assessments and management measures, including where Detailed Noise and Vibration Impact Statements (DNVIS) may be required.

Table 4-7: Station Noise and Vibration Risk Summary

Station	Risk	Rating	Specific Mitigation Measures
Westmead	- Proximity of residential receivers (i.e., overlooking apartments) - This site has more stringent NMLs than other sites, particularly in NCA02. - Out-of-hours works will generate noise impacts during substructure, superstructure and surface works.	High	Standard mitigations apply (refer Section 5.2). Site-specific and activity-specific mitigations will be identified and implemented via the site-specific DNVIS in accordance with CoA E33.
North Strathfield	Noise impacts during out-of-hours works for substructure, superstructure and surface works in the surrounding low to medium density housing.	Medium - High	
Burwood North	- Proximity of residential receivers (i.e., overlooking receiver 8 Burwood Road) - Noise impacts during out-of-hours works for substructure, superstructure and surface works. - Potential for ground-borne noise and vibration impacts when working close to Burton Street receivers.	High	
Five Dock	- High noise impacts during out-of-hours works for substructure, superstructure and surface works. - This location has the most stringent NMLs during the night-time, driven by noise logger locations which may not represent the potentially most affected sensitive receivers. - A small number of residential receivers overlooking the site will limit the benefit of hoarding for the most affected.	Very High	
The Bays	- Buchanan Street moderately impacted by noise - Vibration impacts to structures related to the White Bay Power Station	Low-Medium	

Notes:

1. Station precincts have been subject to previous and concurrent major infrastructure projects. The potential for cumulative impacts and construction fatigue will be assessed and managed on an activity-specific basis through the DNVIS and OOHV Permit processes, in accordance with CoA E41 and CEMF-NV29.

5 ENVIRONMENTAL MITIGATION MEASURES

This section sets out the construction noise and vibration mitigation measures to be implemented for the SPW works. Measures are presented in a structured register format to support construction planning, consistent implementation across sites, and auditable demonstration of compliance with the Planning Approval (CoA and REMMs) and Sydney Metro requirements (including the CNVS and CEMF).

Mitigation measures are grouped as follows:

- Standard measures (Section 5.2): apply across all SPW works unless otherwise stated.
- Additional measures (Section 5.3): apply where predicted or actual impacts exceed relevant criteria, where works are higher risk (including OOHV), or where required through consultation, monitoring outcomes, or direction from the AA/ER.

5.1 Control Hierarchy and SMART Application

Construction noise and vibration mitigation for the SPW works is structured around a hierarchy of controls, with mitigation measures defined and implemented in accordance with SMART (Specific, Measurable, Achievable, Realistic and Timely) principles.

Table 5-1 illustrates the control hierarchy applied under this Plan and how SMART requirements are embedded into the selection, implementation and verification of mitigation measures.

Table 5-1: Control Hierarchy and SMART Application

SMART	Control Type	Example
S – Specific, what must be done M – Measurable, how it will be checked A – Achievable, can be implemented in construction R – Realistic, practical for site conditions T – Timely, applied when required	Avoid / Eliminate	Design and planning choices that avoid noisy or vibration intensive activities (e.g. alternative staging, avoiding concurrent high-impact activities, pre-cast elements instead of in-situ concrete works)
	Substitute / Minimise at Source	Selection of lower noise or vibration plant, equipment and construction methods where reasonably practicable
	Engineering	Physical controls (i.e. hoarding and noise barriers) which reduce transition of noise at the source
	Administrative	Planning, scheduling, approvals that minimise the duration, intensity and exposure of noise generating works (including OOHV)
	Receiver Based Mitigation	Measures that manage residual impacts at sensitive receivers (e.g. at-property treatment, respite and alternative accommodation)

5.2 Standard Noise and Vibration Mitigation Measures

Standard mitigation measures applicable across the SPW works are provided in Table 5-2.

Table 5-2: Standard Noise and Vibration Mitigation Measures

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
SCNV01	Noise and vibration mitigation must be implemented with the aim of achieving the construction noise management levels and vibration assessment criteria detailed in Section 3 of the NVMP.	Elimination Substitution Engineering	Pre-construction / Construction	Environment and Sustainability Manager / Environmental Advisor	CoA E29, Good Practice	DNVIS, AMP, ECM, NVMoP, Site environmental inspection and verification records
SCNV02	A Detailed Noise and Vibration Impact Statements (DNVIS) must be prepared for any Work that may exceed the noise management levels, vibration criteria and/or ground-borne noise levels specified in CoA E29 and CoA E30 at any residence outside work hours identified in Condition E25, or and where receivers will be highly noise affected. A DNVIS must be prepared for each construction site before construction noise and vibration impacts commence and include specific mitigation measures identified through consultation with the occupants of affected sensitive land use(s) and updated as required if site conditions or activities change. The NVIS must include specific mitigation measures identified through consultation with affected receivers of the sensitive land use(s) and the mitigation measures must be implemented for the duration of the works.	Elimination Substitution Engineering Administrative	Pre-construction / Construction	Environment and Sustainability Manager Acoustic Specialist	CoA E33 CoA E34	DNVIS, Sensitive Receiver Register, Consultation records, Out-of-Hours Work Protocol (where applicable), Out-of-Hours Work Permit (where applicable)
SCNV03	Community consultation or notification measures are to be undertaken in accordance with the Community Communication Strategy. The community will be kept informed of upcoming construction work through notification letters, the project website, the project information telephone line, and Place Managers. Further engagement and consultation will be carried out with affected communities to understand their preferences for mitigation and management measures, and with 'other sensitive' receivers (e.g., schools, medical facilities, places of worship) to understand periods in which they are more sensitive to	Administrative	Pre-construction / Construction	Environment and Sustainability Manager Community and Stakeholder Engagement Manager Place Managers	CEMF – NV16 – 18, CoA E36, CoA E37	CCMS, Sydney Metro West Out of Hours Works Protocol

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
	impacts. Based on this consultation, appropriate mitigation options will be considered and implemented where feasible and reasonable. In accordance with CoA E36 and CoA E37, residential receivers (in both non-residential and residential zones) likely to experience out-of-hours internal noise levels exceeding the applicable statutory thresholds (e.g., Leq(15minute) 45 dB(A) or greater between 8:00 pm and 7:00 am) will be offered additional noise and vibration mitigation measures as per the Sydney Metro CNVS. A register of relevant noise and vibration sensitive receivers will be kept, including the address, category, and contact details for each receiver where known. Notifications will detail work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone numbers. Complaints received as a result of the OOHW will be managed in accordance with the Sydney Metro Community Complaints Management System (CCMS). On receipt of any complaints, an investigation will be undertaken and where feasible and reasonable, changes to the works implemented to address the issue of concern. Where relevant to the detail of the complaint, monitoring will be undertaken to inform the investigation and verify predicted noise and vibration levels.					
SCNV04	All construction activities are to be undertaken during approved construction hours unless otherwise approved under the EPL or OOHW Protocol, following the completion of an OOHW Permit.	Elimination	Construction	Environment and Sustainability Manager / Environmental Advisor/ Superintendent	CoA E28	AMP, Out-of-Hours Work Protocol, Out-of-Hours Work Permit
SCNV05	Respite periods may be applied where required as a reasonable and feasible mitigation measure to reduce noise and vibration impacts to sensitive receivers. Where out-of-hours works (OOHW) are undertaken, construction planning will seek to schedule higher noise generating activities during the earlier parts of the	Elimination	Construction	Environment and Sustainability Manager / Environmental	CoA E28, E26, E29, E43, E44 CEMF NV21	AMP, DNVIS, Out-of-Hours Work Protocol, Out-of-Hours Work Permit, Community consultation records, Construction planning /

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
	evening or night-time period where practicable, consistent with the Sydney Metro West OOHW Protocol. Respite may be implemented in accordance with CoA E44, the Sydney Metro West OOHW Protocol, and the outcomes of community consultation, including in the following circumstances: - Where construction activities are predicted to exceed the “Highly Noise Affected” construction noise management level of 75 dB(A) - For highly noise intensive works as described under CoA E26 - Where there is potential for vibration levels approaching or exceeding screening criteria for cosmetic damage under CoA E29, and alternative construction methods are not feasible or reasonable - Where respite periods are identified as an appropriate mitigation measure through consultation and agreement with affected sensitive receivers. Where implemented, respite periods will be consistent with CoA E44 and CEMF NV21 and may include temporary cessation of high-noise activities or scheduling adjustments to provide periods of reduced noise exposure for affected receivers. This will include coordination with other relevant works (including ancillary works such as utility relocations, and those approved by an EPL or undertaken by a third party) to minimise overall noise impacts and to avoid scheduling such activities during planned respite periods, consistent with the requirements of CoA E28(e), CoA E43, and the Out-of-Hours Work Protocol, if and as they apply. In accordance with CoA E26, where highly noise intensive works are undertaken (i.e. between 8:00 am to 6:00 pm Monday to Friday, and 8:00 am to 1:00 pm Saturdays), activities will occur in continuous blocks not exceeding three (3) hours, with a minimum respite period of one (1) hour between blocks, unless otherwise agreed with affected parties. This specific daily 1-hour block respite requirement does not apply to Out-of-Hours Work (OOHW). Respite for OOHW is managed separately through the Sydney Metro West OOHW Protocol and CoA E44 to minimise the number of OOHW periods.			Advisor/ Superintendent		possession / staging program

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
SCNV06	A site-specific induction will 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. The content of inductions will be specific and relevant to the site and activities and may include details such as the location of sensitive receivers, specific mitigation measures, site hours of operation, noise complaints procedure, etc., as well as the consequences of not complying with these mitigation measures. The induction will demonstrate intent to cultivate a culture of proactive noise planning and execution during out-of-hours works. Supported by effective site supervision, this includes the strict enforcement of behavioural practices to minimise noise at the source, such as avoiding unnecessary shouting, preventing the dropping of materials from height, and avoiding impulsive noise such as metal-on-metal contact.	Administrative	Pre-construction/ Construction	Environment and Sustainability Manager	CEMF NV6 Good Practice	Training and briefing content, AMP, ECM
SCNV07	Targeted noise and vibration training will be conducted for the duration of the Project to ensure effective management of noise and vibration risks. Training may be delivered through site inductions, toolbox talks, and targeted “noise champion” training. Training will include, but not be limited to: • All project specific and relevant standard noise and vibration mitigation measures • License and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers • Employee parking areas • Designated loading/unloading areas • Site opening and closing times • Environmental incident procedures • Scheduling of vehicle movements during less sensitive time periods where possible • Avoidance of the use of engine compression brakes	Administrative	Pre-construction/ Construction	Environment and Sustainability Manager	CEMF NV6 Good Practice	Training and briefing content, AMP

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
	- Driver behaviour - Identification of activities likely to cause complaint - Cultivating a culture of proactive noise planning and execution during out-of-hours works, focusing on specific behavioural practices that minimise noise emissions at the source (e.g., preventing metal-on-metal contact, no dropping of materials, and preventing unnecessary shouting)					
SCNV08	Work compounds, loading/unloading areas, parking areas, equipment and material stockpile sites, toolbox locations will be designed to reduce impacts and positioned as far as practicable away from noise-sensitive receivers. Management Measures for Construction traffic includes but are not limited to: - On-site spoil storage capacity would be maximised to reduce the need for truck movements during sensitive times - Vehicle movements would be redirected away from sensitive receiver areas and scheduled during less sensitive times - The speed of vehicles would be limited, and the use of engine compression brakes would be avoided Heavy vehicles would not be permitted to idle near sensitive receivers.	Elimination Engineering	Pre-construction / Construction	Environment and Sustainability Manager / Environmental Advisor/ Superintendent	CoA E28, E44 CEMF NV21 - 22, 27	AMP, ECM, Compound layout / traffic management drawings, Out-of-Hours Work Protocol (where applicable), Site inspections and supervision records
SCNV09	Work generating high noise and/or vibration levels would be scheduled during work hours or other less sensitive time periods, where feasible and reasonable. Where this is not feasible and reasonable, the works would be carried out as early as possible in each work shift.	Elimination	Pre-construction / Construction	Environment and Sustainability Manager / Environmental Advisor/ Superintendent	CEMF NV2	DNVIS, OOHW Protocol, OOHW Permit
SCNV10	When working adjacent to schools, churches and other noise sensitive facilities, particularly noisy activities would be scheduled outside normal operating hours, where feasible and reasonable.	Elimination	Pre-construction / Construction	Environment and Sustainability Manager / Environmental Advisor/ Superintendent	CEMF NV3	DNVIS, OOHW Protocol, OOHW Permit
SCNV11	Noisy plant and equipment would be located and operated to minimise the level and duration of impacts on sensitive receivers.	Elimination	Construction	Environmental Advisor/	CEMF NV4	DNVIS, AMP, ECM

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
				Project/Site Engineer Superintendent		
SCNV12	Where feasible and reasonable heavy vehicle movements would be limited to daytime hours.	Elimination	Construction	Environmental Advisor/ Project/Site Engineer Superintendent	CEMF NV5	DNVIS, AMP, ECM
SCNV13	Plant, vehicles and equipment will be selected and maintained to minimise noise and vibration impacts through: • Appropriate mufflers and noise attenuation fitted on all plant and equipment utilised. • Damped hammers and shears/ pulverisers used where feasible and reasonable • Vehicles fitted with straps rather than chains for unloading, wherever feasible and reasonable • All plant and machinery regularly maintained to assist in minimising noise emissions • Use of engine exhaust brakes avoided where possible. Air brake silencers would be used on heavy vehicles that access construction sites multiple times per night or over multiple night. • Non-tonal movement alarms (or an equivalent mechanism) fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work.	Elimination Substitution	Pre-construction / Construction	Environmental Advisor/ Project/Site Engineer Superintendent	CoA E24 CEMF NV7, 8, 9, 11 & 12 NV23	DNVIS, AMP, ECM
SCNV14	Alternative construction methodologies and measures that minimise noise and vibration levels during noise intensive works would be investigated and implemented where feasible and reasonable. This would include consideration of: • Selecting quieter equipment such as lower emission, electric, smaller, lower powered, attenuated, newer or better maintained • The use of hydraulic concrete shears in lieu of hammers/rock breakers	Elimination Substitution Engineering	Pre-construction / Construction	Environment and Sustainability Manager / Environmental Advisor/ Acoustic Specialist/ Superintendent	CoA E24 CEMF 25 & 30	DNVIS, AMP, ECM, Construction methodology / work pack, Temporary works / hoarding / acoustic barrier design details (where applicable)

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
	- Sequencing works to shield noise sensitive receivers by retaining building wall elements - Locating demolition load out areas away from the nearby noise sensitive receivers - Minimising structural-borne noise to adjacent buildings including separating the structural connection prior to demolition through saw-cutting and propping, using handheld splitters and pulverisers or hand demolition. - Installation of minimum 3 m noise hoarding where required to provide acoustic screening between construction activities and nearby sensitive receivers, as identified through the DNVIS, construction planning processes or activity-specific environmental controls. - Installing sound barrier screening to scaffolding facing noise sensitive neighbours - Using portable noise barriers or acoustic shielding around particularly noisy equipment, such as concrete saws and concrete pumps - Modifying demolition works sequencing / hours to minimise impacts during peak pedestrian times and / or adjoining neighbour outdoor activity periods - Use of bored piling in lieu of impact piling. - Implementation of less ground-borne noise and less vibration intensive alternative construction methodologies.					
SCNV15	Minimise cumulative construction noise impacts through coordination between potentially interacting projects to minimise concurrent or consecutive works in the same areas, where possible. Specific mitigation strategies would be developed to manage impacts. This includes consideration of cumulative impacts and coordination principles consistent with the requirements of CoA E28(e), E43 and E44, and as implemented through the Out-of-Hours Work Protocol, if and as they apply.	Administrative Avoid / Eliminate	Pre-construction / Construction	Environment and Sustainability Manager / Environmental Advisor/ Acoustic Specialist/ Interfacing Project Team	CoA E28(e), E43 and E44 CEMF NV29	DNVIS, Interface management / coordination meeting minutes, Inter-project staging / look-ahead planning records, Community consultation records, AMP (where relevant)
SCNV16	Where vibration generating activities will be carried out within minimum working distances for cosmetic damage, vibration levels are to be predicted using safe working distance criteria and risk assessment mapping. Where predictions	Elimination	Construction	Project / Site Engineer	Good Practice	DNVIS AMP

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
	indicate cosmetic damage criteria are likely to be exceeded, alternative low-vibration work practices will be investigated and implemented.			Environment and Sustainability Manager (or delegate)		ECM
SCNV17	Owners and occupiers of properties at risk of exceeding cosmetic damage vibration screening criteria will be notified prior to commencement of vibration-generating works. Where exceedances are ongoing, schedules of potential exceedances will be provided.	Administrative	Pre-construction / Construction	Environment and Sustainability Manager Community and Stakeholder Manager	CoA E35	Community Communication Strategy DNVIS
SCNV18	A detailed land use survey will be undertaken to identify and confirm sensitive land uses and critical working areas prior to commencement of works generating noise, vibration or ground-borne noise. Survey outcomes will inform DNVIS preparation, mitigation selection and consultation.	Administrative	Pre-construction	Environment and Sustainability Manager / Environmental Advisor	CoA E23 CEMF NV18	Land use survey records, Sensitive Receiver Register, DNVIS, Community consultation records
SCNV19	Noise-generating works that may exceed NMLs in the vicinity of schools, medical facilities, places of worship or other sensitive receivers will not be scheduled during sensitive periods unless alternative arrangements are agreed at no cost to the affected institution.	Elimination	Pre-construction / Construction	Environment and Sustainability Manager / Superintendent	CoA E31 CEMF NV3	DNVIS, OOHW Protocol, AMP
SCNV20	Where vibration levels are predicted to exceed the screening criteria (i.e., within the minimum working distances for cosmetic damage provided in Table 3-12), a more detailed assessment of the structure will be carried out in consultation with a structural engineer, and continuous vibration monitoring will be undertaken to ensure levels remain below appropriate limits. For Heritage items, vibration testing will be conducted to identify minimum working distances. If preferred values are exceeded, the construction methodology will be reviewed and additional mitigation implemented (e.g., modification of excavation techniques) in accordance with CoA E39. If a Heritage item is found to be structurally unsound, a reduced cosmetic damage criterion of 2.5 mm/s peak component particle velocity (DIN 4150) will be applied in accordance with CoA E40, and the detailed assessment will consider heritage values in consultation with a heritage specialist.	Engineering Administrative	Construction	Environment and Sustainability Manager / Acoustic Specialist	CoA E39, E40 CEMF NV15	NVMoP, DNVIS, Heritage Management Plan

ID	Measure	Control Type	Timing / Frequency	Responsibility	Source / Reference	Relevant Management Document / Process
SCNV21	Noise and vibration monitoring will be undertaken in accordance with the approved monitoring program. Significant plant, defined as plant identified in the relevant DNVIS as dominant contributors to construction noise emissions, will have verified sound power levels, with audits undertaken to confirm compliance with predicted levels. Verification and auditing will be undertaken upon mobilisation to site and periodically thereafter (or in response to complaints). Verification may include: • Inspection of plant noise attenuation features (e.g., mufflers, acoustic panels or enclosures) when plant is mobilised to site, • Confirmation that plant is appropriately maintained and fitted with required noise attenuation devices, and • Acoustic verification measurements where required. (Acoustic verification measurements may be undertaken at representative distances, e.g., approximately 7 m, where appropriate). Where plant noise emissions are found to be inconsistent with expected performance, the plant will be modified, replaced or additional mitigation implemented where reasonable and feasible.	Administrative Engineering	Construction	Environment and Sustainability Manager / Acoustic Specialist	CEMF NV19, NV20	NVMoP, DNVIS

5.3 Additional Mitigation Measures

The implementation of the standard management measures (refer Section 5.2) should significantly reduce the noise and vibration impacts on nearby sensitive receivers.

Nevertheless, due to the highly variable nature of construction activities and the likelihood of work outside the standard construction hours, some exceedances of the construction noise and vibration management levels are likely to be unavoidable.

Where there is a potential exceedance of the construction noise and vibration management levels, several additional measures to mitigate such exceedances, primarily aimed at pro-active engagement with affected sensitive receivers, will be explored and have been included in this NVMP. The additional mitigation measures to be applied are outlined in Table 5-3.

Additional mitigation measures (AMMs) will be implemented in accordance with the Sydney Metro CNVS where construction noise and vibration levels are predicted to exceed the relevant management levels.

In accordance with CoA E36 and CoA E37, this includes ensuring that residential receivers (in both non-residential and residential zones) likely to experience out-of-hours internal noise levels exceeding the statutory thresholds defined within those conditions will be offered additional noise and vibration mitigation measures as per the CNVS.

Table 5-3: Additional Mitigation Measures

Measure	Description	Abbreviation
Letter box drops	Letter box drops collectively consist of the following Standard Mitigation Measures a) Newsletters of work activities and progress b) Notification letters prior to especially noisy activities and out-of-hours works. These are distributed to local communities, stakeholders and businesses via letterbox drop and/or email to subscribers where relevant email addresses are known, as well as made available on the Sydney Metro website.	LB a) b)
Monitoring	Where it has been identified that specific construction activities are likely to exceed the relevant noise or vibration goals, noise or vibration monitoring may be conducted at the affected receiver(s) or a nominated representative location (typically the nearest receiver where more than one receiver have been identified). Monitoring can be in the form of either unattended logging or operator attended surveys. The purpose of monitoring is to inform the relevant personnel when the noise or vibration goal has been exceeded so that additional management measures may be implemented.	M
Individual Briefings	Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Communications representatives would deliver specific notification, visit in person and/or email / call contact by phone identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project and specific needs etc. Individual briefings may be undertaken when specific contact details of impacted stakeholders are available, or where access to deliver specific notifications or visit is achievable.	IB
Project specific respite offer	The purpose of a project specific respite offer is to provide residents subjected to lengthy periods of noise or vibration respite from an ongoing impact.	RO
Alternative accommodation	Alternative accommodation options may be provided for residents living in close proximity to construction works that are likely to incur unreasonably high impacts over an extended period of time. Alternative accommodation will be determined on a case-by-case basis.	AA

5.3.1 Applying Additional Mitigation Measures

In circumstances where following application of the standard mitigation measures, the LAeq(15minute) construction noise and vibration levels are still predicted to exceed the Noise Management Level, the relevant Additional Mitigation Measures (AMM) are considered to determine any offset strategies for these impacts (refer Table 5-4, Table 5-5, and Table 5-6).

Table 5-4: Additional Mitigation Measures Matrix (AMMM) - Airborne Construction Noise

Time Period		Mitigation Measures				
		Predicted LAeq (15minute) noise level Above NML				Predicted LAeq (15minute) noise level
		0 to 10 dB	11 to 20 dB	21 - 30 dB	> 30 dB	> 75 dBA
Standard	Monday-Friday (7.00 am - 6.00 pm)	-	LB a)	LB a) and b), M	LB a) and b), M	Must not commence before 8.00am ¹
	Saturday (8.00 am - 6.00 pm)					Must be complete by 1.00pm ¹
	Sunday/ Public Holiday (Nil)					Additional approval required
OOHW Period 1 DAY	Saturday (7.00 am – 8.00 am)	LB a)	LB a), M	LB a) and b), M	LB a) and b), M, IB, RO	Additional approval required
	Sunday and Public Holidays (8.00 am - 6.00 pm)					
OOHW Period 1 EVENING	Monday-Saturday (6.00 pm - 10.00 pm)	LB a)	LB a), M	LB a) and b), M, RO	LB a) and b), M, IB, RO	Additional approval required
OOHW Period 2 NIGHT	Monday-Friday (10.00 pm - 7.00 am)	LB a)	LB a) and b), M, RO	LB a) and b), M, IB, RO, AA	LB a) and b), M, IB, RO, AA	Additional approval required
	Saturday (10.00 pm - 8.00 am Sunday morning)					
	Sunday (6.00 pm - 7.00 am Monday morning)					
	Public Holidays (Before 8.00 am or after 6.00 pm)					
Notes:						
1. Except under an EPL or alternate approval, high impacts works must not exceed three (3) hours, with a minimum cessation of work of not less than one (1) hour.						

Table 5-5: Additional Mitigation Measures Matrix (AMMM) – Ground borne Construction Noise

Time Period		Mitigation Measures				
		Predicted LAeq (15minute) noise level Above NML			Internal Residential Objective LAeq(15minute)	
		0 to 10 dB	11 to 20 dB	> 20 dB	> 40dB	> 35 dB
Standard	Monday-Friday (7.00 am - 6.00 pm)	No NML for GBN during standard hours, refer to Table 5-6				
	Saturday (8.00 am - 6.00 pm)					
	Sunday/ Public Holiday (Nil)					
OOHW Period 1 DAY	Saturday (7.00 am – 8.00 am)	LB a)	LB a) and b), M	LB a) and b), M, IB, RO	Nothing additional	
	Sunday and Public Holidays (8.00 am - 6.00 pm)					
OOHW Period 1 EVENING	Monday-Saturday (6.00 pm - 10.00 pm)	LB a)	LB a) and b), M	LB a) and b), M, IB, RO	LB a) and b), M, IB, RO	Nothing additional
OOHW Period 2 NIGHT	Monday-Friday (10.00 pm - 7.00 am)	LB a) and b), M	LB a) and b), M, IB, RO, AA	LB a) and b), M, IB, RO, AA	LB a) and b), M, IB, RO, AA	
	Saturday (10.00 pm - 8.00 am Sunday morning)					
	Sunday (6.00 pm - 7.00 am Monday morning)					
	Public Holidays (Before 8.00 am or after 6.00 pm)					

Table 5-6: Additional Mitigation Measures Matrix (AMMM) – Vibration

Time Period		Mitigation Measures
		Predicted Vibration Levels Exceed the maximum levels predicted to cause adverse comment (refer Section 3.4.2.3)
Standard	Monday-Friday (7.00 am - 6.00 pm)	LB a), M, RO
	Saturday (8.00 am - 6.00 pm)	
	Sunday/ Public Holiday (Nil)	
OOHW Period 1 DAY	Saturday (7.00 am – 8.00 am)	LB a) and b), M, IB, RO
	Sunday and Public Holidays (8.00 am - 6.00 pm)	
OOHW Period 1 EVENING	Monday-Saturday (6.00 pm - 10.00 pm)	LB a) and b), M, IB, RO
OOHW Period 2 NIGHT	Monday-Friday (10.00 pm - 7.00 am)	LB a) and b), M, IB, RO, AA
	Saturday (10.00 pm - 8.00 am Sunday morning)	
	Sunday (6.00 pm - 7.00 am Monday morning)	
	Public Holidays (Before 8.00 am or after 6.00 pm)	

6 IMPLEMENTATION AND RESPONSIBILITIES

6.1 Roles and Responsibilities

This section defines the roles and responsibilities of key Project personnel in relation to the implementation, management and compliance of construction noise and vibration requirements. The responsibilities outlined in this section are specific to noise and vibration management only. Detailed descriptions of broader project roles and responsibilities are provided in the Section 4 of the CEMP. The roles, responsibilities of key project personnel are provided in Table 6-1.

Table 6-1: Noise and Vibration Responsibilities

Role	Responsibility
Project Director	- Decision-making authority over all aspects of the environmental performance of the Project, including construction noise and vibration management. - Ensure appropriate resource needs for noise and vibration management are considered, identified and established. - Review the CEMP and this NVMP.
Construction Director	- Manage the delivery of the construction process in relation to noise and vibration management in conjunction with the Project Environment & Sustainability Manager. - Ensure construction planning and methodologies consider noise and vibration impacts - Support implementation of mitigation measures in conjunction with the Environment and Sustainability Manager.
Environment and Sustainability Manager (Or Delegate)	- Overall responsibility for implementation and compliance of this NVMP. - Ensure noise and vibration risks are identified, assessed and appropriately managed. - Review monitoring results, complaints and exceedances related to noise and vibration. - Liaise with the ER, Acoustic Advisor and Sydney Metro on noise and vibration matters.
Environment Team	- The Environment Team is responsible for the implementation of this Plan. - Coordinate noise and vibration monitoring in accordance with the Noise and Vibration Monitoring Program, including monitoring associated with out-of-hours works where required. - Investigate noise and vibration complaints and monitoring exceedances. - Support the Superintendent / Supervisor in cultivating a culture of proactive noise planning and execution during out-of-hours works through targeted training, monitoring, and verification of low-noise behavioural practices. - Maintain records of noise and vibration monitoring, complaints and corrective actions.
Stakeholder and Communications Team	- Manages key stakeholder relationships, including in relation to any noise and vibration impacts throughout construction - Provision of strategic advice to the leadership team - Coordinate community notifications for high-noise or vibration-generating activities. - Provide strategic advice to the Project team on stakeholder sensitivities and concerns.
Acoustic Consultant	- Preparation of the Detailed Noise and Vibration Impact Statement (DVIS). - Undertake noise and vibration assessments and modelling as required - Review Noise Management Levels (NMLs) and vibration criteria. - Provide technical advice on noise and vibration mitigation measures and compliance
Site / Project Engineer	- Incorporate noise and vibration mitigation measures into construction planning and work methodologies. - Implement noise and vibration controls within the Activity Management - Ensure plant and equipment selection considers noise and vibration impacts. - Coordinate with Superintendents/ Supervisors and the Environment Team to implement controls.

Role	Responsibility
Superintendent / Supervisor	- Ensure site controls for noise and vibration management are implemented in conjunction with the Environment Team - Ensure works are undertaken in accordance with approved methodologies and work hours. - Ensure construction activities, particularly out-of-hours works, are planned and implemented to minimise noise and vibration impacts through the application of reasonable and feasible mitigation measures. - Provide effective supervision to cultivate a culture of proactive noise planning and execution during out-of-hours works. This includes the strict enforcement of behavioural practices to minimise noise at the source, such as avoiding unnecessary shouting, preventing the dropping of materials from height, and avoiding impulsive noise such as metal-on-metal contact. - Stop or modify works where monitoring, complaints or inspections indicate that construction noise or vibration criteria may be exceeded.
Acoustic Advisor (AA)	- Provide independent expert advice on noise and vibration matters. - Review monitoring data, exceedances and mitigation measures as required. - Recommend improvements to noise and vibration management practices.
Environmental Representative (ER)	- Undertake compliance oversight of noise and vibration management in accordance with approval conditions. - Review noise and vibration performance, incidents and complaints. - Provide direction or recommendations where non-compliance or significant impacts are identified.
Sydney Metro	- Oversight of compliance with approval conditions related to noise and vibration. - Review noise and vibration performance and reporting as required. - Participate in resolution of significant noise and vibration issues where necessary.

6.2 Construction Planning and Work Authorisation

6.2.1 Activity Management Plan (AMP)

To ensure that the specific management and mitigation measures identified in a noise and vibration assessment are implemented appropriately, the required actions are to be included in the AMP prepared for the relevant activities prior to commencement of works in accordance with requirements detailed in Section 5 of the CEMP, the AMP will address the following as relevant to the works:

- Out-of-Hours Work (OOHW) Permit(s)
- Environmental Incident and Non-Compliance Notification Report
- Emergency Response specific controls relevant to the activity location
- Interface and Community Details relevant to the activity location
- Environmental Control Maps relevant to the activity location

6.2.2 Environment Control Maps

Environmental Control Maps (ECMs) will be prepared and implemented in accordance with Section 5.9 of the CEMP and the Sydney Metro Construction Environmental Management Framework (CEMF), to support the effective implementation of noise and vibration management measures.

For the purposes of this Noise and Vibration Management Plan (NVMP), ECMs will be prepared for activities and work areas identified through the Environmental Risk and Aspects Register and/or activity-specific planning (including Activity Management Plan (AMP)) as having a medium to high noise and/or vibration risk.

Where relevant, the mitigation and management measures reflected in the ECMs will be informed by the outcomes of the DNVIS, as well as the requirements of this NVMP, the CEMP and other applicable environmental management procedures.

ECMs are an operational communication tool utilised to convey the environmental requirements to the construction personnel and support the implementation of approved environmental management measures during the delivery of the works. In accordance with the CEMF, ECMs are endorsed by the Environment Manager (or delegate) and do not form a separate statutory review or approval pathway.

ECMs will include noise and vibration-specific information relevant to the activity and work area, including but not limited to:

- Worksite boundaries, limits of work and access/egress points
- Identification of nearby noise- and vibration-sensitive receivers and any applicable exclusion zones, buffers or constraints
- Locations of noise and vibration mitigation measures, such as temporary noise barriers, acoustic treatments, plant restrictions or respite arrangements
- Noise and/or vibration monitoring locations where monitoring is required
- Activity-specific environmental requirements relevant to noise and vibration management, including restricted working hours, approvals, permits or other conditions that must be in place prior to works commencing.

ECMs will be used as a key communication tool and will be made available to construction personnel through site inductions, pre-start meetings and toolbox talks to ensure awareness of noise and vibration risks and the required mitigation measures prior to and during works.

6.2.3 Detailed Noise and Vibration Impact Statements (DNVIS)

The Detailed Noise and Vibration Impact Statements (DNVIS) form a key control within construction planning and work authorisation for activities that have potential to exceed applicable Noise Management Levels (NMLs), vibration limits or ground-borne noise criteria, particularly for works occurring outside work hours or where receivers may be highly noise affected.

- DNVIS are prepared on a site-specific basis prior to the commencement of relevant works and are used to:
- Identify and assess noise and vibration impacts for specific construction activities
- Define project-specific mitigation measures developed through consultation with affected sensitive land uses
- Inform construction sequencing, methodology selection and work scheduling
- Confirm the acceptability of proposed works prior to authorisation.

Works subject to a DNVIS will not commence until the DNVIS has been finalised, mitigation measures incorporated into work planning and a copy provided to the Acoustic Advisor (AA) and Environmental Representative (ER). Mitigation measures identified in the DNVIS will be implemented for the duration of the works.

The DNVIS will be updated where construction methodologies, staging or plant configurations materially differ from those assessed. Minor additional scopes may be addressed through DNVIS addenda, provided the base DNVIS remains current. Addenda and updates will be made publicly available in accordance with CoA B11 (e).

6.2.4 Out-of-Hours Work Approvals

For works proposed outside the work hours defined in Conditions E25 and E26, and not otherwise permitted by the Planning Approval, an Out-of-Hours Work (OOHW) Permit will be required. The permit provides the mechanism for assessing noise and vibration risk, justification for undertaking works outside approved construction hours, and confirmation of the management and mitigation measures to be implemented.

OOHW under CoA E27(c)(ii) will be assessed and approved in accordance with the OOHW Protocol (Appendix C):

- Low-risk OOHW will be approved by the Environmental Representative (ER) in consultation with the Acoustic Advisor (AA), with endorsement provided by the AA.
- High-risk OOHW will be approved by DPHI, following endorsement by the Acoustic Advisor (AA) and review by the Environmental Representative (ER).

For OOHW not covered by the OOHW Protocol (Section 3.3.3), Permits will be approved by the Gamuda Environment Operations and Approvals Lead in consultation with the Community and Stakeholder Engagement Manager (or delegate). For out-of-hours works not covered by the OOHW Protocol, cumulative impacts and coordination will be considered and managed as described in SCNV15, to the extent that those requirements apply.

An OOHW Permit will be prepared and approved prior to commencement of the works and will not be authorised until all required approvals, mitigation measures and notification requirements have been implemented. To facilitate the AA's statutory duties under CoA A39(d), a copy of all proposed internal OOHW Permits involving night-time works will be provided to the AA for information prior to the commencement of works.

6.3 Training and Awareness

All Project personnel, including employees, contractors and utility staff working onsite, will undergo site induction training relating to noise and vibration management issues. The induction training will address elements related to noise and vibration management including:

- Applicable noise and vibration approval conditions, including Noise Management Levels (NMLs), vibration criteria and permissible construction hours.
- Identification of high-risk noise and vibration activities (e.g. piling, demolition, concrete pours, crane operations) and the location of nearby sensitive receivers.
- Site-specific noise and vibration mitigation measures and required work practices, including plant selection, equipment operation and behavioural controls.
- Cultivating a culture of proactive noise planning and execution during out-of-hours works. This includes training on expected behavioural practices to minimise noise and vibration at the source (including avoiding unnecessary idling, impulsive noise, shouting, loud radios, and metal-on-metal contact).
- Requirements for managing OOHW in accordance with the Sydney Metro West OOHW Protocol, including approval pathways, notification obligations and respite requirements.
- Procedures for monitoring, identifying and responding to noise and vibration exceedances, complaints or observed impacts.
- Requirements to immediately report any noise or vibration incidents, exceedances, complaints or unapproved activities to the Environment Team.

Targeted training in the form of toolbox talks or specific training will be provided to personnel with a key role in noise and vibration management. Table 6-2 details specific requirements relevant to this Plan.

Table 6-2: Training Responsibilities Relevant to this Plan

Training	Delivery Method	Target Personnel
Overview of noise and vibration approval conditions, NMLs, vibration criteria, permissible hours and OOHW requirements	Site induction	All site personnel
Noise and vibration mitigation measures, site-specific controls and behavioural expectations	Toolbox Talk / Pre-start	All site personnel
Implementation of noise and vibration controls within construction methodologies and Activity Method Plans and Environment Control Maps	Toolbox talk	Superintendents, Supervisors
Noise and vibration monitoring requirements, response triggers and escalation procedures	Toolbox talk / Targeted briefing/Training	Environment Team, Supervisors
DNVIS requirements, mitigation implementation and compliance during high-risk or OOHW	Targeted technical training	Environment Team, Project Engineers
OOHW Protocol and OOHW Permitting Process	Targeted technical training	Environment Team, Project Engineers
General principles of Noise and Vibration management and controls.	Toolbox talk	Site Engineers, Superintendents

6.3.1 Induction

All employees, contractors and subcontractors will receive an environmental induction prior to commencing work on site, in accordance with Section 6.2 CEMP and the noise and vibration requirements relevant to the individual's role and work area will be included in the induction and reinforced through toolbox talks and targeted briefings where required.

As a minimum, the induction will cover:

- Applicable noise and vibration approval and licence requirements
- Permissible construction hours and any limitations on high-noise activities
- Key noise and vibration mitigation measures and required work practices
- Location of nearby sensitive receivers
- Site logistics controls relevant to noise management (parking, loading/unloading areas, deliveries, and site hours)
- Activities likely to generate noise and vibration complaints, and
- Expected behavioural practices to minimise noise and vibration (including avoiding unnecessary idling, impulsive noise, shouting, loud radios, and metal-on-metal contact), and environmental incident reporting procedures.

Induction and training records will be maintained in accordance with the CEMP.

7 MONITORING AND VERIFICATION

7.1 Construction Noise and Vibration Monitoring Program Interface

Noise and vibration monitoring will be undertaken in accordance with the Construction Noise and Vibration Monitoring Program (refer Appendix D), prepared in consultation with relevant agencies in accordance with CoA C13(a).

This CNVMP establishes the management measures, performance criteria and controls to avoid or minimise noise and vibration impacts, while the Monitoring Program provides the framework to verify performance, including monitoring methodology, locations, frequency, instrumentation, data management, and reporting arrangements.

7.2 Inspections and Verification

7.2.1 Verification Monitoring

Noise and vibration monitoring will also occur routinely for the duration of the Project, in accordance with CoA C13 through implementation of the Project's Noise and Vibration Monitoring Program (SMWSTSPW-GEA-SWD-EN-PRG-000002)

Monitoring will be undertaken for the duration of construction works including:

- Routine monitoring, undertaken at the locations and frequencies specified within the Noise and Vibration Monitoring Program to confirm compliance with the applicable noise and vibration criteria,
- Attended monitoring at the commencement of vibration generating activities where there is potential for exceedances, including monitoring of human comfort and ground-borne noise where relevant, to confirm compliance with the applicable criteria and the DNVIS validate predicted impacts, and
- Targeted monitoring in response to complaints, observed impacts, or changes to construction methodology

Where sensitive receivers do not provide access for monitoring, monitoring may be undertaken at an alternative representative location, as determined by the Acoustic Advisor/Acoustic Consultant, consistent with relevant monitoring program provisions.

7.2.1.1 Dilapidation Surveys

For construction activities which have the potential to cause damage through vibration to nearby public utilities, structures, buildings and their contents, an Existing Condition Inspection of these items is required to be undertaken in accordance with AS 4349.1 "Inspection of Buildings". To define the general extent of these surveys, the Project will adopt a vibration screening criteria of 7.5 mm/s for vibratory works.

For applicable heritage properties within this screening zone (such as those identified in Table 4-6), the condition survey will explicitly include an assessment by a suitably qualified professional to determine if the item is 'structurally unsound' (unless already completed by the previous project stage). The outcomes of this inspection will directly inform the application of the reduced 2.5 mm/s cosmetic damage vibration criterion in accordance with CoA E40.

Prior to conducting the Existing Condition Inspections, the property owners will be advised of the inspection scope and methodology and the process for making a property damage claim. At the same time, maintain a register of all properties inspected and of any properties where owners refused the inspection offer.

The findings of all dilapidation surveys conducted for each Sydney Metro construction site would be compiled into a report to be forwarded to the construction contractor and Construction Director. Follow-up Condition Inspections would be required at the completion of certain major works (e.g. completion of shaft bulk excavation works).

7.2.2 Inspections

Inspections of sensitive areas, mitigation measures, and activities which have the potential to generate noise and vibration impacts will occur for the duration of the Project. Requirements and responsibilities in relation to monitoring and inspections are documented in Section 9.1 of the CEMP.

7.3 Reporting

A summary of noise and vibration management reporting requirements is provided in Table 7-1.

Table 7-1: Noise and Vibration Reporting Obligations

Report Name	Source Reference	Report Details	Timing	Report Recipient
DNVIS	CoA E33 and E34	Detailed Noise and Vibration Impact Statements detailing specific mitigation measures and monitoring requirements.	Before the commencement of associated works	Sydney Metro ER and AA
Monitoring Data Access and Records	CoA C15(c)	Provision of access to real time noise and vibration monitoring result and attended monitoring activities as they take place.	Ongoing	ER and AA
Monthly Data and Complaints Provision	CoA A33(k) & CoA A39(h)(v); NVMoP	Provision of monitoring data summaries, incident notifications, and the Complaints Register (upon request) to facilitate the ER and AA in preparing their respective statutory Monthly Reports	Monthly / Upon request	ER and AA
Monitoring Report	CoA C21; NVMoP	Formal reporting of noise and vibration monitoring results to confirm compliance against predicted performance	6 Monthly	Planning Secretary (for information) Sydney Metro (upon request) ER and AA (where relevant) Relevant regulatory agencies (EPA) Publicly Available on Project Website

8 COMPLAINTS, INCIDENTS AND NON-COMPLIANCES

8.1 Complaints Management

Noise and vibration complaints will be managed in accordance with the framework established under CEMP Section 7.4, which defines the Project-wide approach to community information, notifications and complaints handling.

Consistent with this framework, Gamuda will be responsible for managing and responding to noise and vibration complaints related to construction activities within its scope and will provide the necessary information to Sydney Metro through the Community Complaints Management System (CCMS).

Where required, corrective actions will be implemented by the construction team as soon as reasonably practicable to minimise further impacts. Complaints and associated investigation outcomes will be recorded within Sydney Metro's nominated complaints management system in accordance with CEMP Section 7.4.2.

Escalation of noise and vibration matters will be initiated where complaint frequency, monitoring results or site observations indicate potential exceedance of criteria, ineffective controls, unanticipated impacts or unresolved community concern

Where complaints relate to potential exceedances of noise or vibration criteria or out of hours works, the Acoustic Advisor (AA) will be engaged as required in accordance with the Planning Approval and Project protocols.

8.2 Incident and Non-Compliance Management

All noise and vibration-related environmental incidents, non-compliances and associated events arising from SPW works will be managed in accordance with Section 8.1 of the CEMP. Incident classification and reporting will be undertaken in accordance with this framework to meet internal, Sydney Metro and external reporting requirements.

8.2.1 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub plan, CoA and other relevant approvals, licenses, and guidelines. These audits will be undertaken at planned intervals to provide information on whether the Project:

- Is meeting its compliance obligations
- Conforms to this Plan
- Determines if this Plan is effectively implemented and maintained.

The approach to internal and independent audits, including audit requirements and the auditing schedule, are detailed in Section 9.3 of the CEMP. Management of environmental incidents is detailed in Section 8.1.2 of the CEMP.

The approach to internal and independent audits, including audit requirements and the auditing schedule, are detailed in Section 9.3 of the CEMP.

8.2.2 Non-Compliance and Environmental Issues

Noise and vibration–related statutory incidents and non-compliances arising from SPW works will be identified, classified, escalated, managed and closed out in accordance with the Planning Approval (SSI-22765520) and overarching framework detailed in Section 8.1.3 of the CEMP.

For the purposes of this Plan, specific triggers that may require investigation to determine the appropriate classification and management response include:

- Discharge, emission, or damage that does not meet the criteria specified in this Plan or applicable regulatory authorisations
- Failure to implement required noise and vibration management measures or controls
- Deviations from the procedures outlined in this Plan or the overarching CEMP
- Non-compliance with Planning Approval requirements
- Potential incidents or non-compliances identified by Sydney Metro and/or the Environmental Representative (ER).

As detailed in Section 8.1.3 of the CEMP, any event meeting the definition of a statutory incident or non-compliance under the Planning Approval is to be classified and managed in accordance with the relevant notification and reporting requirements.

Events that do not meet the definition of a statutory incident or non-compliance under the Planning Approval may be managed as an Environmental Issue in accordance with the Sydney Metro Environmental Incident and Non-Compliance Reporting Procedure (EINCRP), where applicable.

For clarity, where adopted in accordance with the EINCRP, an Environmental Issue:

- Does not constitute a statutory incident or non-compliance
- Does not trigger Planning Approval notification requirements
- Is managed to support effective environmental management and continuous improvement.

In the spirit of collaborative Project delivery, Environmental Issues and other lower-level environmental matters will be managed in good faith with Sydney Metro, the Environmental Representative (ER), and relevant stakeholders to support proactive resolution and continuous environmental improvement, consistent with the EINCRP framework.

The identification and management of Environmental Issues do not in itself constitute a breach of this Plan or the Planning Approval.

9 REVIEW AND CONTINUAL IMPROVEMENT

9.1 Continuous Improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives, and targets.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of Environmental Issues, statutory non-compliances and associated events
- Develop and implement a plan of corrective and preventative action to address any Environmental Issues, statutory non-compliances and associated events
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Compare objectives and targets.

To facilitate ongoing continuous improvement and ensure collaborative management of potential impacts, Gamuda will:

- Hold bi-annual workshops with the Acoustic Advisor (AA) and Environmental Representative (ER) to review Project noise and vibration performance, evaluate the effectiveness of implemented controls, and explore opportunities for improvement.
- Include updates as a standard agenda item during regular environment meetings to ensure emerging issues or trends are identified and addressed proactively.

9.2 Review Triggers

This Plan will be reviewed and, where necessary, updated to ensure it remains effective, compliant with approval requirements, and reflective of current construction activities and environmental risks. Reviews will be undertaken annually as a minimum, or in response to specific events or circumstances where deemed necessary, including:

- Issues raised during environmental surveillance, audits, complaints and monitoring as identified by the Project team, ER, AA or Sydney Metro
- Expanded scope of works (which alters the environmental risk rating detailed in Section 4)
- Environmental Issues, statutory non-compliances and incidents
- Changes to the Gamuda Australia IMS.

9.3 Plan Updates

The processes described in Section 10.2 of the CEMP may result in the need to update or revise this Plan. This will occur as needed. Only the Environment and Sustainability Manager (or delegate) has the authority to make and approve changes to the requirements of this Plan.

Minor Amendments may be approved by the Environmental Representative (ER) in accordance with Condition A33(j) and Section 10.2 of the CEMP, provided they do not increase impacts to nearby sensitive land use(s) and are consistent with the conditions of the approval. In addition, in accordance with Condition A39(h)(iii), if requested by the ER, the Acoustic Advisor (AA) will

consider and endorse minor amendments to this Plan that require updating or are of an administrative nature and are consistent with the conditions of this approval. Amendments not considered minor by the ER must be submitted to the Planning Secretary for approval.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure. For details, refer to Section 10 of the CEMP.

APPENDICES

Appendix A – Construction Noise and Vibration Management Compliance Matrix

Table A-1: Relevant Conditions of Approval

CoA No.	Requirement	Document Reference
C5	Of the CEMP Sub-plans required to be prepared under Condition C1, the following CEMP Subplans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of issues raised by a government agency during consultation must be included in the relevant CEMP Sub-plan, including copies of all correspondence from those government agencies as required by Condition A6. Where a government agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why: (a) Noise and Vibration: Place Management NSW and Port Authority of NSW (in respect of The Bays), SOPA (in respect of Sydney Olympic Park) and Relevant Council(s) (b) Heritage (Non-Aboriginal and Aboriginal): Heritage NSW, Place Management NSW and Port Authority of NSW (in respect of The Bays), SOPA (in respect of Sydney Olympic Park) and Relevant Council(s) (c) Contamination: SOPA (in respect of Sydney Olympic Park)	Section 1.5; Appendix B
C6	The CEMP Sub-plans must state how: (a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved; (b) the mitigation measures identified in the documents listed in Condition A1 will be implemented; (c) the relevant terms of this approval will be complied with; and (d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Sections 2, 3, 5; Appendix A
C7	With the exception of any CEMP Sub-plans expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMP Sub-plans must be submitted to the Planning Secretary for approval.	Section 1.5
C8	The CEMP Sub-plans not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all relevant undertakings made in the documents listed in Condition A1. Any of these CEMP Sub-plans must be submitted to the ER with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is phased no later than one (1) month before the commencement of that phase.	Section 1.5
C9	Any of the CEMP Sub-plans to be approved by the Planning Secretary must be submitted to the Planning Secretary with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is phased no later than one (1) month before the commencement of that phase.	Section 1.5
C13	The following Construction Monitoring Program must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP: (a) Noise and Vibration: EPA, Place Management NSW (in respect of The Bays), SOPA (in respect of Sydney Olympic Park) and Relevant Council(s)	Section 7; Section 7.1; Appendix D
E10	Before installing acoustic treatment at any Heritage item identified in the documents listed in Condition A1, the advice of a suitably qualified and experienced built heritage expert must be obtained to guide installation to minimise impact to the heritage significance of the item or fabric.	Section 1.4.1; Heritage Management Plan Section 4.6
E23	A detailed land use survey must be undertaken to confirm the occupants of the sensitive land use(s) potentially exposed to construction noise and vibration and construction ground-borne noise. The survey may be undertaken on a progressive basis but must be undertaken in any one area before the commencement of work which generates construction noise, vibration or groundborne noise in that area. The results of the survey must be included in the Noise and vibration CEMP Sub-plan required by Condition C5. Notes: 1. Sensitive land use(s) include critical working areas such as operating theatres and precision laboratories. 2. Detailed land use surveys from previous stages of the CSSI are permitted to be used, provided the land use has not changed.	Section 4; Appendix E; Section 5.2 (SCNV18)
E24	Industry best practice construction methods must be implemented where reasonably practicable to ensure that noise and vibration impacts are minimised. Practices must include, but are not limited to: (a) use of regularly serviced low sound power equipment; (b) early occupation and later release of road carriageways and work sites; (c) scheduling of noisiest work during construction hours specified in Condition E26; (d) at-source controls, temporary noise barriers (including the arrangement of plant and equipment) around noisy equipment and activities; (e) use of non-tonal reversing alarms; and (f) use of alternative construction and demolition techniques.	Sections 5.1–5.2
E25	Work must be undertaken during the following hours: (a) 7:00 am to 6:00 pm Mondays to Fridays, inclusive; (b) 8:00 am to 6:00 pm Saturdays; and (c) at no time on Sundays or public holidays.	Section 3.3
E26	Except as permitted by an EPL, highly noise intensive work that results in an exceedance of the applicable Noise Management Level (NML) at the same receiver must only be undertaken: (a) between the hours of 8:00 am to 6:00 pm Monday to Friday; (b) between the hours of 8:00 am to 1:00 pm Saturday; and	Section 3.3

CoA No.	Requirement	Document Reference
	(c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one (1) hour. For the purposes of this condition, 'continuously' includes any period during which there is less than one (1) hour between ceasing and recommencing any of the work.	
E27	Notwithstanding Conditions E25 and E26 work may be undertaken outside the hours specified in the following circumstances: (a) Safety and Emergencies, including: (i) for the delivery of materials required by the NSW Police Force or other authority for safety reasons; or (ii) where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm. On becoming aware of the need for emergency work in accordance with (a)(ii) above, the AA, the ER, the Planning Secretary and the EPA where an EPL is in force must be notified of the reasons for such work. The Proponent must use best endeavours to notify all noise and / or vibration affected occupants of sensitive land use(s) of the likely impact and duration of those work. (b) Low noise or vibration impact construction, including: (i) construction that causes LAeq(15 minute) noise levels: • no more than 5 dB(A) above the rating background level (RBL) at any residence in accordance with the ICNG, and • no more than the 'Noise affected' NMLs specified in Table 3 of the ICNG at other sensitive land use(s); or (ii) construction that causes LAFmax noise levels during the night time period of no more than 15 dB(A) above the RBL at any residence; or (iii) construction that causes: • continuous or impulsive vibration values, measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006), or • intermittent vibration values measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006). (c) By Approval, including: (i) where different construction hours are permitted or required under an EPL in force in respect of the CSSI; or (ii) works which are not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition E28; or (iii) negotiated agreements with directly affected residents and occupants of sensitive land use(s). (d) By Prescribed Activity, including: (i) tunnel fit out works, underground fit out works and /or internal station fit out works, and internal facility fit out works within the Clyde Stabling and Maintenance Facility and the Rosehill Services Facility (which are permitted 24 hours a day, seven (7) days a week); or (ii) work that must be undertaken during rail possessions, including the delivery and removal of material to support those works; or (iii) delivery of material that is required to occur outside the construction hours identified in Condition E25 to directly support: • tunnel fit out works; • underground and / or internal station fit out activities (excluding surface works); and • work for the Clyde Stabling and Maintenance Facility and the Rosehill Services Facility, except where doing so would result in noise levels above LAeq(15 minute) 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and / or LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater for residential receivers above the existing noise environment (as of the date of this approval), unless otherwise approved in accordance with (a) and (c) above; or (iv) haulage of spoil except between the hours of 10:00pm and 7:00am to / from Westmead construction site using any roads / streets, except as permitted by (d)(ii) above; or (v) works within an acoustic shed where there is no exceedance of the noise levels under 'Low noise or vibration impact construction' circumstances identified in (b) above, unless otherwise agreed by the Planning Secretary.	Section 3.3
E28	An Out-of-Hours Work Protocol must be prepared before the approval of out-of-hours-work under Condition E27(c)(ii). The Protocol must identify a process for the consideration, management and approval of work which is outside the construction hours defined in Conditions E25 and E26. The Protocol must be approved by the Planning Secretary and implemented before commencement of the out-of-hours work. The Protocol must be prepared in consultation with the ER and the AA. The Protocol must include: (a) justification for why out-of-hours works are required; (b) identification of low and high-risk activities and an approval process that considers the risk of activities, proposed mitigation, management, and coordination, including where: (i) the ER and the AA review all proposed out-of-hours activities and confirm their risk levels, (ii) low risk activities can be approved by the ER in consultation with the AA, and (iii) high risk activities that are approved by the Planning Secretary; (c) a process for the consideration of out-of-hours work against the relevant NML and vibration criteria including reasons for why it is required under each situation; (d) a process for selecting and implementing mitigation measures for residual impacts in consultation with the community at each affected location, including respite periods consistent with the requirements of Condition E44. The measures must take into account the predicted noise levels and the likely frequency and duration of the out-of-hours works that sensitive land use(s) would be exposed to, including the number of noise awakening events; (e) procedures to facilitate the coordination of out-of-hours work including those approved by an EPL or undertaken by a third party, to ensure appropriate respite is provided; and (f) notification arrangements for affected receivers for approved out-of-hours work and notification to the Planning Secretary of approved low risk out-of-hours works. This condition does not apply if the requirements of Condition E27(b) are met. Notes: 1. Out-of-hours work is any work that occurs outside the construction hours identified in Conditions E25 and E26. 2. The Out-of-Hours Work Protocol is intended to be used for activities where these activities cannot be undertaken during the construction hours identified in Conditions E25 and E26.	Section 3.3 Appendix C
E29	All reasonable and feasible mitigation measures must be implemented with the aim of achieving the following construction NMLs and vibration objectives: (a) construction 'Noise affected' NMLs established using the ICNG; (b) vibration criteria established using the Assessing vibration: a technical guideline (DEC, 2006) (for human exposure); (c) BS 7385 Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2" as they are "applicable to Australian conditions"; and	Sections 3.4, 5.2 and 6.2.3

CoA No.	Requirement	Document Reference
	(d) the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures (for structural damage for structurally unsound Heritage items). Any work identified as exceeding the NMLs and / or vibration criteria must be managed in accordance with the Noise and vibration CEMP Sub-plan. 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.	
E30	All reasonable and feasible mitigation measures must be applied when the following residential ground-borne noise levels are exceeded: (a) evening (6:00 pm to 10:00 pm) — internal LAeq(15 minute): 40 dB(A); and (b) night (10:00 pm to 7:00 am) — internal LAeq(15 minute): 35 dB(A). The mitigation measures must be outlined in the Noise and vibration CEMP Sub-plan, including those set out in an Out-of-Hours Work Protocol, as required by Condition E28.	Sections 3.4.3 and 5.3
E31	Noise generating work in the vicinity of potentially-affected community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas resulting in noise levels above the NMLs must not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions are made at no cost to the affected institution. Note: Critical working areas include theatres, laboratories and operating theatres.	Sections 5.2; 6.2
E32	At no time can noise generated by construction exceed the National Standard for exposure to noise in the occupational environment of an eight-hour (8hr) equivalent continuous A-weighted sound pressure level of LAeq,8h of 85 dB(A) for any employee working at a location near the CSSI.	Health and Safety Management Plan
E33	Detailed Noise and Vibration Impact Statements (DNVIS) must be prepared for all work (excluding emergency work) that may exceed the NMLs, vibration limits and / or ground-borne noise levels specified in Condition E29(c), Condition E29(d) and Condition E30 at any residence outside construction hours identified in Condition E25 or where receivers will be highly noise affected. The DNVIS must include specific mitigation measures identified through consultation with affected sensitive land use(s) and the mitigation measures must be implemented for the duration of the works. A copy of the DNVIS must be provided to the AA and ER before the commencement of the associated works. The Planning Secretary may request a copy(ies) of the DNVIS.	Section 6.2.3
E34	A DNVIS must be prepared for each construction site before construction noise and vibration impacts commence and include specific mitigation measures identified through consultation with the occupants of affected sensitive land use(s) and updated as required if site conditions or activities change.	Sections 4; 6.2.3
E35	Owners and occupiers of properties at risk of exceeding the screening criteria for cosmetic damage must be notified before work that generates vibration commences in the vicinity of those properties. If the potential exceedance is to occur more than once or extend over a period of 24 hours, owners and occupiers must be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the owner and occupier. These properties must be identified and considered in the Noise and vibration CEMP Sub-plan and the process for notifying those owners and occupiers within the Community Communication Strategy(s) required by Condition E85.	Sections 4.6, 5.2 (SCNV17), and 8
E36	The Proponent must ensure that residential receivers, located in non-residential zones, likely to experience an internal noise level exceeding Leq(15 minute) 60 dB(A) between 8:00 pm and 9:00 pm or Leq(15 minute) 45 dB(A) between 9:00 pm and 7:00 am (inclusive of a 5 dB penalty if rock breaking or any other annoying activity likely to result in ground-borne noise, or a perceptible level of vibration is planned (including works associated with utility adjustments)) must be offered additional noise and vibration mitigation measures as per the CNVS.	Section 5.2 (SCNV03), Section 5.3
E37	The Proponent must ensure that residential receivers in residential zones likely to experience an internal noise level of Leq(15 minute) 45 dB(A) or greater between 8:00 pm and 7:00 am (inclusive of a 5 dB penalty if rock breaking or any other annoying activity likely to result in ground-borne noise, or a perceptible level of vibration is planned (including works associated with utility adjustments)) must be offered additional noise and vibration mitigation measures as per the CNVS.	Section 5.2 (SCNV03), Section 5.3
E38	For all work sites where acoustic sheds are installed, the sheds must be designed, constructed and operated to minimise noise emissions. This would include the following considerations: (a) all significant noise producing equipment used during the night-time be inside the sheds; (b) noise generating ventilation systems be located inside the sheds and external air intake / discharge ports be appropriately acoustically treated; and (c) the doors of acoustic sheds be kept closed during the night-time period. Where night-time vehicle access is required at sites with nearby residences, the shed entrances must be designed and constructed to minimise noise breakout. Note: Noise generating ventilation systems include compressors and scrubbers.	No Acoustic Sheds proposed
E39	Vibration testing must be conducted during vibration generating activities that have the potential to impact on Heritage items to identify minimum working distances to prevent cosmetic damage. In the event that the vibration testing and attended monitoring shows that the preferred values for vibration are exceeded, the Proponent must review the construction methodology and, if necessary, implement additional mitigation measures. Such measures must include, but not be limited to, review or modification of excavation techniques.	Sections 7; 4.6
E40	If a Heritage item is found to be structurally unsound (following inspection) a cosmetic damage criterion of 2.5 mm/s peak component particle velocity (from DIN 4150) must be applied.	Section 3.4.2
E41	Where occupants of sensitive land uses would be impacted by prolonged construction noise impacts, the AA may identify that such properties must be considered for additional noise mitigation treatments over and above those measures specified in the CNVS. This could include at-property or other treatment measures in consultation with the property owner and / or occupier.	Section 5.3
E42	The implementation of at-property treatment does not preclude the application of other noise and vibration mitigation and management measures including temporary and long term accommodation.	Section 5.3
E43	All utility work undertaken for the delivery of the CSSI, including those undertaken by third parties, must be coordinated to ensure respite periods are provided. The Proponent must: (a) reschedule any work to provide respite to impacted noise sensitive land use(s) so that the respite is achieved in accordance with Condition E44; or (b) consider the provision of alternative respite or mitigation to impacted noise sensitive land use(s); and (c) provide documentary evidence to the AA in support of any decision made by the Proponent in relation to respite or mitigation. The consideration of respite must also include all other approved critical State significant infrastructure, State significant infrastructure and State significant development projects which may cause cumulative and / or consecutive impacts at receivers affected by the delivery of the CSSI. Note: Utility work undertaken includes any utility relocations by the Proponent or third parties.	Sections 3.3.3, 5.2 (SCNV05 and SCNV15), and 6.2
E44	In order to undertake out-of-hours work outside the hours specified under Condition E25, (except emergency work) appropriate respite periods must be identified for the out-of-hours work in consultation with the community at each affected location on a regular basis.	Sections 3.3.3, 5.2 (SCNV05 and

CoA No.	Requirement	Document Reference
	This consultation must include (but not be limited to) providing the community with: (a) a progressive schedule for periods no less than three (3) months, of likely out-of-hours work; (b) a description of the potential work, location and duration of the out-of-hours work; (c) the noise characteristics and likely noise levels of the work; and (d) likely mitigation and management measures which aim to achieve the relevant NMLs and vibration criteria under Conditions E29(c), E29(d) and E30 (including the circumstances of when respite or relocation offers will be available and details about how the affected community can access these offers). The outcomes of the community consultation, the identified respite periods and the scheduling of the likely out-of-hours work must be provided to the AA and ER before the out-of-hours work commences, and to the EPA and the Planning Secretary on request. Note: Respite periods can be any combination of days or hours where out-of-hours work would not be more than 5 dB(A) above the rating background noise level at any residence.	SCNV15), and Appendix C
E45	No blasting is permitted as part of this CSSI.	No Blasting proposed.

Table A-2: Relevant Revised Environmental Management Mitigations Measures

REMM	Outcome	Timing	Document Reference
NV1	Stations and ancillary facilities would be designed to meet the applicable noise criteria derived from the Noise Policy for Industry (EPA, 2017). Train breakout noise from the draft relief shaft would be designed to meet a noise criterion of LAFmax 65 dB(A) at 15 metres. The noise generated by stations and ancillary facilities would be reviewed during further design development to confirm that the noise levels predicted are achievable based on the final design of this proposal.	Design	Design Package(s)
S2	Ongoing engagement would be undertaken with NSW Department of Education and other affected schools to continue to investigate feasible and reasonable mitigation measures related to construction traffic, pedestrian safety, construction noise and vibration, and air quality.	Construction	Sections 3.4, 5.2 and 5.3; DNVIS
NV4	An Operational Noise and Vibration Review would be prepared during design development to confirm the mitigation measures required to manage: - airborne and ground-borne noise and vibration impacts from rail operations - airborne noise impacts from the stabling and maintenance facility - airborne noise impacts from fixed industrial sources, including stations and services facilities. The NSW Environment Protection Authority would be consulted during preparation of the Operational Noise and Vibration Review.	Design	Design Package(s)

Table A-3: Relevant CEMF Requirements

Clause	Requirement	Document Reference
CEMF-NV1	Construction hours would be in accordance with the ICNG, planning approvals and the EPL (if required), except where otherwise specified in an approved noise management plan.	Section 3.3
CEMF-NV2	Work generating high noise and/or vibration levels would be scheduled during standard construction hours or other less sensitive time periods, where feasible and reasonable. Where this is not feasible and reasonable, the works would be carried out as early as possible in each work shift.	Sections 3.3 and 5.2 (SCNV09)
CEMF-NV3	When working adjacent to schools, churches and other noise sensitive facilities, particularly noisy activities would be scheduled outside normal operating hours, where feasible and reasonable.	Sections 4 and 5.2 (SCNV10)
CEMF-NV4	Noisy plant and equipment would be located and operated to minimise the level and duration of impacts on sensitive receivers.	Sections 5.2; 6.2
CEMF-NV5	Where feasible and reasonable heavy vehicle movements would be limited to daytime hours.	Sections 3.3; 5.2
CEMF-NV6	All employees, contractors and subcontractors would receive an environmental induction. The site induction would include the following as a minimum: All relevant project specific and standard noise and vibration mitigation measures - Relevant licence and approval conditions - Permissible hours of work - Any limitations on high noise generating activities - Location of nearest sensitive receivers - Construction employee parking areas - Designated loading/unloading areas and procedures	Section 6.3

Clause	Requirement	Document Reference
	- Site opening/closing times (including deliveries) - Identification of activities likely to cause complaint - Appropriate behavioural practices such as avoiding unnecessary shouting or loud stereos/radios, no dropping of materials from height; throwing of metal items; and slamming of doors, no excessive revving of plant and vehicle engines, turning off idling equipment when not in use, avoiding impulsive noise such as metal and metal contact. - Environmental incident reporting and management procedures.	
CEMF-NV7	Appropriate mufflers and noise attenuation would be fitted on all plant and equipment utilised.	Section 5.2
CEMF-NV8	Damped hammers and shears/ pulverisers would be used where feasible and reasonable.	Section 5.2
CEMF-NV9	All plant and machinery would be regularly maintained to assist in minimising noise emissions.	Section 5.2
CEMF-NV10	Where significant noise impacts are predicted and/or long periods of construction works are planned, acoustic sheds can be used as an effective mitigation method. For all sites where acoustic sheds are proposed, the sheds would be designed and constructed to minimise noise emissions. This would likely include the following considerations: - All significant noise producing equipment that would be used during the night- time would be inside the shed, where feasible and reasonable - Noise generating ventilation systems such as compressors, scrubbers, etc, would also be inside the shed and external air intake/discharge ports would be appropriately acoustically treated - The door of the acoustic shed would be kept closed during the night-time period, where feasible and reasonable. Where night-time vehicle access is required, the doors would be designed and constructed to minimise noise breakout.	Not Applicable - Acoustics Sheds are not planned to be utilised.
CEMF-NV11	Use of engine exhaust brakes should be avoided where possible. Air brake silencers would be used on heavy vehicles that access construction sites multiple times per night or over multiple night.	Section 5.2
CEMF-NV12	Non-tonal movement alarms (or an equivalent mechanism) would be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work.	Section 5.2
CEMF-NV13	Temporary noise barriers / hoarding would be implemented between noise sources and nearby potentially affected noise sensitive receivers, wherever feasible and reasonable. Noise barriers / hoarding would be designed with consideration of on-site heavy vehicle movements with the aim of minimising sleep disturbance impacts.	Section 5.2
CEMF-NV14	Where there is potential for exceedances of the vibration objectives, attended monitoring would be undertaken at the commencement of vibration generating activities to confirm site laws. If, following confirmation of site laws, there continues to be a potential for exceedances, continuous vibration monitoring including audible and visible alarms would be conducted at the nearest sensitive receivers.	Sections 6.2.3; 7
CEMF-NV15	Where vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure (in consultation with a structural engineer) and vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for that structure. For heritage items, the more detailed assessment would specifically consider the heritage values of the structure in consultation with a heritage specialist to ensure sensitive heritage fabric is adequately monitored and managed.	Sections 4.6; 6.2.3
CEMF-NV16	The community would be kept informed of upcoming construction work including through: - Notification letters - Website - Project information and construction response telephone line - Place Managers	Sections 5.2 (SCNV03) and 8
CEMF-NV17	Further engagement and consultation would be carried out with: The affected communities to understand their preferences for mitigation and management measures 'Other sensitive' receivers such as schools, medical facilities or places of worship to understand periods in which they are more sensitive to impacts. Based on this consultation, appropriate mitigation and management options would be considered and implemented where feasible and reasonable to minimise the impacts.	Sections 5.2 (SCNV03) and 8
CEMF-NV18	A register of relevant noise and vibration sensitive receivers would be kept. The register would include the following details for each receiver where known: - Address of receiver - Category of receiver (e.g. Residential, Commercial etc.) - Contact name and phone number	Section 4; Appendix E; Section 5.2 (SCNV03 / SCNV18)
CEMF-NV19	A noise monitoring program would be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions. Where a sensitive receiver has refused monitoring at their property, monitoring would be carried out at an alternate location if available and deemed representative by an acoustic consultant.	Sections 7.1, 7.2.1, and Appendix D
CEMF-NV21	Appropriate respite periods would be provided. This would include: - Consideration of the need to efficiently undertake construction balanced against the communities' preferred noise and vibration management approach - Coordination with any required ancillary works (utility relocations etc.) to minimise overall noise impacts and to avoid scheduling such activities during planned respite periods. High noise and vibration generating activities may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block unless otherwise agreed with the affected parties.	Sections 3.3.3 and 5.2 (SCNV05)
CEMF-NV22	Construction site layouts would aim to minimise airborne noise impact including: - Loading and unloading of materials/deliveries to occur as far as possible from noise sensitive receivers or be appropriately shielded - Site access and egress points and internal roads as far as possible away from noise sensitive receivers and to minimise the need for reversing movement The offset distance between noisy plant items and nearby noise sensitive receivers would be as great as possible.	Sections 4 and 5.2 (SCNV08)

Clause	Requirement	Document Reference
CEMF-NV23	Delivery vehicles would be fitted with straps rather than chains for unloading, wherever feasible and reasonable	Section 5.2
CEMF-NV24	Stationary noise sources would be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained.	Health and Safety Management Plan
CEMF-NV25	Alternative construction methodologies and measures that minimise noise and vibration levels during noise intensive works would be investigated and implemented where feasible and reasonable. This would include consideration of: - Selecting quieter equipment such as smaller, lower powered, newer or better maintained - The use of hydraulic concrete shears in lieu of hammers/rock breakers - Sequencing works to shield noise sensitive receivers by retaining building wall elements - Locating demolition load out areas away from the nearby noise sensitive receivers - Minimising structural-borne noise to adjacent buildings including separating the structural connection prior to demolition through saw-cutting and propping, using handheld splitters and pulverisers or hand demolition - Installing sound barrier screening to scaffolding facing noise sensitive neighbours - Using portable noise barriers around particularly noisy equipment, such as concrete saws - Modifying demolition works sequencing / hours to minimise impacts during peak pedestrian times and / or adjoining neighbour outdoor activity periods - Use of bored piling in lieu of impact piling.	Section 5.2 (SCNV14)
CEMF-NV26	Long term construction site support equipment and machinery would be low noise emitting and suitable for use in residential areas, where feasible and reasonable. Examples include: - Low noise water pumps for use in water treatment facilities - Low noise generators and compressors - Low noise air conditioner units for use of amenities buildings.	Section 5.2
CEMF-NV27	Further assessment of construction traffic would be completed during detailed design, including consideration of the potential for exceedances of the NSW Road Noise Policy base criteria (where greater than 2 dB increases are predicted). The potential impacts would be managed using the following approaches, where feasible and reasonable: - On-site spoil storage capacity would be maximised to reduce the need for truck movements during sensitive times - Vehicle movements would be redirected away from sensitive receiver areas and scheduled during less sensitive times - The speed of vehicles would be limited and the use of engine compression brakes would be avoided - Heavy vehicles would not be permitted to idle near sensitive receivers.	Section 5.2
CEMF-NV28	Condition surveys of buildings and structures near to the tunnel and excavations would be carried out prior to the commencement of excavation at each site, where appropriate. For heritage buildings and structures the surveys would consider the heritage values of the structure in consultation with a heritage specialist.	Section 4.6 Section 7.2.1.1
CEMF-NV29	The likelihood of cumulative construction noise impacts would be reviewed during detailed design when detailed construction schedules are available. Co-ordination would occur between potentially interacting projects to minimise concurrent or consecutive works in the same areas, where possible. Specific mitigation strategies would be developed to manage impacts. Depending on the nature of the impact, this could involve adjustments to construction program or activities of Sydney Metro West or of other construction projects.	Section 4.7 and Section 5.2 (SCNV15)
CEMF-NV30	Feasible and reasonable measures would be implemented to minimise ground-borne noise where exceedances are predicted. This may require implementation of less ground-borne noise and less vibration intensive alternative construction methodologies.	Sections 3.4.3 and 5.2 (SCNV14)

Appendix B – Consultation records

Place Management NSW Engagement Log and Comment Register

Table B-1: Details of Engagement and / Attempted Engagement

Date	Details of Engagement / Attempted Engagement
18 March 2026	Formal consultation submission to Place Management NSW in accordance with CoA C5 and C13. The Noise and Vibration Management Plan (NVMP) and Noise and Vibration Monitoring Program (NVMoP) (both at Rev 01) and supporting comment register were issued for review. A consultation period to 14 April 2026 was requested.
15 April 2026	Written response from Place Management NSW received with letters issued to Sydney Metro. Consultation complete for the purpose of CoA C5 and C13.

Table B-2: Comment and Response Register

Comment Raised*	Project response	Where addressed	Status
All complaints and any unanticipated exceedances of approved noise levels relating to the Bays West Metro Station construction works are to be provided to PMNSW for information within seven (7) days of the complaint or exceedance occurring. An up-to-date Complaints Register for the Bays West Metro Station is also to be provided to PMNSW upon request.	Sydney Metro manages complaints as part of the Sydney Metro Construction Complaints Management System (CCMS) and the Overarching Community Communications Strategy (OCCS). If any works or associated complaints are relevant to NSW Placemaking, Sydney Metro would organise a time to discuss these matters further (if it isn't addressed in The Bays Traffic and Cumulative Impact Coordination Meeting). <i>Note: Response provided by Sydney Metro.</i>	Section 8.1 (Complaints Management)	Closed
Copies of all monthly and six-monthly noise and vibration monitoring reports relating to the Bays West Metro Station are to be provided to PMNSW for information within seven (7) days of the report being prepared.	Noise and vibration monitoring reports will be available every 6 months on the Stations Package West website. Sydney Metro can provide these upon request. <i>Note: Response provided by Sydney Metro.</i>	Section 7.3 (Reporting)	Closed
PMNSW is to be notified of all upcoming extended Out of Hours Works (i.e. 2 or more consecutive periods of OOHW) associated with the Bays West Metro Station construction site. Prior to the commencement of extended OOHW, PMNSW is to be given the opportunity to consult with the proponent and recommend reasonable mitigation measures to minimise noise and vibration impacts arising from those works.	Sydney Metro will manage Out of Hours Works (OOHW) in line with the Noise and Vibration Management Plan and Noise and Vibration Monitoring Program for Stations Package West. Placemaking NSW is notified of upcoming OOHW on The Bays monthly notification. In addition, representatives from Sydney Metro and Place Management NSW regularly attend The Bays Traffic and Cumulative Impact Coordination Meeting typically monthly, along with other key	Section 3.3.3 (Out of House Wok) Section 6.2.4 (Out-of-Hours Work Approvals) Sydney Metro Out of Hours Work Protocol	Closed

Comment Raised*	Project response	Where addressed	Status
	stakeholders for The Bays. This forum is used to coordinate upcoming works, including extended OOHV and discuss potential cumulative impacts and mitigation measures. If further consultation is required on OOHV relevant to The Bays, Sydney Metro can discuss further with Place Management NSW. <i>Note: Response provided by Sydney Metro.</i>		

**Note: Identical comments were received on both the NVMP and NVMoP from Place Management NSW. To avoid duplication, comments have only been included in the Table above once.*

Port Authority of NSW Engagement Log and Comment Register

Table B-3: Details of Engagement and / Attempted Engagement

Date	Details of Engagement / Attempted Engagement
18 March 2026	Formal consultation submission to Ports Authority of NSW (PANSW) in accordance with CoA C5 and C13. The Noise and Vibration Management Plan (NVMP) and Noise and Vibration Monitoring Program (NVMoP) (both at Rev 01) and supporting comment register were issued for review. A consultation period to 14 April 2026 was requested.
9 April 2026	Written response from PANSW received with completed document comments register provided to Sydney Metro. Consultation complete for the purpose of CoA C5 and C13

Table B-4: Comment and Response Register

Comment Raised	Project response	Where addressed	Status
Sydney Regional Environmental Plan (SREP) No. 26 – City West has been repealed and superseded by the State Environmental Planning Policy (SEPP) (Precincts – Eastern Harbour City) 2021. The current SEPP lists the Glebe Island Silos as a heritage item (see Appendix 8, Schedule 4, Part 3). I suggest updating the table accordingly.	Thank you for providing the updated listing information. Listing details for the Glebe Island Silos have been updated to reference SEPP (Precincts – Eastern Harbour City) 2021 in Table 4-6.	Section 4.6 (Heritage Buildings & Structures)	Closed

Inner West Council Engagement Log and Comment Register

Table B-5: Details of Engagement and / Attempted Engagement

Date	Details of Engagement / Attempted Engagement
18 March 2026	Formal consultation submission to Inner West Council (IWC) in accordance with CoA C5 and C13. The Noise and Vibration Management Plan (NVMP) and Noise and Vibration Monitoring Program (NVMoP) (both at Rev 01) and supporting comment register were issued for review. A consultation period to 14 April 2026 was requested.
10 April 2026	IWC provided written response (via email) with comments from their Council Environmental Health Team advising they had reviewed the NVMP and NVMoP, with both documents appearing satisfactory and no specific comments submitted. Consultation completed for the purposes of CoA C5 and C13.

Table B-6: Comment and Response Register

Comment Raised	Project response	Where addressed	Status
I've reviewed the Noise and Vibration Management Plan and associated Monitoring Program. They appear satisfactory to me from an environmental health acoustic perspective. I note that modelling referenced in the plan shows that noise impacts from construction activities at The Bays station will be generally lower relative to other stations further west, with negligible vibration impacts predicted also. The management and mitigation options outlined appear reasonable and consistent with NSW EPA guidelines.	No specific comments were provided by the IWC. The NVMP and NVMoP has been prepared to meet the requirements of the Planning Approval (SSI-22765520) and relevant EPA guidelines and standards. No changes to the document are required as a result of IWC consultation.	Section 1.5 (Consultation, Endorsement and Approval) and Appendix B (this Consultation Record Summary)	Closed

City of Canada Bay Engagement Log and Comment Register

Table B-7: Details of Engagement and / Attempted Engagement

Date	Details of Engagement / Attempted Engagement
18 March 2026	Formal consultation submission to City of Canada Bay Council (CoCB) in accordance with CoA C5 and C13. The Noise and Vibration Management Plan (NVMP) and Noise and Vibration Monitoring Program (NVMoP) (both at Rev 01) and supporting comment register were issued for review. A consultation period to 14 April 2026 was requested.
14 April 2026	Written response from CoCB received with completed document comments register provided to Sydney Metro confirming council had no objections for the submission. Consultation complete for the purpose of CoA C5 and C13

Table B-8: Comment and Response Register

Comment Raised	Project response	Where addressed	Status
No objections for this submission	No specific comments on the NVMP and NVMoP were provided by the CCC. Both documents have been prepared to meet the requirements of the Planning Approval (SSI-22765520) and relevant EPA guidelines and standards. No changes to the document are required as a result of CoCB consultation.	Section 1.5 (Consultation, Endorsement and Approval) and Appendix B (this Consultation Record Summary)	Closed

Burwood Council Engagement Log and Comment Register

Table B-9: Details of Engagement and / Attempted Engagement

Date	Details of Engagement / Attempted Engagement
18 March 2026	Formal consultation submission to Burwood Council in accordance with CoA C5 and C13. The Noise and Vibration Management Plan (NVMP) and Noise and Vibration Monitoring Program (NVMoP) (both at Rev 01) and supporting comment register were issued for review. A consultation period to 14 April 2026 was requested.
9 April 2026	Interim consultation feedback received from Burwood Council via email on the NVMP and NVMoP confirming they had no specific comments, and both documents demonstrated strong compliance with relevant guidelines and local planning policies.
9 April 2026	Written response from Burwood Council received with completed document comments register provided to Sydney Metro, which included no comments on the NVMP or NVMoP. Consultation complete for the purpose of CoA C5 and C13

Table B-10: Comment and Response Register

Comment Raised	Project response	Where addressed	Status
I don't have any comments as both the NVMoP and NVMP demonstrate strong compliance with NCC 2022 expectations, NSW SEPP requirements, Burwood LEP provisions, and DCP guidelines. Compliance Summary: NCC 2022: Not directly applicable to construction noise/vibration. documents correctly rely on ICNG, CNVS, AVTG, and AS1055. No issues. ICNG (Interim Construction Noise Guideline, EPA): Used to establish construction noise management levels and appropriate mitigation measures. CNVS (Construction Noise and Vibration Strategy): Provides comprehensive strategies and management protocols. AVTG (Assessing Vibration: A Technical Guideline, EPA): Used to evaluate vibration impacts, particularly regarding human comfort and disturbance. AS1055 (Australian Standard AS 1055:2018 Acoustics - Description and Measurement of Environmental Noise): Sets procedures for measuring environmental noise, including instrumentation and calibration SEPPs (T&I, Resilience & Hazards, Biodiversity): NVMoP/NVMP comprehensively meet obligations relating to noise, vibration, heritage, sensitive receivers, and risk mitigation.	No specific comments on the NVMP and NVMoP were provided by the CCC. Both documents have been prepared to meet the requirements of the Planning Approval (SSI-22765520) and relevant EPA guidelines and standards. No changes to the document are required as a result of Burwood Council consultation.	Section 1.5 (Consultation, Endorsement and Approval) and Appendix B (this Consultation Record Summary)	Closed

Comment Raised	Project response	Where addressed	Status
Burwood LEP 2012: Consistent with requirements for: • Amenity protection • Land use compatibility • Heritage building protection Burwood DCP: Consistent with expectations for: • Construction noise & vibration control • Heritage preservation • Traffic and construction management • Community notification & complaints handling			

Cumberland City Council Engagement Log and Comment Register

Table B-11: Details of Engagement and / Attempted Engagement

Date	Details of Engagement / Attempted Engagement
18 March 2026	Formal consultation submission to Cumberland City Council (CCC) in accordance with CoA C5 and C13. The Noise and Vibration Management Plan (NVMP) and Noise and Vibration Monitoring Program (NVMoP) (both at Rev 01) and supporting comment register were issued for review. A consultation period to 14 April 2026 was requested.
10 April 2026	Written response from CCC received with completed document comments register provided to Sydney Metro. Consultation complete for the purpose of CoA C5 and C13

Table B-12: Comment and Response Register

Comment Raised	Project response	Where addressed	Status
The CNVMP is acceptable. Could we please request their 'complaints hotline' in case we get noise complaints and then we can direct the complainants to that hotline.	No specific comments on the NVMP and NVMoP were provided by the CCC. Both documents have been prepared to meet the requirements of the Planning Approval (SSI-22765520) and relevant EPA guidelines and standards. No changes to the document are required as a result of CCC consultation.	Section 1.5 (Consultation, Endorsement and Approval) and Appendix B (this Consultation Record Summary)	Closed
The NVMoP or Program is acceptable. Could a 'complaints hotline' be please provided to Council, in case Council receives any CN and V related complaints and then Council can direct the complainants to that hotline.	Project contact details will be provided to CCC in upcoming Third-Party Interface meetings and/or formal communication channels.		Closed

Appendix C – Out of Hours Works Protocol (Sydney Metro, 2025)

West – Rail Infrastructure, stations, precincts and operations (Stage 3) Out-of-Hours Work Protocol

Author:	Sydney Metro West Stage 3 Environment Team
Date:	03/09/2025
Version:	6
Reference:	SM-25-00123220
Division:	Environment, Sustainability & Planning
Review date:	N/A

Contents

1 Introduction.....	3
1.1 Target audience	3
1.2 Purpose and Applicability	3
1.3 Definitions	4
1.4 When to use this document.....	4
2 OOHW approval under this Protocol	5
2.1 Scoping Phase	8
2.1.1 Justification of the OOHW.....	8
2.2 Criteria Phase	9
2.3 Assessment Phase	11
2.3.1 Consideration of OOHW against NML and Vibration criteria	11
2.3.2 Selection and implementation of mitigation measures.....	12
2.3.3 Identification of low and high risk activities	18
2.4 Review Phase	20
2.5 Approval Phase.....	20
2.6 Procedures to facilitate the coordination of OOHW	21
2.7 Consultation and notification for affected receivers	22
2.7.1 Newsletters	22
2.7.2 Door knocks.....	22
2.7.3 Notifications	22
2.7.4 Community Interface Coordination Group	23
3 Compliance matrix.....	23
4 Protocol review and approval	25
Appendix A: Register of Consultation.....	26

1 Introduction

1.1 Target audience

This Protocol applies to permanent, temporary, and casual staff; staff seconded from another organisation; and contingent workers including labour hire, professional services contractors, consultants, delivery partners, contractors and sub-contractors.

1.2 Purpose and Applicability

This protocol was developed to comply with condition E28 of [SSI-22765520](#), reproduced below:

Out-Of-Hours Work Protocol – Works not subject to an EPL

E28 An **Out-of-Hours Work Protocol** must be prepared before the approval of out-of-hours-work under **Condition E27(c)(ii)**. The Protocol must identify a process for the consideration, management and approval of work which is outside the construction hours defined in **Conditions E25 and E26**. The Protocol must be approved by the Planning Secretary and implemented before commencement of the out-of-hours work. The Protocol must be prepared in consultation with the **ER** and the **AA**. The Protocol must include:

- (a) justification for why out-of-hours works are required;
- (b) identification of low and high-risk activities and an approval process that considers the risk of activities, proposed mitigation, management, and coordination, including where:
 - (i) the **ER** and the **AA** review all proposed out-of-hours activities and confirm their risk levels,
 - (ii) low risk activities can be approved by the **ER** in consultation with the **AA**, and
 - (iii) high risk activities that are approved by the Planning Secretary;
- (c) a process for the consideration of out-of-hours work against the relevant NML and vibration criteria including reasons for why it is required under each situation;
- (d) a process for selecting and implementing mitigation measures for residual impacts in consultation with the community at each affected location, including respite periods consistent with the requirements of **Condition E44**. The measures must take into account the predicted noise levels and the likely frequency and duration of the out-of-hours works that sensitive land use(s) would be exposed to, including the number of noise awakening events;
- (e) procedures to facilitate the coordination of out-of-hours work including those approved by an EPL or undertaken by a third party, to ensure appropriate respite is provided; and
- (f) notification arrangements for affected receivers for approved out-of-hours work and notification to the Planning Secretary of approved low risk out-of-hours works.

This condition does not apply if the requirements of **Condition E27(b)** are met.

Notes:

1. *Out-of-hours work is any work that occurs outside the construction hours identified in **Conditions E25 and E26**.*
2. *The Out-of-Hours Work Protocol is intended to be used for activities where these activities cannot be undertaken during the construction hours identified in **Conditions E25 and E26**.*

This Protocol describes the process for considering, managing, and approving work on the Sydney Metro West Stage 3 Package that is undertaken outside the standard hours of work specified in conditions E25 and E26 of planning approval [SSI-22765520](#) (also called SMW – Rail Infrastructure, stations, precincts and operations or Stage 3).

This protocol does not apply to:

- Safety and Emergencies described under Condition E27(a).
- Low Impact Works that comply with Condition E27(b).
- Scheduled Activities which are subject to a current Environmental Protection Licence (EPL) per condition E27(c)(i).
- Negotiated Agreements described under Condition E27(c)(iii).
- Prescribed Activities listed under Condition E27(d).

Other stages of Sydney Metro West have Out-of-Hours Work Protocols that are relevant to those stages under different planning approvals.

This OOHW Protocol should be used in conjunction with:

- The Sydney Metro Construction Noise and Vibration Standard
- The Contractor's Construction Environmental Management Plan
- The Contractor's Noise and Vibration Management Plan
- A relevant Detailed Noise and Vibration Impact Statement

1.3 Definitions

The definitions in the Ministers Conditions of Approval for [SSI-22765520](#) apply and should be read in conjunction with this Protocol.

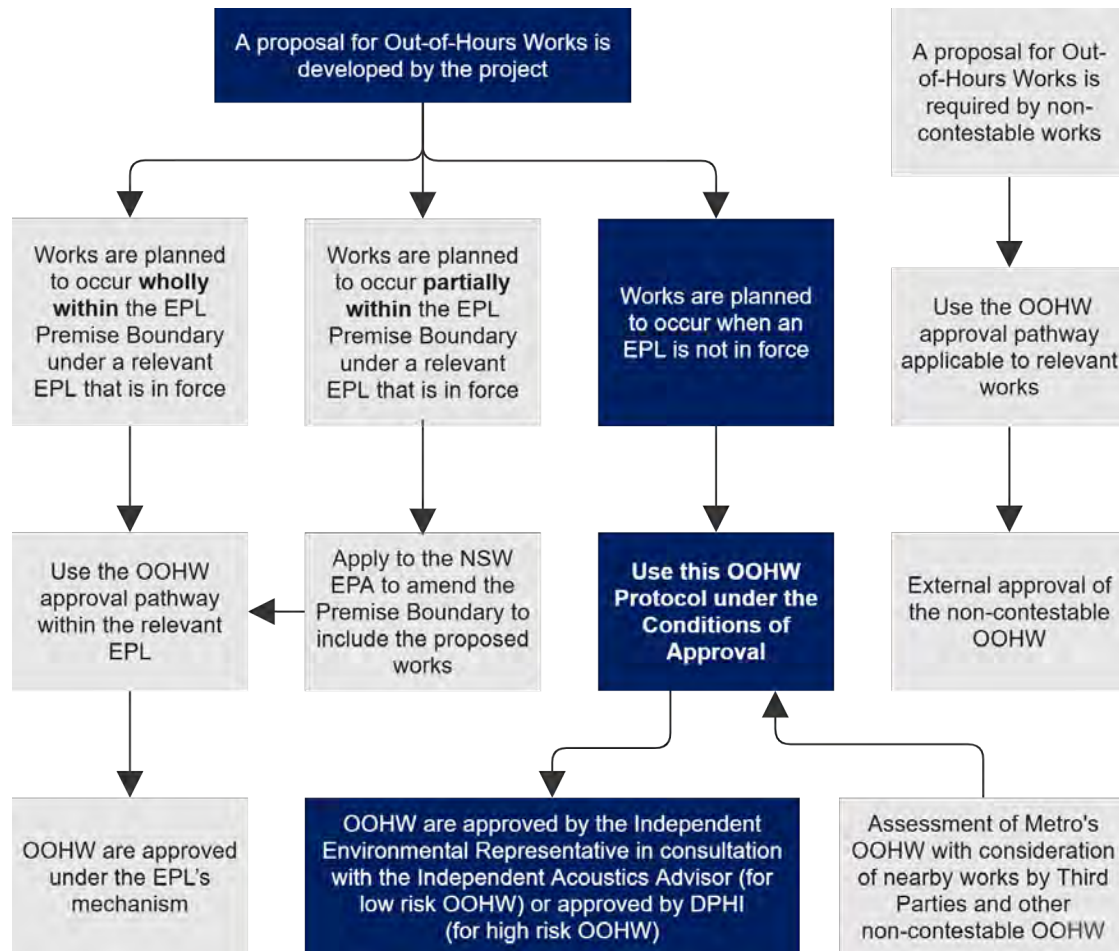
All other terminology in this Protocol are taken to mean the generally accepted or dictionary definition. Other terms and jargon are defined within the [SM-17-00000203 Sydney Metro Glossary](#).

Table 1: Terms/acronyms and definitions

Acronym term/ term	Definition
AA	(Independent) Acoustics Advisor
AAA	Alternate Acoustics Advisor
CEMF	Construction Environmental Management Framework (Sydney Metro West)
CNVS	Construction Noise and Vibration Standard (Sydney Metro West)
CoA or MCoA	Minister's Conditions of Approval
Directly affected sensitive receivers	Noise sensitive receivers predicted to be impacted by noise levels exceeding NMLs
DNVIS	Detailed Noise and Vibration Impact Statement
DPHI	Department of Planning, Housing and Infrastructure
EPA	The NSW Environment Protection Authority
EPL	Environmental Protection Licence
ER	(Independent) Environmental Representative
ICNG	Interim Construction Noise Guideline (DECC, NSW, 2009)
Land Use Survey	Identification of the use of surrounding premises to identify sensitive receiver types and locations.
NML	Noise Management Level
NSR	Noise and Vibration Sensitive Receivers
OCCS	Overarching Community Communication Strategy
OOH (OOHW)	Out-of-Hours (Work)
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
Scheduled Activity	Activities listed in Schedule 1 of the Protection of the Environment Operations Act 1997
Stage 3	Sydney Metro West – Rail infrastructure, stations, precincts and operations (SSI 22765520)

1.4 When to use this document

The flowchart below illustrates where this Out-of-Hours Works Protocol fits alongside the various OOHW approval pathways relevant to Stage 3.



2 OOHW approval under this Protocol

The Sydney Metro Out-of-Hours Review form (SM-25-00017134) shall be used for all proposed OOHW. OOHW reviews under this Protocol will be processed through five phases:

- Scoping Phase where details of the OOHW are initially proposed along with a justification for the works being conducted outside standard hours.
 - Criteria Phase where the criteria for assessing impacts to nearby receivers are selected and formalised.
- Assessment Phase where an assessment of the works against the relevant criteria (noise and non-noise) is conducted and mitigations are introduced to reduce the impacts on receivers as much as practicable. The risk level of the OOHW is confirmed at the end of this phase. All documentation relating to an OOHW proposal will be collated into one OOHW Review form with appendices and signed by the applicant, their Place Manager and their Environment Manager.
- Review Phase where the OOHW Review form is reviewed by the AA and ER depending on the determined risk level
- Approvals Phase where the OOHW are approved by either the ER or DPHI. Low risk OOHW would be approved by the ER in consultation with the AA

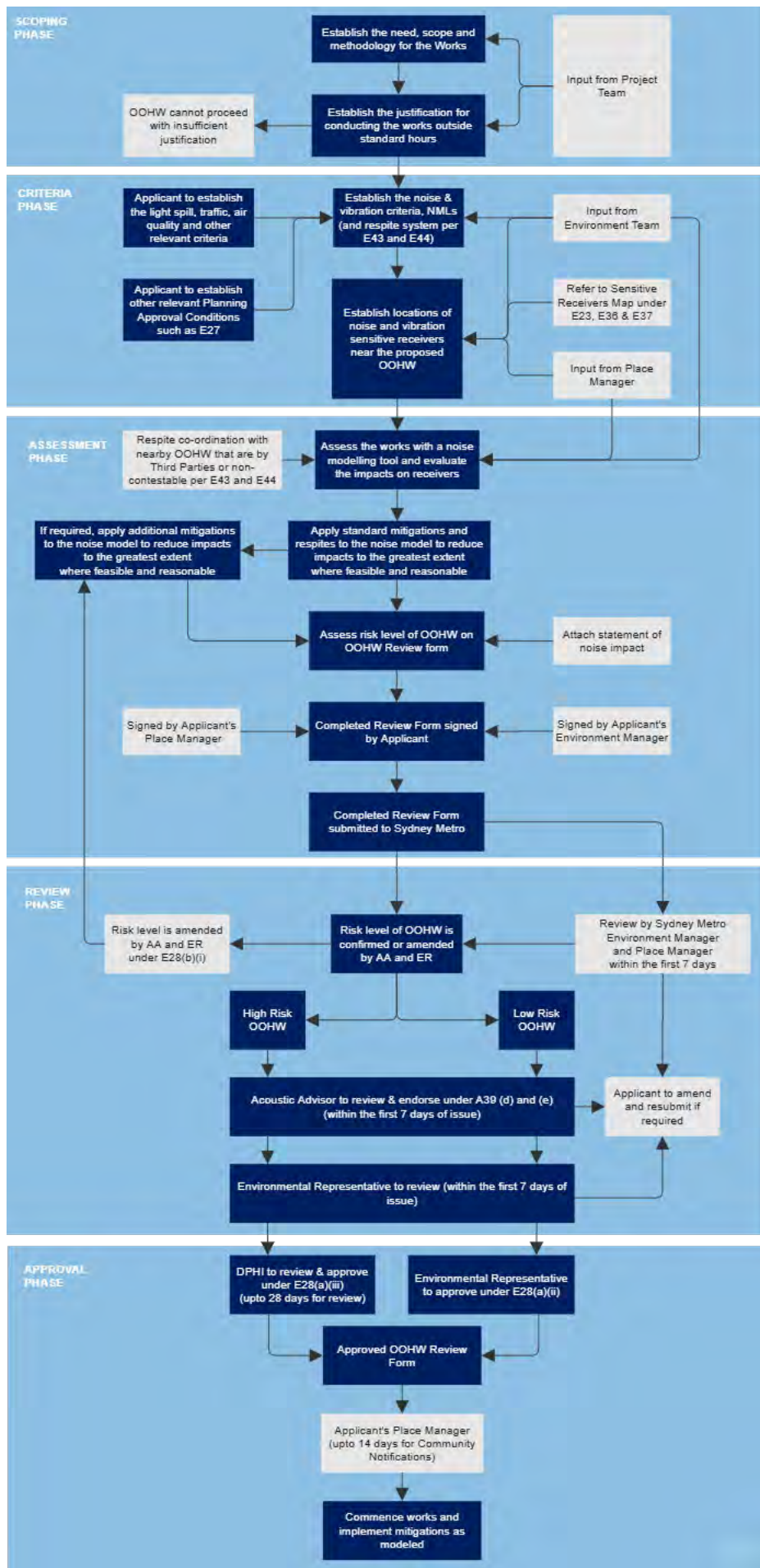
(who would provide an endorsement). High Risk OOHW would be approved by DPHI (endorsed by the AA and reviewed by the ER).

The OOHW Review form is to be used to ensure the applicant will:

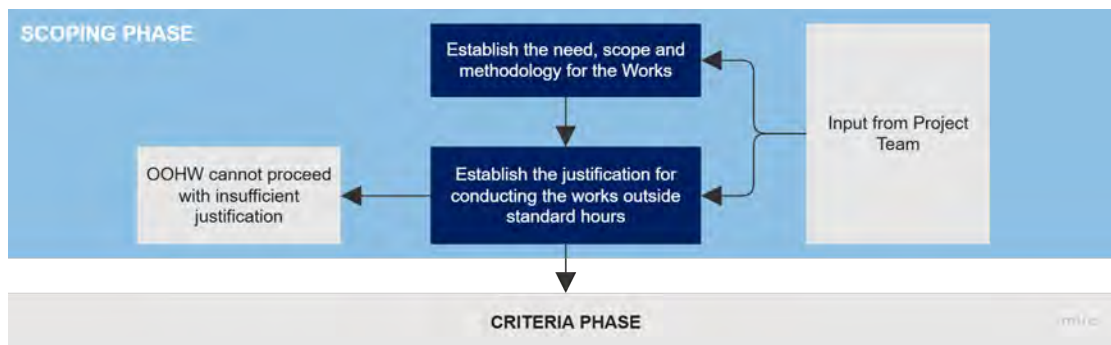
- Provide a strong justification for the works to be undertaken outside of approved hours
- Document an assessment of the noise impacts at nearest receivers with a clear statement of impact (commentary around times and durations of impact, noise character and other relevant information, rather than just a table of dB numbers)
- Demonstrate that mitigations and consultation will be implemented
- Provide an initial classification of the OOHW risk level
- Involve their Environment Manager and Community / Place Manager
- Provide the form to the AA and ER for review, endorsement or approval where required
- Document DPHI's approval prior to commencement of the OOHW, where required.

Once prepared, the OOHW Review form and appendices, are submitted to the Sydney Metro's Environment Manager, Place Manager and the AA and ER for review. Any of the reviewers may provide comments on the proposed OOHW , which need to be adequately addressed by the applicant in a resubmitted document to the satisfaction of the reviewers. The review timeframe is 7 days for the Sydney Metro and ER and the AA to provide comments. Once approved, a community notification timeframe of 14 days also applies.

A flowchart describing the overall process is shown on the next page with targeted discussion on the following pages.



2.1 Scoping Phase



In the scoping phase, the applicant shall document the need, scope and methodology for the proposed works on the OOHW Review form to provide background information. Establishing the proposed methodology and items of construction equipment is important as it will form the basis of impacts and then also mitigations.

Through the Applicant's Place Manager, early consideration of the feedback from potentially affected receivers shall be incorporated within this phase. Such feedback could help develop alternative options for methodology and scheduling can be explored and introduced here also.

2.1.1 Justification of the OOHW

Work associated with the Project will be undertaken in accordance with the assessment and management approach outlined in the Construction Noise and Vibration Standard (CNVS). The CNVS requires that work proposed outside of standard work hours must be appropriately justified. OOHW are defined as any works that are undertaken outside of the hours defined in Infrastructure Approval [SSI-22765520](#) Conditions E25 and E26 being:

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

Except as permitted by an EPL, high noise intensive works that results in an exceedance of the applicable Noise Management Level (NML) at the same receiver must only be undertaken:

- (a) between the hours of 8:00 am to 6:00 pm Monday to Friday;
- (b) between the hours of 8:00 am to 1:00 pm Saturday; and
- (c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one (1) hour.

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

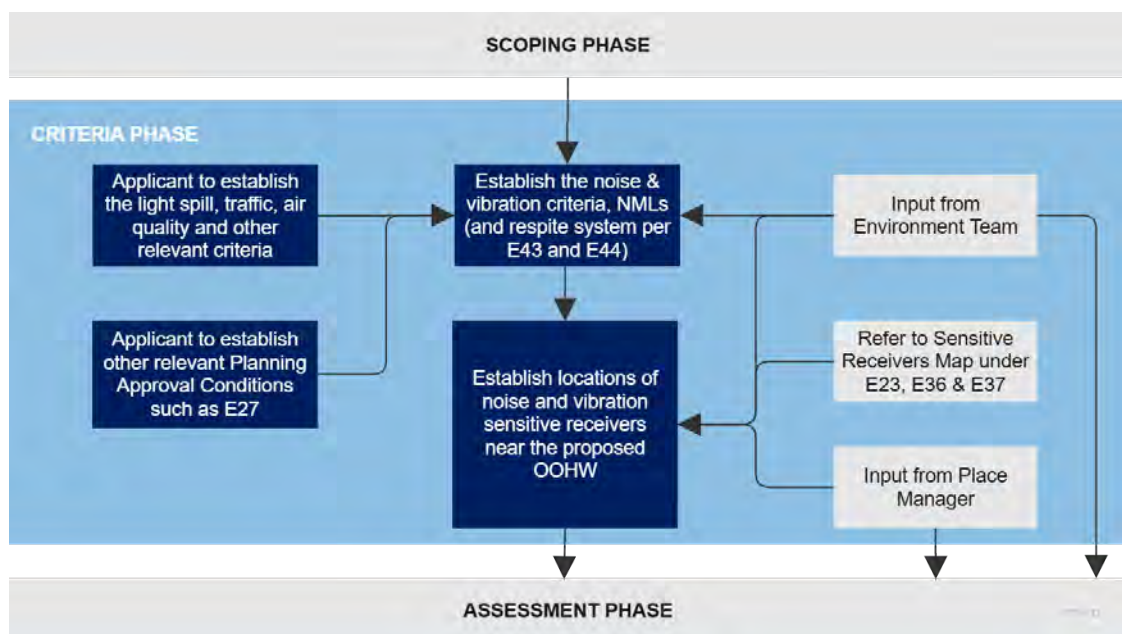
The justification for conducting the proposed works outside standard hours needs to be provided on the OOHW Review form. Given the cost and disruption associated with OOHW, these should only be conducted when daytime works are not approved or if more disruption would occur from daytime works. Justification on the basis of accelerating a work program, or out of convenience for a work program, is not a valid justification and will generally not be accepted. These are only considered on the basis that works are not for program acceleration, but rather to keep sites progressing in the

face of the unforeseen circumstances. Further justification is required to be provided for consideration by Sydney Metro, the AA and, ER, including but not limited to:

- instances where works must occur on/adjacent to live traffic, such that a Road Occupancy Licence must be obtained, of which is only provided during periods of reduced traffic/ pedestrian activity
- to limit the impact to commercial or other sensitive receivers which may operate during specific periods of time (i.e. medical centres, childcare centres etc.)
- to undertake works on utilities such as gas, or water, of which can only be permitted by utility providers during OOHW periods as working on major utilities during the day when they are most in use could pose a risk to the general public.

The Project Team are best placed to document this phase on the OOHW Review form.

2.2 Criteria Phase



Here, the criteria for assessing the OOHW impacts to receivers and for applying mitigations should be formalised and agreed. Criteria for other environmental impacts such as light spill, dust, traffic, crowds etc should also be identified here.

Some relevant guidelines for establishing project-specific noise and vibration criteria to guide the review of mitigation measures include the following:

- Airborne and ground-borne noise - the Interim Construction Noise Guideline (DECC, 2009). The Interim Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5 dB(A) to the predicted level before comparing to the construction Noise Management Level (NML)
- Vibration (human comfort) - Assessing vibration: a technical guideline (DEC, 2006)
- Building damage - BS 7385 Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2" as they are "applicable to Australian conditions"

- Heritage items - German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures (for structural damage) (applicable when a heritage-listed structure is identified as structurally unsound)
- Sleep disturbance - NSW Noise Policy for Industry, Environment Protection Authority 2017
- Environmental Criteria for Road Traffic Noise Road Noise Policy (DECCW, 2011).

In accordance with Section 2.5 of NSW Noise Policy for Industry and Section 2.7 of Sydney Metro CNVS, a detailed maximum noise level assessment should be undertaken where night-time noise levels at a residential location exceed the:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or the
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

Additionally, Noise Sensitive Receivers (NSRs) and sensitive land uses near the OOHW under Condition E23, E36 & E37 also need to be identified and documented within the OOHW Review form. Here, specialist input from the Community and Environment teams would help the applicant develop a better understanding of nearby receivers that may or may not be identified under E23, E36 & E37 that would be impacted. The Place Manager will provide inputs for inclusion in each OOHW Review form for the AA and ER to better understand how the proposed OOHW would impact the nearby receivers, as well as the risk levels of the proposed activity.

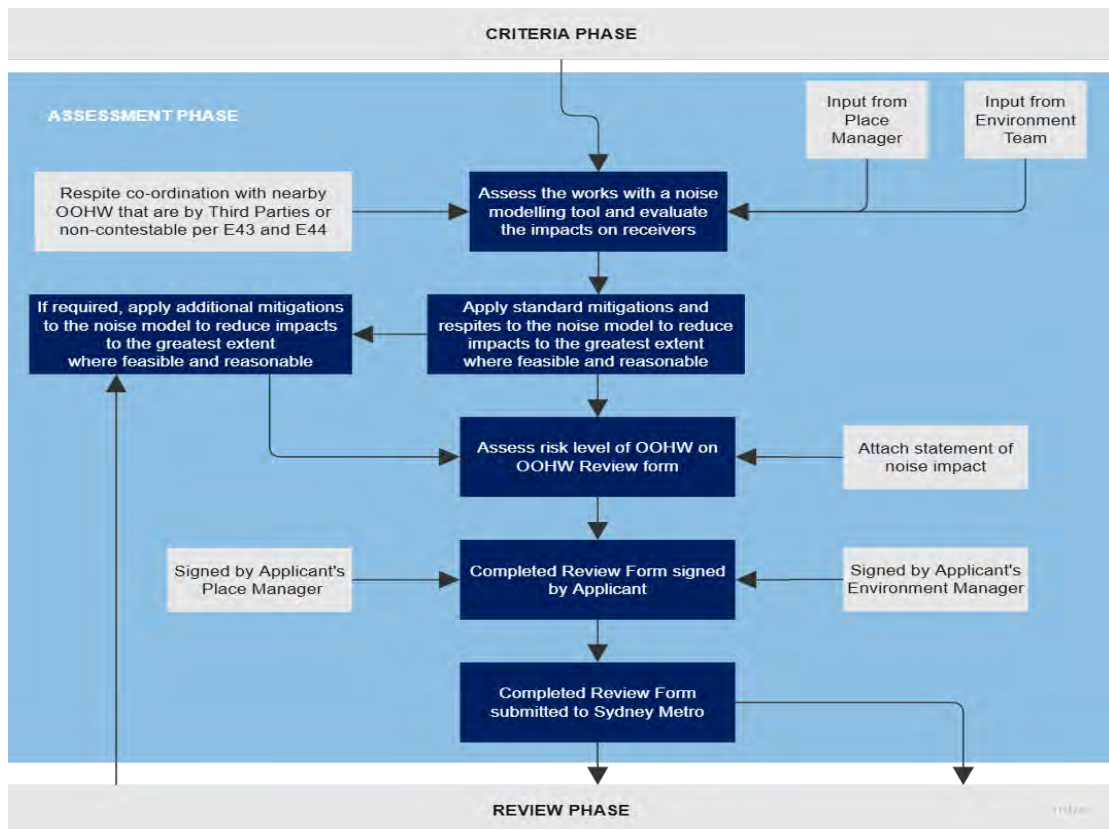
Following identification of NSRs which may be affected by the proposed activity, the above guidelines will be utilised to identify noise and vibration criteria based upon the NSR types, distance from the works, and the location and timing of the proposed activity.

Refer to E43 and E44 for particulars on respite systems to be considered.

Refer to the applicable Construction Noise and Vibration Management Plan (CNVMP) and the CNVS for criteria for building damage as an assessment of the building structure may be required to confirm if it is either:

- (a) Reinforced or framed, or
- (b) Unreinforced or light framed structure
- (c) A heritage structure which is structurally sound or not.

2.3 Assessment Phase



The assessment phase is the key component of the OOHW Protocol and is where the information collected in the scoping and criteria phase are modelled in a noise modelling tool. The impact can only be assessed in conjunction with clear information about the sequence of work (and noise) during a shift (or over the duration of works).

The predicted impacts are displayed and can be checked against the noise-relevant criteria. Mitigations can be introduced to minimise these impacts and the estimated reduction in noise impact can also be modelled.

Importantly, an understanding of the environmental constraints of the proposed OOHW, supported by a noise modelling tool can enable a determination of the risk level of the OOHW to be made. The OOHW approval pathway can then be determined.

2.3.1 Consideration of OOHW against NML and Vibration criteria

Noise Management Levels (NMLs) are specific noise criteria that are unique to each Noise Catchment Area (NCA) within the project and are derived from the Rating Background Level (RBL) for each NCA.

An RBL is usually determined through actual noise measurements for different 'daytime', 'evening' and 'night' periods. The applicant's noise consultant will use established RBLs from the Environmental Impact Assessment (EIS) for different noise catchments and then will add the relevant noise increment to these RBL's to derive each NML.

NML's will be documented in the applicant's Detailed Noise Vibration and Impact Assessment (DNVIS) and then become the baseline against which all future noise assessments are compared. The range between the NML and 75dB(A) is designated as 'noise affected' under the ICNG and the range above 75dB(A) is known as 'highly noise affected'.

The goal of implementing standard and additional mitigation measures is to attenuate the noise experienced by receivers to as close to (or below) the NML as possible.

Consideration of vibration criteria follows a similar pathway. The DNVIS will show the vibration contours at each construction site modelled for different phases of work. The contours should show different levels for:

- human discomfort
- impact on heritage structures
- cosmetic damage

An alternative to vibration contours could be the use of established minimum working distances supported by calculations or validation monitoring of plant that is repeatedly used during OOHW.

Once modelled, mitigations, plant selection or scheduling can be applied to ensure the impact of vibration is managed to below the relevant levels shown in the DNVIS or the statement of impact.

2.3.2 Selection and implementation of mitigation measures

The following sections deal with the selection and implementation of mitigation measures that serve to attenuate the noise emanating from proposed OOHW.

2.3.2.1 Standard mitigations

Standard mitigation measures from Section 4 in the CNVS are shown in Table 2 below and can be used to reduce the noise impact to nearby receivers in the first instance:

Table 2: Standard mitigation measures (Section 4 of the Sydney Metro CNVS)

Action Required	Applies to	Details
Management Measures		
Implementation of any project specific mitigation measures required	Airborne noise Ground-borne noise and vibration	Any <i>project specific</i> mitigation measures identified in the environmental assessment documentation (e.g. EA, REF, submissions or representations report) or approval or licence conditions must be implemented.
Implement community consultation measures	Airborne noise Ground-borne noise and vibration	Tools for consulting with the community are outlined in the OCCS. Some examples may include • newsletters • community notification • website • 24/7 project information line • Phone calls and emails • Individual briefings • In-person and/or virtual meetings with individuals or groups • factsheets • door knock • site signage and hoarding banners

Action Required	Applies to	Details
Surveillance	Airborne noise Ground-borne and vibration noise	Authorised Construction Representatives must observe work behaviours to manage monitor situations such as: • approved equipment/ plant in use • number of equipment / plant in use • time of works in accordance with approval • operating equipment dominating noise levels, and any potential requirements for maintenance/ repairs • unnecessary noise being generated from work behaviours.
Register of Noise Sensitive Receivers	Airborne noise Ground-borne and vibration noise	A register of all noise and vibration sensitive receivers (NSRs) would be kept in the applicant's Noise and Vibration Management Plan (such as the sensitive land use survey required by Condition E23). The register would include the following details for each NSR where known: • address of receiver • category of receiver (e.g. residential, commercial etc.) • contact name and phone number.
Site inductions	Airborne noise Ground-borne and vibration noise	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all relevant project specific and standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.
Behavioural practices	Airborne noise	• no swearing or unnecessary shouting or loud stereos/radios on site • no dropping of materials from height; throwing of metal items; and slamming of doors, tailgates and other equipment • elimination of unnecessary noise generation • avoid impulsive noise such as metal and metal contact • turning off idling equipment when not in use • no excessive revving of plant and vehicle engines • controlled release of compressed air • no excessive signalling with horns.
Source Controls		
Construction hours and scheduling	Airborne noise Ground-borne and vibration noise	Program to avoid noisy activities after midnight as far as practicable (such as hammering, sawing etc).

Action Required	Applies to	Details
Equipment selection and operation	Airborne noise Ground-borne noise and vibration	- Equipment to be maintained and mobilisation/ pre-start checks confirming proper and efficient operation. - Use quieter and less vibration emitting construction methods where feasible and reasonable such as smaller, lower powered, newer, or better maintained. - Examining alternative technologies and methods to complete activities more quietly, including recommend measures to avoid sleep disturbance. - Equipment operator to be appropriately qualified and competent.
Plan worksites and activities to minimise noise and vibration	Airborne noise Ground-borne vibration	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.
Non-tonal reversing alarms**	Airborne noise	Non-tonal reversing beepers** (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant for any out-of-hours work.
Minimise disturbance arising from delivery of goods to construction sites	Airborne noise	- Loading and unloading of materials/deliveries is to occur as far as possible from NSRs - Select site access points and roads as far as possible away from NSRs - Dedicated loading/unloading areas to be shielded if close to NSRs - Delivery vehicles to be fitted with straps rather than chains for unloading, wherever feasible and reasonable
Path Controls		
Shield stationary noise sources such as pumps, compressors, fans etc	Airborne noise	Enclosures or shields on or around stationary noise sources.
Shield sensitive receivers from noisy activities	Airborne noise	Use structures and/ or screens to shield NSRs.

**or movement alarms.

2.3.2.2 Additional mitigation measures

In addition to the above standard mitigation measures, additional mitigation measures described in the CNVS are required to be implemented based on the predicted noise levels above NMLs, or maximum predicted levels, as reasonable and feasible. Such additional mitigation measures and matrices for noise, ground-borne noise and vibration exceedances are shown in the CNVS (reflected in Tables 3, 4, 5 and 6 below for the OOHW periods).

There may be personal circumstances among the NSRs where the conventional approach to additional mitigation measures is not best suited. The AA in accordance with E41 has the authority to amend/ over-ride the below approach with the aim of achieving a better outcome for unique circumstances of NSR's.

Table 3: Additional mitigation measures (CNVS Table 15)

Measure	Description	Abbreviation
Letter box drops	Letter box drops collectively consist of the following Standard Mitigation Measures a) Newsletters of work activities and progress b) Notification letters prior to especially noisy activities and out-of-hours works. These are distributed to local communities, stakeholders and businesses via letterbox drop and/or email to subscribers where	LB a) b)

Measure	Description	Abbreviation
	relevant email addresses are known, as well as made available on the Sydney Metro website.	
Monitoring	Where it has been identified that specific construction activities are likely to exceed the relevant noise or vibration goals, noise or vibration monitoring may be conducted at the affected receiver(s) or a nominated representative location (typically the nearest receiver where more than one receiver have been identified). Monitoring can be in the form of either unattended logging or operator attended surveys. The purpose of monitoring is to inform the relevant personnel when the noise or vibration goal has been exceeded so that additional management measures may be implemented.	M
Individual briefings	Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Communications representatives would deliver specific notification, visit in person and/or email / call contact by phone identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project and specific needs etc. Individual briefings may be undertaken when specific contact details of impacted stakeholders are available, or where access to deliver specific notifications or visit is achievable.	IB
Project specific respite offer	The purpose of a project specific respite offer is to provide residents subjected to lengthy periods of noise or vibration respite from an ongoing impact.	RO
Alternative accommodation	Alternative accommodation options may be provided for residents living in close proximity to construction works that are likely to incur unreasonably high impacts over an extended period of time. Alternative accommodation will be determined on a case-by-case basis.	AA

Table 4: Additional mitigation measures – Airborne construction noise (CNVS Table 16)

Time Period		Mitigation Measures Predicted LAeq (15minute) noise level Above NML				Predicted LAeq (15minute) noise level
		0 to 10 dB	11 to 20 dB	21 to 30 dB	> 30 dB	> 75 dBa
Standard	Mon-Fri (7.00 am - 6.00 pm)	-	LB a)	LB a) and b), M	LB a) and b), M	Must not commence before 8.00am NOTE 1
	Sat (8.00 am - 6.00 pm)					NOTE 1 Must be complete by 1.00pm
	Sun/Pub Hol (Nil)					Additional approval required
OOHW Period 1 DAY	Saturday (7.00 am – 8.00 am)	LB a)	LB a), M	LB a) and b), M	LB a) and b), M, IB, RO	Additional approval required
	Sunday and Public Holidays (8.00 am - 6.00 pm)					

Time Period		Mitigation Measures Predicted LAeq (15minute) noise level Above NML				Predicted LAeq (15minute) noise level
		0 to 10 dB	11 to 20 dB	21 to 30 dB	> 30 dB	> 75 dBa
OOHW Period 1 EVENING	Mon-Sat (6.00 pm - 10.00 pm)	LB a)	LB a), M	LB a) and b), M, RO	LB a) and b), M, IB, RO	Additional approval required
OOHW Period 2 NIGHT	Mon-Fri (10.00 pm - 7.00 am)	LB a)	LB a) and b), M, RO	LB a) and b), M, IB, RO, AA	LB a) and b), M, IB, RO, AA	Additional approval required
	Sat (10.00 pm - 8.00 am Sunday morning)					
	Sunday (6.00 pm - 7.00 am Monday morning)					
	Public Holidays (Before 8.00 am or after 6.00 pm)					

NOTE 1: Except under an EPL or alternate approval, high impacts works must not exceed three (3) hours, with a minimum cessation of work of not less than one (1) hour.

Table 5: Additional mitigation measures – Groundborne const. Noise (CNVS table 17)

Time Period		Mitigation Measures				
		Predicted LAeq (15minute) noise level Above NML			Internal Residential Objective LAeq (15minute)	
		0 to 10 dB	11 to 20 dB	> 20 dB	> 40 dB	> 35 dB
Standard	Mon-Fri (7.00 am - 6.00 pm)	No NML for GBN during standard hours, refer to Table 18 of CNVS				
	Sat (8.00 am - 1.00 pm)					
	Sun/Pub Hol (Nil)					
OOHW Period 1 DAY	Saturday (7.00 am – 8.00 am)	LB a)	LB a) and b), M	LB a) and b), M, IB, RO	Nothing additional	
	Sunday and Public Holidays (8.00 am - 6.00 pm)					
OOHW Period 1 EVENING	Mon-Sat (6.00 pm - 10.00 pm)	LB a)	LB a) and b), M	LB a) and b), M, IB, RO	LB a) and b), M, IB, RO	Nothing additional
OOHW Period 2 NIGHT	Mon-Fri (10.00 pm - 7.00 am)	LB a) and b), M,	LB a) and b), M, IB, RO, AA	LB a) and b), M, IB, RO, AA	LB a) and b), M, IB, RO, AA	
	Sat (10.00 pm - 8.00 am)					
	Sunday (6.00 pm - 7.00 am Monday morning)					
	Public Holidays (Before 8.00 am or after 6.00 pm)					

Table 6: Additional Mitigation Measures – Groundborne Vibration (CNVS table 18)

	Time Period	Mitigation Measures
		Predicted Vibration Levels Exceed the maximum levels predicted to cause adverse comment (See Table 6 of CNVS)
Standard	Mon-Fri (7.00 am - 6.00 pm)	LB a), M, RO
	Sat (8.00 am - 6.00 pm)	
	Sun/Pub Hol (Nil)	
OOHW Period 1 DAY	Saturday (7.00 am – 8.00 am)	LB a) and b), M, IB, RO
	Sunday and Public Holidays (8.00 am - 6.00 pm)	
OOHW Period 1 EVENING	Mon-Sat (6.00 pm - 10.00 pm)	LB a) and b), M, IB, RO
OOHW Period 2 NIGHT	Mon-Fri (10.00 pm - 7.00 am)	LB a) and b), M, IB, RO, AA
	Sat (10.00 pm - 8.00 am)	
	Sunday (6.00 pm - 7.00 am Monday morning)	
	Public Holidays (Before 8.00 am or after 6.00 pm)	

2.3.3 Identification of low and high risk activities

The applicant will initially categorise the proposed OOHW as either low or high risk. The AA and ER will review all proposed OOHW and confirm or amend these risk levels.

The proposed OOHW will then be subject to the relevant approval pathway:

- Low risk activities are approved by the ER in consultation with the AA
- High risk activities are approved by the Planning Secretary.

High risk and Low risk OOHW are differentiated using the below table:

Table 7: Classification of low and high risk OOHW

Low Risk	High Risk
Works that do not trigger the 'high risk' criteria for residential receivers Works that are not considered high risk following consultation with the AA, the ER and input from the Place Manager	OOHW will be categorised as 'high risk' for residential receivers if the first two mandatory criteria and then at least one of the three supplementary criteria are satisfied OR Any other works that are considered high risk by the AA or the ER. Mandatory: 1. The affected noise sensitive receivers are High Impact as defined in the CNVS: e.g. Residential home for the elderly/high density unit blocks/ persistent complainants/ residents deemed to have "construction noise fatigue"; and 2. The predicted noise level of the OOHW exceeds the sleep disturbance criteria (i.e. LAFmax 52 db(A) or the prevailing Rating Background Level + 15 dB or more); and At least one of the following three supplementary criteria: 3. The type of and intensity of noise emitted from the OOHW is categorised as High Noise Impact (e.g. prolonged high noise and / or vibration intensive activities); or 4. OOHW that will result in noise from the project exceeding the NML during the night period for any sensitive receiver for more than: a) 2 consecutive nights; or b) 3 nights in any week; or c) 10 nights in any month, or 5. The OOHW will result in out of hours noise at a sensitive receiver, between the hours of 12:00am and 7:00am, exceeding the NML by 30 dB(A) for airborne noise or 20 dB(A) for ground borne noise or vibration exceeding the human response criteria. Other Cases: Any other works that are considered high risk by the AA or the ER¹. For non-residential receivers, OOHW may be considered as 'high risk' if undertaken during trading hours and in close proximity to their place of business (for example, during Saturday trading hours). Since each non-residential receiver has different business needs, it is imperative that the Place Manager provides advice for inclusion in each OOHW Review form for the AA and ER to better understand how the proposed OOHW would impact any businesses and confirm the risk levels of the proposed activity.

¹ This includes any other factors the AA and ER consider relevant as per Table 8 of this document.

As part of their review, using the applicant's assigned risk level as a 'starting point', the AA and ER will consider other relevant factors to confirm or adjust the nominated risk level from either 'high risk' to 'low risk' or vice-versa. These relevant factors include:

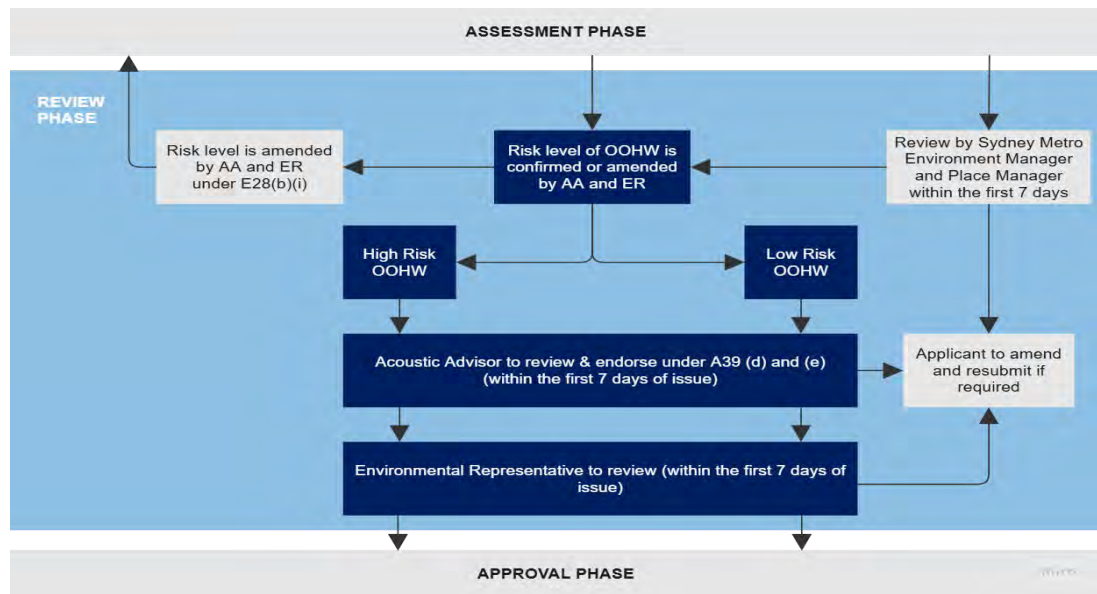
- those listed in Table 8 of this document
- Third Party approvals and permits
- any other factors the AA and ER consider relevant.

Table 8: Risk level considerations

Aspect	Guidance
Predicted Noise Exceedance	The degree of predicted noise level exceedance above the RBL or NML as appropriate
Duration and timing	Length of time the peak predicted noise levels are anticipated, and timing during the shift peak predicted noise levels are likely to occur.
Certainty	Whether RBLs, NMLs or predicted noise impacts are not well understood
Past Experience	Nature of works are new, in a new location or have not been undertaken by the contractor on the project already
Frequency	The number of consecutive evenings/ nights of work, the number of non-consecutive evenings/ nights in a week, the overall number of evenings/ nights.
Negotiated Agreement with Sensitive Receivers	Whether negotiated agreements have been obtained in accordance with CoA E27(c)(iii). Substantial majority should be more than 65% of respondents.
Potential Sleep Disturbance	Whether the activity is likely to exceed the Project's sleep disturbance criteria
Number of awakening events	How often (the potential number) and when in the shift are awakening events likely to occur, and how do the noise levels of the awakening events compare to ambient noise levels.
Non-Residential Receivers	Whether the impacted non-residential receivers operate within the same time period as scheduled OOHW.
Special Events	The timing and location of special events in the area of the proposed OOHW may be scheduled at the same time or immediately before or after the special event (e.g. festivals, public gatherings etc.)
Consultation fatigue	Where a noise sensitive receiver is being notified continuously for upcoming OOHW. The notifications and OOHW lookaheads should regulate the flow of information so that it remains consistent, and predictable.
Construction fatigue	Where a common NSR is subjected to very long periods (more than 3 months) of day work and OOHW from overlapping or concurrent projects.

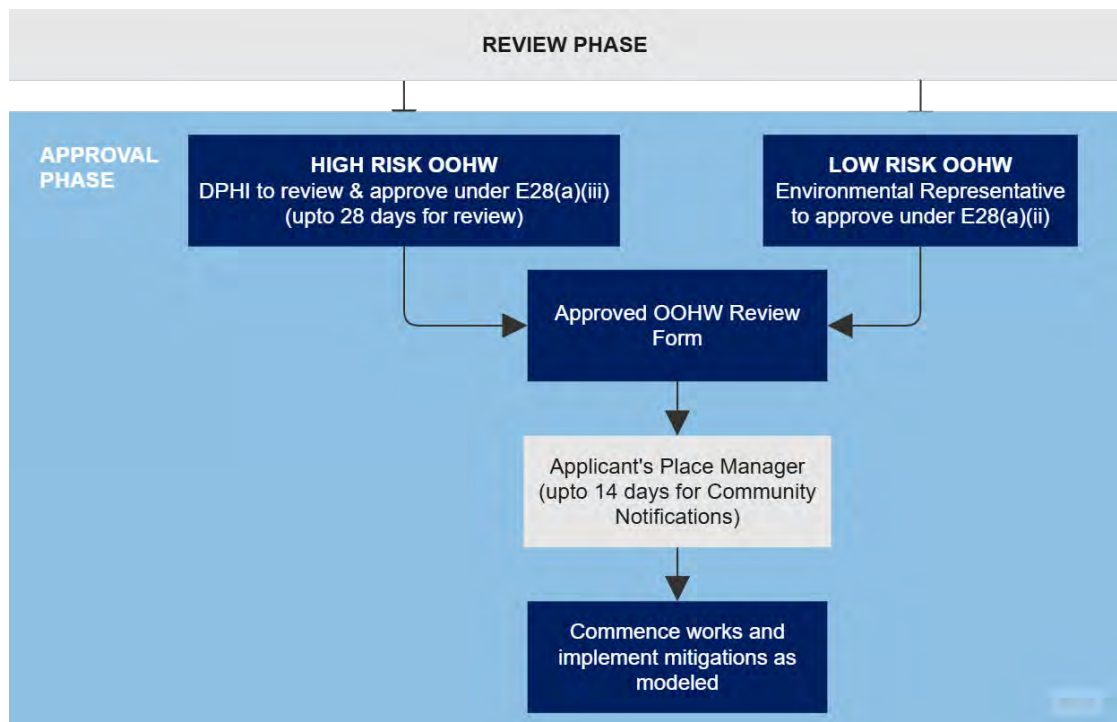
Following their consideration, the AA and ER will confirm the final classification level on the OOHW Review form (including any risk identification commentary), the approval pathway will follow that outlined in the table below.

2.4 Review Phase



When the OOHW Review form is submitted to Sydney Metro, the target review period is seven days for review by the Sydney Metro Environment Manager, Place Manager, Acoustic Advisor and Environmental Representative. Please note that these reviews may occur in parallel. Comments from this review phase will be provided to the applicant for amendment of the OOHW Review form. Close-out of comments should be actioned within 24 hours to enable the review to progress to approvals quickly. It is to be noted that submission of a OOHW Review form does not constitute approval to commence OOHW.

2.5 Approval Phase



Low Risk OOHW can be approved by the ER under E28(b)(ii) in consultation with the AA. The ER will rely on the AA's assessment and endorsement of noise and vibration related aspects of the application. High Risk OOHW must be submitted to DPHI for a

standard 28-day review and approval period. This is summarised again in Table 9 below:

Table 9: Role according to OOHW Classification

Classification	AA	ER	DPHI
Low risk	Review & endorse under A39(d) and (e)	Review & approve under E28(b)(ii)	N/A
High risk	Review & endorse under A39(d) and (e)	Review	Review & approve under E28(b)(iii)

For High Risk OOHW, it is suggested to hold a **targeted meeting with DPHI before the application** is submitted to explain the works and justifications in a presentation. Mitigations and alternatives can be discussed, and it would also be a valuable forum for DPHI to ask any questions about the High Risk OOHW whilst the AA and the ER are present. DPHI may confer with the AA and the ER in these applications also.

Once approved, the OOHW Review form should be provided to the applicant's Place Manager for the development and distribution of notifications to the affected community. There is up to no less than 5 calendar days and not more than 14 calendar days period for notification which must be observed, after which the OOHW can commence.

Following the community notification letterbox drop, the OOHW Review form will be returned to the team performing the work and the OOHW register updated.

2.6 Procedures to facilitate the coordination of OOHW

Coordination of OOHW with relevant interface projects occurs per the following guidelines:

- contractor's environment team prepares an OOHW lookahead program and distributes this program to relevant stakeholders regularly in accordance with E44(a). The lookahead program at a minimum should consider the following:
 - a progressive schedule for periods no less than three months with description of potential work, location and duration of out-of-hours work
 - noise characteristics and likely noise levels of the work
 - mitigation to achieve the relevant NMLs and vibration criteria
 - any updates to the program resulting in changes to OOHW reviews
- relevant interface projects would examine each other's OOHW lookahead programs to identify overlapping works
- where possible and without causing an adverse cumulative impact, OOHW are to be conducted on the same nights as neighbouring projects in order to preserve respite days/ nights
- neighbouring interface projects should communicate to resolve situations where simultaneous OOHW would yield a cumulative impact to common receivers
- interface projects should share noise data, list of OOHW plant and noise models to enable the common receivers to be identified and mitigated
- appropriate mitigations for the common receivers must be discussed and applied. Relevant interface projects should collaborate and negotiate fairly to ensure the best outcome for the community is achieved

2.7 Consultation and notification for affected receivers

Consultation with affected receivers would be carried out by the applicant's Community team so that opportunities for the best outcomes for affected receivers can be discovered. Consultation would aim to comprehensively inform noise affected receivers about the proposed OOHW and discuss options for standard and additional mitigations that would be available for the receiver.

Outcomes of the community consultation, including any identified respite periods, and the scheduling of the likely out-of-hours work, would be documented and provided to the AA, ER, EPA and the Planning Secretary before the out-of-hours works commence in accordance with E44.

2.7.1 Newsletters

Communities are more likely to understand the impacts from noise and vibration if they are provided with detailed information and commitments on mitigation measures to be implemented that are adhered to by the project prior to the works commencing. Therefore, newsletters are to be produced and distributed as follows:

- undertaken by letterbox drop or email
- made available on the Sydney Metro website
- broadly describe the locations, type of work, and provide a progressive schedule for periods no less than three (3) months for OOHW
- detail the expected noise impacts, characteristics and levels, of the works
- detail mitigation and management measures and proposed respite periods
- clearly state how additional information can be obtained through details on how to contact Sydney Metro included the number of the 24-hour telephone complaints line, site contact (where available) and the Project website address.

2.7.2 Door knocks

Individual door knock meetings are used as required to discuss potential impacts of Sydney Metro works with highly impacted stakeholders, especially residents and businesses directly neighbouring construction sites and owners or managers of nearby social infrastructure or community facilities.

2.7.3 Notifications

Specific community notifications are used as an additional mitigation measure for receivers of noise and vibration impacts from OOHW events. OOHW notifications will be issued to potentially affected sensitive receivers not less than 5 calendar days and not more than 14 calendar days prior to the OOHW commencing. Such notifications will:

- be undertaken by letterbox drop or email, and be made available on the Sydney Metro website
- clearly outline the reason that the work is required to be undertaken outside standard construction hours specified
- include a diagram that clearly identifies the location of the proposed works in relation to nearby cross streets and local landmarks
- include details of relevant time restrictions that apply to the proposed works

- clearly outline the location, nature, type of work, scope and days and dates and hours of the proposed works
- detail the expected noise impacts, characteristics and levels, of the works
- detail mitigation and management measures and proposed respite periods
- clearly state how additional information can be obtained, how to contact Sydney Metro for consulting on respite periods and how to access mitigation offers
- include the number of the 24-hour telephone complaints line, site contact (where available) and the Project website address
- The applicant, through Sydney Metro will also provide a notification to DPHI of approved low risk out-of-hours works.

2.7.4 Community Interface Coordination Group

To manage interface with another project Sydney Metro will establish a Communications Interface Coordination Group (CICG) prior to construction work at each site, when and if required. The role of the CICG is to:

- establish relationships between communications teams from interfacing projects to facilitate effective handling of enquiries and complaints where relevant
- provide an update on current and upcoming milestones, construction program and stakeholder and community issues
- provide a forum to exchange information and coordinate communication and consultation activities to ensure a consistent approach to stakeholders, the community and others is delivered.

3 Compliance matrix

This Protocol has been developed to comply with [SSI-22765520](#) CoAs and Revised Environmental Mitigation Measures (REMMs). Table 10 indicates where these requirements have been addressed.

Table 10: Out-of-Hours Work SSI CoAs and REMMs

Reference	Requirement	Addressed in
CoA E25	Work must be undertaken during the following hours: (a) 7:00 am to 6:00 pm Mondays to Fridays, inclusive; (b) 8:00 am to 6:00 pm Saturdays; and (c) at no time on Sundays or public holidays.	Section 2.1.1
CoA E26	Except as permitted by an EPL, highly noise intensive work that results in an exceedance of the applicable Noise Management Level (NML) at the same receiver must only be undertaken: (a) between the hours of 8:00 am to 6:00 pm Monday to Friday; (b) between the hours of 8:00 am to 1:00 pm Saturday; and (c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one (1) hour. For the purposes of this condition, 'continuously' includes any period during which there is less than one (1) hour between ceasing and recommencing any of the work.	Section 2.1.1

Reference	Requirement	Addressed in
CoA E28	An Out-of-Hours Work Protocol must be prepared before the approval of out-of-hours-work under Condition E27(c)(ii). The Protocol must identify a process for the consideration, management and approval of work which is outside the construction hours defined in Conditions E25 and E26. The Protocol must be approved by the Planning Secretary and implemented before commencement of the out-of-hours work. The Protocol must be prepared in consultation with the ER and the AA. The Protocol must include:	This Protocol
(a)	justification for why out-of-hours works are required;	Section 2.1.1
(b)	identification of low and high-risk activities and an approval process that considers the risk of activities, proposed mitigation, management, and coordination, including where: (i) the ER and AA review all proposed out-of-hours activities and confirm their risk levels; (ii) low risk activities can be approved by the ER in consultation with the AA; and (iii) high risk activities that are approved by the Planning Secretary;	Section 2.3.3
(c)	a process for the consideration of out-of-hours work against the relevant NML and vibration criteria;	Section 2.3.1
(d)	a process for selecting and implementing mitigation measures for residual impacts in consultation with the community at each affected location, including respite periods consistent with the requirements of Condition E44. The measures must take into account the predicted noise levels and the likely frequency and duration of the out-of-hours works that sensitive land user(s) would be exposed to, including the number of noise awakening events;	Section 2.3.2
(e)	procedures to facilitate the coordination of out-of-hours work including those approved by an EPL or undertaken by a third party, to ensure appropriate respite is provided; and	Section 2.6
(f)	notification arrangements for affected receivers for all approved out-of-hours works and notification to the Planning Secretary of approved low risk out-of-hours works. This condition does not apply if the requirements of Condition E27(b) are met. Notes: Out-of-hours work is any work that occurs outside the construction hours identified in Condition E25 and E26. The Out-of-Hours Work Protocol is intended to be used for activities where these activities cannot be undertaken during the construction hours identified in Conditions E25 and 26	Section 2.7
CoA E30	All reasonable and feasible mitigation measures must be applied when the following residential ground-borne noise levels are exceeded: (a) evening (6:00 pm to 10:00 pm) — internal LAeq(15 minute): 40 dB(A); and (b) night (10:00 pm to 7:00 am) — internal LAeq(15 minute): 35 dB(A). The mitigation measures must be outlined in the Noise and Vibration CEMP Sub-plan, including in any Out-of-Hours Work Protocol, required by Condition E28.	Section 2.3.2.1 and 2.3.2.2

Reference	Requirement	Addressed in
CoA E44	In order to undertake out-of-hours work outside the hours specified under Condition E25, (except emergency work) appropriate respite periods must be identified for the out-of-hours work in consultation with the community at each affected location on a regular basis. This consultation must include (but not be limited to) providing the community with: (a) a progressive schedule for periods no less than three (3) months, of likely out-of-hours work; (b) a description of the potential work, location and duration of the out-of-hours work; (c) the noise characteristics and likely noise levels of the work; and (d) likely mitigation and management measures which aim to achieve the relevant NMLs and vibration criteria under Conditions E29(c), E29(d) and E30 (including the circumstances of when respite or relocation offers will be available and details about how the affected community can access these offers). The outcomes of the community consultation, the identified respite periods and the scheduling of the likely out-of-hours work must be provided to the AA, ER, EPA and the Planning Secretary before the out-of-hours works commence. Note: Respite periods can be any combination of days or hours where out-of-hours work would not be more than 5 dB(A) above the rating background noise level at any residence.	Section 2.2, 2.6 and 2.7
REMM NV02	The use of noise intensive equipment at construction sites with 'moderate' and 'high' out-of-hours noise management level exceedances would be scheduled for standard construction hours, where feasible and reasonable. Where this is not feasible and reasonable, the works would be undertaken as early as possible in each work shift.	Section 2.1.1 2.3.3.1, 2.3.2.1, 2.3.3.

4 Protocol review and approval

In accordance with condition E28, the Out-of-Hours Work (OOHW) Protocol must be prepared in consultation with the Acoustic Advisor (AA) and Environmental Representative (ER). The AA will then endorse the OOHW Protocol as per A39(e). Following this, the OOHW Protocol must then be approved by the Planning Secretary before the commencement of the OOHW.

A Consultation Register showing dates of consultation with the AA and the ER will be included within Appendix A.

Appendix A: Register of Consultation

Version	Date Issued to AA and ER	Date comments received
1	6/06/2025	12/06/2025, 20/06/2025
2	2/07/2025	7/07/20025, 8/07/2025
3	28/07/2025	30/07/2025
4	30/07/2025	Endorsed by AA
5	12/08/2025	RFI requested by DPHI
6	18/08/2025	Response to RFI by Sydney Metro
7	29/08/2025	RFI requested by DPHI
8	03/09/2025	Response to RFI by Sydney Metro

Our ref: SSI 22765520 PA 10

[REDACTED]
A/Executive Director
Environment, Sustainability and Planning
Sydney Metro

22 October 2025

Subject: Sydney Metro West – Stage 3 – Rail Infrastructure, Stations, Precincts and Operations
– Out of Hours Works Protocol

Dear [REDACTED]

Thank you for submitting the West – Rail Infrastructure, stations, precincts and operations (Stage 3) Out-of Hours Work Protocol, Version 6, dated 3/9/2025 (the OOHWP) on 12/9/2025. Thank you also for your response to our requests for additional information.

I note the OOHWP:

- has been reviewed by Sydney Metro and no issues have been raised with the department
- has been reviewed by the Environmental Representative, and
- has been endorsed by the Acoustic Adviser

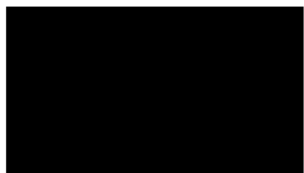
Accordingly, I approve the OOHWP under condition E28 of SSI 22765520 as nominee of the Planning Secretary.

If there are any inconsistencies between the document and the conditions of approval, the conditions prevail.

Please make the document and this letter publicly available on the project website as soon as possible.

If you wish to discuss the matter further, please contact [REDACTED]
[REDACTED]

Yours sincerely,

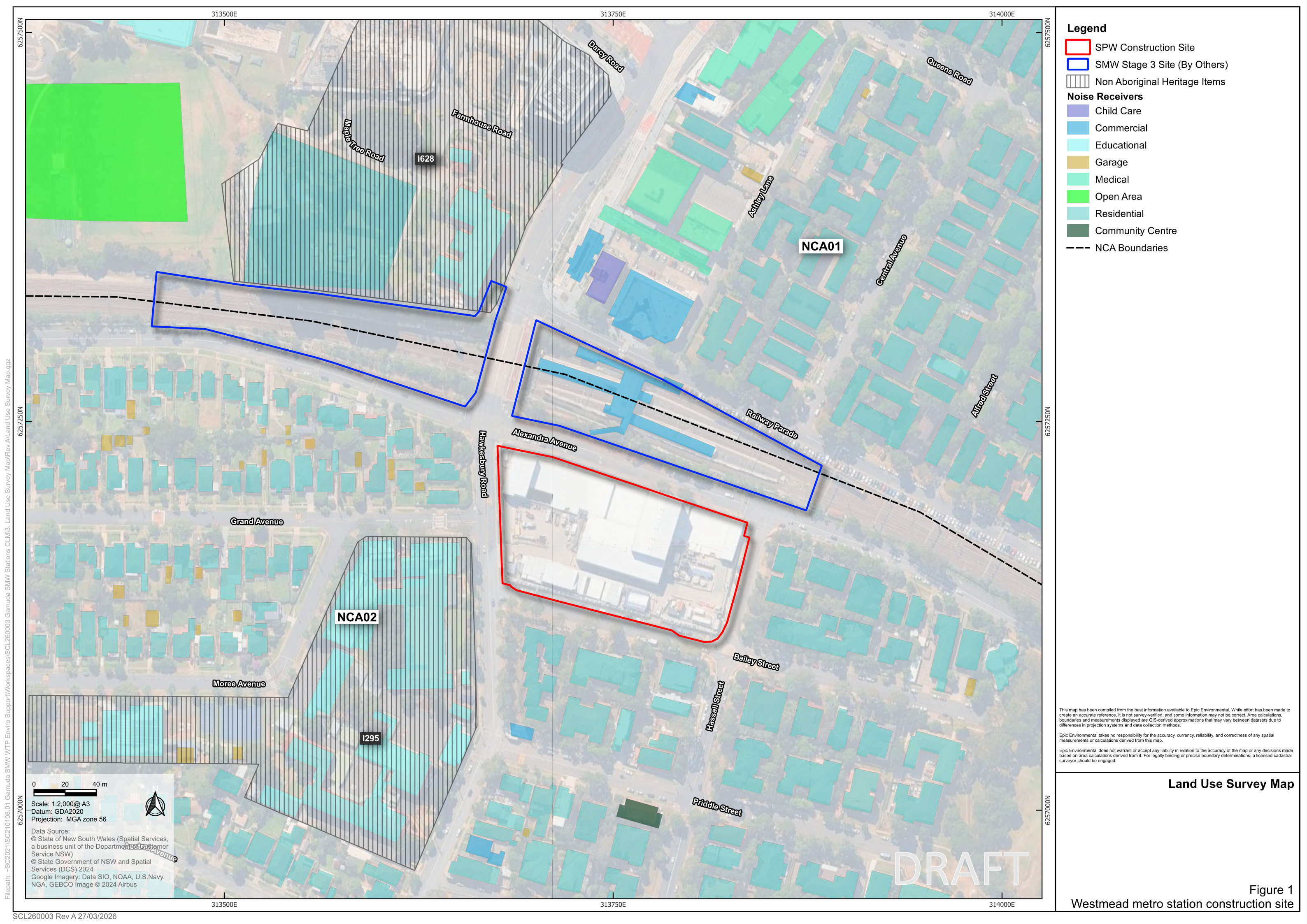


Executive Director
Infrastructure Assessments

Appendix D – Construction Noise and Vibration Monitoring Program

Refer - SMWSTSPW-GEA-SWD-EN-PRG-000002

Appendix E – Land Use Surveys



- Legend**
- SPW Construction Site
 - SMW Stage 3 Site (By Others)
 - Non Aboriginal Heritage Items
 - Noise Receivers**
 - Child Care
 - Commercial
 - Educational
 - Garage
 - Medical
 - Open Area
 - Residential
 - Community Centre
 - NCA Boundaries

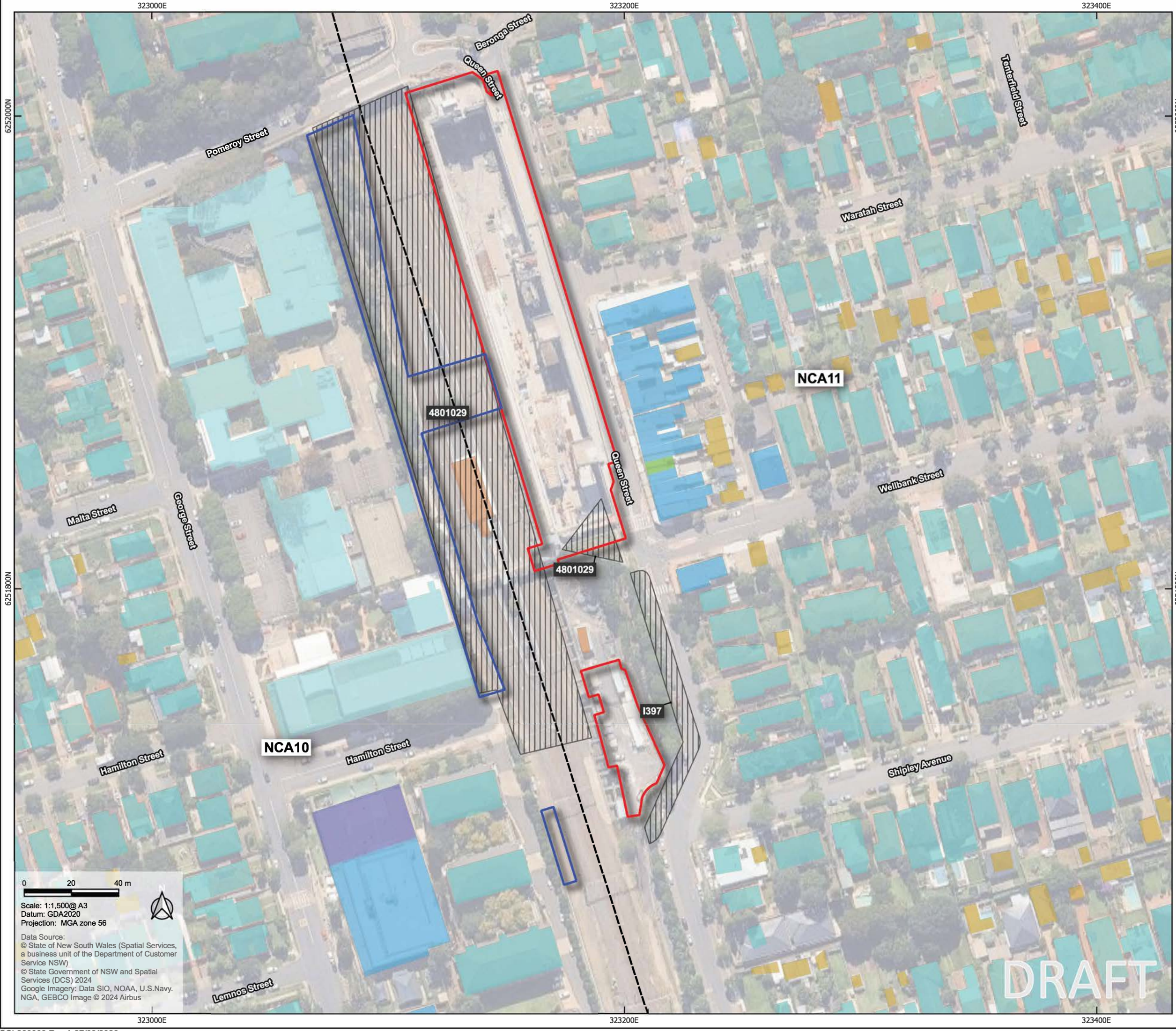
This map has been compiled from the best information available to Epic Environmental. While effort has been made to create an accurate reference, it is not survey-verified, and some information may not be correct. Area calculations, boundaries and measurements displayed are GIS-derived approximations that may vary between datasets due to differences in projection systems and data collection methods.

Epic Environmental takes no responsibility for the accuracy, currency, reliability, and correctness of any spatial measurements or calculations derived from this map.

Epic Environmental does not warrant or accept any liability in relation to the accuracy of the map or any decisions made based on area calculations derived from it. For legally binding or precise boundary determinations, a licensed cadastral surveyor should be engaged.

Land Use Survey Map

Figure 1
Westmead metro station construction site



- Legend**
- SPW Construction Site
 - SMW Stage 3 Site (By Others)
 - Non Aboriginal Heritage Items
 - Noise Receivers**
 - Child Care
 - Commercial
 - Educational
 - Garage
 - Industrial
 - Residential
 - Retail
 - NCA Boundaries

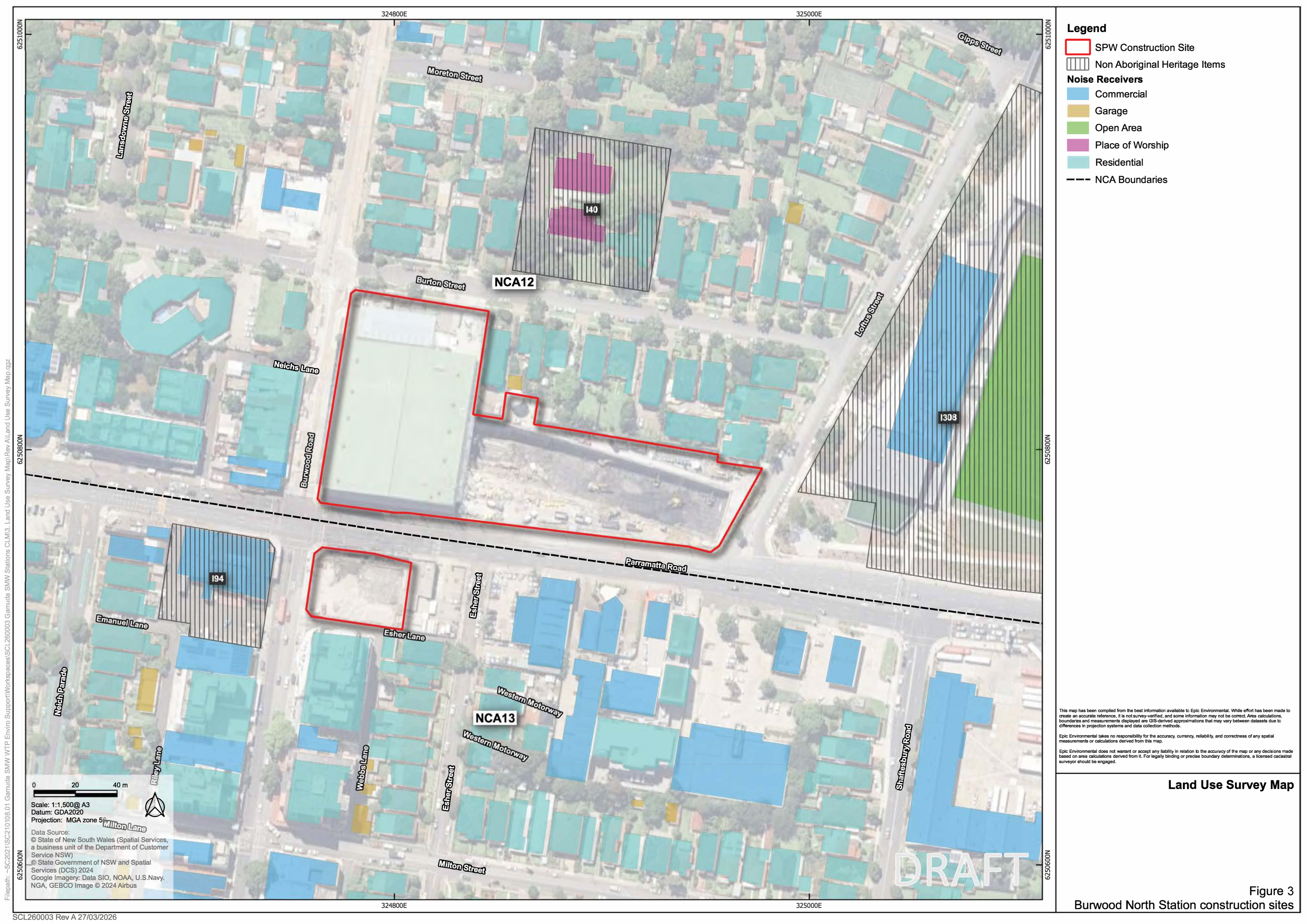
This map has been compiled from the best information available to Epic Environmental. While effort has been made to create an accurate reference, it is not survey-verified, and some information may not be correct. Area calculations, boundaries and measurements displayed are GIS-derived approximations that may vary between datasets due to differences in projection systems and data collection methods.

Epic Environmental takes no responsibility for the accuracy, currency, reliability, and correctness of any spatial measurements or calculations derived from this map.

Epic Environmental does not warrant or accept any liability in relation to the accuracy of the map or any decisions made based on area calculations derived from it. For legally binding or precise boundary determinations, a licensed cadastral surveyor should be engaged.

Land Use Survey Map

Figure 2
North Strathfield metro station
construction sites



Legend

- SPW Construction Site
- Non Aboriginal Heritage Items
- Noise Receivers**
 - Commercial
 - Garage
 - Open Area
 - Place of Worship
 - Residential
- NCA Boundaries

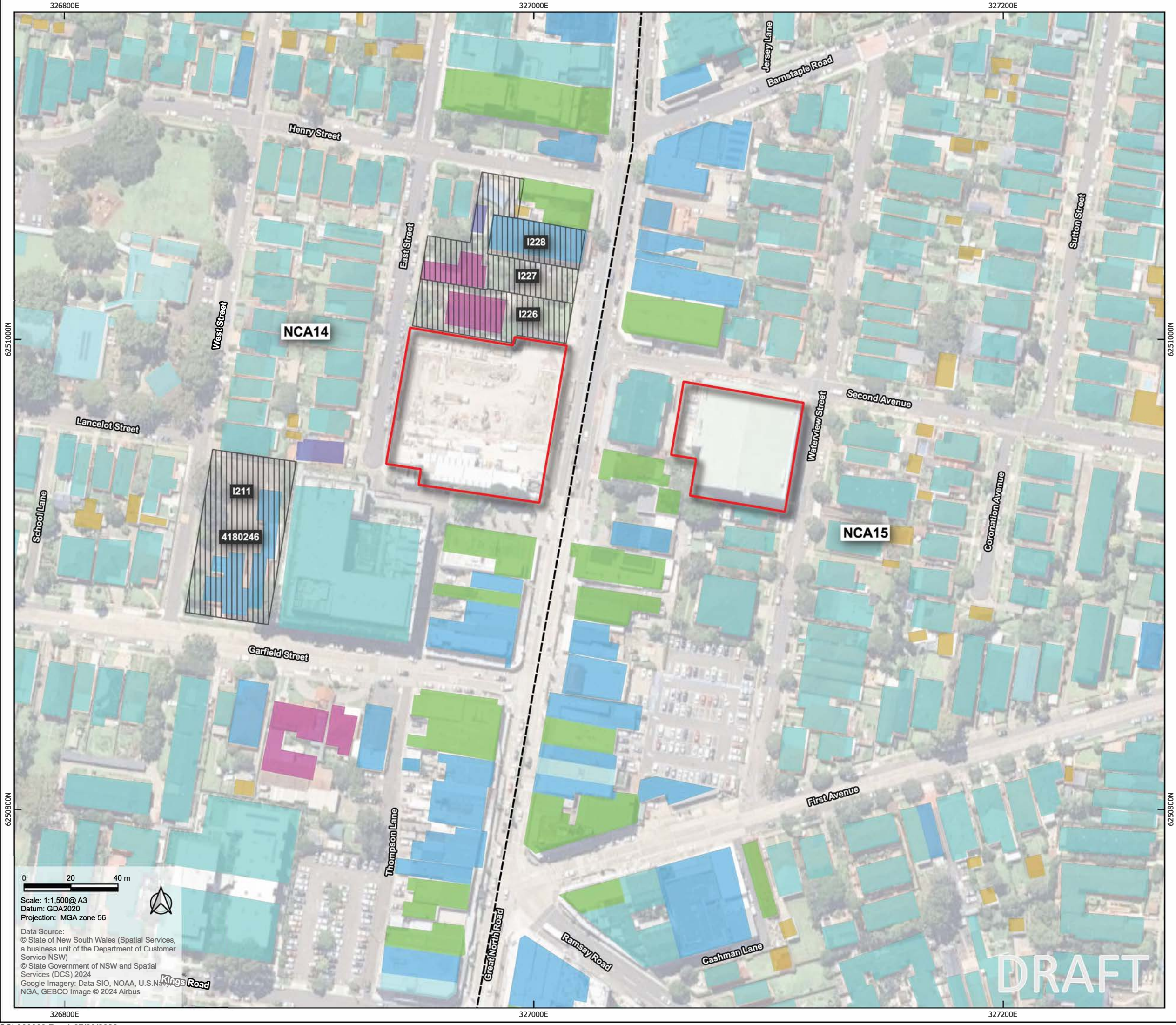
This map has been compiled from the best information available to Epic Environmental. While effort has been made to create an accurate reference, it is not survey-verified, and some information may not be correct. Area calculations, boundaries and measurements displayed are GIS-derived approximations that may vary between datasets due to differences in projection systems and data collection methods.

Epic Environmental takes no responsibility for the accuracy, currency, reliability, and correctness of any spatial measurements or calculations derived from this map.

Epic Environmental does not warrant or accept any liability in relation to the accuracy of the map or any decisions made based on area calculations derived from it. For legally binding or precise boundary determinations, a licensed cadastral surveyor should be engaged.

Land Use Survey Map

Figure 3
Burwood North Station construction sites



Legend

- SPW Construction Site
- Non Aboriginal Heritage Items
- Noise Receivers**
 - Child Care
 - Commercial
 - Educational
 - Garage
 - Place of Worship
 - Residential
 - Retail
- NCA Boundaries

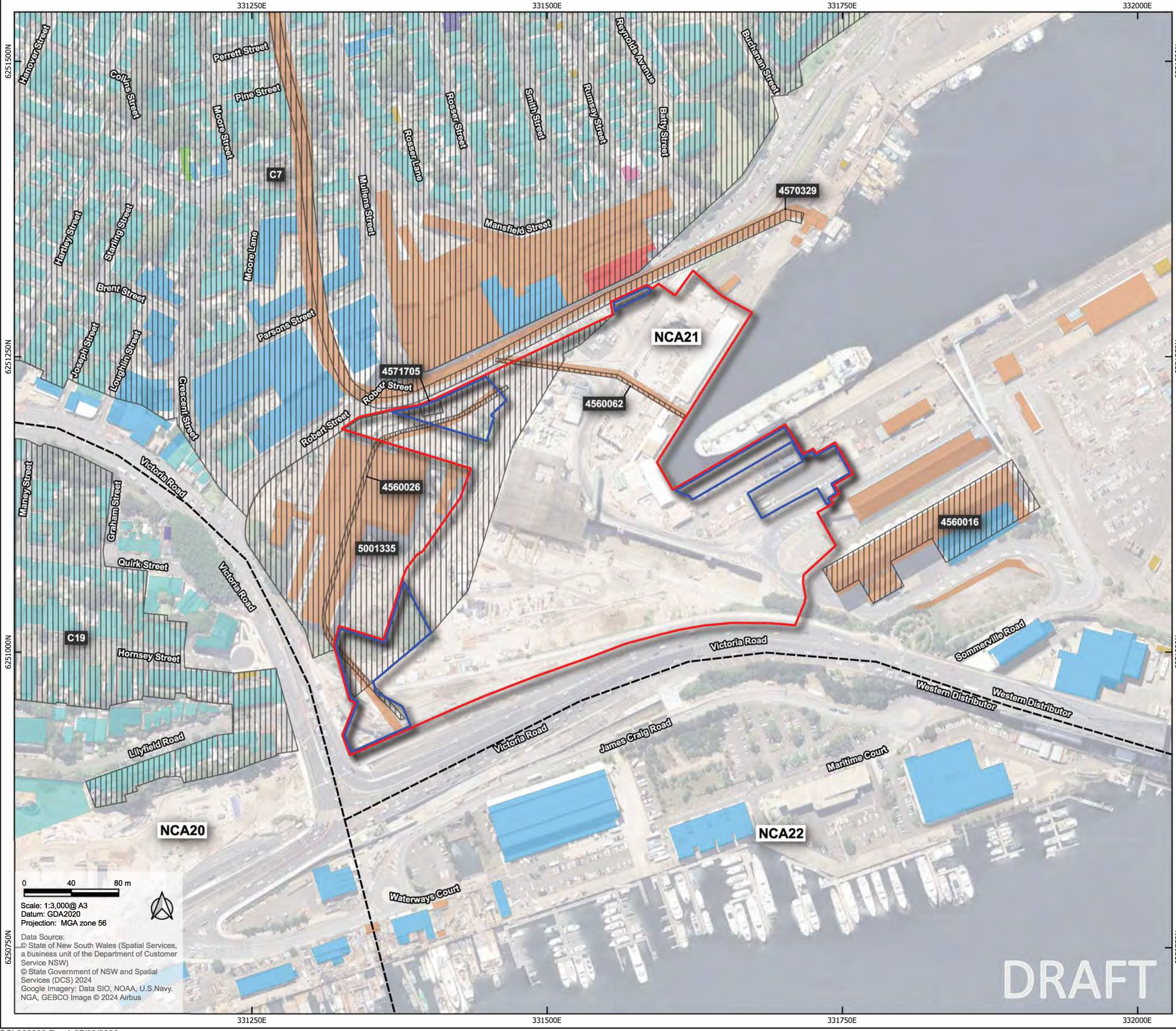
This map has been compiled from the best information available to Epic Environmental. While effort has been made to create an accurate reference, it is not survey-verified, and some information may not be correct. Area calculations, boundaries and measurements displayed are GIS-derived approximations that may vary between datasets due to differences in projection systems and data collection methods.

Epic Environmental takes no responsibility for the accuracy, currency, reliability, and correctness of any spatial measurements or calculations derived from this map.

Epic Environmental does not warrant or accept any liability in relation to the accuracy of the map or any decisions made based on area calculations derived from it. For legally binding or precise boundary determinations, a licensed cadastral surveyor should be engaged.

Land Use Survey Map

Figure 4
Five Dock Station construction sites



- Legend**
- SPW Construction Site
 - SMW Stage 3 Site (By Others)
 - Non Aboriginal Heritage Items
 - Noise Receivers**
 - Child Care
 - Commercial
 - Educational
 - Garage
 - Hotel
 - Industrial
 - Residential
 - Retail
 - Studio
 - NCA Boundaries

This map has been compiled from the best information available to Epic Environmental. While effort has been made to create an accurate reference, it is not survey-verified, and some information may not be correct. Area calculations, boundaries and measurements displayed are GIS-derived approximations that may vary between datasets due to differences in projection systems and data collection methods.

Epic Environmental takes no responsibility for the accuracy, currency, reliability, and correctness of any spatial measurements or calculations derived from this map.

Epic Environmental does not warrant or accept any liability in relation to the accuracy of the map or any decisions made based on area calculations derived from it. For legally binding or precise boundary determinations, a licensed cadastral surveyor should be engaged.

Land Use Survey Map

Figure 5
The Bays Station construction site

ACOUSTICS ADVISOR ENDORSEMENT

SYDNEY METRO WEST STAGE 3 (SSI 22765520)

Review of	Stations Package West: Noise and Vibration Management Plan & Noise and Vibration Monitoring Program	Reviewed document references:	SMWSTSPW-GEA-SWD-EN-PLN-000007 Rev. 03
Prepared by:	Aaron Miller, Acoustics Advisor		SMWSTSPW-GEA-SWD-EN-PRG-000002 Rev. 03
Date of issue:	29 April 2026		

Condition of Approval A39 e) states:

The approved AA must: review noise and vibration documents required to be prepared under the conditions of this approval, and should they be consistent with the conditions of this approval, endorse them before submission to the Planning Secretary (if required to be submitted to the Planning Secretary) or before implementation (if not required to be submitted to the Planning Secretary);

Conditions of Approval C5 a) and C13 a) require the preparation of a CEMP Noise and Vibration Sub-plan (NVMP) and a Construction Noise and Vibration Monitoring Program (NVMoP) respectively. These documents are required to be submitted to the Planning Secretary in accordance with Conditions of Approval C7 and C16 respectively.

As an approved Acoustics Advisor for the Sydney Metro West Stage 3 project, I have reviewed and provided comment on:

- The NVMP (document reference SMWSTSPW-GEA-SWD-EN-PLN-000007): Rev. 00 dated 16 February 2026, Rev. 01 dated 16 March 2026 and Rev. 02 dated 13 April 2026
- The NVMoP (document reference SMWSTSPW-GEA-SWD-EN-PRG-000002): Rev. 00 dated 25 February 2026, Rev. 01 dated 16 March 2026 and Rev. 02 dated 10 April 2026

My review comments on both documents, and those of Sydney Metro and the ER, have been addressed in Rev. 03 (dated 28 April 2026) of both plans. These noise and vibration documents are consistent with the Conditions of Approval and I therefore endorse them for submission to the Planning Secretary, in accordance with Condition of Approval A39 (e).

I note that in addition to meeting the reporting requirements of the Conditions of Approval, the contractor has agreed to collaboratively develop a practical, informal process of keeping the Acoustics Advisor informed of the outcomes of monitoring activities, with the intention of ensuring that any issues are proactively identified and resolved.



Aaron Miller, Sydney Metro West Stage 3 Acoustics Advisor

Ryan Butler
Acting Director Sustainability, Environment & Planning
Metro West
Sydney Metro
PO Box K659
Haymarket NSW 1240

30 April 2026

Ref: 251202 (c) NVMP and NVMonP (Rev 03)

Dear Ryan

RE: Sydney Metro West - Station Package West (SPW) - Noise and Vibration Management Plan (Rev 03) and Noise and Vibration Monitoring Program (Rev 03)

I refer to Sydney Metro's (SM) submission of the following documents required by Conditions C1, C5(a) and C13(a) of the Sydney Metro West – Rail Infrastructure, Stations, Precincts and Operations Approval (SSI 22765520, 25 January 2023)

- Noise and Vibration Management Plan, Sydney Metro West - Station Package West Rev 03, dated 28 April 2026 (SMWSTSPW-GEA-SWD-EN-PLN-000007)
- Noise and Vibration Monitoring Program, Sydney Metro West - Station Package West Rev 03, dated 28 April 2026 (SMWSTSPW-GEA-SWD-EN-PRG-000002)

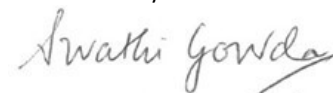
It is noted that:

- The Noise and Vibration Management Plan (Rev 03) and Noise and Vibration Monitoring Program (Rev 03) has been prepared by Gamuda (the SPW Contractor), to address the requirements of Conditions C1, C5(a) and C13(a) of the Infrastructure Approval.
- Previous versions of the aforementioned documents have been reviewed and updated following comments from SM, the Acoustic Advisor (AA) and the Environmental Representative (ER); and endorsed by the AA on 29 April 2026, in accordance with Condition A39 (e).
- In accordance with Condition C5(a) requirements, consultation has been undertaken for the NVMP with Place Management NSW and Port Authority of NSW (in respect of The Bays) and Relevant Council(s).
- In accordance with Condition C13 (a), consultation has been undertaken for the Noise and Vibration Monitoring Program with the EPA, Place Management NSW (in respect of The Bays) and Relevant Council(s).

Following the above reviews, as the approved Environmental Representative for Sydney Metro West Stage 3 and as required by Conditions A33(d), C7 and C16, I am satisfied that the aforementioned documents are consistent with requirements in or under the Approval (SSI 22765520). It should be noted that the ER is not required to endorse the specialist content in documents requiring specialist review and / or endorsement with respect to A33 d) above, as per the Approval.

On the basis of the above, the Noise and Vibration Management Plan (Rev 03) and Noise and Vibration Monitoring Program (Rev 03), are both endorsed and considered appropriate for submission to the Planning Secretary for their consideration for Approval.

Yours sincerely



Swathi Gowda
Environmental Representative – Sydney Metro West Stage 3 – Stations Package West
CC: Ari Stypel