Sydney International Speedway

Environmental Impact Statement

Volume 2 Appendices

August 2020

Cover: Artist’s impression of the new Sydney International Speedway.

Appendix A

Assessment requirements

Appendix A

Assessment requirements

Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements and where these requirements are addressed in this Environmental Impact Statement, are outlined in Table 1.

Some of the Secretary's Environmental Assessment Requirements outlined in Table 1 make reference to requirements specified in the Scoping Report. All Scoping Report requirements and where they are addressed in this Environmental Impact Statement are outlined in Table 2 of this Appendix.

Table 1 Secretary's Environmental Assessment Requirements

Reference	Secretary's Environmental Assessment Requirements	Where addressed
1. General SEARs		
1. Environmental Impact Assessment Process		
1. 1.1	The Environmental Impact Statement must be prepared in accordance with Part 3 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (the EP&A Regulation).	Appendix B(Environmental Planning and Assessment Regulation 2000, Part 3 of Schedule 2 checklist)
1.1.2	It is the Proponent's responsibility to determine whether the project needs to be referred to the Commonwealth Department of the Environment and Energy (DoEE) for an approval under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). If DoEE has determined that an approval is required under the EPBC Act, supplementary environmental assessment requirements may need to be issued to ensure a streamlined assessment under an Accredited Assessment can be achieved.	Chapter 3 (Planning and assessment process)
1.1.3	The onus is on the Proponent to ensure legislative requirements relevant to the project are met.	
2. Environmental Impact Statement		
1.2.1	The EIS must include, but not necessarily be limited to, the following: a. executive summary;	Executive Summary
	b. a description of the project, including key components and activities (including ancillary components and activities) required to construct and operate it including- • project overview • site location (including use of plans) • scope of work to construct the project, including key activities, description of methodologies, • working hours, indicative plant and equipment to be used • operational activities and times • acquisition of privately owned, council and crown land.	Chapter 5 (Project description)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
1.2.1	c. a statement of the objective(s) of the project;	Chapter 2 (Strategic need, justification and project alternatives)
	d. a summary of the strategic need for the project with regard to its State significance and relevant State Government policy;	
	e. an analysis of any feasible alternatives to the project;	
	f. a description of feasible options within the project;	
	g. a description of how alternatives to and options within the project were analysed to inform the selection of the preferred alternative / option. The description must contain sufficient detail to enable an understanding of why the preferred alternative to and options(s) within the project were selected	
	h. a concise description of the general biophysical and socio-economic environment that is likely to be impacted by the project (including offsite impacts). Elements of the environment that are not likely to be affected by the project do not need to be described;	Chapter 1 (Introduction) Chapter 17 (Socio-economic)
	i. a demonstration of how the project design has been developed to avoid or minimise likely adverse impacts;	Chapter 2 (Strategic need, justification and project alternatives)
	j. the identification and assessment of key issues as provided in the 'Assessment of Key Issues' performance outcome;	Chapter 6 to 15 and Chapter 19 (Hazards)
	k. a statement of and the quantification of outcomes and performance criteria the Proponent will achieve for each key issue;	Chapter 24 (Synthesis and conclusion of the Environmental Impact Statement)
	l. measures to avoid, minimise or offset impacts must be linked to the impact(s) they treat, so it is clear which measures will be applied to each impact;	Chapters 6 to 25
	m. consideration of the interactions between measures proposed to avoid or minimise impact(s), between impacts themselves and between measures and impacts; and	Chapter 6 to 25
	n. an assessment of the relevant cumulative impacts of the project taking into account other projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed;	Chapter 23 (Cumulative impacts)
	o. statutory context of the project as a whole, including: • how the project meets the provisions of the EP&A Act and EP&A Regulation; • a list of any approvals that must be obtained under any other Act or law before the project may lawfully be carried out;	Chapter 3 (Planning and assessment process) and Appendix B (Environmental Planning and Assessment Regulation 2000, Part 3 of Schedule 2 checklist)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
1.2.1	p. a chapter that synthesis the environmental impact assessment and provides: • a succinct but full description of the project for which approval is sought; • a description of uncertainties that remain around design, construction methodologies and/or operational methodologies and how these will be resolved in the next stages of the project; • a compilation of the impacts of the project that have not been avoided; • a compilation of the proposed measures associated with each impact to avoid or minimise (through design refinements or ongoing management during construction and operation) or offset these impacts; • a compilation of the outcomes and criteria the Proponent will achieve and how these will be monitored; and • the reasons justifying carrying out the project as proposed, having regard to the biophysical, economic and social considerations, including ecologically sustainable development and cumulative impacts.	Chapter 25 (Synthesis and conclusion of the Environmental Impact Statement)
	q. relevant project plans, drawings, diagrams in an electronic format that enables integration with mapping and other technical software.	Chapters 5 to 23
3. Assessment of Key Issues		
1.3.1	The level of assessment of likely impacts must be proportionate to the significance of, or degree of impact on, the issue, within the context of the proposal location and the surrounding environment. The level of assessment must be commensurate to the degree of impact and sufficient to ensure that the Department and other government agencies are able to understand and assess impacts.	Whole Environmental Impact Statement
1.3.2	For each key issue the Proponent must: r. describe the biophysical and socio-economic environment, as far as it is relevant to that issue, including substantiated baseline data that is reflective of current guidelines where relevant;	Chapters 6 to 15 and Chapter 19
	s. describe the legislative and policy context, as far as it is relevant to the issue;	
	t. identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), the impacts of concurrent activities within the proposal and cumulative impacts (parallel and sequential) with other projects;	Chapter 24 (Environmental Risk Analysis)
	u. demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies);	Chapters 6 to 15 and Chapter 19
	v. detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant);	
	w. detail how any residual impacts will be managed or offset, and the approach and effectiveness of these measures; and	
	x. measures to monitor the avoidance, minimisation and offsetting of impacts to ensure quantified outcomes and criteria are met.	

Reference	Secretary's Environmental Assessment Requirements	Where addressed
4. Consultation		
1.4.1	The project must be informed by consultation, including with relevant local, State and Commonwealth government agencies, infrastructure and service providers, special interest groups, affected landowners, businesses and the community.	Chapter 4 (Stakeholder and community engagement)
1.4.2	The Proponent must document the consultation process and demonstrate how the project has responded to the inputs received.	
1.4.3	The Proponent must describe the timing and type of consultation proposed during the design and delivery of the project, the mechanisms for community feedback, the mechanisms for keeping the community informed, and procedures for complaints handling and resolution.	
2. Key Issues		
1. Transport and Traffic		
2.1.1	The Proponent must assess construction transport and traffic (vehicle, pedestrian and cyclists) impacts, including, but not necessarily limited to: a. route identification, site access and egress and the nature of existing traffic on construction access routes;	Chapter 6 (Traffic, transport and parking)
	b. the indicative number and frequency of daily and peak construction related vehicle movements (passenger, commercial and heavy vehicles, including spoil management movements);	
	c. construction worker parking; and	
	d. impacts to pedestrian, cyclist and public transport access and movement.	
2.1.2	The Proponent must assess the operational transport impacts of the project, including: a. an assessment of existing local traffic volumes against forecast volumes including year of opening and 10 years from opening;	Chapter 6 (Traffic, transport and parking)
	b. performance of key intersections by undertaking a level of service analysis at key locations; and	
	c. assessment of the traffic and parking capacity of Ferrers Road and the proposed parking capacity for the project during concurrent events with the adjacent Sydney Dragway.	
2.1.3	d. The Proponent must describe the accessibility impacts of and initiatives of the project and the broader precinct, including in relation to: e. public transport infrastructure and services;	Chapter 6 (Traffic, transport and parking)
	f. cyclists and pedestrian access, amenity and safety across and adjoining the project; and	
	g. strategies and initiatives to integrate and enhance accessibility including the provision of public transport infrastructure.	
2. Noise and Vibration – Amenity		
2.2.1	The Proponent must assess construction and operational noise and vibration impacts (including cumulative impacts of concurrent events) in accordance with relevant NSW noise and vibration guidelines.	Chapter 7 (Noise and vibration)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
2.2.2	The assessment of construction noise and vibration must address: a. the nature of construction and operational activities and related noise characteristics;	Chapter 7 (Noise and vibration)
	b. the intensity and duration of both air and ground borne noise and vibration impacts;	
	c. the identification and nature of receivers existing during construction and operation;	
	d. the nature of the impact and the sensitivity of receivers and level of impact for out of hours work and events;	
	e. an assessment of operational road traffic noise;	
	f. details and analysis of the predicted effectiveness of mitigation measures to adequately manage identified impacts,	
	g. any potential residual noise and vibration impacts following application of mitigation measures; and	
	h. a description of how feedback received during the preparation of the EIS has been taken into account (and would be taken into account post exhibition of the EIS) in the design of mitigation measures, including any tailored mitigation, management and communication strategies for sensitive receivers.	Chapter 4(Stakeholder and community engagement)
3. Noise and Vibration – Structural		
2.3.1	The Proponent must assess construction and operation noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must include consideration of impacts to the structural integrity and heritage significance of items (including Aboriginal places and items of environmental heritage).	Chapter 7 (Noise and vibration)
2.3.2	The Proponent must assess the construction and operation vibration impacts of the development upon pipeline(s) and identify relevant mitigation measures where required.	Chapter 7 (Noise and vibration)
4. Biodiversity		
2.4.1	The Proponent must assess biodiversity impacts in accordance with s7.9 of the *Biodiversity Conservation Act 2016 (BC Act)*, the Biodiversity Assessment Method (BAM), and be documented in a Biodiversity Development Assessment Report (BDAR).	Chapter 8 (Biodiversity) and Technical Paper 3 (Biodiversity Development Assessment Report)
2.4.2	The BDAR must include information in the form detailed in s6.12 of the BC Act, cl6.8 of the *Biodiversity Conservation Regulation 2017* and the BAM.	Technical Paper 3 (Biodiversity Development Assessment Report)
2.4.3	The BDAR must be submitted with all digital spatial data associated with the survey and assessment as per Appendix 10 of the BAM.	Technical Paper 3 (Biodiversity Development Assessment Report)
2.4.4	The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the *Application of the Biodiversity Assessment Method Order 2017* under s6.10 of the BC Act.	Technical Paper 3 (Biodiversity Development Assessment Report)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
2.4.5	The BDAR must include details of the measures proposed to address offset obligations.	Technical Paper 3 (Biodiversity Development Assessment Report)
2.4.6	The Proponent must assess any impacts on biodiversity values not covered by the BAM.	Chapter 8 (Biodiversity)
2.4.7	The Proponent must identify whether the project, or any component of the project, would be classified as a Key Threatening Process (KTP) in accordance with the listings in the BC Act, FM Act and *the Environmental Protection and the Biodiversity Conservation Act 2000* (EPBC Act).	Chapter 8 (Biodiversity)
5. Heritage		
2.5.1	The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of: a. Aboriginal places, objects and cultural heritage values, as defined under the *National Parks and Wildlife Act 1974* and in accordance with the principles and methods of assessment identified in the current guidelines;	Chapter 10 (Aboriginal heritage)
	b. Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan;	Chapter 10 (Aboriginal heritage)
	c. environmental heritage, as defined under the *Heritage Act 1977*; and	Chapter 10 (Aboriginal heritage) and Chapter 11 (Non-Aboriginal heritage)
	d. items listed on the State, National and World Heritage lists;	Chapter 10 (Aboriginal heritage) and Chapter 11 (Non-Aboriginal heritage)
	e. heritage items and conservation areas identified in environmental planning instruments applicable to the project area.	Chapter 10 (Aboriginal heritage) and Chapter 11 (Non-Aboriginal heritage)
2.5.2	Where impacts to State or locally significant heritage items are identified, the assessment must: a. include a significance assessment, a statement of heritage impact for all heritage items and a historical archaeological assessment;	Chapter 11 (Non-Aboriginal heritage)
	b. consider the conservation policies of any relevant conservation management plan;	Chapter 11 (Non-Aboriginal heritage)
	c. consider impacts to the item caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment, drainage infrastructure, contamination remediation and site compounds (as relevant)	Chapter 11 (Non-Aboriginal heritage)
	d. outline measures to avoid and minimise those impacts during construction and operation in accordance with the current guidelines; and	Chapter 11 (Non-Aboriginal heritage)
	e. be undertaken by a suitably qualified heritage consultant(s) and/or historical archaeologist (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria).	Chapter 11 (Non-Aboriginal heritage)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
2.5.3	Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010).	No archaeological investigations are proposed as detailed in Chapter 10 (Aboriginal heritage).
2.5.4	Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines.	Chapter 10 (Aboriginal heritage)
6. Air Quality and Dust Generation		
2.6.1	The Proponent must undertake an air quality impact assessment (AQIA) for construction and operation of the project in accordance with the current guidelines.	Chapter 9 (Air quality)
2.6.2	The Proponent must ensure the AQIA includes the following: a. Identification of receivers sensitive to changes in air quality likely to result from construction or operation	Chapter 9 (Air quality)
	b. the source and intensity of emissions during construction and operation that could reduce air quality in the vicinity;	
	c. demonstrated ability to comply with the relevant regulatory framework; and	
	d. appropriate measures to avoid, minimise and/or mitigate potential impacts during construction and operation.	
2.6.3	e. The Proponent must assess the impacts of dust generation during construction and operation, including impacts affecting the safe operation of the adjacent drag strip and how the design has responded to address identified impacts, including any proposed mitigation measures.	Chapter 9 (Air quality)
7. Design, Sustainability and Visual Amenity		
2.7.1	The Proponent must identify how the project will demonstrate public benefit outcomes, including design principles, strategies and initiatives that: a. achieve quality design (landscaping, streetscape, and architectural) consistent with the existing and desired future character of the area as defined in the Eastern Creek Motor Sports Precinct, part of the *Western Sydney Parklands Plan of Management*;	Chapter 5 (Project description) and Chapter 12 (Landscape character and visual amenity)
	b. identify opportunities to reduce urban heat island effects, including in parking areas; and	
	c. address the ongoing maintenance of the space.	
2.7.2	The Proponent must provide visual representations of the project from key receiver locations and assess the visual impact of the project on: a. views and vistas;	Chapter 12 (Landscape character and visual amenity)
	b. the Western Sydney Parklands; and	
	c. heritage items including Aboriginal places and environmental heritage.	Chapter 10 (Aboriginal heritage) and Chapter 11 (Non-Aboriginal heritage)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
2.7.3	The Proponent must assess open space and tree impacts, including: a. the provision of green infrastructure;	Chapter 12 (Landscape character and visual amenity)
	b. estimating the number of trees to be cleared that will not be covered by a biodiversity offset strategy (a tree is defined by Australian Standard 4970); and	Chapter 8 (Biodiversity) and Chapter 12 (Landscape character and visual amenity)
	c. describe how the project will achieve a net increase in tree numbers and canopy within proximity of the impacted area.	Chapter 12 (Landscape character and visual amenity)
2.7.4	The Proponent must assess the project against the relevant sustainability guidelines including targets and strategies to improve Government efficiency in use of water, energy and transport.	Chapter 6 (Traffic, transport and parking), Chapter 20 (Greenhouse gases and energy) and Chapter 22 (Waste management and resource use)
8. Safety and Risk		
2.8.1	The Proponent must assess the likely risks of the project to public safety, paying particular attention to pedestrian safety, bushfire risks and the handling and use of dangerous goods.	Chapter 6 (Traffic, transport and parking) and Chapter 19 (Hazards)
2.8.2	The Proponent must undertake a risk screening assessment and analysis of the need for a preliminary hazard analysis including: a. identification of potential hazardous materials and, where possible, the volumes to be used or stored that will be used or stored at the site;	Chapter 19 (Hazards)
	b. credible adverse events that could arise;	
	c. an evaluation of potential risks against relevant criteria; and	
	d. measures to be employed to avoid, minimise or mitigate identified risks.	

Reference	Secretary's Environmental Assessment Requirements	Where addressed
9. Water – Quality		
2.9.1	The Proponent must: a. identify the ambient NSW Water Quality Objectives (NSW WQO) and environmental values for the receiving waters relevant to the project, including the indicators and associated trigger values or criteria for the identified environmental values;	Chapter 13 (Soils and surface water)
	b. demonstrate how construction and operation of the project will, to the extent that the project can influence: – where the NSW WQOs for receiving waters are currently being met they will continue to be protected; and – where the NSW WQOs are not currently being met, activities will work toward their achievement over time;	
	c. justify, if required, why the WQOs cannot be maintained or achieved over time;	
	d. identify and estimate the quality and quantity of pollutants that may be discharged and an analysis of the likely nature and degree of impact that any discharge(s) may have on the receiving environment;	
	e. identify the rainfall event that water quality protection measures will be designed to cope with;	Chapter 5 (Project description) and Chapter 13 (Soils and surface water quality)
	f. demonstrate that all practical measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented; and	Chapter 13 (Soils and surface water quality)
	g. identify sensitive receiving environments (which may include estuarine and marine waters downstream) and develop a strategy to avoid or minimise impacts on these environments; and	
	h. identify proposed monitoring and indicators of surface and groundwater quality.	
10. Soils and Contamination		
2.10.1	The Proponent must assess whether the land is likely to be contaminated and identify if remediation of the land is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses. Where assessment and/or remediation is required, the Proponent must document how the assessment and/or remediation would be undertaken in accordance with current guidelines.	Chapter 14 (Contamination)
2.10.2	The Proponent must assess the impacts on soil and land resources (including erosion risk or hazard). Particular attention must be given to soil erosion and sediment transport consistent with the practices and principles in the current guidelines.	Chapter 13 (Soils and surface water quality)

Reference	Secretary's Environmental Assessment Requirements	Where addressed
11. Water – Hydrology		
2.11.1	The Proponent must: a. describe any surface and groundwater resource (including reliance by users and for ecological purposes) likely to be impacted by the project, including stream orders, as per the BAM	Chapter 13 (Soils and surface water quality) and Chapter 15 (Groundwater and geology)
	b. prepare a water balance for ground and surface water for construction.	Chapter 22 (Waste management and resource use)
	c. assess (and model if appropriate) the impact of the construction and operation of the project (both built elements and discharges) on surface and groundwater hydrology in accordance with the current guidelines.	Chapter 13 (Soils and surface water quality) and Chapter 15 (Groundwater and geology)
	d. identify any requirements for baseline monitoring of hydrological attributes.	Chapter 13 (Soils and surface water quality)
	e. outline opportunities for the use of integrated water cycle management practices and principles to optimise opportunities for sustainable water supply, wastewater and stormwater management across the project.	Chapter 22 (Waste management and resource use)
	f. assess impacts of the development on drainage paths and on the Warragamba Pipelines Corridor.	Chapter 13 (Soils and surface water quality)
12. Other issues		
2.12.1	Social and economic, flooding, greenhouse gas and energy, climate change adaptation, waste management, property and land use assessments should be undertaken in accordance with the commitments in Section 6 of the Scoping Report.	Chapters 17 (Socio-economics), 16 (Flooding and hydrology), 20 (Greenhouse gases and energy), 21 (Climate change adaptation), 22 (Waste management and resource use), and 18 (Property and land use) Refer to Table 2. of this appendix for Scoping Report requirements.

Scoping Report assessment requirements

The Secretary's Environmental Assessment Requirements include references to the assessment requirements set out in the Sydney International Speedway Scoping Report. These requirements and where they are addressed in this Environmental Impact Statement, are outlined in Table 2.

Table 2 Scoping report requirements

Reference	Scoping Report requirements	Where addressed
Flooding and hydrology		
6.12.3	Confirmation of the existing flood behaviour for the site through a review of available site survey data, LiDAR data, land use and existing flood models and modelling results	Chapter 16 (Flooding and hydrology)
	Assessment of consistency between stormwater management and drainage design for the Sydney International Speedway with Blacktown City Councils' Floodplain Risk Management Plans and flood policy, and existing flooding behaviour	
	Identification of potential impacts of the project on catchment hydrology, loss of flood conveyance and floodplain storage	
	Identification of potential impacts due to climate change	
	Recommendation of mitigation and management measures, including those that extend beyond design responses already considered.	
Greenhouse gas ad energy		
6.13.2	Identification and quantification of the sources of greenhouse gas emissions associated with the construction and operation of the project	Chapter 20 (Greenhouse gases and energy)
	Opportunities for reducing greenhouse gas emissions and energy consumption.	
Climate change adaptation		
6.14.3	A review of climate data (including rainfall, temperature and windspeed) for the project site	Chapter 21 (Climate change adaptation)
	Identification of parts of the project which are most susceptible to climate change impacts	
	Identification of possible climate related impacts.	
Socio-economic		
6.15.3	Description of the existing socio-economic profile for the communities and businesses surrounding the project, including: • Social characteristics, including population and demography; families and housing; travel behaviour; socio-economic indicators • Economic characteristics, including labour force, income and employment; and business and industry.	Chapter 17 (Socio-economic) and Technical Paper 10 (Socio-economic)
	Description of the key stakeholder groups and the values held by these communities, such as population and demographics, community services and facilities, local access and connectivity, amenity and character, and business and industry	
	Assessment of the potential impacts of the project on the socio-economic values of the study area	
	Identification of appropriate management and mitigation measures including measures to enhance the project's benefits and to avoid, manage or mitigate its potential impacts.	

Reference	Scoping Report requirements	Where addressed
Property and land use		
6.16.3	Identification of existing local land uses and property (Lot/DP) that may be affected by the project	Chapter 18 (Property and land use)
	Review of key planning policy, strategy and relevant controls and identification of strategic planning context and future land use priorities	
	Assessment of potential property and land use impacts including: • Direct impacts as a result of land occupation • Indirect impacts on surrounding land uses during construction and operation • Consistency with the aims and objectives of the *State Environmental Planning Policy (Western Sydney Parklands) 2009* and the *Western Sydney Parklands Plan of Management 2030* • Compliance with relevant land use and planning controls. • Development of mitigation and management measures.	
Waste management and resource use		
6.17.2	Identification of the waste streams likely to be generated during construction and operation of the project	Chapter 22 (Waste management and resource use)
	Identification of the expected resources required for construction and operation	
	Strategies for minimising the export of excavated materials off-site, maximising reuse opportunities and minimising the volume of excavated material disposal to landfill	
	Strategies for reducing waste such as the use of recycled materials, bulk delivery of goods to minimise packaging and arrangements with suppliers to return any unused construction materials.	

Appendix B

Environmental Planning and Assessment Regulation 2000, Part 3 of Schedule 2 checklist

Appendix B

Environmental Planning and Assessment Regulation 2000, Part 3 of Schedule 2 checklist

The requirements of Schedule 2 (Part 3) of the *Environmental Planning and Assessment Regulation 2000* and where they are addressed in this Environmental Impact Statement are outlined in Table 1.

Table 1 Requirements of Schedule 2 (Part 3) of the Regulation

Clause(s)	Where addressed
6. Form of environmental impact statement	
An environmental impact statement must contain the following information -	
a. the name, address and professional qualifications of the person by whom the statement is prepared	Certification
b. the name and address of the responsible person	Certification
c. the address of the land -	
i. in respect of which the development application is to be made, or	Certification
ii. on which the activity or infrastructure to which the statement relates is to be carried out	Certification
d. a description of the development, activity or infrastructure to which the statement relates	Chapter 5 (Project description)
e. an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure to which the statement relates, dealing with the matters referred to in this Schedule	Certification
f. a declaration by the person by whom the statement is prepared to the effect that -	
i. the statement has been prepared in accordance with this Schedule, and	Certification
ii. the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and	Certification
iii. that the information contained in the statement is neither false nor misleading.	Certification
7. Content of environmental impact statement	
1. An environmental impact statement must also include each of the following -	
a. a summary of the environmental impact statement	Executive Summary Chapter 25 (Synthesis and conclusion of the Environmental Impact Statement)
b. a statement of the objectives of the development, activity or infrastructure	Chapter 2 (Strategic need, justification and project alternatives)
c. an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure	Chapter 2 (Strategic needs, justification and project alternatives)
d. an analysis of the development, activity or infrastructure, including -	

Clause(s)	Where addressed
i. a full description of the development, activity or infrastructure	Chapter 5 (Project description)
ii. a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected	Chapter 6 to 23
iii. the likely impact on the environment of the development, activity or infrastructure	Chapter 6 to 23
iv. a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment	Chapter 6 to 23
v. a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out	Chapter 3 (Planning and assessment process)
e. a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d)(iv)	Chapter 25 (Synthesis and conclusion of the Environmental Impact Statement)
f. the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4).	Chapter 25 (Synthesis and conclusion of the Environmental Impact Statement)
2. Subclause (1) is subject to the environmental assessment requirements that relate to the environmental impact statement.	Secretary's Environmental Assessment Requirements are addressed throughout the document. A summary is provided in Appendix A (Assessment requirements).
3. Not applicable	N/A
4. The principles of ecologically sustainable development.	Chapter 25 (Synthesis and conclusion of the Environmental Impact Statement)

Appendix C

Construction Environmental Management Framework and Construction Noise and Vibration Standard

sydney METRO

CONSTRUCTION ENVIRONMENTAL MANAGEMENT FRAMEWORK

NSW GOVERNMENT | Transport for NSW

NSW MAKING IT HAPPEN

Contents

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1. Introduction

1.1 Purpose and Scope

This Construction Environmental Management Framework (CEMF) is a Sydney Metro project framework which sets out the environmental, stakeholder and community management requirements for construction. It provides a linking document between the planning approval documentation and the construction environmental management documentation to be developed by the Principal Contractors relevant to their scope of works.

Sydney Metro Principal Contractors will be required to implement and adhere to the requirements of this CEMF.

1.2 Status

This is a controlled document, please refer to the version register below which is updated as required.

Table 1 Document Review Status

	EIS 1 – Northwest Rail Link	4 April 2012
	EIS 1 Submissions Report – Northwest Rail link	26 July 2012
	EIS 2 and the Rapid Transit Rail Facility (RTRF) – Northwest Rail Link	31 October 2012
	Updated to incorporate all planning approvals, including ECRL conversion Part 5 approvals	11 July 2014
	Updated to encompass the scope of Sydney Metro – Chatswood to Sydenham EIS	16 February 2016
	Updated for - Chatswood to Sydenham Submissions Report and Preferred Infrastructure Report	15 August 2016
	Updated for – Sydenham to Bankstown EIS	25 August 2017
	Updated for inclusion in Sydney Metro West EIS	23 January 2020

1.3 Environment and Sustainability Policy

Sydney Metro has developed an Environment and Sustainability Policy (Appendix A) which applies to Sydney Metro projects. Principal Contractors are required to undertake their works in accordance with this policy. The policy reflects a commitment in the delivery of the project to:

- Optimise sustainability outcomes, transport service quality, and cost effectiveness.
- Develop effective and appropriate responses to the challenges of climate change, carbon management, resource and waste management, land use integration, customer and community expectation, and heritage and biodiversity conservation.
- Be environmentally responsible, by avoiding pollution, enhancing the natural environment and reducing the project ecological footprint, while complying with all applicable environmental laws, regulations and statutory obligations.
- Be socially responsible by delivering a workforce legacy which benefits individuals, communities, the project and industry, and is achieved through collaboration and partnerships.

2. Legislative and Other Requirements

The below table (Table 2) identifies key NSW environmental legislative requirements and their application to SM construction works, current as at the date of this document. Sydney Metro and its Contractors must regularly review their legislative and other requirements.

Table 2 NSW Legislative Requirements

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Biosecurity Act 2015	Under this Act, all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.	Control weeds as required on land under the management of the Contractor.
Contaminated Land Management Act 1997 NSW Environment Protection Authority (EPA)	The Act provides a process for the investigation and remediation of land where contamination presents a significant risk of harm to human health or some other aspect of the environment. The Act also outlines the circumstances in which notification to the Environment Protection Authority is required in relation to the contamination of land.	Follow the legislative process where contaminated land is identified.
Dangerous Goods (Road and Rail Transport) Act 2008 EPA / SafeWork NSW	A licence is required for the storage (SafeWork NSW) and /or transport (EPA) of prescribed quantities of dangerous goods.	Obtain a licence where storage of dangerous goods would exceed licensable quantities.
Environmental Planning and Assessment Act 1979 Department of Planning and Environment (DPI&E)	Encourages proper environmental impact assessment and management of development areas for the purpose of promoting the social and economic welfare of the community and a better environment.	Adhere to mitigation measures and conditions within the planning approval documentation. The proponent and their contractors must endeavour to deliver in a consistent manner within the assessed scope of works.

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Heritage Act 1977 NSW Department of Premier and Cabinet	The Act aims to encourage the conservation of the State's heritage and provides for the identification and registration of items of State heritage significance. The Heritage Council must be notified 'of the location of the relic, unless he or she believes on reasonable grounds that the Heritage Council is aware of the location of the relic'.	Projects assessed under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from approvals required under Part 4 and permits required under section 139.
Marine Pollution Act 2012	This Act includes provisions to protect the sea and waters from pollution by oil and other noxious substances discharged from vessels.	Any construction activities requiring the use of a vessel (e.g. a barge) must comply with the requirements of this Act and the Marine Pollution Regulation 2014.
National Parks and Wildlife Act 1974 OEH	The objectives of the Act are for the conservation of nature and the conservation of objects, places or features (including biological diversity) of cultural value within the landscape.	Projects assessed under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from obtaining an Aboriginal Heritage Impact Permit required under section 90.
Biodiversity Conservation Act 2016 OEH	The relevant purpose of the Act is to conserve biodiversity and maintain the diversity and quality of ecosystems.	Projects assessed under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from an order or direction under Part 11 of the Act. The Act also established that other permits and approvals are not required for projects assessed and determined under Part 5, Division 5.2 of the EP&A Act.
Protection of the Environment Operations Act 1997 EPA	The relevant objective of the Act is to prevent environmental pollution.	Where Sydney Metro projects are scheduled activities under Schedule 1 of the Act an Environment Protection Licence (EPL) must be obtained. Further details on the requirements to obtain an EPL are provided in Section 2.3.

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Roads Act 1993 Roads and Maritime Service	The relevant objective of the Act is to regulate the carrying out of various activities on public roads.	Obtain consent under Section 138 for carrying out work in, on or over a public road, or digging up or disturbance of the surface of the road. Under Section 38N of the *Transport Administration Act 1988*, Section 138 of the *Roads Act 1993* does not apply to Sydney Metro activities in relation to classified roads for which a council is the roads authority. However, consent from Transport for New South Wales is still required under Section 38N(2) of the *Transport Administration Act 1988* for those activities described in Section 138(1) of the *Roads Act 1993*, when carried out in relation to a classified road.
Waste Avoidance and Resource Recovery Act 2001 EPA	The objectives of the Act are to reduce environmental harm, provide for the reduction in waste generation and the efficient use of resources.	Implement strategies to reduce waste volumes and report on waste generated.
Water Management Act 2000 NSW Office of Water	The relevant objective of the Act is to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality.	Sydney Metro projects assessed under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from obtaining water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91.

Key Commonwealth environmental legislative requirements and their application to SM construction works are identified in Table 3, current as at the date of this document. Sydney Metro and its Contractors should regularly review their legislative requirements.

Table 3 Commonwealth Legislative Requirements

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Environment Protection and Biodiversity Conservation Act 1999 Department of the Environment	The relevant objective of the Act is to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance.	A project may be defined as a controlled action under the Act due to impacts on matters of national environmental significance. If an approval under the Environment Protection and Biodiversity Conservation Act is required for the project, Sydney Metro Principal Contractors must comply with any relevant conditions of the approval.
National Greenhouse and Energy Reporting Act 2007 Department of Climate Change and Energy Efficiency	The Act established a framework for reporting of greenhouse gas emissions, abatement actions, energy consumption and production data.	Report on greenhouse gas and energy usage data as required by the Act.

2.1 Environmental Approvals

All Sydney Metro projects require a planning approval under the *Environmental Planning and Assessment Act 1979*. For infrastructure components, this may take the form of:

- State significant infrastructure or critical State significant infrastructure under Part 5, Division 5.2 of the Act, with Department of Planning, Industry and Environment as the determining authority.
- An approval under Part 5 of the Act, with Sydney Metro as the determining authority.
- Exempt development under Section 1.6 of the Act and in accordance with a relevant State Environmental Planning Policy.

For development components, this may take the form of:

- State significant development under Part 4, Division 4.7 of the Act.
- A local development application under Part 4 of the Act.

The requirements of the relevant approval are required to be complied with by Sydney Metro. Responsibility for implementing mitigation measures and conditions of approval will be allocated between Sydney Metro and Principal Contractors as appropriate. Typically where there are multiple packages of works, Sydney Metro will produce a Staging Report which sets out the applicability and allocation of approval requirements within the project's program of works.

2.2 Environment Protection Licence Requirements

Sydney Metro projects can meet the definition of a number of scheduled activities under Schedule 1 of the *Protection of the Environmental Operation Act 1997* (POEO Act). Contractors need to review the applicability of Scheduled Activities and assess the need to obtain an Environment Protection Licence (EPL). In other circumstances work may be undertaken using the existing EPL held by Sydney Trains.

Where required, Sydney Metro Principal Contractors will:

- Apply for and be granted an EPL from the EPA.
- Hold an EPL which covers their scope of works as necessary under the POEO Act.
- Undertake their scope of works in accordance with the conditions of the applicable EPLs as issued by the EPA.
- Work under the existing Sydney Trains EPL.

2.3 Standards and Guidelines

Numerous environmental publications, standards, codes of practice and guidelines are relevant to Sydney Metro construction and are referenced throughout this Construction Environmental Management Framework. A summary of key applicable standards and guidelines is provided in Table 4.

Table 4 Environmental Standards and Guidelines

Standard / Guideline	Relevant Authority	CEMF Reference
ISO14001 Environmental Management System – Requirements with Guidelines for Use	DPIE	Section 3.1
Interim Construction Noise Guidelines (Department of Environment and Climate Change, 2009)	EPA	Section **7.1.**
Managing Urban Stormwater: Soil and Construction (Landcom, 2008)	EPA	Section 10.2
Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2008)	EPA	Section 12.1
Australian and New Zealand Guidelines for Fresh and Marine Water Quality	ANZECC	Section 10.2

3. Environmental Management Requirements

3.1 Environmental and Sustainability Management System

a. Principal Contractors are required to have a corporate Environmental Management System certified under AS/NZS ISO 14001:2015.

b. Principal Contractors are required to develop a project based Environment and Sustainability Management System (E&SMS). The E&SMS will:

i. Be consistent with the Principal Contractors corporate Environmental Management System and AS/NZS ISO 14001:2015;

ii. Be supported by a process for identifying and responding to changing legislative or other requirements;

iii. Include processes for assessing construction methodology changes for consistency against the planning approvals;

iv. Include processes for tracking and reporting performance against sustainability and compliance targets;

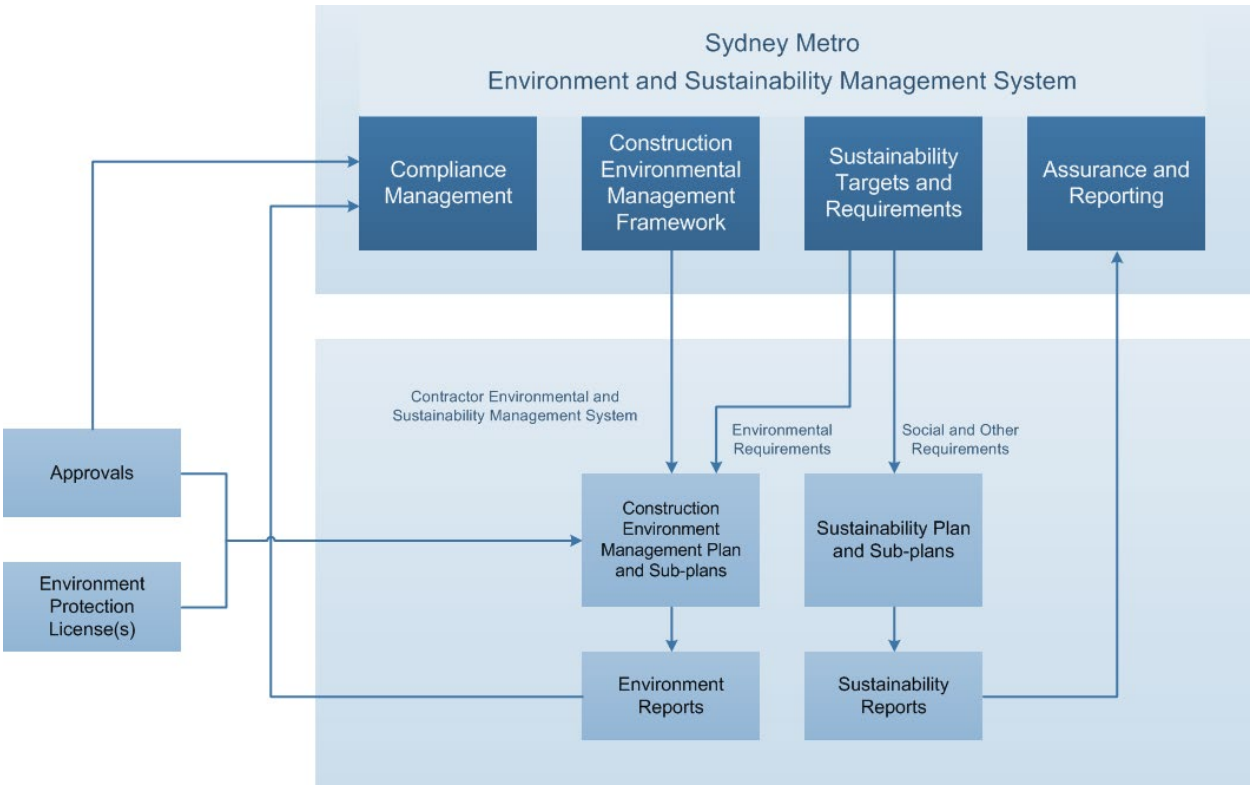
v. Include a procedure for the identification and management of project specific environmental risks and appropriate control measures; and

vi. Be consistent with the SM C&SW Sustainability Strategy and Sydney Metro Environment and Sustainability Policy.

c. All sub-contractors engaged by the Principal Contractor will be required to work under the Principal Contractor's Environment and Sustainability Management System.

d. The relationship between the Sydney Metro Environment and Sustainability Management System and the Principal Contractor's Environment and Sustainability Management System is shown in Figure 1.

Figure 1 Environmental Management and Sustainability Structure



3.2 Sustainability Management Plan

a. Principal Contractors are required to prepare and implement a Sustainability Management Plan (SMP) relevant to the scale and nature of the Project Works.

b. The SMP must, as a minimum, address and detail:

Table 5 Sustainability Requirements for Design and Construction

Reference	SMP Requirements
SMP1	The relevant requirements of the Sydney Metro Environment and Sustainability Policy
SMP2	A sustainability policy statement
SMP3	The carbon and energy mitigation measures as detailed in the environmental approval documentation that are applicable to the Project Works
SMP4	The low carbon strategies and initiatives that will be implemented to minimise the carbon emissions
SMP5	The energy efficiency strategies and initiatives that will be implemented to minimise energy use

Reference	SMP Requirements
SMP6	The strategies and initiatives that will be implemented to minimise overall water use, maximise the availability and use of non-potable water sources
SMP7	Estimates of the quantity of potable water which will be consumed during construction
SMP8	Estimates of the quantity of water from non-potable sources which will be consumed during construction
SMP9	The strategies and initiatives that will be implemented to maximise the use of recycled materials
SMP10	The strategies and initiatives to recycle and reuse materials onsite
SMP11	The strategies and initiatives to prioritise the use of low-VOC, low emission materials
SMP12	Estimates of fuel consumption
SMP13	Estimates of electricity consumption
SMP14	A Sustainable Procurement Policy that must, as a minimum, include: ▪ The processes and procedures that will be used to provide environmental and social improvement ▪ The responsibilities of key project personnel with respect to the implementation of the policy ▪ Compliance record generation and management ▪ The processes and environmental and social criteria that will be used for the selection of Subcontractors ▪ The processes that will be used to ensure ethical sourcing of labour and materials ▪ Local sourcing ▪ Where equipment, materials or labour are procured from locations outside Australia, the processes that will be used to ensure human rights impacts and risks are identified and mitigated as well as processes to ensure compliance with modern slavery, and modern slavery reporting

3.3 Construction Workforce Development and Industry Participation Plan

a. The Workforce Development and Industry Participation Plan will address and detail:

i. *The proposed response to policies related to skills, apprenticeships, diversity, small business and Aboriginal Participation which will be delivered on the project*;

ii. *Proposed appropriately skilled key personnel to support delivery of the workforce development and industry participation requirements*;

iii. *Implementation approach, processes and systems to ensure delivery and reporting of workforce development and industry participation priority areas*:

- *Jobs and Industry Participation*;
- *Skills Development*;
- *Diversity and Inclusion*; and
- *Inspiring Future Talent*.

3.4 Construction Environmental Management Plan

a. Principal Contractors are required to prepare and implement a Construction Environmental Management Plan (CEMP) relevant to the scale and nature of their scope of works. The CEMP shall comprise of a main CEMP document, issue specific sub plans, activity specific procedures and site based control maps. The CEMP shall illustrate the relationship between other plans required by the contract.

b. Depending on the scope and scale of the works, Sydney Metro may decide to streamline the CEMP and sub-plan requirements. For example, depending on the risk associated with particular environmental issues it may be appropriate to remove the need for a sub plan, or replace with a procedure as part of the CEMP.

c. The CEMP will cover the requirements of the relevant planning approval documentation, the conditions of all other permits and licences, the Principal Contractor's corporate EMS, the environmental provisions of the contract documentation and this Construction Environmental Management Framework.

d. As a minimum the CEMP will:

i. Include a contract specific environmental policy;

ii. Include a description of activities to be undertaken during construction;

iii. For each plan under the CEMP include a matrix of the relevant Conditions of Approval or Consent referencing where each requirement is addressed;

iv. For each plan under the CEMP, set objectives and targets, and identify measurable key performance indicators in relation to these;

v. For each role that has environmental accountabilities or responsibilities, including key personnel, provide a tabulated description of the authority and roles of key personnel, lines of responsibility and communication, minimum skill level requirements and their interface with the overall project organisation structure;

vi. Assign the responsibility for the implementation of the CEMP to the Environment Manager, who will have appropriate experience. The Principal Contractor's Project Director will be accountable for the implementation of the CEMP;

vii. Identify communication requirements, including liaison with stakeholders and the community;

viii. Include induction and training requirements and a summary of the Training Needs Analysis required in Section 3.10(b);

ix. Management strategies for environmental compliance and review of the performance of environmental controls;

x. Procedures for environmental inspections and monitoring, auditing and review, and reporting on environmental performance including environmental compliance tracking;

xi. Include an annual schedule for auditing the CEMP and Sub-Plans that is updated at least monthly;

xii. Include procedures for emergency and incident management, non-compliance management, and corrective and preventative action; and

xiii. Include procedures for the control of environmental records.

e. The CEMP and associated sub-plans will be reviewed by Sydney Metro and/or an independent environmental representative (see Section 3.12) prior to any construction works commencing. Depending on the Conditions of Approval, the CEMP and certain sub-plans may also require the approval of the Department of Planning, Industry and Environment (DPIE).

f. Where a corresponding systems document exists within the Sydney Metro Integrated Management System, the Principal Contractor's procedures will be required to be consistent with any requirements in those documents.

3.5 Construction Environmental Management Sub-Plans

a. Subject to Section 3.4(b) the Principal Contractor will prepare issue-specific environmental sub plans to the CEMP which address each of the relevant environmental impacts at a particular site or stage of the project. Issue specific sub plans will include:

i. Heritage management (Aboriginal);

ii. Flora and fauna management;

iii. Soil and surface water management;

iv. Construction traffic and transport; and

v. Air quality management.

b. Additional detail on the minimum requirements for these sub plans is provided in Sections 6-13 of this CEMF.

3.6 Environmental Procedures and Control Maps

a. The Principal Contractor will prepare and implement activity specific environmental procedures. These procedures should supplement environmental management sub plans, but may substitute for sub plans in agreement with Sydney Metro if a reasonable risk based justification can be made and the sub plan is not a requirement of any approval.

b. The procedures will include:

i. A breakdown of the work tasks relevant to the specific activity and indicate responsibility for each task;

ii. Potential impacts associated with each task;

iii. A risk rating for each of the identified potential impacts;

iv. Mitigation measures relevant to each of the work tasks; and

v. Responsibility to ensure the implementation of the mitigation measures.

c. The Principal Contractor will prepare and implement site based progressive Environmental Control Maps (ECM's) which as a minimum:

i. Depicts the current representation of the site;

ii. Indicate which environmental procedures, environmental approvals, or licences are applicable;

iii. Illustrate the site, showing significant structures, work areas and boundaries;

iv. Illustrate the environmental control measures and environmentally sensitive receivers;

v. Is endorsed by the Principal Contractors Environmental Manager or delegate;

vi. Include all the training and competency requirements for relevant workers; and

vii. Be communicated to relevant workers, including sign-off for the appropriate procedures prior to commencing works on the specific site and / or activity.

3.7 Additional Environmental Assessments

a. Where the requirement for an additional environmental assessment is identified, this will be undertaken prior to undertaking any construction activities. The environmental assessment will include:

i. A description of the existing surrounding environment;

ii. Details of the ancillary works and construction activities required to be carried out including the hours of works;

iii. An assessment of the environmental impacts of the works, including, but not necessarily limited to, traffic, noise and vibration, air quality, soil and water, ecology and heritage;

iv. Details of mitigation measures and monitoring specific to the works that would be implemented to minimise environmental impacts; and

v. Identification of the timing for completion of the construction works, and how the sites would be reinstated (including any necessary rehabilitation).

3.8 Condition Surveys

a. Prior to the commencement of construction the Principal Contractors are to offer Pre-construction Building Condition Surveys, in writing, to the owners of buildings where there is a potential for construction activities to cause damage regardless of severity. If accepted, the Principal Contractor will produce a comprehensive written and photographic condition report produced by an appropriate professional prior to relevant works commencing.

b. Prior to the commencement of construction the Principal Contractor will prepare a Road Dilapidation Report for all local public roads proposed to be used by heavy vehicles. Dilapidation reports are to include other road infrastructure such as signs, curbs, applicable driveways and pedestrian paths.

3.9 Register of Hold Points

a. Principal Contractors will identify hold points, beyond which approval is required to proceed with a certain activity. These hold points will be documented in the CEMP or relevant sub-plans. Example activities include vegetation removal and water discharge.

b. Table 1.4 provides the structure for these hold points to be included in the CEMP as well as an initial list of hold points which will be implemented.

Table 6 Initial list of Hold Points

Hold Point	Release of Hold Point	By Who
Prior to Vegetation Clearing / Ground Disturbance	Pre-clearing inspection Erosion and sediment control plan	Qualified Ecologist Contractor's Environmental Manager or delegate
Discharge of water	Water tested to verify compliance and approval to discharge	Contractor's Environment Manager or delegate
Out of hours works	Noise Assessment	Contractor's Environment Manager
Use of local roads by heavy vehicles	Road Dilapidation Report	Appropriate Professional nominated by Principal Contractor
Construction identified as affecting buildings	Building Condition Survey	Appropriate Professional nominated by Principal Contractor

3.10 Training, Awareness and Competence

a. Principal Contractors are responsible for determining the training needs of their personnel. As a minimum this will include site induction, regular toolbox talks and topic specific environmental training as follows:

i. The site induction will be provided to all site personnel and will include, as a minimum:

- Training purpose, objectives and key issues;
- Contractor's environmental and sustainability policy(s) and key performance indicators;
- Due diligence, duty of care and responsibilities;
- Relevant conditions of any environmental licence and/or the relevant conditions of approval;
- Site specific issues and controls including those described in the environmental procedures;
- Reporting procedure(s) for environmental hazards and incidents; and
- Communication protocols for interactions with community and stakeholders.

ii. Toolbox talks will be held on a regular basis in order to provide a project or site wide update, including any key or recurring environmental issues; and

iii. Topic specific environmental training should be based upon, but is not limited to, Issue specific sub-plans required under Section 3.5 (a) (i-vi).

3.11 Emergency and Incident Response

a. Contractors' emergency and incident response procedures will be consistent with any relevant Sydney Metro procedures and will include:

i. Categories for environmental emergencies and incidents;

ii. Notification protocols for each category of environmental emergency or incident, including notification to Sydney Metro and notification to owners / occupiers in the vicinity of the incident. This is to include relevant contact details;

iii. Identification of personnel who have the authority to take immediate action to shut down any activity, or to affect any environmental control measure (including as directed by an authorised officer of any regulator or government department);

iv. A process for undertaking appropriate levels of investigation for all incidents and the identification, implementation and assessment of corrective and preventative actions; and

v. Notification protocols of incidents to relevant regulators and stakeholders including (but not limited to) the EPA or DPIE that are made by the Contractor or Sydney Metro.

b. The Contractor will make all personnel aware of the plan and their responsibilities.

3.12 Independent Environmental Representatives

a. Sydney Metro will engage Independent Environmental Representatives (ERs) as required under the CSSI approval to undertake the following, along with any additional roles as required:

i. Review, provide comment on and endorse (where required) any relevant environmental documentation to verify it is prepared in accordance with relevant environmental legislation, planning approval conditions, Environment Protection Licences, relevant standards and this CEMF;

ii. Monitor and report on the implementation and performance of the above mentioned documentation and other relevant documentation;

iii. Provide independent guidance and advice to Sydney Metro and the Contractors in relation to environmental compliance issues and the interpretation of planning approval conditions;

iv. Be the principal point of advice for the DP&E in relation to all questions and complaints concerning the environmental performance of the project;

v. Ensure that environmental auditing is undertaken in accordance with all relevant project requirements; and

vi. Recommend reasonable steps, including 'stop works', to be taken to avoid or minimise adverse environmental impacts.

3.13 Roles and Responsibilities

a. In relation to Roles and Responsibilities the CEMP will:

i. Describe the relationship between the Principal Contractor, Sydney Metro, key regulatory stakeholders, and the independent environmental representative;

ii. For each role that has environmental accountabilities or responsibilities, including key personnel, provide a tabulated description of the authority and roles of key personnel, lines of responsibility and communication, minimum skill level requirements and their interface with the overall project organisation structure;

iii. Provide details of each specialist environment, sustainability or planning consultant who is employed by the Principal Contractor including the scope of their work; and

iv. Provide an overview of the role and responsibilities of the Independent Environmental Representative, and other regulatory stakeholders.

b. All sub-contractors engaged by the Principal Contractor will be required to operate within the EMS documentation of that Principal Contractor.

3.14 Environmental Monitoring, Inspections and Auditing

a. Issue specific environmental monitoring will be undertaken as required or as additionally required by any approval, permit or licence conditions.

b. The results of any monitoring undertaken as a requirement of a licence or permit that is required to be published will be published on the Principal Contractor's, or a project specific, website within 14 days of obtaining the results.

c. Environmental inspections will include:

i. Surveillance of environmental mitigation measures by the Site Foreman; and

ii. Periodic inspections by the Principal Contractor's Environmental Manager (or delegate) to verify the adequacy of all environmental mitigation measures. This will be documented in a formal inspection record.

d. Regular site inspections by the ERs and Sydney Metro representatives at a frequency to be agreed with the Principal Contractor.

e. Principal Contractors must undertake internal environmental audits. The scope will include:

i. Compliance with any approval, permit or licence conditions;

ii. Compliance with the E&SMS, CEMP, SMP, sub-plans and procedures;

iii. Community consultation and complaint response;

iv. Environmental training records; and

v. Environmental monitoring and inspection results.

f. Sydney Metro (or an independent environmental auditor) will also undertake periodic audits of the Principal Contractor's E&SMS, including this Construction Environmental Management Framework.

3.15 Environmental Non-compliances

a. Principal Contractors will document and detail any non-compliances with the requirements of any legislative or other requirements. Sydney Metro will be made aware of all non-compliances in a timely manner.

b. Principal Contractors will develop and implement corrective actions to rectify the non-compliances in order to prevent a re-occurrence of the non-compliance. Contractors will also maintain a register of non-compliances and associated corrective actions.

c. Sydney Metro or the Environmental Representative may raise non-compliances against environmental requirements. In these circumstances the Principal Contractor must abide by any requirements of Sydney Metro's procedure for managing non-compliances.

3.16 Environmental Records and Compliance Reporting

a. Principal Contractors will maintain appropriate records of the following:

i. Site inspections, audits, monitoring, reviews or remedial actions;

ii. Documentation as required by performance conditions, approvals, licences and legislation;

iii. Modifications to site environmental documentation (eg CEMP, sub-plans and procedures); and

iv. Other records as required by this Construction Environmental Management Framework.

b. Records must be accessible onsite for the duration of works.

c. Additionally records will be retained by the Principal Contractor for a period of no less than 7 years. Records will be made available in a timely manner to Sydney Metro (or their representative) upon request.

d. Compliance reports detailing the outcome of any environmental surveillance activity including internal and external audits (refer to Section 3.14) will be produced by the Principal Contractors Environmental Manager or delegate. These reports will be submitted to Sydney Metro at an agreed frequency.

3.17 Review and Improvement of the Environment and Sustainability Management System

a. Principal Contractors will ensure the continual review and improvement of the management systems. This will generally occur in response to:

i. Issues raised during environmental surveillance and monitoring;

ii. Expanded scope of works;

iii. Environmental incidents; and

iv. Environmental non-conformances.

b. A formal review of the management systems by the Principal Contractor's Senior Management Team will also occur on an annual basis, as a minimum. This review shall generate actions for the continual improvement of the systems and supporting management plans.

4. Stakeholder and Community Involvement

4.1 Overview

a. Throughout construction, Sydney Metro and the Principal Contractors will work closely with stakeholders and the community to ensure they are well informed regarding the construction works.

b. Stakeholders and the community will be informed of significant events or changes that affect or may affect individual properties, residences and businesses. These will include:

i. Significant milestones;

ii. Design changes;

iii. Changes to traffic conditions and access arrangements for road users and the affected public; and

iv. Construction operations which will have a direct impact on stakeholders and the community including noisy works, interruptions to utility services or construction work outside of normal work hours.

4.2 Community Communication Strategy

a. A Community Communication Strategy will be developed which will be implemented at appropriate times in the construction process, and include:

i. Notification (including targeted letterbox drops and email) of any works that may disturb local residents and businesses (such as noisy activities and night works) at least seven days prior to those works commencing;

ii. Notification (including targeted letterbox drops and email) of works that may affect transport (such as road closures, changes to pedestrian routes and changes to bus stops);

iii. Traffic alerts (via email) to all key traffic and transport stakeholders advising of any changes to access and local traffic arrangements (at least seven days prior to significant events);

iv. Print and radio advertisements regarding major traffic changes;

v. 24-hour toll-free community project information phone line;

vi. Complaints management ;

vii. Community information sessions, as required;

viii. Regular updates to the Sydney Metro website (sydneymetro.info), including uploading of all relevant documents, and contact details for the stakeholder and community relations team;

ix. Provision of information to the Sydney Metro Community Information Centre including community newsletters, information brochures and fact sheets and interactive web-based activities;

x. Clear signage at the construction sites;

xi. Newspaper advertisements in local and metropolitan papers as required;

xii. Regular inter-agency group meetings;

xiii. Community, business and stakeholder satisfaction surveys and feedback forms;

xiv. Translator and interpreter services; and

xv. The Principal Contractor's Community Relations Team will liaise with the Sydney Metro Project Communications team as the point of contact for the community.

4.3 Complaint Handling

a. Community liaison and complaints handling will be undertaken in accordance with the Construction Complaints Management System and will include:

i. Principal Contractors will deal with complaints in a responsive manner so that stakeholders' concerns are managed effectively and promptly; and

ii. A verbal response will be provided to the complainant as soon as possible and within a maximum of two hours from the time of the complaint (unless the complainant requests otherwise). A detailed written response will then be provided, if required, to the complainant within one week.

4.4 Urban Design of Temporary Works

a. Principal Contractors will ensure as a minimum:

i. Temporary construction works consider urban design and visual impacts, including:

- Artwork, graphics and images to enhance the visual appearance of temporary works in high visibility locations;
- Project information to raise awareness on benefits, explain the proposed works at each site and provide updates on construction progress;
- Community information, including contact numbers for enquiries / complaints;
- Signage and information to mitigate impacts on local businesses which may be obscured by the construction site;
- Sydney Metro advertising / public awareness campaigns; and
- Logos / branding, including Sydney Metro, NSW Government, and Contractor branding.

ii. The design of all temporary works will require Sydney Metro approval in relation to urban design and visual impacts and Sydney Metro will stipulate the design of hording artwork, including:

- Sydney Metro advertising / public awareness campaigns; and
- Logos / branding, including Sydney Metro, NSW Government, and Contractor branding.

b. Construction hoardings, scaffolding and acoustic sheds will be regularly inspected and kept clean and free of dust build up. Graffiti on construction hoardings, scaffolding or acoustic sheds will be removed or painted over promptly.

c. The principles of Crime Prevention Through Environmental Design will be applied to all works, including temporary works, that have a public interface.

4.5 Business and Property Impacts

a. Principal Contractors will proactively work with potentially affected stakeholders to identify the likely impacts and put in place measures to minimise impacts.

b. Construction works will be undertaken to meet the following objectives:

i. Minimise the potential impact of the project to businesses affected by construction works;

ii. Ensure businesses are kept informed of the project and consulted in advance of major works or factors that are likely to have a direct impact;

iii. Consult with all business directly affected by changes to access arrangements regarding specific requirements at least two weeks prior to those changes coming into effect; and

iv. Ensure that business stakeholder enquiries and complaints regarding the project are managed and resolved effectively.

c. The Community Communication Strategy (Section 4.2) will cover key issues relating to business impacts by locality with a particular focus on proactive consultation with affected businesses. Including:

i. Identification of specific businesses which are sensitive to construction activity disturbances;

ii. Summary of the commercial character of the locality, its general trading profile (daily and annually) and information gained from the business profiling such as:

- Operating hours;
- Main delivery times;
- Reliance on foot traffic;
- Any signage or advertising that may be impacted;
- Customer origin; and
- Other information specific to the business that will need to be considered in construction planning.

iii. Define the roles and responsibilities in relation to the control and monitoring of business disturbances;

iv. Identification of locality specific standard business mitigation measures which would be implemented;

v. Maps and diagrams to illustrate the information for easy identification of measures which would be implemented;

vi. Description of the monitoring, auditing and reporting procedures; and

vii. Procedure for reviewing performance and implementing corrective actions.

5. General Site Works

Figure 2 Aerial View of the Sydney Metro Northwest Station Site

5.1 Working Hours

a. Standard working hours are between 7am – 6pm on weekdays and 8am – 1pm on Saturdays.

b. Works which can be undertaken outside of standard construction hours without any further approval include:

i. Those which have been described in respective environmental assessments as being required to take place 24/7. For example, tunnelling and underground excavations and supporting activities will be required 24/7;

ii. Works which are determined to comply with the relevant Noise Management Level at sensitive receivers;

iii. The delivery of materials outside of approved hours as required by the Police or other authorities (including Sydney Roads) for safety reasons;

iv. Where it is required to avoid the loss of lives, property and / or to prevent environmental harm in an emergency; and

v. Where written agreement is reached with all affected receivers.

5.2 Site Layout

a. Principal Contractors will consider the following in the layout of construction sites:

i. The location of noise intensive works and 24 hour activities in relation to noise sensitive receivers;

ii. The location of site access and egress points in relation to noise and light sensitive receivers, especially for sites proposed to be utilised 24 hours per day;

iii. The use of site buildings to shield noisy activities from receivers;

iv. The use of noise barriers and / or acoustic sheds where feasible and reasonable for sites proposed to be regularly used outside of daytime hours;

v. Aim to minimise the requirement for reversing, especially of heavy vehicles; and

vi. Any applicable Construction Traffic Management requirements.

5.3 Reinstatement

a. Mitigation measures required for reinstatement will be incorporated into the CEMP and will include as a minimum:

i. Principal Contractors will clear and clean all working areas and accesses at project completion;

ii. At the completion of construction all plant, temporary buildings or vehicles not required for the subsequent stage of construction will be removed from the site;

iii. All land, including roadways, footpaths, loading facilities or other land having been occupied temporarily will be returned to their pre-existing condition or better; and

iv. Reinstatement of community spaces, infrastructure and services will occur as soon as possible after completion of construction.

6. Spoil Management

Figure 3 Spoil and Excavation Works at the Showground Site

6.1 Spoil Management Objectives

a. The following spoil management objectives will apply to the construction of the project:

i. Minimise spoil generation where possible;

ii. The project will mandate 100% reuse or recycling (on or off-site) of usable spoil;

iii. Spoil will be managed with consideration to minimising adverse traffic and transport related issues;

iv. Spoil will be managed to avoid contamination of land or water;

v. Spoil will be managed with consideration of the impacts on residents and other sensitive receivers; and

vi. Site contamination will be effectively managed to limit the potential risk to human health and the environment.

7. Construction Noise and Vibration Management

Figure 4 Hebel Wall Noise Barrier at the Cheltenham Services Facility Site

7.1 Construction Noise and Vibration Management Objectives

a. The following noise and vibration management objectives will apply to construction:

i. Minimise unreasonable noise and vibration impacts on residents and businesses;

ii. Avoid structural damage to buildings or heritage items as a result of construction vibration;

iii. Undertake active community consultation; and

iv. Maintain positive, cooperative relationships with schools, childcare centres, local residents and building owners.

v. Be consistent with, and include the requirements of the noise and vibration mitigation measures as detailed in, the environmental approval documentation and the Sydney Metro Construction Noise and Vibration Standard (CNVS).

8. Heritage Management

Figure 5 White Hart Inn Excavation Site

8.1 Heritage Management Objectives

a. The following heritage management objectives will apply to construction:

i. Embed significant heritage values through any architectural design, education or physical interpretation;

ii. Minimise impacts on items or places of heritage value;

iii. Avoid accidental impacts on heritage items; and

iv. Maximise worker's awareness of indigenous heritage.

8.2 Heritage Management Implementation

a. Principal Contractors will develop and implement a Heritage Management Plan which will include as a minimum:

i. Evidence of consultation with Registered Aboriginal Parties;

ii. Identify initiatives that will be implemented for the enhancement of heritage values and minimisation of heritage impacts, including procedures and processes that will be used to implement and document heritage management initiatives;

iii. The heritage mitigation measures as detailed in the environmental approval documentation;

iv. The responsibilities of key project personnel with respect to the implementation of the plan;

v. Procedures for undertaking salvage of heritage relics or sites (where relevant), consistent with and any recordings of heritage relics prior to works commencing that would affect them;

vi. Details for the short and / or long term management of artefacts or movable heritage;

vii. Details of management measures to be implemented to prevent and minimise impacts on heritage items (including further heritage investigations, archival recordings and/or measures to protect unaffected sites during construction works in the vicinity);

viii. Procedures for unexpected heritage finds, including procedures for dealing with human remains;

ix. Heritage monitoring requirements; and

x. Compliance record generation and management.

b. The Contractor's regular inspections will include checking of heritage mitigation measures.

c. Compliance records will be retained by the Contractor. These will include:

i. Inspections undertaken in relation to heritage management measures;

ii. Archival recordings undertaken of any heritage item;

iii. Unexpected finds and stop work orders; and

iv. Records of any impacts avoided or minimised through design or construction methods.

9. Flora and Fauna Management

Figure 6 Demarcation of Retained Flora

9.1 Flora and Fauna Management Objectives

a. The following flora and fauna management objectives will apply to construction:

i. Minimise impacts on flora and fauna;

ii. Design waterway modifications and crossings to incorporate best practice principles;

iii. Retain and enhance existing flora and fauna habitat wherever possible; and

iv. Appropriately manage the spread of weeds and plant pathogens.

9.2 Flora and Fauna Management Implementation

a. Principal Contractors will develop and implement a Flora and Fauna Management Plan which will include as a minimum:

i. The ecological mitigation measures as detailed in the environmental approval documentation;

ii. The responsibilities of key project personnel with respect to the implementation of the plan;

iii. Procedures for the clearing of vegetation and the relocation of flora and fauna;

iv. Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction footprint;

v. Identification of measures to reduce disturbance to sensitive fauna;

vi. Weed management measures focusing on early identification of invasive weeds and effective management controls;

vii. A procedure for dealing with unexpected EEC threatened species identified during construction, including cessation of work and notification of the Department, determination of appropriate mitigation measures in consultation with the OEH (including relevant relocation measures) and updating of ecological monitoring or off-set requirements;

viii. Details on the methodology for vegetation mapping and survey;

ix. Ecological monitoring requirements; and

x. Compliance record generation and management.

b. Principal Contractors would undertake the following ecological monitoring as a minimum:

i. A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor's Environmental Manager (or delegate). The pre-clearing inspection will include, as a minimum:

- Identification of hollow bearing trees or other habitat features;
- Identification of any threatened flora and fauna;
- A check on the physical demarcation of the limit of clearing;
- An approved erosion and sediment control plan for the worksite; and
- The completion of any other pre-clearing requirements required by any project approvals, permits or licences.

ii. The completion of the pre-clearing inspection will form a Hold Point requiring sign-off from the Contractor's Environmental Manager (or delegate) and a qualified ecologist; and

iii. A post clearance report, including any relevant Geographical Information System files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.

c. The Principal Contractor's regular inspections will include a check on the ecological mitigation measures and project boundary fencing.

d. The following compliance records would be kept by the Principal Contractor:

i. Records of pre-clearing inspections undertaken;

ii. Records of the release of the pre-clearing hold point; and

iii. Records of ecological inspections undertaken.

10. Soil and Water Management

Figure 7 Erosion and Sediment Controls at the Cudgegong Road Site

10.1 Soil and Water Management Objectives

a. The following soil and water management objectives will apply to construction:

i. Minimise pollution of surface water through appropriate erosion and sediment control;

ii. Minimise leaks and spills from construction activities; and

iii. Source construction water from non-potable sources, where feasible and reasonable.

10.2 Soil and Water Implementation

a. Principal Contractors will develop and implement a Soil and Water Management Plan for their scope of works. The Soil and Water Management Plan will include as a minimum:

i. The surface water and flooding mitigation measures as detailed in the environmental approval documentation;

ii. Details of construction activities and their locations, which have the potential to impact on water courses, storage facilities, stormwater flows, and groundwater;

iii. Surface water and ground water impact assessment criteria consistent with the principles of the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines;

iv. Management measures to be used to minimise surface and groundwater impacts, including identification of water treatment measures and discharge points, details of how spoil and fill material required by the project will be sourced, handled, stockpiled, reused and managed; erosion and sediment control measures; salinity control measures and the consideration of flood events;

v. Management measures for contaminated material (soils, water and building materials) and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material, including asbestos, during construction;

vi. A description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, the locations where monitoring would take place, how the results of the monitoring would be recorded and reported, and, if any exceedance of the criteria is detected how any non-compliance can be rectified;

vii. The requirements of any applicable licence conditions;

viii. The responsibilities of key project personnel with respect to the implementation of the plan;

ix. Procedures for the development and implementation of Progressive Erosion and Sediment Control Plans;

x. Identification of locations where site specific Stormwater and Flooding Management Plans are required; and

xi. Compliance record generation and management.

b. Principal Contractors will develop and implement Progressive Erosion and Sediment Control Plans (ESCPs) for all active worksites in accordance with Managing Urban Stormwater: Soils & Construction Volume 1 (Landcom, 2004) (known as the “Blue Book”). The ESCPs will be approved by the Contractor’s Environmental Manager (or delegate) prior to any works commencing (including vegetation clearing) on a particular site. Copies of the approved ESCP will be held by the relevant Contractor personnel including the Engineer and the Site Foreman.

c. ESCPs will detail all required erosion and sediment control measures for the particular site at the particular point in time and be progressively updated to reflect the current site conditions. Any amendments to the ESCP will be approved by the Contractor’s Environmental Manager (or delegate).

d. Principal Contractors will undertake the following soil and water monitoring as a minimum:

i. Weekly inspections of the erosion and sediment control measures. Issues identified would be rectified as soon as practicable;

ii. Additional inspections will be undertaken following significant rainfall events (greater than 20 mm in 24 hours); and

iii. All water will be tested (and treated if required) prior to discharge from the site in order to determine compliance with relevant approvals and licence requirements. No water will be discharged from the site without written approval of the Contractor's Environmental Manager (or delegate). This is to form a Hold Point.

e. The following compliance records will be kept by the Principal Contractors:

i. Copies of current ESCPs for all active construction sites;

ii. Records of soil and water inspections undertaken;

iii. Records of testing of any water prior to discharge; and

iv. Records of the release of the hold point to discharge water from the construction site to the receiving environment.

f. The following water resources management objectives will apply to the construction of the project:

i. Minimise demand for, and use of potable water;

ii. Maximise opportunities for water re-use from captured stormwater, wastewater and groundwater;

iii. Examples of measures to minimise potable water consumption include:

- Water efficient controls, fixtures and fittings in temporary facilities;
- Collecting, treating and reusing water generated in tunnelling operations, concrete batching and casting facility processes;
- Using recycled water or treated water from onsite sources in the formulation of concrete;
- Harvesting and reusing rainwater from roofs of temporary facilities;
- Using water from recycled water networks;
- Collecting, treating and reusing groundwater and stormwater;
- Using water efficient construction methods and equipment; and
- Providing designated sealed areas for equipment wash down.

11. Air Quality

Figure 8 Dust Mitigation at Northwest Station Site

11.1 Air Quality Management Objectives

a. The following air quality management objectives will apply to construction:

i. Minimise gaseous and particulate pollutant emissions from construction activities as far as feasible and reasonable; and

ii. Identify and control potential dust and air pollutant sources.

11.2 Air Quality Management Implementation

a. Principal Contractors will develop and implement an Air Quality Management Plan which will include, as a minimum:

i. The air quality mitigation measures as detailed in the environmental approval documentation;

ii. The requirements of any approval and applicable licence conditions;

iii. Site plans or maps indicating locations of sensitive receivers and key air quality / dust controls;

iv. The responsibilities of key project personnel with respect to the implementation of the plan;

v. Air quality and dust monitoring requirements; and

vi. Compliance record generation and management.

b. Air quality and dust monitoring will involve the following as a minimum:

i. Meteorological conditions will be monitored and appropriate responses will be organised and undertaken periodically by the Principal Contractor;

ii. Regular visual monitoring of dust generation from work zones; and

iii. Monitoring emissions from plant and construction vehicles to ensure they have appropriate emission controls and are being maintained correctly.

c. The following compliance records will be kept by the Principal Contractor:

i. Records of any meteorological condition monitoring;

ii. Records of any management measures implemented as a result of adverse, windy weather conditions; and

iii. Records of air quality and dust inspections undertaken.

12. Waste Management

12.1 Waste Objectives

a. The following waste objectives will apply to construction:

i. Minimise waste throughout the project life-cycle; and

ii. Waste management strategies will be implemented in accordance with the *Waste Avoidance and Resource Recovery Act 2001* management hierarchy as follows:

- Avoidance of unnecessary resource consumption;
- Resource recovery (including reuse, reprocessing, recycling and energy recovery); and
- Disposal.

iii. Targets for the recovery, recycling or reuse of construction waste, and beneficial reuse of spoil will be provided by the Principal Contractor.

iv. Adequate procedures for the assessment, classification, management and disposal of waste in accordance with Waste Classification Guidelines; and

v. Comprehensive compliance record generation and management.

13. Construction Traffic and Transport

13.1 Construction Traffic Management Objectives

a. The following traffic management objectives will apply to the construction of the project:

i. Minimise disruption to traffic operation, road users, pedestrians, cyclists and access to adjoining properties (private and public)

ii. Maximise the safety for the workers, by isolating work areas from traffic flows, applying low exposure work methods, education and the installation of appropriate traffic control

iii. Limit obstructions and restrictions, and when required, provide alternatives to maintain access for local community, transport operators (buses) including over-dimension load movements and commercial developments

iv. Encourage sustainable transport options by site workers.

13.2 Construction Traffic Management Implementation

a. Principal Contractors will develop and implement a Construction Traffic Management Plan for their scope of works that is in accordance with the Principal's General Specifications G10 – Traffic and Transport Management, for endorsement by Transport Coordination and approval by TfNSW (Sydney Roads). The Construction Traffic Management Plan will as a minimum:

i. Address the traffic and transport mitigation measures as detailed in the environmental approval documentation and in accordance with TfNSW (RMS) Traffic Control at Worksites Manual, AS 1742.3 Manual of uniform traffic control devices - Traffic control for works on roads; Sydney Metro Principal Contractor Health and Safety standard, relevant Austroad Guides and TfNSW (RMS) Supplements to Australian Standards and Austroads.

ii. Be developed in consultation with the relevant road authority, Sydney Metro, Transport Coordination and TfNSW (Sydney Roads).

iii. Describe the work activities being proposed, their impact on the roadway and on road users, and how these impacts are being addressed.

iv. Set out the overall traffic management resources, processes and procedures for the management of traffic and transport during construction of the Project Works and Temporary Works.

v. Include Construction Traffic Control Plans setting out the specific traffic and transport management arrangements to be implemented at specific locations during the construction of the Project Works and Temporary Works and the intended timing of the proposed traffic management measures (e.g. nights, weekends, or 24/7).

vi. Includes a Parking Management Plan that identifies:

- parking requirements and on and offsite parking arrangements and associated impacts,
- remote parking arrangements and associated access between sites and public transport nodes,
- alternate parking arrangements for displaced parking, and
- communication and parking management measures.

vii. Include procedures for unplanned traffic management activities, including emergency work due to incidents, to the satisfaction of relevant Authorities.

viii. Identify types and volumes of construction vehicles, proposed routes to and from the work sites and timing.

ix. Identify traffic generation from other infrastructure developments, impacts from construction traffic and haulage routes.

x. Identify activities that could result in the disruption to traffic and transport networks including pedestrian, cyclist and public transport networks and during special events.

14. Acronyms

	Construction Environmental Management Plan
	Construction Noise and Vibration Standard
	Department of Planning and Environment (Formerly Department of Planning and Infrastructure)
	Environmental Impact Statement
	Environmental Management Framework
	Environmental Management System
	Environment Protection Authority
	Environmental Planning and Assessment Act 1979
	Environment Protection Licence (issued by EPA under the POEO Act)
	Environmental Representative
	Erosion and Sediment Control Plan
	National Occupational Health and Safety Commission
	Office of Environment and Heritage (Formerly DECCW)
	Protection of the Environment Operation Act 1997
	Roads and Maritime Service (Formerly RTA)
	Tunnel Boring Machine
	Transport for NSW

Appendix A – Environment and Sustainability Policy

NSW GOVERNMENT

Transport Environment and Sustainability Policy

Transport is a key enabler of economic and social activity. We are committed to delivering transport which contributes to economic prosperity and social inclusion in an environmentally responsible and sustainable manner, consistent with the Future Transport Strategy 2056.

Transport for NSW's activities cover the whole State and its infrastructure will last for generations to come. We have a duty to undertake our activities in the interest of the greater good, moving beyond compliance, and being a genuine leader in environment and sustainability performance.

We will work towards achieving this for NSW by:

- Leadership – contributing to and influencing the strategic environment and sustainability agenda of the NSW Government
- Environmental protection – being accountable for addressing and minimising the environmental impacts of our activities to satisfy the expectations and legislative requirements of the NSW Government and community
- Energy and carbon – improving energy efficiency and working towards net zero carbon emissions
- Resilience – embedding climate risk and resilience considerations in our activities
- Sustainable procurement – procuring and delivering sustainable, efficient and cost effective transport options, including responsible supply chains
- Whole of life – considering whole of life benefits and impacts from our activities across all life cycle stages - demand/need, plan, acquire, operate/maintain and disposal
- Social – recognising the social impacts and benefits of our activities, and working for healthy liveable communities
- Awareness – raising the awareness and capacity of our workforce to be accountable for implementing the Policy through their activities to achieve enhanced environmental outcomes and a culture of environmental responsibility
- Communication – communicating openly, responsively and empathetically with our customers, partners and stakeholders on environmental matters and report on our performance

This Policy applies to the agencies listed below:

- Transport for NSW
- Department of Transport
- Sydney Trains
- NSW Trains
- RailCorp
- State Transit Authority
- Sydney Metro

This Policy applies to permanent, temporary and casual staff of the above agencies, staff seconded from another organisation and contingent workers including labour hire, professional services contractors and consultants.

Rodd Staples
Secretary
13 January 2020

Transport for NSW T 8202 2200 | F 8202 2209
18 Lee Street, Chippendale NSW 2008 | PO Box K659, Haymarket NSW 1240

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Integrated Management System

Sydney Metro Construction Noise and Vibration Standard

Report No 610.14213-R3

Sydney Metro Integrated Management System (IMS)

Applicable to:	Sydney Metro West
Author:	Sydney Metro
System owner:	Sydney Metro
Status:	Final
Version:	4.1
Date of issue:	09/04/2020
Security classification:	Open Access

Table of Contents

1. PURPOSE AND SCOPE

This Standard applies to all Sydney Metro projects and covers all elements of the project lifecycle with the exception of operational activities. Additionally, this standard only applies to design activities insofar as design decisions affect construction-related noise and vibration impacts (such as route selection, at-grade or underground rail systems and tunnel depth).

1.1. Distribution and Use

This document may be used in the development of, or referred to in:

- Environmental Impact Assessment documents;
- Design and construction environmental management documents;
- Contract documents; or
- Approvals and licences (subject to the agreement of the relevant regulatory authority).

1.2. Strategic Objectives

Sydney Metro recognise that sources of Noise and Vibration originating from our activities have a significant impact to local communities. We have adopted several strategic objectives to understand and manage these impacts:

- Applying a risk-based approach and implementing an appropriate hierarchy of controls at each stage of the project lifecycle to minimise impacts.
- Building an approach to reducing Noise and Vibration risks within each stage of the project lifecycle through active collaboration with internal and external stakeholders.
- Developing a clear understanding of our Construction Noise and Vibration Impacts and applying best practice management techniques.
- Valuing genuine community engagement that is sensitive to the needs and expectations of local communities and businesses.
- Committing to the continual improvement of Noise and Vibration management.

1.3. Construction Noise and Vibration Terminology

Decibel (dB): Decibel, often expressed as an ‘A – weighted’ sound pressure level, which has been found to correlate well with human subjective reactions to moderate noise levels. For steady, broadband noise, an increase or decrease of approximately 10 dB corresponds to a subjective doubling or halving of the loudness and a change of 2 to 3 dB is subjectively barely perceptible.

Sound Pressure Level (SPL or Lp): Expressed in dB, it is the level of noise measured by a standard sound level meter. It must be accompanied by a description of the measurement distance from the source, if used in any noise predictions or calculations. In a free field (eg outside on flat ground), each doubling of distance results in approximately 6dB reduction in airborne sound pressure level due to distance attenuation.

Sound Power Level (SWL or Lw): Expressed in dB, it is the total acoustic energy radiated by a plant or equipment to the environment. Sound power level is independent of distance from the source of the noise.

Rating Background Level (RBL): Rating background level is the overall single-figure background level representing each assessment period (day/evening/night) over a measurement period. As defined in the EPA "Noise Policy for Industry" dated October 2017.

Vibration: Vibration may be expressed in terms of displacement, velocity and acceleration. Velocity (mm/s), acceleration (m/s^2) and Vibration Dose Value (VDV, m/s$^{1.75}$) are most commonly used when assessing human comfort issues respectively. Peak Particle Velocity (PPV, mm/s) is typically used to assess impacts on structures.

Ground borne noise and Structure-borne noise: The transmission of noise energy as vibration travelling through the ground and / or structures and re-radiated as audible noise.

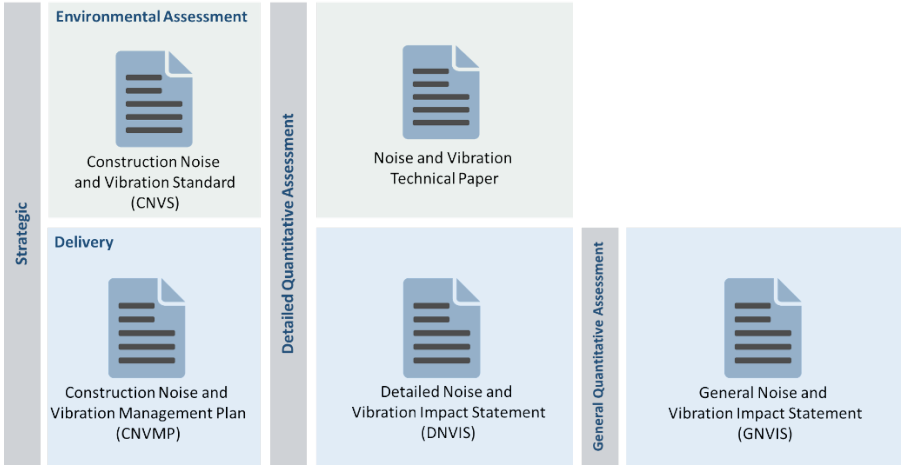
The three primary noise metrics used to describe construction noise emissions in the modelling and assessments are:

$L_{A1(1minute)}$	The typical 'maximum noise level for an event', used in the assessment of potential sleep disturbance during night-time periods. Alternatively, assessment may be conducted using the L_{Amax} or maximum noise level
$L_{Aeq(15minute)}$	The 'energy average noise level' evaluated over a 15-minute period. This parameter is used to assess the potential construction noise impacts.
L_{A90}	The 'background noise level' in the absence of construction activities. This parameter represents the average minimum noise level during the daytime, evening and night-time periods respectively. The LAeq(15minute) construction noise management levels are based on the LA90 background noise levels.

1.4. Documentation Framework

There are five main documents (**Figure 1**) which comprise the noise and vibration documentation framework. Together they provide a comprehensive approach to the assessment and delivery of works which generate noise and vibration while mitigating the impacts.

Figure 1 - Noise and Vibration Documentation Framework



1.4.1. Construction Noise and Vibration Standard (CNVS)

The CNVS (this document) establishes a consistent strategy for the assessment, mitigation and monitoring of noise and vibration generated by construction activities. It defines a minimum standard for managing noise and vibration impacts that considers currently best practice guidelines and other regulatory requirements. It is included in all Sydney Metro Environmental Assessments.

1.4.2. Construction Noise and Vibration Management Plan (CNVMP)

Where works will cause significant noise and vibration impacts upon sensitive receivers Principal Contractors will be required to prepare and implement CNVMP's. These documents form part of the CEMP suite of documentation.

The function of the CNVMP is to provide a strategic overview of how the requirements of the CNVS will be applied to activities or locations under the control of the Principal Contractor. This overview includes an outline of how quantitative noise and vibration assessments will be undertaken across worksites and/or activities, and an indicative construction schedule.

The CNVMP also links to Community and Stakeholder consultation processes and explains how commercial and residential receivers will be consulted throughout the construction phase with regard to mitigating impacts upon them.

Further detail on the requirements for CNVMP's can be found in the Sydney Metro Construction Environmental Management Framework.

1.4.3. Noise and Vibration Technical Paper

The Noise and Vibration Technical Paper is produced as part of the Environmental Assessment carried out in the planning phase of Sydney Metro projects. This document is a Quantitative Noise Assessment based upon the information known at the time the assessment is undertaken and makes recommendations for mitigation.

Typically it will include a range of assumptions on equipment lists and construction methodologies on the basis of which the impact upon sensitive receivers will be determined. As such, these Quantitative Assessments are generally conservative and may over predict actual impacts during construction.

1.4.4. Detailed Noise and Vibration Impact Statements (DNVIS)

While quantitative noise assessments are documented in environmental assessments, Principal Contractors will have a better understanding of the exact equipment list and construction methodology to be used in carrying out their works. As a result, certain assumptions made in the Noise and Vibration Technical Paper can be clarified in a secondary quantitative assessment undertaken by the Principal Contractor. These documents are called Detailed Noise and Vibration Impact Statements.

They are typically written with a focus on specific activities or locations and consider works carried out inside and outside of standard working hours.

Where 24/7 works are approved under an SSI approval, a separate DNVIS should be carried out specifically for these activities.

Work described in a DNVIS's cannot proceed until the DNVIS is approved by an Acoustic Advisor appointed under an SSI approval. Should the scope of work or the timing of works change, the Principal contractor must update the DNVIS and seek subsequent approval for the new version. See **Section 3.1** for more detail on DNVIS's.

1.4.5. General Noise and Vibration Impact Statements (GNVIS)

General Noise and Vibration Impact Statements are also secondary assessments and have the same purpose as DNVIS's except that the assessment process is simplified. A GNVIS may be undertaken for works not being carried out under an SSI Approval.

Work described in a GNVIS's cannot proceed until the GNVIS is approved by Sydney Metro. Should the scope of work or the timing of works change, the Principal contractor must update the GNVIS and seek subsequent approval for the new version. See **Section 3.2** for more detail on GNVIS's.

2. NOISE AND VIBRATION GUIDELINES

2.1. Construction Hours

Where possible, works will be completed during the standard day time construction hours of Monday to Friday 7.00 am to 6.00 pm and Saturdays 8.00 am to 1.00 pm. However, the nature of infrastructure projects means evening and night works are likely to be required throughout construction due to various considerations including avoiding sensitive periods for sensitive receivers, delivery of oversized plant or structures, emergency works, or other activities that require the temporary closure of roads. In these situations the impacts of works outside standard construction hours will be approved via updates to the relevant activities DNVIS or GNVIS.

In other cases there may be a need to assess activities that require 24 hour working for a significant portion of the construction period. Examples of construction scenarios that will require 24/7 works include:

- Excavation of station shafts;
- Truck movements to manage spoil;
- Excavation of the station caverns;
- Operation of tunnel boring machines; or
- Spoil removal and transport from site.

Works requiring 24/7 activity are usually proposed in the environmental assessment and will be subsequently assessed in a secondary quantitative assessment during delivery. Where the need for 24 hours works arises post approval, a consistency assessment would be undertaken to determine if a modification to the planning approval is required.

2.2. Construction Noise Management Levels (NML)

Construction Noise Management Levels (NML) for all Sydney Metro projects is determined in accordance with the EPA's "Interim Construction Noise Guideline" dated July 2009 (ICNG, 2009). The following sections supplement this guideline with respect to Sydney Metro projects.

2.2.1. Residences and Other Sensitive Land Uses

Noise Management Levels and how they are applied is set out in **Table 1.** This approach is intended to provide respite for residents exposed to excessive construction noise whilst allowing construction to occur without undue constraints.

The Rating Background Level (RBL) is used when determining the management level and is the overall single-figure background noise level measured in each relevant assessment period (as defined in the EPA "Noise policy for Industry" dated January 2017).

Table 1: Noise Management Levels for different times of day and considerations on their application

Time of Day	Noise Management Level $L_{Aeq\ (15minute)}$[1]	Management Considerations
Recommended standard hours: Monday to Friday 7.00 am to 6.00 pm Saturday 8.00 am to 1.00 pm	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq\ (15minute)}$ is greater than the noise affected level, the proponent would apply all feasible and reasonable work practices to minimise noise. The proponent would also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the proponent would consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level. If no quieter work method is feasible and reasonable, and the works proceed, the proponent would communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.
Outside recommended standard hours	Noise affected RBL + 5 dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent would apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent would negotiate with the community. For guidance on negotiating agreements see Section 7.2.2 of the ICNG.

Note 1: Noise levels apply at the property boundary that is most exposed to construction noise. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence.

Management levels for noise near properties which are sensitive to Noise Impacts are presented in **Table 2.** These values are set and based on the principle that the characteristic activities for each would not be unduly disturbed. The noise management levels apply only when the property is being used, for example, classrooms during school hours. Internal noise levels are to be assessed at the centre of the occupied room. External noise levels are to be assessed at the most-affected point within 50 m of the area boundary.

Table 2: Noise Management Levels for certain sensitive receivers

Land Use	Management Level, $L_{Aeq\ (15minute)}$ (Applies When Land Use is being Utilised)
Classrooms at schools and other educational institutions	Internal noise level 45 dB
Hospital wards and operating theatres	Internal noise level 45 dB
Places of worship	Internal noise level 45 dB
Active recreation areas (such as parks and sports grounds or playgrounds)	External noise level 65 dB
Passive recreation areas (such as outdoor grounds used for teaching, outdoor cafes or restaurants)	External noise level 60 dB

Other noise-sensitive businesses require separate specific noise goals and it is suggested in the ICNG that the internal construction noise levels at these premises are to be referenced to the 'maximum' internal levels presented in AS 2107. Recommended 'maximum' internal noise levels from AS 2107 are reproduced in **Table 3** for other sensitive receiver types.

However, the ICNG and AS 2107 do not provide specific criteria for childcare centres. Childcare centres generally have internal play areas and sleep areas. The Association of Australian Acoustical Consultants (AAAC) Technical Guideline on Child Care Centre Noise Assessments provides criteria for these land uses. Based on this guideline an $L_{Aeq\ (1hour)}$ of 55 dBA for external play areas and $L_{Aeq\ (1hour)}$ of 40 dBA for indoor play areas and sleeping areas would be adopted.

Table 3 AS 2107 Recommended Maximum Internal Noise Levels

Land Use	Time Period	AS 2107 Classification	Recommended "Maximum" Internal LAeq (dBA)
Hotel	Daytime & Evening	Bars and Lounges	50 dB
	Night-time	Sleeping Areas: - Hotels near major roads	40 dB
Café	When in use	Coffee bar	50 dB
Bar/Restaurant	When in use	Bars and Lounges / Restaurant	50 dB
Library	When in use	Reading Areas	45 dB
Recording Studio	When in use	Music Recording Studios	25 dB
Theatre / Auditorium	When in use	Drama Theatres	30 dB

2.2.2. Commercial and Industrial Premises

Due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining Noise Management Levels is separated into three categories. The external noise levels would be assessed at the most-affected occupied point of the premises:

- Industrial premises (external): 75 dB $L_{Aeq(15minute)}$
- Offices, retail outlets (external): 70 dB $L_{Aeq(15minute)}$
- Other businesses that may be very sensitive to noise, where the noise level is project specific as discussed below.

Examples of other noise-sensitive businesses are theatres, studios and child care centres. The proponent would undertake a special investigation to determine suitable noise levels on a project-by-project basis; the recommended internal noise levels presented in Table 1 of AS 2107 “Acoustics - Recommended design sound levels and reverberation times for building interiors” (Standards Australia 2000) may assist in determining relevant noise levels; however, an acoustic consultant would be engaged in order to determine corresponding external noise levels based on the published internal noise levels. The proponent would assess construction noise levels for the project, and consult with occupants of commercial and industrial premises prior to lodging an application where required. During construction, the proponent would regularly update the occupants of the commercial and industrial premises regarding noise levels and hours of work.

2.3. Ground-Borne Vibration

The effects of vibration in buildings can be divided into three main categories; those in which the occupants or users of the building are inconvenienced or possibly disturbed, those where the building contents may be affected and those in which the integrity of the building or the structure itself may be prejudiced.

2.3.1. Human Comfort Vibration

The DECCW’s “Assessing Vibration: a technical guideline” dated February 2006 (DEC, 2006) recommends the use of BS 6472-1992 for the purpose of assessing vibration in relation to human comfort.

British Standard 6472-1992 “*Guide to evaluation of human exposure to vibration in building*” nominates guideline values for various categories of disturbance, the most stringent of which are the levels of building vibration associated with a “low probability of adverse comment” from occupants.

BS 6472-1992 provides guideline values for continuous, transient and intermittent events that are based on a Vibration Dose Value (VDV), rather than a continuous vibration level. The vibration dose value is dependent upon the level and duration of the short term vibration event, as well as the number of events occurring during the daytime or night-time period.

The vibration dose values recommended in BS 6472-1992 for which various levels of adverse comment from occupants may be expected are presented in **Table 4**.

Table 4: Vibration Dose Value Ranges which Might Result in Various Probabilities of Adverse Comment within Residential Buildings

Place and Time	Low Probability of Adverse Comment ($m/s^{1.75}$)	Adverse Comment Possible ($m/s^{1.75}$)	Adverse Comment Probable ($m/s^{1.75}$)
Residential buildings 16 hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Note: For offices and workshops, multiplying factors of 2 and 4 respectively would be applied to the above vibration dose value ranges for a 16 hr day.

2.3.2. Structural Damage Vibration

Most commonly specified 'safe' structural vibration limits are designed to minimise the risk of threshold or cosmetic surface cracks, and are set well below the levels that have potential to cause damage to the main structure.

In terms of the most recent relevant vibration damage goals, Australian Standard AS 2187: Part 2-2006 'Explosives - Storage and Use - Part 2: Use of Explosives' recommends the frequency dependent guideline values and assessment methods given in BS 7385 Part 2-1993 'Evaluation and measurement for vibration in buildings Part 2' as they "are applicable to Australian conditions".

The Standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

Sources of vibration that are considered in the standard include demolition, blasting (carried out during mineral extraction or construction excavation), piling, ground treatments (e.g. compaction), construction equipment, tunnelling, road and rail traffic and industrial machinery.

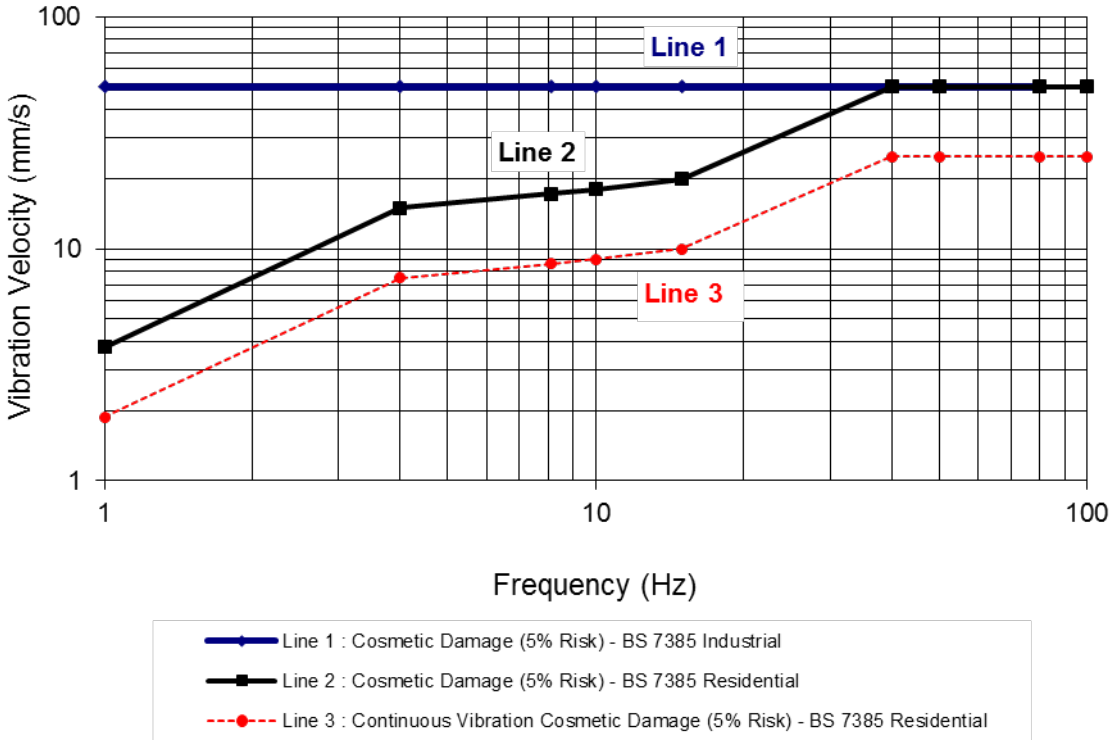
2.3.3. Cosmetic Damage Vibration

The recommended limits (guide values) for transient vibration to ensure minimal risk of cosmetic damage to residential and industrial buildings are presented numerically in **Table 5** and graphically in **Figure 2**.

Table 5: Transient Vibration Guide Values - Minimal Risk of Cosmetic Damage

Line	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

Figure 2: Graph of Transient Vibration Guide Values for Cosmetic Damage



The Standard goes on to state that minor damage is possible at vibration magnitudes which are greater than twice those given in **Table 5**, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the Standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the guide values in **Table 5** would not be reduced for fatigue considerations.

In order to assess the likelihood of cosmetic damage due to vibration, AS2187 specifies that vibration measured would be undertaken at the base of the building and the highest of the orthogonal vibration components (transverse, longitudinal and vertical directions) would be compared with the guidance curves presented in **Figure 2**.

It is noteworthy that extra to the guide values nominated in **Table 5**, the standard states that:

> *"Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK."*

Also that:

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

2.4. General Vibration Screening Criterion

The Standard states that the guide values in **Table 5** relate predominantly to transient vibration which does not give rise to resonant responses in structures and low-rise buildings.

Where the dynamic loading caused by continuous vibration may give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in **Table 5** may need to be reduced by up to 50%.

Note: rock breaking/hammering and sheet piling activities are considered to have the potential to cause dynamic loading in some structures (e.g. residences) and it may therefore be appropriate to reduce the transient values by 50%.

Therefore for most construction activities involving intermittent vibration sources such as rock breakers, piling rigs, vibratory rollers, excavators and the like, the predominant vibration energy occurs at frequencies greater than 4 Hz (and usually in the 10 Hz to 100 Hz range). On this basis, a conservative vibration damage screening level per receiver type is given below:

- Reinforced or framed structures: 25.0 mm/s
- Unreinforced or light framed structures: 7.5 mm/s

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

2.5. Guidelines for Vibration Sensitive and Special Structures

2.5.1. Heritage

Heritage buildings and structures would be assessed as per the screening criteria in **Section 2.4** as they should not be assumed to be more sensitive to vibration unless they are found to be structurally unsound. If a heritage building or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage criteria of 2.5 mm/s peak component particle velocity (from DIN 4150) would be considered.

2.5.2. Sensitive Scientific and Medical Equipment

Some scientific equipment (e.g. electron microscopes and microelectronics manufacturing equipment) can require more stringent objectives than those applicable to human comfort.

Where it has been identified that vibration sensitive scientific and/or medical instruments are likely to be in use inside the premises of an identified vibration sensitive receiver, objectives for the satisfactory operation of the instrument would be sourced from manufacturer's data. Where manufacturer's data is not available, generic vibration criterion (VC) curves as published by the Society of Photo-Optical Instrumentation Engineers (Colin G. Gordon - 28 September 1999) may be adopted as vibration goals. These generic VC curves are presented below in **Table 6** and **Figure 3**.

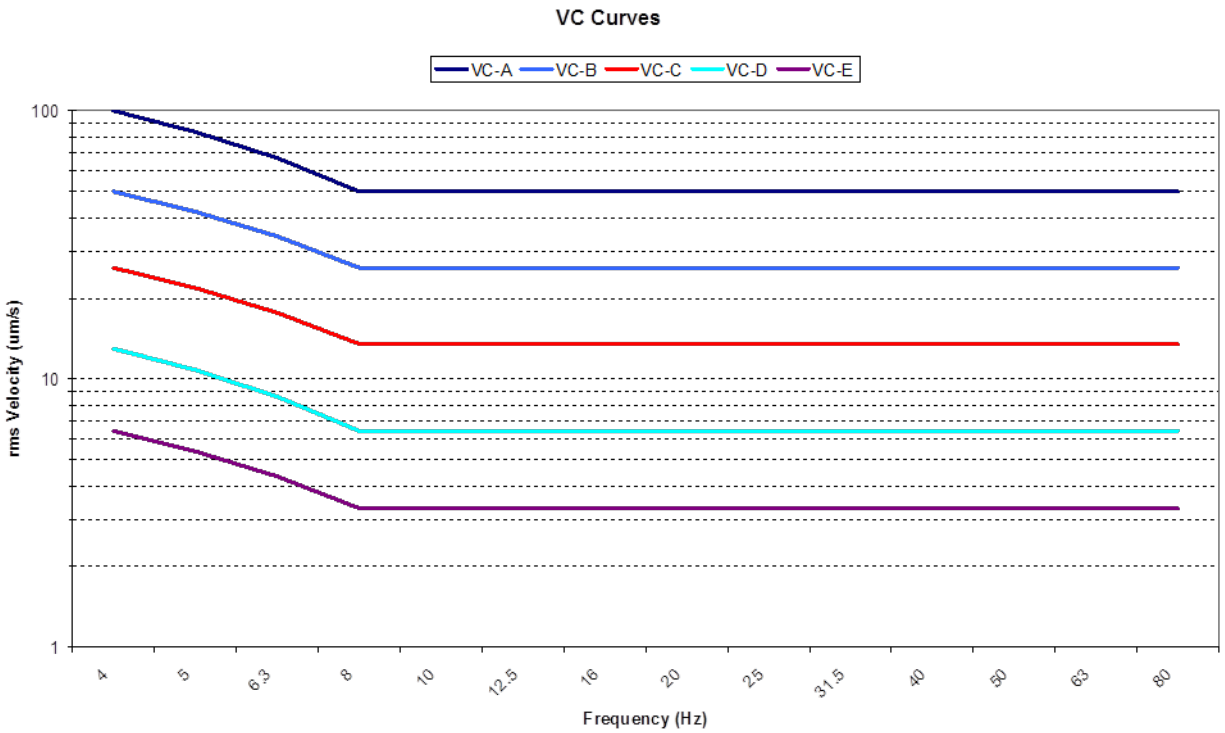
Table 6: Application and Interpretation of the Generic Vibration Criterion (VC) Curves (as shown in Figure 3)

VC-A	50	8	Adequate in most instances for optical microscopes to 400X, microbalances, optical balances, proximity and projection aligners, etc.
VC-B	25	3	An appropriate standard for optical microscopes to 1000X, inspection and lithography equipment (including steppers) to 3 micron line widths.
VC-C	12.5	1	A good standard for most lithography and inspection equipment to 1 micron detail size.
VC-D	6	0.3	Suitable in most instances for the most demanding equipment including electron microscopes (TEMs and SEMs) and E-Beam systems, operating to the limits of their capability.
VC-E	3	0.1	A difficult criterion to achieve in most instances. Assumed to be adequate for the most demanding of sensitive systems including long path, laser-based, small target systems and other systems requiring extraordinary dynamic stability.

Note 1: As measured in one-third octave bands of frequency over the frequency range 8 to 100 Hz.

Note 2: The detail size refers to the line widths for microelectronics fabrication, the particle (cell) size for medical and pharmaceutical research, etc. The values given take into account the observation requirements of many items depend upon the detail size of the process.

Figure 3: Vibration Criterion (VC) Curves



2.5.3. 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 2.4** may need to be adopted. Examples of such structures and utilities include:

- Tunnels
- Gas pipelines
- Fibre optic cables

Specific vibration goals would be determined on a case-by-case basis. An acoustic consultant would be engaged by the construction contractor and would liaise with the structure or utility's owner in order to determine acceptable vibration levels.

2.6. Vibration and Overpressure from Blasting

The DECCW's ICNG recommends that vibration and overpressure from blasting be assessed against the levels presented in the Australian and New Zealand Environment Council's (ANZECC) Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC, 1990).

The criteria set by this standard are targeted at operations that occur for long periods of time such as those at mining sites and hence are targeted at protecting human comfort vibration levels. As a result the vibration levels are conservative and can introduce unnecessary constraints when applied to construction projects which typically occur for much shorter time periods. Recent NSW infrastructure project approvals have recognised the restrictive nature of these blasting criteria when applied to construction projects and have therefore allowed the following vibration and overpressure limits:

- Vibration (PPV): 25 mm/s
- Overpressure: 125 dBL

These upper limits are deemed acceptable where the proponent has a written agreement with the relevant landowner to exceed the criteria and the Secretary has approved the terms of the written agreement. These upper limits to vibration and overpressure are intended to target the protection of building structures from cosmetic damage rather than human comfort criteria as construction works are considered short-term.

2.7. Ground-Borne (Regenerated) Noise

Ground-borne (regenerated) noise is noise generated by vibration transmitted through the ground into a structure. Ground-borne noise caused, for example by underground works such as tunnelling, can be more noticeable than airborne noise. The following ground-borne noise levels for residences are nominated in the ICNG and indicate when management actions would be implemented. These levels recognise the temporary nature of construction and are only applicable when ground-borne noise levels are higher than airborne noise levels.

The ground-borne noise management levels are given below:

- Day (7.00 am to 6.00pm)
  Internal Residential: 45 dB $L_{Aeq(15minute)}$
  Internal Commercial: 50 dB $L_{Aeq(15minute)}$
- Evening (6.00 pm to 10.00 pm)
  Internal Residential: 40 dB $L_{Aeq(15minute)}$
- Night-time (10.00 pm to 7.00 am)
  Internal Residential: 35 dB $L_{Aeq(15minute)}$

The daytime criteria are applicable to both residential and commercial receivers, whereas the evening and night-time criteria are only applicable to residential receivers.

The internal noise levels are to be assessed at the centre of the most-affected habitable room. For a limited number of discrete, ongoing ground-borne noise events, such as drilling or rock-hammering, The L_{Amax} noise descriptor using a slow response on the sound level meter may be better than the L_{Aeq} noise descriptor (15 min) in describing the noise impacts. The level of mitigation of ground-borne noise would depend on the extent of impacts and also on the scale and duration of works. Any restriction on the days when construction work is allowed would take into account whether the community:

- Has identified times of day when they are more sensitive to noise (for example Sundays or public holidays).
- Is prepared to accept a longer construction duration in exchange for days of respite.

2.8. Traffic Noise Assessment Goals

When trucks and other vehicles are operating within the boundaries of the various construction sites, road vehicle noise contributions are included in the overall predicted $L_{Aeq(15minute)}$ construction site noise emissions. When construction related traffic moves onto the public road network a different noise assessment methodology is appropriate, as vehicle movements would be regarded as 'additional road traffic' rather than as part of the construction site.

The ICNG does not provide specific guidance in relation to acceptable noise levels associated with construction traffic. For assessment purposes, guidance is taken from the RNP.

One of the objectives of the RNP is to apply relevant permissible noise increase criteria to protect sensitive receivers against excessive decreases in amenity as the result of a proposal. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

On this basis, construction traffic NMLs set at 2 dB 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 dB as a result 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 dB, consideration would also be given to the actual noise levels associated with construction traffic and whether or not these levels comply with the following road traffic noise criteria in the RNP:

- 60 dB $L_{Aeq(15hour)}$ day and 55 dB $L_{Aeq(9hour)}$ night for existing freeway/ arterial/ sub-arterial roads.

- 55 dB $L_{Aeq(1hour)}$ day and 50 dB $L_{Aeq(1hour)}$ night for existing local roads.

2.8.1. Sleep Disturbance and Maximum Noise Events

In addition to the current legislative guidance on potential sleep disturbance outlined in Section 5.10 the RNP refers to Practice Note 3 of the ENMM for specific impacts from road traffic. The ENMM recommends an evaluation of the number and distribution of night-time pass by events where the L_{AFmax} - $L_{Aeq(1hour)}$ difference is greater than 15 dB, and the maximum noise level of that event is greater than 65 dB L_{Amax}.

On the basis of the current guidance:

- External sleep disturbance screening criterion of RBL + 15 dB
- External sleep disturbance criterion of 65 dB L_{Amax} (assuming open windows).

2.9. Sleep Disturbance and Maximum Noise Level Events

The DECCW's ECRTN and the Road and Traffic Authority's (RTA's) 'Environmental Noise Management Manual' (ENMM) provide guidance as to the likelihood of sleep disturbance resulting from maximum noise level events (mainly associated with heavy vehicle movements). The ECRTN points out the following:

"There are no universally accepted criteria governing the likelihood of sleep disturbance. In other words, at the current level of understanding, it is not possible to establish absolute noise levels that correlate to levels of sleep disturbance (for all or even a majority of people)."

Notwithstanding the ECRTN/ENMM suggests that:

- Maximum internal noise levels below 50 dB to 55 dB L_{Amax} are unlikely to cause awakening reactions.
- One or two events per night, with maximum internal noise levels of 65 dB to 70 dB LAmax, are not likely to affect health and wellbeing significantly.
- At locations where road traffic is continuous rather than intermittent, the L_{Aeq}(9hour) target noise level should sufficiently account for sleep disturbance impacts.
- Where the emergence of LAmax noise levels over the ambient L_{Aeq} noise level is greater than 15 dB, the L_{Aeq} criterion may not sufficiently account for sleep disturbance impacts.

A maximum noise event can be defined as any pass by for which the difference in the L_{Amax} and L_{Aeq}(1Hour) noise levels is greater than 15 dB. Furthermore, the ECRTN recommends that the assessment of sleep disturbance should include a consideration of the maximum noise level exceedances occurring during the night-time period and the emergence of these exceedances above the ambient noise level.

3. CONSTRUCTION NOISE & VIBRATION ASSESSMENT METHODOLOGY

There are planning processes at all levels of government that may apply to works carried out by Sydney Metro, some of these processes (particularly State and Federal planning processes) require a detailed Environmental Assessment of the construction phases for the proposal. As construction contractors are not typically appointed until later in a project's timeline, the exact construction methodology they will use for a particular project may not be known when the environmental assessment is being carried out (see Table 7).

With respect to the assessment of noise and vibration impacts in environmental assessments they are to include a detailed quantitative assessment that adopts conservative assumptions to account for uncertainty in the precise delivery methodology. In most circumstances the noise and vibration impacts predicted by an environmental assessment will overestimate real impacts during delivery. As a result, this strategy requires secondary quantitative assessments to be undertaken during delivery by the Principal Contractor to verify impacts and better inform how to mitigate impacts.

For construction works approved under Division 5.2 of the EP&A Act, further quantitative noise and vibration assessments will be undertaken for activities and/or locations where work will occur. These are called Detailed Noise and Vibration Impact Statements (DNVIS), and works subject to these assessments will not proceed until the DNVIS has been approved by an Acoustic Advisor appointed under an SSI approval, or where there is no SSI approval, approved by Sydney Metro. **Section 3.1** of this Standard provides information on the requirements for a DNVIS.

For construction works approved under any other planning approval pathway, the secondary quantitative noise assessment may take a less detailed approach and is referred to as a General Noise and Vibration Impact Assessment (GNVIS). **Section 3.2** of this Standard provides information on the requirements for a GNVIS.

In order to develop a comprehensive secondary assessment framework specific details of the construction methodology (including the size and type of equipment) is required. Detailed design, construction and engineering solutions are progressively developed and applied throughout the life-span of the project and consequently secondary assessments are to be updated to reflect changing design and/or construction methodologies. Secondary assessments may take one of two forms and each are updated when a change occurs:

- General Construction Activity for construction scenarios that are consistently the same and progressively move along the project alignment e.g. tunnelling, retaining walls.
- Location Specific for construction scenarios that are specific to a location.

How these statements are distributed across the scope of work is to be articulated in the Noise and Vibration Management Plan, or where one is not required, the CEMP.

In all cases the overriding objective of noise and vibration assessments is to firstly identify impact reduction techniques to reduce noise and vibration impacts below the NML using Standard Mitigation Measures (refer to **Section 4**) so that the reliance upon impact offset measures is removed or minimised (refer to **Section 5)**.

Table 7: Summary of Assessment Detail Required During the Various Stages of the Project

Assessment Input	Environmental Impact Statement / Environmental Assessment	In Delivery
Construction Scenarios / Equipment List	Construction scenarios defined by project team, based on potential construction methodologies known at the time	Construction scenarios defined by construction team. These are expected to include finalised equipment lists, itemising the realistic worst-case plant proposed to be used at any one time, and in any one location
Modelled works location	Works location by scenario (or group of scenarios) i.e. different locations for different works	Works location by works scenario i.e. specific locations for each works
Background noise monitoring	Background noise monitoring required to determine RBL at locations representative of worst-affected receiver areas adjacent to the works areas	Supplementary noise monitoring required to determine RBL at locations representative of worst-affected receiver areas adjacent to the works areas where noise survey data is not current (i.e. more than 5 years old)
Study Area	The study area must, as a minimum, include receivers subjected to predicted $L_{Aeq(15minute)} \geq$ RBL+5dB for the applicable time period. Vibration level predictions up to 100 m	Predict noise and vibration levels to the sensitive receivers within the area surrounding the works, to include all receivers where the $L_{Aeq(15minute)} \geq$ RBL +5dB and the vibration screening criteria are exceeded during the applicable time periods.
Assessment of mitigation	Demonstration that assessment of this stage includes reasonable and feasible mitigation measures	Based on these predictions the Construction Noise and Vibration Management Plan (CNVMP) shall identify all reasonable and feasible mitigation measures to minimise noise and vibration from construction. Sections 4 and 5 identify the standard and additional mitigation measures to be included where applicable in the CNVMP. Eg. Detailed vibration assessments to include dilapidation surveys, continuous vibration monitoring and accurate vibration transfer measurements (site law measurements) for all buildings with the potential to exceed the screening criteria for vibration.
Documentation	Environmental Assessment and associated documentation	Activity or location specific Construction Noise Impact Statements Construction Noise and Vibration Management Plans OOHW Applications

3.1. Detailed Noise and Vibration Impact Statements

For all DNVIS reports the noise impacts are to be assessed based on construction scenarios. A construction scenario relating to noise impact is essentially a construction activity which is made up of the required plant and equipment. A number of construction scenarios will make up any one DNVIS report. In undertaking an assessment of the noise impact from a construction scenario(s) the following steps are to be taken:

- Identify all Noise and Vibration Sensitive Receivers (NSRs) which may be affected by the project.
- Conduct background noise monitoring at representative NSRs to determine the rating background noise levels (RBLs) in accordance with the procedures presented in the NSW Industrial Noise Policy, where RBLs have not been established in previous project stages.
- Determine the appropriate noise and vibration management levels of each NSR.
- Determine the source noise levels (Sound Power Levels) of each noise generating plant and equipment item required to undertake the construction scenario. Note: Sound Power Levels for each plant and equipment would be less than the maximum allowable levels found in Table 13 and Table 14.
- Clearly indicate which mitigation measures identified in Section 4 have been/are to be incorporated into the noise assessment. Noise mitigation measures to be implemented will vary for reasons such as safety and space constraints, these are to be identified and the calculations adjusted accordingly.
- For location specific construction scenarios and where applicable for generic scenarios, include the effects of noise shielding provided by site offices, residential fences, noise barriers or natural topographic features.
- Where applicable include the effects of noise reflections and ground attenuation.
- Calculate the L_{Aeq} noise or range of levels from construction scenarios at sensitive receiver groups, with the use of noise contour maps where appropriate and/or at 10 m, 25 m, 50 m, 75 m,100 m and 200 m for more general construction activities.
- Compare these against the goals identified for each NSR and identify predicted exceedances.
- For night-time activities, calculate the $L_{A1(60second)}$ noise levels and compare with the DECCW's RBL + 15 dB sleep disturbance screening criterion. On the basis of the ambient noise environment during the night-time period, the predicted L_{A1} noise levels and the number of expected L_{A1} noise events would be assessed. From this assessment determine the likelihood of potential sleep disturbance. Note: the L_{Amax} noise level can be used to estimate the L_{A1} noise level.
- On completion of all DNVIS reports for the subjective classification of the noise impact is to be evaluated and documented as:
    - Low Impact
    - Moderate Impact
    - High Impact

The classifications are to be determined on a case-by-case basis with consideration of the following points:

- The location of the works in relation to NSRs with consideration of noise attenuation features such as noise barriers including topographical features (earth-mounds), buildings, dividing fences etc (distance of works from sensitive receiver(s)).
- The type and sensitivity of the NSRs:
    - Low Impact: e.g. Commercial buildings/ Scattered Residential (low density)
    - Moderate Impact: e.g. Standard residential (typical density)

  - High Impact: e.g. Residential home for the elderly/high density unit blocks/persistent complainers/residents deemed to have “construction noise fatigue”.
- The extent of noise exceedance above Noise Management Level.
- The likelihood for potential sleep disturbance RBL + 15 dB.
- The type of and intensity of noise emitted from works (i.e. tonal or impulsive):
  - Lower Impact: No high noise and/or vibration intensive activities
  - Moderate Impact: Short/intermittent high noise and/or vibration intensive activities
  - High Impact: Prolonged high noise and/or vibration intensive activities.
- The duration of any OOHW required.
- The time frames for any OOHW:
  - Lower Impact: 6.00 pm till 10.00 pm weekdays 1.00 pm till 10.00pm Saturdays 8.00 am till 6.00 pm Sundays or Public Holidays.
  - Moderate Impact: 10.00 pm to 7.00 am Weekday Nights 10.00 pm to 8.00 am Saturdays.
  - High Impact: 6.00 pm to 7.00 am Sundays and Public Holidays.
- As a result of noise classification and/or the noise level exceedances at sensitive receivers provided by the DNVIS reports, appropriate reasonable and feasible noise mitigation is to be adopted and implemented. For sites where works are predicted to significantly exceed noise goals and impact on receivers for a significant period of time, additional reasonable and feasible noise mitigation measures such as those outlined in Section 5 would be considered if practical to reduce the noise levels and impact on sensitive receivers.

3.2. General Noise and Vibration Impact Assessments

For works other than those carried out under an SSI Approval a more generalised approach is adopted to assess impacts, this is called a GNVIS. These assessments rely upon indicative Sound Power Level’s from typical plant and equipment (Table 8), auditing of plant and equipment during delivery, and typical variables that modify the transmission of noise and vibration to determine a predicted impact at the most affected NSR.

Where a change occurs in relation to works described in a GNVIS, it will be updated and resubmitted to Sydney Metro for approval. For example, works during standard working hours being rescheduled outside standard working hours.

The first step in the GNVIS is to determine the relevant period of time during which the works will occur. This is either during standard working hours, or outside standard working hours during daytime, evening or night. Depending on the timeframe there will be differing Noise Management Levels for the activity. Section 2.2 outlines how Noise Management levels (NML) are calculated.

Secondly, Table 8 is used to determine the Sound Power Level (SWL) of the Noisiest piece of Plant or Equipment. Each piece of plant or equipment is required by this standard to be audited regularly and the SWL confirmed to fall within the range indicated in Table 13 or Table 14.

Table 8 - Indicative SWL's for GNVIS Assessments

Plant/Equipment Noise Level at 10m		dBA
Including non-continuous use reduction (-5dBA) and annoying activity penalty (+5dBA) for as per ICNG (refer to ICNG Appendix B for predicted noise level data).	Impact sheet piling rig	100
	Hand-held tamper, excavator with hammer, rock-breaker, driven/vibratory piling, concrete saw, diamond saw, air track drill, large dozer, hand-held rail grinder	95
	Jackhammer, rock crusher, angle grinder, pneumatic hammer, medium dozer, tracked loader, impact wrench	90
	Mainline tamper, ballast regulator, dynamic track stabiliser, vibratory roller, mainline rail grinder, ballast train (pour/fill ballast), chainsaw, tub grinder/large mulcher, scraper, grader, super-sucker/vacuum truck, large backhoe/wheeled front-end loader, bored piling, pavement profiler, fixed crane, tracked excavator	85
	Small bulldozer, small excavator, tower crane, truck-mounted crane, forklift, bobcat, skid-steer front-end loader, road truck/truck and dog, dump truck, concrete truck/pump/mixer, compressor, non-vibratory/large pad foot roller, whacker packer/compactor, water cart, pavement laying machine, asphalt truck and sprayer, line marking truck, standard penetration testing, welder, pin puller	80
	Concrete vibrator, cherry-picker scissor lift/elevated work platform/Franna crane, small backhoe, front end loader, fence post driver, electric drill rig, hand held rattle gun, generator (diesel/petrol), spreader	75
	Lighting tower, medium-rigid truck/semi-trailer, welding equipment, small front end loader	70
	Light vehicle, hand-tools (no impact), small cement mixer, attenuated generator (inside housing)	65

Thirdly, the nearest residential and non-residential sensitive receivers are identified that are closest to the point at which the noisiest piece of plant or equipment will be operated.

Lastly, a series of factors are considered which have either exacerbating or mitigating effects (Table 10) on the transmission of noise and vibration to arrive at a predicted noise level at both the residential and non-residential receiver. The predicted level is then compared against the NML and an exceedance is calculated. The receiver with the highest exceedance determines the level of Additional Mitigation Measures which must be considered (see Section 5).

All this information is collated into a table similar to Table 9 below.

Table 9 - GNVIS Calculations

Period	Noisiest Plant/Equipment SWL	Receiver Type	Enter the most applicable values from **Table 8**, then add to determine the Predicted Noise Level				**Predicted Noise Level** (1 + 2 + 3 + 4)	NML	**Exceedance** (Predicted Noise Level minus NML)
			1. Plant/Equipment Noise Level	2. Multiple Plant/Equipment	3. Local Screening	4. Distance Attenuation			
Standard Hours		Residential							
		Non-Residential							
Daytime OOH *		Residential							
		Non-Residential							
Evening OOH *		Residential							
		Non-Residential							
Night Time OOH *		Residential							
		Non-Residential							

Table 10 - Exacerbating and Mitigating Factors

Exacerbating and Mitigating Factors		dBA
Multiple Plant	More than one of the noisiest plant being used simultaneously at roughly the same location	+5
Local Screening	Existing screening between site and receiver (buildings, cuttings, canopies, etc.)	- 5
	Temporary screening to be implemented near work site	- 10
	Acoustic shed or enclosure	- 25
Distance Attenuation	< 10 metres	0
	10 to 20 metres	- 5
	20 to 35 metres	- 10
	35 to 60 metres	- 15
	60 to 100 metres	- 20
	100 to 180 metres	- 25
	180 to 350 metres	- 30
	350 to 1,000 metres	- 40

3.3. Noise and Vibration Sensitive Receivers

The sensitivity of occupants to noise and vibration varies according to the nature of the occupancy and the activities performed within the affected premises. For example, recording studios are more sensitive to vibration and ground borne noise than residential premises, which in turn are more sensitive than typical commercial premises.

Specific noise and vibration sensitive receivers (NSRs) relevant to individual construction sites would be identified and addressed in the Environmental Assessment of each Sydney Metro project. Each receiver would be identified as falling into one of the following categories:

- Commercial
- Educational
- Industrial
- Mixed residential/commercial
- Residential
- Residential occupied by shift workers
- Place of Worship
- Medical facilities
- Other sensitive receivers

3.4. Ground-Borne (Regenerated) Noise

Ground-borne noise as a result of construction activities is usually associated with tunnelling projects where equipment such as tunnel boring machines, road headers, rock hammers and drilling rigs are operated underground. It is therefore anticipated that ground-borne noise may be an issue during the construction of Sydney Metro projects.

If NSR's may be affected by ground-borne noise as a result of construction activities, a DNVIS or GNVIS report specifically in relation to the assessment of ground-borne construction noise would be undertaken.

In undertaking a DNVIS or GNVIS report for ground-borne construction noise the following steps are to be taken:

- Determine the location of each plant and equipment item in relation to each receiver.
- On the basis of ground-borne noise versus distance prediction algorithms for each plant item, determine the level of ground-borne noise at each building location. For highly sensitive building occupancies, such as recording studios, the assessment may need to incorporate the acoustic properties of the building space and the structural response of the building. This is to be determined by a qualified acoustic consultant, should ground-borne noise be a potential issue.
- Include the effect of all relevant standard mitigation measures as part of the construction scenario.
- Calculate the $L_{Aeq(15minute)}$ noise levels from the proposed construction actives at each receiver and compare these to the ground-borne noise management levels.

3.5. Ground-Borne Vibration

Vibration as a result of construction activities is usually associated with tunnelling projects where equipment such as tunnel boring machines, road headers, rock hammers and drilling rigs are operated underground. It is therefore anticipated that ground-borne vibration may be an issue during the construction of Sydney Metro projects.

If vibration impacts are anticipated as a result of construction activities, a DNVIS or GNVIS report specifically in relation to the assessment of construction vibration would be undertaken.

In undertaking a DNVIS or GNVIS report for ground-borne construction vibration the following steps are to be taken:

- Determine the location of each plant and equipment item in relation to each receiver.
- On the basis of ground-borne vibration versus distance prediction algorithms for each plant item, determine the level of ground-borne vibration at each building location. For highly sensitive building occupancies, such as recording studios, the assessment may need to incorporate the vibration properties of the building space and the structural response of the building. This is to be determined by a qualified acoustic consultant, should ground-borne vibration be a potential issue.
- Include the effect of all relevant standard mitigation measures as part of the construction scenario.

Calculate the vibration levels from the proposed construction actives at each receiver and compare these to the ground-borne vibration criteria.

3.6. Vibration and Overpressure from Blasting

Vibration and overpressure as a result of construction activities is usually associated with tunnelling projects where blasting is required. If this construction is implemented then vibration and overpressure may be an issue during the construction of Sydney Metro projects.

If vibration and overpressure impacts are anticipated as a result of construction blasting, a DNVIS report, specifically in relation to the assessment of construction blasting would be undertaken regardless of the projects planning approval pathway.

In undertaking a DNVIS report for blasting vibration and overpressure the following steps are to be taken:

- Determine the location of blast charge in relation to each receiver.
- On the basis of vibration / overpressure versus distance prediction algorithms for blasting determine the level of vibration / overpressure at each receiver (building) location.
- Include the effect of all relevant standard mitigation measures as part of the construction scenario.

Calculate the vibration and overpressure levels from the proposed blasting actives at each receiver and compare these to the blasting criteria.

4. STANDARD NOISE AND VIBRATION MITIGATION MEASURES

4.1. Minimum Requirements

This section sets out the standard construction noise and vibration mitigation measures to be implemented on all Sydney Metro projects and delivered via relevant procedures, systems, environmental assessment, construction environmental management and all relevant contract documentation.

For all Sydney Metro construction projects, the standard mitigation measures in **Table 11** shall be applied by default in order to minimise the potential noise and vibration impacts at the surrounding Noise Sensitive Receivers. The effect of applying standard mitigation measures may be considered in noise and vibration assessments to achieve NML's.

4.1.1. Management Strategies during Construction

- Construction hours would be in accordance with the ICNG, project approvals and the EPL if required, except where otherwise specified in an approved noise management plan.
- When working adjacent to schools, medical facilities and childcare centres, particularly noisy activities would be scheduled outside normal working hours, where feasible and reasonable.
- When working adjacent to churches and places of worship particularly noisy activities would be scheduled outside services, where feasible and reasonable.
- Avoiding the coincidence of noisy plant working simultaneously close together and adjacent to sensitive receivers will result in reduced noise emissions.
- Where feasible and reasonable, the offset distance between noisy plant items and nearby noise sensitive receivers would be as great as possible.
- Regular compliance checks on the noise emissions of all plant and machinery used for the project would indicate whether noise emissions from plant items were higher than predicted. This also identifies defective silencing equipment on the items of plant.
- Ongoing noise monitoring during construction at sensitive receivers during critical periods (i.e. times when noise emissions are expected to be at their highest - e.g. piling and hammering) to identify and assist in managing high risk noise events.
- Where feasible and reasonable heavy vehicle movements would be limited to daytime hours.
- The implementation of procedures to maximise the night-time onsite spoil storage capacity where spoil is produced between the hours of 10.00 pm and 7.00 am.

4.1.2. Site Induction for all Employees, Contractors and Subcontractors

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
- Site opening/closing times (including deliveries)
- Environmental incident reporting and management procedures

4.1.3. Source Noise Control Strategies

- Engines and exhausts are typically the dominant noise sources on mobile plant such as cranes, graders, excavators, heavy vehicles, etc. In order to minimise noise emissions, residential grade mufflers would be fitted on all mobile plant utilised on Sydney Metro construction projects.
- The use of damped hammers is recommended such as the 'City' model Rammer hammers. These reduce the 'ringing' of the rock pick, cylinder and excavator arm that is commonly associated with rock breaking works. Approximately 10 dB attenuation can be achieved compared to undamped hammers of the same size.
- Regular maintenance of all plant and machinery used for the project will assist in minimising noise emissions, including the reporting of the results.
- Acoustic enclosure of plant items, if required, as identified during compliance monitoring.
- Air brake silencers would be correctly installed and fully operational for any heavy vehicle that approaches and uses any Sydney Metro construction site.
- Non-tonal reversing alarms would be used for all permanent mobile plant operating on Sydney Metro construction projects. Whilst the use of non-tonal reversing alarms is suggested to ensure noise impacts are minimised, it is noted that OH&S requirements must also be fully satisfied.

4.1.4. Noise Barrier Control Strategies

Temporary noise barriers are recommended between the noise sources and nearby potentially affected noise sensitive receivers, wherever feasible. Typically, 5 dB to 15 dB attenuation can be achieved with a well-constructed barrier.

4.1.5. Acoustic Enclosures

Where significant noise impacts are predicted and/or long periods of construction works are planned, acoustic enclosures can be used as an effective mitigation method. Acoustic enclosures act to contain the sources of noise, whilst also providing the benefit of screening the construction site from view. An enclosure with no openings would be expected to provide attenuation the order of 20 dB.

4.1.6. Vibration Control Strategies

Attended vibration measurements are required at the commencement of vibration generating activities to confirm that vibration levels satisfy the criteria for that vibration generating activity. Where there is potential for exceedances of the criteria further vibration site law investigations would be undertaken to determine the site-specific safe working distances for that vibration generating activity. Continuous vibration monitoring with audible and visible alarms would be conducted at the nearest sensitive receivers whenever vibration generating activities need to take place inside the calculated safe-working distances.

4.1.7. Community Consultation

Active community consultation and the maintenance of positive, cooperative relationships with schools, local residents and building owners and occupiers assists in managing impacts from noisier operations and in alleviating concerns and thereby minimising disturbance and complaint. This includes, for example:

- Periodic notification or work activities and progress (e.g. regular letterbox drops, e-consult)
- Specific notification (letter-box drop) prior to especially noisy activities
- Comprehensive website information
- Project information and construction response telephone line
- Email distribution list

4.2. Summary of the Standard Mitigation Measures

The actions set out in **Table 11** must be implemented on all Sydney Metro construction projects.

Table 11: Standard Mitigation Measures to Reduce Construction Noise and Vibration

Action required	Applies to	Details
Management Measures		
Implementation of any project specific mitigation measures required	Airborne noise Ground-borne noise and vibration	In addition to the measures set out in this table, any *project specific* 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	Periodic Notification (monthly letterbox drop)[1] Website Project information and construction response telephone line Email distribution list Place Managers

[1] Detailing all upcoming construction activities at least 14 days prior to commencement of relevant works

Action required	Applies to	Details
Register of Noise Sensitive Receivers	Airborne noise Ground-borne noise and vibration	A register of all noise and vibration sensitive receivers (NSRs) would be kept on site. The register would include the following details for each NSR: • Address of receiver • Category of receiver (e.g. Residential, Commercial etc.) • Contact name and phone number
Site inductions	Airborne noise Ground-borne noise and vibration	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. No excessive revving of plant and vehicle engines Controlled release of compressed air.
Monitoring	Airborne noise Ground-borne noise and vibration	A noise monitoring program is to 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.
Attended vibration measurements	Ground-borne vibration	Attended vibration measurements are required at the commencement of vibration generating activities to confirm that vibration levels satisfy the criteria for that vibration generating activity. Where there is potential for exceedances of the criteria further vibration site law investigations would be undertaken to determine the site-specific safe working distances for that vibration generating activity. Continuous vibration monitoring with audible and visible alarms would be conducted at the nearest sensitive receivers whenever vibration generating activities need to take place inside the applicable safe-working distances.
Source Controls		
Construction hours and scheduling	Airborne noise Ground-borne noise and vibration	Where feasible and reasonable, construction would be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels would be scheduled during less sensitive time periods.

Action required	Applies to	Details
Construction respite period	Ground-borne noise and vibration Airborne noise	High noise and vibration generating activities[2] may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block[3].
Equipment selection	Airborne noise Ground-borne noise and vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits.
Maximum noise levels	Airborne-noise	The noise levels of plant and equipment must have operating Sound Power Levels compliant with the criteria in **Table 13**.
Rental plant and equipment	Airborne-noise	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in **Table 13**.
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 regularly used on site and 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	Stationary noise sources would be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained. Appendix F of AS 2436: 1981 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities	Airborne noise	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

[2] Includes jack and rock hammering, sheet and pile driving, rock breaking and vibratory rolling.

[3] "Continuous" includes any period during which there is less than a 60 minutes respite between ceasing and recommencing any of the work.

Table 12: Minimum Requirements for Construction Methods

Method	Minimum Requirements
Excavator	Ensure that the Sound Power Levels given in **Table 13** have been met.
Truck	Ensure that the Sound Power Levels given in **Table 13** have been met.
Rock breakers and jackhammers	Ensure that the Sound Power Levels given in **Table 13.** have been met. Noise and vibration monitoring would be conducted at the nearest identified NSR where exceedances of the criteria have been predicted.
PCF	Where it has been predicted that vibration / regenerated noise is likely to be in excess of the nominated goals, specific notification would be given to all NSRs a minimum of 2 weeks prior to a shot being fired. Vibration and overpressure monitoring would be conducted at the nearest identified NSR.
Blasting	Where it has been predicted that vibration / overpressure is likely to be in excess of the nominated goals, specific notification would be given to all NSRs a minimum of 2 weeks prior to a shot being fired. Vibration and overpressure monitoring would be conducted at the nearest identified NSR.
TBM	Noise and vibration monitoring would be conducted at the nearest identified NSR where levels are expected to exceed the relevant noise and vibration goals.
Road headers	Noise and vibration monitoring would be conducted at the nearest identified NSR where levels are expected to exceed the relevant noise and vibration goals.

4.3. Maximum Allowable Plant Sound Power Levels

Plant or equipment operating on Sydney Metro project construction sites shall have an operating sound power level (SWL) which is no higher than the corresponding SWL presented in **Table 13**. The SWLs presented in **Table 13** have been compiled from a selection of field measurements conducted between 2004 and 2008 of plant and equipment operating on large construction projects throughout NSW and are therefore considered to representative of plant and equipment SWLs which are readily achieved by current plant and equipment normally used in the construction industry.

Plant and equipment with SWLs higher than those presented in **Table 13** would be deemed to be emitting an excessive level of noise and would not be permitted to operate Sydney Metro project construction sites.

Table 13: Maximum Allowable Sound Power Levels for Construction Equipment

Equipment	Maximum Allowable Sound Power Level (dB) LAmax	Maximum Allowable Sound Pressure Level (dB) LAmax at 7 m
Excavator Hammer	118	93
Excavator (approx. 3 tonne)	90	65
Excavator (approx. 6 tonne)	95	70
Excavator (approx. 10 tonne)	100	75
Excavator (approx. 20 tonne)	105	80
Excavator (approx. 30 tonne)	110	85
Excavator (approx. 40 tonne)	115	90
Skidsteer Loaders (approx. 1/2 tonne)	107	82

Equipment	Maximum Allowable Sound Power Level (dB) LAmax	Maximum Allowable Sound Pressure Level (dB) LAmax at 7 m
Skidsteer Loaders (approx. 1 tonne)	110	85
Dozer (tracking) - equiv. CAT D8	118	93
Dozer (tracking) - equiv. CAT D9	120	95
Dozer (tracking) - equiv. CAT D10	121	96
Backhoe/FE Loader	111	86
Dump Truck (approx. 15 tonne)	108	83
Concrete Truck	112	87
Concrete Pump	109	84
Concrete Vibrator	105	80
Bored Piling Rig	110	85
Scraper	110	85
Grader	110	85
Vibratory Roller (approx. 10 tonne)	114	89
Vibratory Pile Driver	121	96
Impact Piling Rig	134	109
Compressor (approx. 600 CFM)	100	75
Compressor (approx. 1500 CFM)	105	80
Concrete Saw	118	93
Rock hammers and Jackhammers	113	88
Generator	104	79
Lighting Tower	80	55
Flood Lights	90	65
Cherry Picker	102	77
Mobile Crane	110	85

Where an item of construction equipment is not listed in **Table 13**, generic sound power levels presented in **Table 14** may be adopted.

Table 14: Generic Equipment or System Sound Power Level Limit[1]

Equipment	Maximum Allowable Sound Power Level (dB) LAmax	Maximum Allowable Sound Pressure Level (dB) LAmax at 7 m
Motorised (<25kW)	90	65
Motorised (<50kW)	95	70
Motorised (<100kW)	100	75
Motorised (<200kW)	105	80
Motorised (>200kW)	110	85
All other Auxiliary Equipment or Systems	90	65

Note 1: Sound Power Levels in dBA relative to 10 pW.

4.4. Auditing and Monitoring

All items of plant would have noise audits conducted upon arrival at a Sydney Metro construction site and at 6 month intervals thereafter. The purpose of these audits is to validate that individual items of plant and equipment fall within the Sound Power Level ranges identified in **Table 13**.

Where it has been identified within this strategy that noise and/or vibration monitoring is required at the nearest sensitive receiver; however, the nearest sensitive receiver has refused monitoring at their property, monitoring would be undertaken at the near point to that receiver within the site boundary or at another suitable location determined by an acoustic consultant.

5. ADDITIONAL NOISE AND VIBRATION MITIGATION MEASURES

The implementation of the standard management measures, compliance with maximum sound power levels for plant and equipment, construction hour management and standard community consultation measures in this Strategy 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 on Sydney Metro projects, exceedances of the construction noise and vibration management levels are likely to occur.

Where there is a potential exceedance of the construction noise and vibration management levels a number of additional measures to mitigate such exceedances – primarily aimed at pro-active engagement with affected sensitive receivers – would be explored and have been included in this Strategy. The additional mitigation measures to be applied are outlined in **Table 15**.

Table 15: Additional Management Measures

Measure	Description	Abbreviation
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
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 from the contractor would visit 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.	IB
Letter box drops	For each Sydney Metro project, a newsletter is produced and distributed to the local community via letterbox drop and the project mailing list. These newsletters provide an overview of current and upcoming works across the project and other topics of interest. The objective is to engage and inform and provide project-specific messages. Advanced warning of potential disruptions (e.g. traffic changes or noisy works) can assist in reducing the impact on the community. Content and newsletter length is determined on a project-by-project basis. Most projects distribute notifications on a monthly basis. Each newsletter is graphically designed within a branded template.	LB
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

Measure	Description	Abbreviation
Phone calls and emails	Phone calls and/or emails detailing relevant information would be made to identified/affected stakeholders within 7 days of proposed work. Phone calls and/or emails provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs etc.	PC
Specific notifications	Specific notifications would be letterbox dropped or hand distributed to identified stakeholders no later than 7 days ahead of construction activities that are likely to exceed the noise objectives. This form of communication is used to support periodic notifications, or to advertise unscheduled works.	SN

5.1. Applying Additional Mitigation Measures

In circumstances where following application of the standard mitigation measures, the $L_{Aeq(15minute)}$ 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 (**Table 16**).

The following steps need to be carried out to determine the Additional Mitigation Measures to be implemented:

- Determine the duration (time period) when the work is to be undertaken.
- Determine the level of exceedance above the NML.
- From the AMM table, identify the additional mitigation measures to be implemented (abbreviation codes are explained in **Table 15**).

Table 16: Additional Mitigation Measures – Ground Bourne and Airborne Construction Noise

Time Period		Mitigation Measures Predicted $L_{Aeq\ (15minute)}$ noise level Above NML			
		0 to 10 dB	10 to 20 dB	20 to 30 dB	> 30 dB
Standard	Mon-Fri (7.00 am - 6.00 pm)	LB	LB, M	LB, M, SN	LB, M, SN
	Sat (8.00 am - 1.00 pm)				
	Sun/Pub Hol (Nil)				
OOHW (Evening)	Mon-Fri (6.00 pm - 10.00 pm)	LB, M	LB, M, SN	LB, M, SN, RO	LB, M, SN, IB, PC, RO, SN
	Sat (1.00 pm - 10.00 pm)				
	Sun/Pub Hol (8.00 am - 6.00 pm)				
OOHW (Night)	Mon-Fri (10.00 pm - 7.00 am)	LB, M	LB, M, SN, RO	LB, M, SN, IB, PC, RO, AA	LB, M, SN, IB, PC, RO, SN, AA
	Sat (10.00 pm - 8.00 am)				
	Sun/Pub Hol (6.00 pm - 7.00 am)				

Table 17: Additional Mitigation Measures - Ground-borne Vibration

Time Period		Mitigation Measures
		Predicted Vibration Levels Exceed Maximum Levels
Standard	Mon-Fri (7.00 am - 6.00 pm)	LB, M, RO
	Sat (8.00 am - 1.00 pm)	
	Sun/Pub Hol (Nil)	
OOHW (Evening)	Mon-Fri (6.00 pm - 10.00 pm)	LB, M, IB, PC, RO, SN
	Sat (1.00 pm - 10.00 pm)	
	Sun/Pub Hol (8.00 am - 6.00 pm)	
OOHW (Night)	Mon-Fri (10.00 pm - 7.00 am)	LB, M, IB, PC, RO, SN, AA
	Sat (10.00 pm - 8.00 am)	
	Sun/Pub Hol (6.00 pm - 7.00 am)	

6. MONITORING, AUDITING AND REPORTING

6.1. Plant Noise Auditing, Compliance Evaluation and Reporting

In order to compare the noise levels of plant and equipment with the values in **Section 4.3**, the following guidelines are recommended:

- Measurements of Sound Pressure Level (SPL) at 7 m (with plant or equipment stationary) shall be undertaken using procedures that are consistent with the requirements of Australian Standard AS2012–1990 Acoustics – Measurement of Airborne Noise Emitted by Earthmoving Machinery and Agricultural Tractors – Stationary Test Condition Part 1: Determination of Compliance with Limits for Exterior Noise.
- Measurements of Sound Power Level (SWL) shall be determined using procedures that are consistent with the requirements of International Standard ISO 9614-2 1996 Acoustics – Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scanning.
- If measuring the SPL at 7 m of moving plant, compliance measurements would be guided by the requirements of Australian Standard AS2012–1977 Method for Measurement of Airborne Noise From Agricultural Tractors and Earthmoving Machinery.

For all measurements, the plant or equipment under test would be measured while operating under typical operating conditions. If this is not practical, it may be appropriate to conduct a stationary test at high idle.

In the case of an exceedance in Sound Power Levels the item of plant would either be replaced, or the advice of an acoustic consultant would be sought to provide suitable mitigation measures, which may include:

- ensuring all bolts are tightened and no parts are loose
- cleaning and/or lubricating moving parts
- replacing old or worn parts
- implementing additional or upgrading existing muffling devices
- building enclosures around items of stationary plant (e.g. pumps or generators).

A register of measured sound power levels for each item of plant would be kept for reference where future noise audits are conducted. The register would be reviewed annually in conjunction with this strategy and corresponding revisions made to the Sound Power Levels presented in **Section 4.3** to represent contemporary plant noise emission levels.

6.2. Noise Monitoring

Where a DNVIS or GNVIS has been prepared for a Sydney Metro construction site and it has been predicted that noise levels may be in excess of the nominated construction noise goals at a noise sensitive receiver, noise monitoring would be conducted at:

- the affected receiver; or
- if more than one affected receiver has been identified, at the nearest affected receiver; or

- where the nearest affected receiver refuses noise monitoring on their property, at the near point to that receiver within the site boundary.
- If it can be demonstrated that direct measurement of noise from the construction site is impractical, alternative means of determining construction noise levels may be adopted in accordance with Chapter 11 of the NSW Industrial Noise Policy.

All noise monitoring results would be assessed against the nominated noise goals and compiled into a report to be forwarded to the construction contractor and project manager. Reporting would be submitted to the construction contractor and project manager within one week of being undertaken or at weekly intervals for continuous monitoring. All noise monitoring reports would also be made available to the public through a publically accessible website.

6.3. Vibration Monitoring

Where it is anticipated that an item of plant will exceed the cosmetic damage criteria given in **Section 2.3.3**, vibration monitoring would be required at the nearest affected receiver. Where it is anticipated that an item of plant will exceed the human response / ground borne noise criteria and concerns have been raised regarding vibration, vibration monitoring would also be required at the receiver(s) under question.

All vibration monitoring results would be assessed against the nominated vibration goals and compiled into a report to be forwarded to the construction contractor and project manager. Reporting would be submitted to the construction contractor and project manager within one week of being undertaken or at weekly intervals for continuous monitoring. All vibration monitoring reports would also be made available to the public through the publically accessible website.

6.4. Blast Monitoring

As specified in the minimum requirements presented in **Section 3.6**, vibration and overpressure monitoring would be conducted for all PCF and blasting activities which take place on Sydney Metro construction sites.

Monitoring would be conducted as a minimum at the sensitive receiver(s) likely to receive the maximum vibration and/or overpressure emissions from the blast as identified by an acoustic consultant.

All blast monitoring results would be assessed against the nominated goals and compiled into a report to be forwarded to the construction contractor and project manager. All blast monitoring reports would also be made available to the public through the Sydney Metro website.

As the effect of vibration and overpressure from blasting have the potential to cause structural damage to buildings and services, accurate records of all blasts are required to be maintained. Such records would describe the location of the blast and all the blast holes, the design of the blast in terms of type of explosives, mass of explosives, initiating system used, ground vibration and overpressure measurement data.

Records of every blast would be kept for a minimum of seven years. A longer period of retention of the records may be warranted if a construction project is blasted over an extended or disrupted period.

For any section of tunnel construction where blasting is proposed, a series of initial trials at reduced scale shall be conducted prior to production blasting to determine site-specific blast response characteristics and to define allowable blast sizes to meet the airblast overpressure and ground vibration limits.

6.5. Dilapidation Surveys

If construction activities 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*".

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 complied into a report to be forwarded to the construction contractor and project manager. Follow-up Condition Inspections would be required at the completion of certain major works (e.g. completion of shaft bulk excavation works).

7. COMPLAINT HANDLING

All complaints handling would be in accordance with the Sydney Metro Construction Complaints Management System.

8. COMMUNITY CONSULTATION AND LIAISON

All community consultation would be in accordance with relevant project communications plans.

9. DOCUMENTATION REQUIREMENTS

Any acoustic assessment, CNVIS or CNVMP undertaken for the Sydney Metro project must document the following as a minimum (where applicable):

- Acoustic Terminology / Glossary
- Overview of the Project / Works
- Secretary's Environmental Assessment Requirements
- EPL conditions (if applicable)
- Site Plan and Sensitive Receivers
- Ambient Noise Monitoring: methodology, locations, analysis and results
- Construction Noise and Vibration Criteria
  - Construction Airborne Noise Criteria
  - Construction Tunnelling Ground-borne Noise Criteria (if applicable)
  - Construction Ground-borne Noise Criteria
  - Construction Vibration Criteria
- Construction Noise and Vibration Assessment
  - Construction Airborne Noise Methodology / Predictions
  - Construction Tunnelling Ground-borne Noise Methodology / Predictions (if applicable)
  - Construction Ground-borne Noise Methodology / Predictions
  - Construction Vibration Methodology / Predictions
- Summary of Noise and Vibration Impacts
- Summary of all Standard and Additional Mitigation Measures
- References

All noise and vibration predictions are to be presented (as a minimum) as facade noise maps for a distance of at least 300 m in all directions from each work site / project area under assessment.

10. REFERENCES

Related Documents and References
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Appendix D

Overarching Community Communications Strategy

Appendix D

Overarching Community Communications Strategy (OCCS)

A framework for communication and engagement during construction

Project:	Sydney Metro	**Date:**	17 July 2020
Group:	Project Communication	**Status:**	FINAL
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Company:	Sydney Metro	**File number:**	
File name:	Overarching Community Communication Strategy (OCCS)		

Revision	Revision date	Status	Brief reason for update	Name/ position/ company	Author/ Reviewer/ Approver	Signature
1	17/7/20			A/Deputy Executive Director Communications & Engagement	Anita Brown	Anita Brown
2	05/08/20		Updated roles and responsibilities for independent advisors	A/Deputy Executive Director Communications & Engagement	Anita Brown	Anita Brown

Table of Contents

1 Introduction

1.1 Sydney Metro

Sydney's new world-scale metro system is the biggest program of public transport infrastructure currently under construction in Australia and the largest urban rail infrastructure investment in the nation's history.

A key part of delivering the NSW Government's Future Transport 2056 priorities, this customer-focused fully-accessible metro service will help grow the state's economy and help create vibrant places and communities. Sydney Metro has responsibility for delivering great places around metro stations so that precincts are designed, developed, activated and managed in line with the metro system to ensure the best outcomes for customers and communities.

Sydney Metro works collaboratively and in partnership with the Australian Government to deliver Sydney Metro – Western Sydney Airport which is a jointly-funded project.

1.2 Transforming Sydney

Sydney Metro is transforming Sydney, cutting travel times, reducing congestion and making it easier and faster to get around Australia's biggest city.

This new world-class mass transit system will evolve with the city it will serve for generations to come. Metro rail will catalyse development in Greater Western Sydney and serve as the transport spine for new communities.

Global Sydney's population will pass 6 million by 2036; an extra 1.7 million people will progressively move into to Australia's biggest city, which will support an extra 840,000 jobs and 680,000 homes.

Sydney Metro will help boost economic productivity by bringing new jobs and new educational opportunities closer to home.

Designed with customers at its centre, stations will be quick and easy to get in and out of, trains will be fast, safe and reliable, and technology will keep customers connected at every step of the journey.

Sydney Metro will integrate with new communities and transform existing urban centres.

1.3 Future Transport

In October 2017, the NSW Government announced Future Transport 2056 – Transport for NSW's 40-year blueprint for the future of the NSW transport system.

To support the Greater Sydney Commission's Greater Sydney Region Plan, the new transport strategy aims to improve public transport so that – by 2056 – 70 per cent of people will live within 30 minutes of work, study and entertainment.

Future Transport 2056 is a comprehensive strategy to ensure travel is more personal, integrated, accessible, safe, reliable and sustainable.

There are three parts to the strategy: programs that are committed to or funded by the NSW Government over the next 10 years; those that are under investigation; and visionary projects in the 20 year-plus timeframe that are being identified now for future consideration as the population grows.

More information about Future Transport 2056 is available at: https://future.transport.nsw.gov.au/

1.4 Sydney Metro values

At Sydney Metro our vision and values guide us in our interactions with each other, our stakeholders and our partners.

Our Vision is "Transforming Sydney with a world class metro", and our Mission is to deliver Sydney a connected metro service: providing more choice to customers and opportunities for our communities now and in the future.

Culture is a critical enabler of an organisation's success. To help develop a strong organisational culture, Sydney Metro has established a set of values that guides its approach to the procurement and delivery of Sydney Metro. These values are:

Figure 1 Sydney Metro Core Values

Sydney Metro has an expectation that contractors will adhere and uphold these values in their dealings with Sydney Metro, other contractors and stakeholders. Our values support us working together to achieve agreed outcomes supporting the delivery of our projects across our many diverse communities.

Sydney Metro has a number of programs and initiatives in place to embed these values and recognise individuals and teams for consistently demonstrating them.

1.5 Sydney Metro community and stakeholder engagement

We meet communities where they are based so we can build strong relationships and create opportunities for meaningful engagement.

Sydney Metro creates successful engagement outcomes by working closely and cooperatively with the community, Federal, State and local government, contractors, advisors, other service providers and key stakeholders.

Sydney Metro has been working with stakeholders and communities every step of the way since 2011, adapting to community needs and refining our approach to delivering community and stakeholder engagement to achieve better outcomes.

Key to the ongoing success of our engagement program has been a commitment to building personal relationships through face-to-face and digital engagement, supported by effective action and collaboration within multidisciplinary project teams.

Sydney Metro understands that the community and stakeholders want to communicate and access information in ways that are convenient and accessible. Our communication approach continues to evolve to ensure our diverse communities have access to a variety of platforms that ensure a personalised approach to community engagement. Sydney Metro will continue to monitor the communication landscape to provide best practice solutions to engagement.

1.6 Our neighbours

New metro stations are a catalyst for development, regeneration and renewal of neighbourhoods, bringing to life placemaking opportunities. It can be exciting to watch the metro station and local precinct come to life but we also know that communities located immediately near construction sites will be more likely to notice construction works and associated impacts, and may potentially find the cumulative changes happening in their local area difficult to comprehend.

In line with TfNSW's Good Neighbour Policy, Sydney Metro's communication and engagement approach places particular emphasis on these communities whether they are residents, businesses, schools and childcare centres, or places of worship.

Sydney Metro has extensive experience working with a range of businesses located near our construction sites, and we ensure that tailored communication solutions are provided. Our approach ensures businesses are provided with engagement solutions for their type of business, operational hours of work and size of the organisation.

1.7 A new project delivery landscape

Sydney is growing and the NSW Government is delivering projects to reduce traffic congestion and improve public transport.

Sydney Metro is committed to working closely with other nearby projects, local councils, Federal and State Government agencies, and our stakeholders to manage and coordinate construction activities and traffic to help minimise impacts on the community.

Sydney Metro works with other nearby projects to enable close coordination of communication, sharing of information to streamline engagement, and assist the community to understand projects more holistically in their area.

1.8 Fostering strong relationships throughout the project lifecycle

Sydney Metro works with the community and its stakeholders throughout project development, planning, and project delivery. At all stages of this project lifecycle, Sydney Metro ensures engagement is open and transparent ensuring goodwill is established and strong relationships formed.

Sydney Metro will work with its delivery partners to ensure project commitments and community and stakeholder needs established during the planning phases are continued and considered during the delivery phase.

1.9 Statutory planning context

The delivery of the Sydney Metro network are predominately considered State significant infrastructure (SSI) projects under Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) requiring preparation and public exhibition of an Environmental Impact Statement and approval from the NSW Minister for Planning and Public Spaces. The Minister for Planning and Public Spaces may approve the projects subject to conditions of approval.

In addition to approval under the EP&A Act, some Sydney Metro projects may also require assessment and approval under Commonwealth legislation, such as the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). Specifically, Sydney Metro Wester Sydney Airport also requires approval under the Commonwealth *Airports Act 1996* (Airports Act) for all works located within the footprint of Western Sydney International (Nancy Bird-Walton) Airport.

Sydney Metro projects associated with the delivery of integrated stations and precinct developments are generally subject to assessment and approval as State significant development (SSD) in accordance with Division 4.7 of the EP&A Act.

This Overarching Community Communication Strategy (OCCS) and the commitments provided within this strategy are intended to form part of any relevant planning approval for Sydney Metro projects. Following the approval of projects, contractor-specific community communication strategies will be prepared in accordance with this overarching strategy and any relevant project-specific conditions of approval.

1.10 Integrated stations and precinct developments

New metro stations create opportunities to provide for community needs in consideration of the future vision, relevant planning controls and local character of each area.

An integrated station and precinct development is made up of the metro station and building(s) above and/or around the station. Once built, these developments could deliver a range of uses like community facilities, new homes and green spaces, shops, restaurants and commercial office spaces.

All future integrated station and precinct developments would be subject to separate planning approval processes that would include community and stakeholder engagement in line with this OCCS and any statutory requirements of a State Significant Development.

Where required, early engagement would be undertaken with key project stakeholders to support the development of a two-way dialogue in relation to integrated station and precinct developments ahead of relevant planning approval processes.

2 About this plan

The Overarching Community Communication Strategy (OCCS) has been prepared to guide Sydney Metro's approach to stakeholder and community liaison including engagement with communities, stakeholders and businesses. This plan is intended to be used as a framework for community engagement across all Sydney Metro projects and contracts.

The OCCS considers all work activities and packages for Sydney Metro and its projects for the duration of work, and 12 months following the completion of construction.

Sydney Metro is responsible for the development and implementation of the OCCS to ensure there is a coordinated approach to stakeholder, business and community liaison across the entire program of work for Sydney Metro.

Contract specific Community Communication Strategies (CCS) will be developed by appointed project delivery communication teams (PDCT) to address contract and site specific needs of the community, stakeholders and businesses. These strategies will reflect the requirements of the OCCS (this plan) and they will adhere to the requirements outlined in the relevant contract specification – Stakeholder and Community Engagement, along with requirements identified in any relevant planning approval.

The OCCS and CCS' are supported by a Construction Complaints Management System (CCMS) which outlines the framework for managing complaints, enquiries and escalation processes throughout the project lifecycle. The CCMS also outlines the process for reporting complaints.

The Small Business Owners Engagement Plan (SBOEP) is a stand-alone plan which supports these strategies.

Figure 2 Communication strategy hierarchy

The communication strategy hierarchy is supported by the procedures and processes outlined in Section 8 and the Sydney Metro Integrated Management System's Communication and Engagement Management Plan, which outlines Sydney Metro's approach to stakeholder management, public affairs, public communication and strategic partnerships.

2.1 Accountabilities

The Deputy Executive Director Communication and Engagement, or delegate is accountable for this document. Accountability includes authorising the document, monitoring its effectiveness, and performing a formal document review.

Members of the team including Sydney Metro staff, contractors, subcontractors and consultants are accountable for ensuring the requirements of this plan are implemented within their area of responsibility.

This document will be reviewed and reissued annually.

2.2 Purpose

This OCCS will guide Sydney Metro's interactions with stakeholders and the community and will outline the:

- Approach, objectives, principals, and tools to be used
- Team structure, roles and responsibilities
- Communication protocols and procedures to be followed
- Key stakeholders
- Approach to low impact works or preparatory activities
- Approach to reporting and evaluation.

- The commitments provided in this plan are intended to form part of, and satisfy the obligations of, any relevant planning approval for Sydney Metro projects.

2.3 Communication and engagement approach

Sydney Metro is committed to establishing genuine relationships with stakeholders and the community. This is underpinned by the belief that effective communication is a crucial element in the successful delivery of all our projects.

Sydney Metro recognises the diverse engagement and information needs of the community and stakeholders and commits to robust and transparent engagement processes that are inclusive in nature.

The International Association for Public Participation (IAP2) is used to guide engagement during different project phases with an emphasis on inform, consult and active participation levels as appropriate. The levels of consultation outlined in the spectrum are provided as a guide only, and the Project team will ensure an individual approach is taken when engaging with each stakeholder.

The spectrum may be considered in engagement with members of the community, stakeholders including Government agencies, members of parliament and public sector stakeholders.

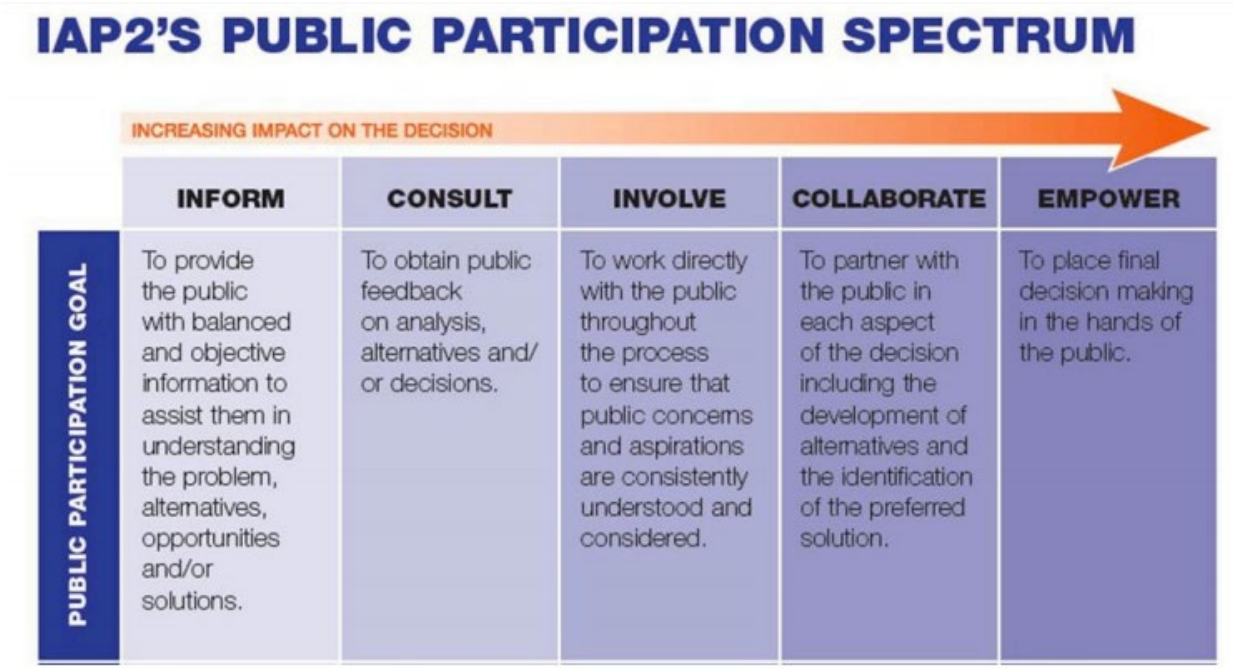

Figure 3 The IAP2 public participation spectrum

2.4 Place managers

Sydney Metro ensures a personal approach is undertaken when undertaking community engagement by having dedicated community relations specialists called place managers. Their role is to act as a single, direct contact between members of the community and the project team.

Sydney Metro also has personal managers to provide support throughout any property acquisition process. Their role is to work closely with property owners or tenants and to make sure the process is as easy as possible.

2.5 Objectives

Sydney Metro's corporate strategic objectives are:

- Manage customer and community expectations
- Integration of 'place'
- Record infrastructure investment
- Technological change
- Drive towards long-term financial sustainability

The Sydney Metro project communication and engagement objectives are to:

- Minimise project impacts on stakeholders and the community where possible
- Minimise project impacts on local businesses recognising specific needs and requirements
- Provide adequate, timely and coordinated stakeholder and community communication and engagement
- Assist stakeholders and the community in their understanding of project construction including activities to be undertaken by project delivery partners and their objectives, benefits, potential impacts and expected outcomes
- Appropriately address stakeholder and community issues
- Provide consistency across our external communication activities and interfaces with stakeholders during delivery of all Sydney Metro projects
- Coordinate approach to manage project enquiries and complaints with interface projects where appropriate
- Act as a conduit and advocate between the project team and the broader community.

2.6 Roles and responsibilities

Figure 4 below demonstrates that throughout the project lifecycle Sydney Metro will begin engaging with the community and stakeholders in the early strategic planning stages of the project and will continue this relationship through to commissioning, and operation of metro services after which point some of these stakeholders and community members will become customers of metro.

The project lifecycle can involve several project phases occurring concurrently. Understanding this assists Sydney Metro and the PDCT(s) to work together to ensure communication is clear and consistent across the different facets of the project.

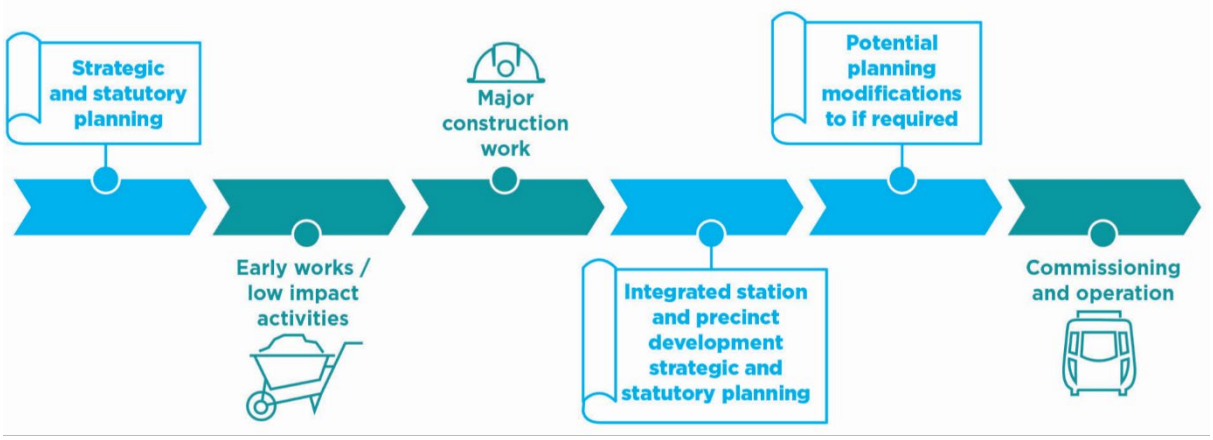

Figure 4 Potential stakeholder and community engagement touchpoints through the project lifecycle

Figure 5 below outlines key responsibilities of Sydney Metro projects, and project delivery communications teams during project planning and delivery. Figure 5 is intended as a guide noting there would be times when responsibilities would overlap particularly in the pre-construction phase and in the transition between statutory planning and construction communication. The full suite of delivery partner responsibilities for the PDCT would be outlined in the contract general specification – stakeholder and community engagement.

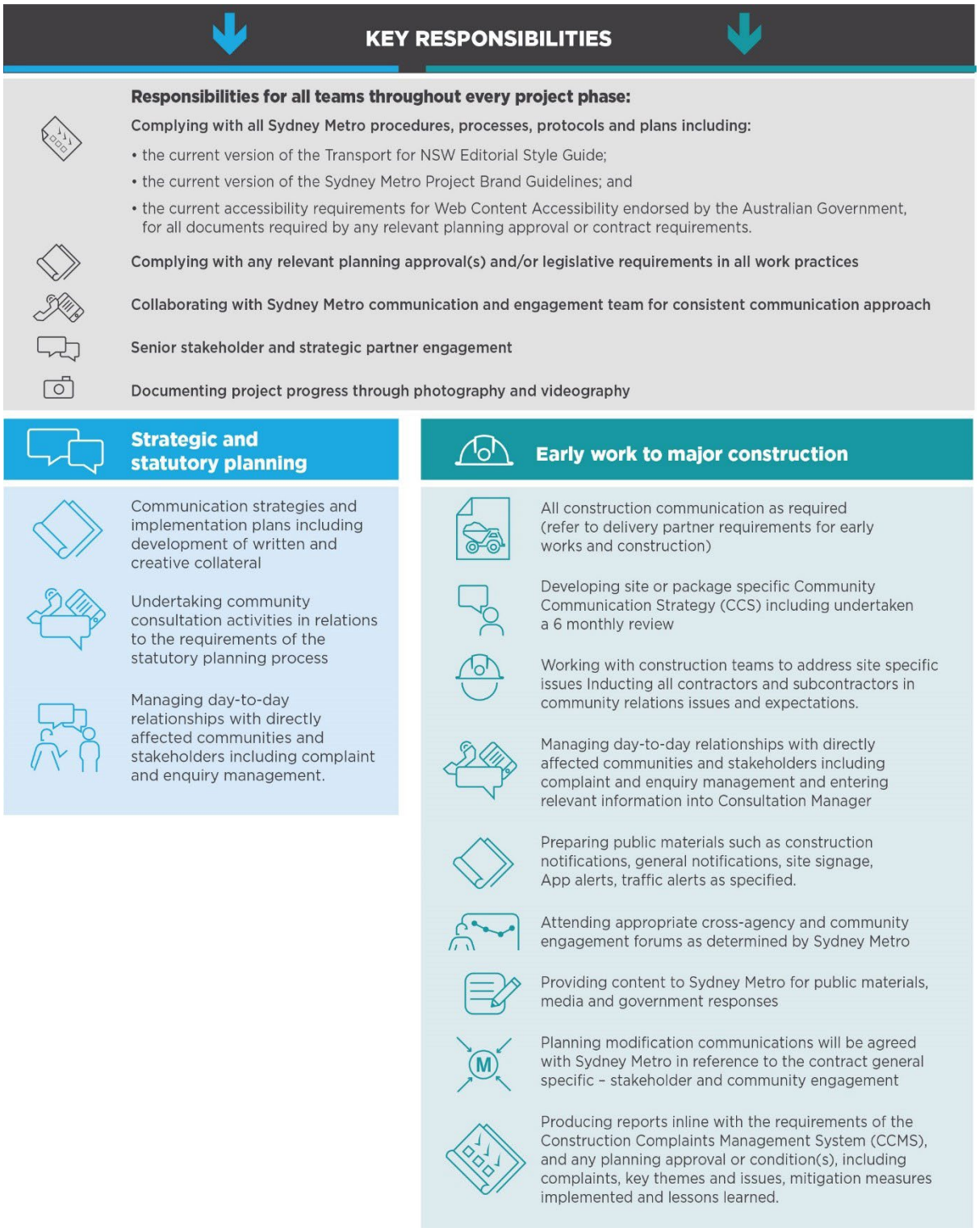

Figure 5 Responsibilities during planning and construction

Table 1 roles and responsibilities in the planning and delivery phases of the project.

Role	Responsibility
Environmental Representative	A suitably qualified and experienced Environmental Representative is independent of the design and construction personnel and responsible for advising the Department of Planning, Industry and Environment on the environmental performance of projects. The Environmental Representative is engaged by the Sydney Metro for the duration of construction of the project and approved by the Secretary of the Department of Planning, Industry and Environment. The Environmental Representative may provide advice to the Sydney Metro Communication and Engagement teams in relation to environmental performance and mitigation measures. Provide an independent review to help resolve complaints about construction issues where a resolution has been unable to be reached by the contractor and the Sydney Metro project team
Acoustic Advisor, if required according to planning approval	A suitably qualified and experienced Acoustic Advisor is independent of the design and construction personnel and responsible for advising the Department of Planning, Industry and Environment specifically on noise and vibration performance of the project. The Acoustic Advisor is engaged by Sydney Metro for the duration of construction of the project and approved by the Secretary of the Department of Planning, Industry and Environment. The Acoustic Advisor may provide advice to the Sydney Metro Communication and Engagement teams in relations to acoustic performance and mitigation measures.
Independent property impact assessment panel, if required according to planning approval	An independent panel may provide assistance in the resolution of property damage concerns following investigation by Sydney Metro and technical specialists in consultation with the affected property owner.
Western Sydney Airport or Airport Environment Officer, if required according to planning approval	Western Sydney Airport is the lessee of Western Sydney International (Nancy Bird-Walton) Airport and have responsibility for the site. An Airport Environment Officer is responsible for the day to day regulatory oversight of compliance with the Commonwealth *Airport (Environment Protection) Regulations 1997* (AEPRs) at Western Sydney International (Nancy Bird-Walton) Airport and will have a role in relation to works for Sydney Metro – Western Sydney Airport on this site.
Other project technical specialists	Provide subject matter technical expertise for the duration of construction, or as otherwise agreed by the Secretary of the Department of Industry, Planning and Environment. This scope will include but not limited to: construction, noise, vibration, tunnelling and general project related issues
Independent mediation service(s) (engaged as required)	Upon the recommendation of the Director, Project Communication or the Environmental Representative, provide independent mediation to help resolve complaints about construction issues where a resolution has been unable to be reached by the contractor and the Sydney Metro project team. Any mediator engaged by Sydney Metro, to assist in resolving a complaint, would be required to hold suitable qualifications and have experience mediating similar matters.
Deputy Executive Director Communication & Engagement	Overall responsibility for defining, developing and implementing the strategic direction of Sydney Metro in respect of all communication and engagement activities.

Role	Responsibility
Director Project Communications	Responsible and accountable for authorising all communication and engagement documents, monitoring their effectiveness and performing formal document review.
Sydney Metro Communication and Engagement Team	This team's key accountabilities and responsibilities include: • Communication and engagement • Stakeholder management • Public affairs • Public communication • Strategic partnerships • Project communications
Project Communication teams (Sydney Metro and PDCT)	• Develop and/or implement this Overarching Community Communications Strategy • Provide Place Managers to engage with the local community during the design, planning approval and early work / low impact/major construction activity stages • Develop and implement project communication plans • Develop external facing project communication collateral • Proactively identify potential issues and work cooperatively to develop agreed management strategies

2.7 Roles and responsibilities for complaint management during construction

The CCMS will outline the framework for managing complaints, enquiries and escalation processes throughout the project lifecycle.

Complaints are first managed by the PDCT and any unresolved complaints may then be escalated to Sydney Metro.

The Director, Project Communications is the designated complaints handling management representative for the escalation of complaints for independent review. Complaints would only be escalated for independent review following a full and thorough investigation by the PDCT and Sydney Metro. The Director, Project Communication may also refer a complaint to independent mediation at any stage in the complaint management process.

Following any escalation for independent review, the Environmental Representative would make an assessment on the adequacy of Sydney Metro's response to the complaint in accordance with this plan, the CCMS and the project's planning and assessment process, in consideration of what is fair and reasonable.

Following this review the Environmental Representative would either make a recommendation to close the complaint and notify the Secretary or provide recommendations for consideration by Sydney Metro on any additional actions that could be undertaken to assist in resolving the complaint.

The Environmental Representative may also refer any reasonable and unresolved complaint for independent mediation, at which time a qualified mediator would be engaged by the project. This process is outlined in figure 6.

This process does not apply to complaints specifically relating to the Western Sydney Airport site which would be managed and escalated to Western Sydney Airport in accordance with the CCMS.

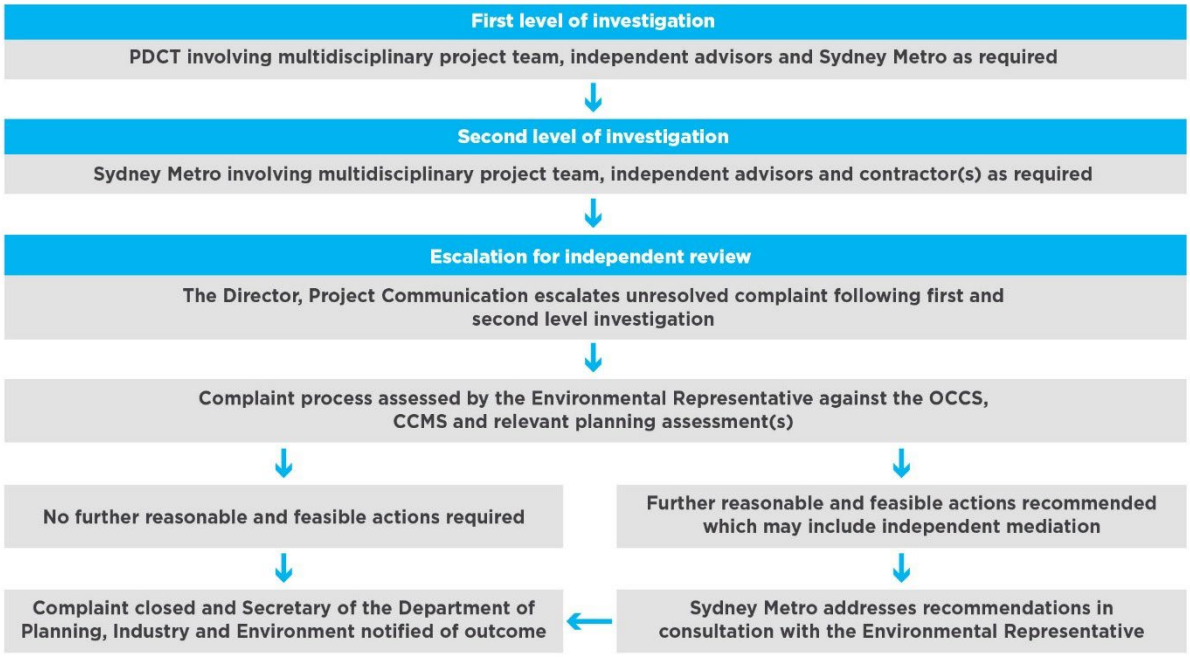

Figure 6 complaint escalation process for Sydney Metro West

3 Our stakeholders

3.1 Our relationships

Effective relationships and consistent and accountable communication practices are crucial to the successful delivery of Sydney Metro. Sydney Metro is committed to providing proactive and positive interactions with all our stakeholders during the delivery of our projects. Our stakeholders include:

- Our colleagues across Transport for NSW
- Local, State and Federal government departments and agencies
- Media
- Industry partners
- Precinct partners and city deal partners
- Broader network users and customers
- The community across Sydney, including businesses.

Table 2 Sydney Metro stakeholders (as relevant to each Sydney Metro project)

Sector	Stakeholders
Community	Neighbours Residents and residents groups Businesses and business groups Property owners and tenants Business owners and tenants Land owners Interest groups Education and religious facilities Transport users Owners and managers of local social infrastructure and community facilities
	Peak community groups
	Multicultural support groups

Sector	Stakeholders
Government	Federal Minister for Infrastructure, Transport and Regional Development Federal Minister for Population, Cities and Urban Infrastructure
	NSW Minister for Transport and Roads NSW Minister for Jobs, Investment, Tourism and Western Sydney
	State elected members and their electoral offices Local elected members Local Council General Managers/CEOs
	Department of Infrastructure, Transport, Regional Development and Communications Department of Energy and Environment Western Sydney Airport
	Department of Planning, Industry and Environment Sydney Coordination Office Transport for NSW (Motorways) Sydney Trains Infrastructure NSW Department of Premier and Cabine NSW Treasury Port Authority of NSW NSW Health Department of Family and Community Services Department of Education Schools Infrastructure NSW Western City Aerotropolis Authority Planning Partnership Office Western Sydney City Deal Delivery Office
	Council officers Emergency services • Police • Ambulance • NSW Fire and Rescue • Rural Fire Services • State Emergency Services
Neighbouring projects	Parramatta Light Rail Western Harbour Tunnel and Beaches Link WestConnex Rozelle Interchange Westmead redevelopment Glebe Island Multi-User facility Revitalisation of Blackwattle Bay and the new Fish Market Western Sydney International Airport M12 Motorway

Sector	Stakeholders
Service providers	Sydney Water Water NSW Power utilities Telecommunication providers Local Councils
Industry	Academic institutions Contractors Peak bodies Transport associations Transport experts Unions
Precinct partners, City Deal partners	Local Councils State Government agencies Federal Government agencies Government-owned corporations
Media	All media

4 Our communities

Sydney Metro recognises that our projects are undertaken across a range of diverse communities and our information needs to be accessible for all people. The project will continue to monitor, adapt and review communication streams, key messages and audiences to continue to connect with people in ways that are meaningful to them.

4.1 Community demographics

Sydney Metro uses area demographics and census data to better understand the communities in which we operate. The information we gather ensures we provide accessible information to people from all backgrounds including:

- People with languages other than English (LOTE)
- Culturally and linguistically diverse communities (CALD)
- Vulnerable communities
- Aboriginal and Torres Strait Islander Communities (ATSI)
- Diverse communities

The PDCT CCS must demonstrate how their communication approach will use tools and strategies that meet the needs of their diverse communities. Specific tools outlined below should be considered as appropriate.

4.2 Working with culturally and linguistically diver (CALD) and languages other than English (LOTE) communities

The following processes and communication tools can be used to improve accessibility and outreach with people who come from CALD and LOTE backgrounds:

- Providing project information on the Sydney Metro website which can be translated into 58 different languages.
- Working closely with local councils and community groups to utilise existing CALD relationships.
- Continued outreach with targeted CALD community groups, and face-to-face meetings and briefings with CALD communities as required.
- Advertising project milestones in foreign language newspapers.
- Translating project milestone factsheets and newsletters into targeted languages.
- Ensuring that foreign language submissions can be received.
- Providing translators for meetings and engagements as required.

4.3 Working with vulnerable communities

Sydney Metro recognises that a range of community members may be vulnerable in relation to disabilities and health, age, employment and housing status, among other issues.

The following processes, communication tools and approaches would be used to improve accessibility and outreach with vulnerable communities:

- Engage with relevant support organisations to keep vulnerable communities informed of work occurring.
- Training construction personal that all interactions with vulnerable people should be respectful and courteous.
- Where required provide regular updates to rough sleepers about construction timing and impacts.
- Businesses impacted by people sleeping rough who may have been displaced by construction should also be kept informed and engaged.

Sydney Metro endorses the NSW Government approach to homelessness by incorporating the Sydney Metro Protocol for Homelessness within all community communication strategies.

4.4 Working with Aboriginal and Torres Strait Islander (ATSI) communities

The following key focus areas have been developed by the Transport for NSW Reconciliation Action Plan (RAP), and will be reflected and incorporated in all engagement objectives and activities undertaken by Sydney Metro:

- Build and strengthen relationships.
- Respect and celebrate culture.

The following processes and communication tools can be used to improve accessibility and outreach with ATSI communities:

- Working collaboratively and respectfully with our Aboriginal and Torres Strait Islander staff, Aboriginal Peak Bodies, and with the communities in which we operate.
- Continue working with our key stakeholders to further build upon existing relationships, and seek to invest in new partnerships to support our progress in delivering meaningful outcomes for Aboriginal and Torres Strait Islander peoples whist delivering on our core business.

4.5 Working with diverse communities

Sydney Metro will continue to review its communication tools to ensure inclusive community engagement and the varied information requirements of our communities and stakeholders is prioritised.

The following processes and communication tools can be used to improve accessibility and outreach with diverse communities:

- Web and digital based engagement tools allowing people to engage with the project at a time that is convenient to them.
- Using multiple communication platforms to enhance communication reach, for example printed notifications, face-to-face doorknocks and email.
- Ensuring communities are providing with convenient options to access the project team such as providing multiple times for community information sessions and a 1800 number 24 hour a day, seven days a week.
- Harnessing a place management approach to understand the specific needs of communities and tailor communication accordingly.

All Sydney Metro communication materials will adhere to Web Content Accessibility Guidelines (WCAG 2.0).

5 Businesses

Sydney Metro would work with local businesses within project catchments to ensure communication and engagement is tailored to their specific needs.

Sydney Metro's overarching approach to business engagement is to:

- Identify and document potentially impacted businesses prior to project commencement
- Provide early advice to businesses of upcoming projects
- Provide businesses with information about the project and its long terms benefits.
- Provide businesses with information about construction progress.
- Ensure businesses understand the scope of the works and mitigation measures contractors can provide.
- Ensure businesses understand the proposed timing of the works.
- Consult with businesses and take steps to minimise potential impacts.
- Ensure the project team understands the operational requirements and sensitivities of businesses around each site.

The contractor CCS must include at a minimum the identification and details of specific businesses located within 50 metres of each relevant construction site.

Contractors must identify the specific needs of each business, any potential impacts associated with construction works, and proposed mitigation measures. These measures must also address if there is a need for translation or cultural and other specialists.

The CCS must also outline the approach and timing of holding regular business forums at each construction site.

Evaluation and monitoring of business engagement is outlined in section 11.

5.1 Small Business Owners Engagement Plan

The Sydney Metro PDCT will provide assistance if required to small business owners located within 50 metres of a Sydney Metro construction site, where they may be potentially impacted by construction activities. For the purposes of this program, a 'small business' is defined as a business that employs fewer than 20 people.

Sydney Metro activities to support to eligible businesses may include:

- Small business education and mentoring
- Activation events
- Business engagement events
- Marketing and promotion.

6 Communication tools

Sydney Metro uses a range of communication and engagement tools to ensure project information reaches a wide variety of people likely to be impacted by the project. Using a variety of tools provides our communities with options to engage with the project in ways that suit their needs and lifestyle.

When planning communication strategies the PDCT must consider the requirements of the General Specification – Stakeholder and Community Engagement along with the specific needs of their community as identified in their CCS. The CCS should then outline the specific tools used to reach their identified stakeholders.

The following communication tools matrix is provided as a guide only and other communication tools may be used with prior approval from the Director, Project Communication. CALD communication tools are also included in the table below.

Sydney Metro will provide a suite of project specific templates to the PDCT to assist in the development of communication collateral.

Table 3 Sydney Metro communication and engagement tools

Tool	Explanation and purpose	Responsibility
Community contact tools		
Community information line	Operational 24 hours a day and included on all public communication materials Translation services are available for those with English as a second language.	SM
Community email address	This allows stakeholders and the community to have access to the project teams and to provide feedback and ask questions. All communication materials and the website will include the community email address. During construction, emails will be redirected to relevant contractors as required.	SM
Community post box	All stakeholders can use the postal address: PO Box K659, Haymarket NSW 1240 for all Sydney Metro enquires.	SM
CALD Translation services	All communication will promote our translation services for those with English as a second language.	SM
Information tools		
Newsletters	Printed and web accessible online site-specific newsletters will include information on: • construction progress • upcoming construction stages and milestones • environmental management achievements • community involvement achievements • three month look-ahead • community contact information. Newsletters will be distributed to local communities, stakeholders and businesses and made available of the Sydney Metro website.	SM/PDCT
Sydney Metro direct mail email updates	The community, stakeholders and businesses will be offered the opportunity to register to receive Sydney Metro milestone updates.	SM
Construction email updates	The community, stakeholders and businesses will be offered the opportunity to register to receive construction updates.	PDCT
Fact sheets	Printed and/or web accessible fact sheets will be used as required to explain key aspects of Sydney Metro to the community and our stakeholders.	PDCT

Tool	Explanation and purpose	Responsibility
Photography and videography	Photos and videos will be used to record the construction process and assist with explaining aspects of Sydney Metro to stakeholders and the community. Images and footage will be used in notifications, newsletters, on the Sydney Metro website, presentations and reports as required.	SM/PDCT
Information videos	Information videos can be used to highlight key project milestones, construction information or elements of the statutory planning process	SM/PDCT
Site signage and hoarding banners	Site signage and hoarding banners will identify Sydney Metro and provide contact information.	SM/PDCT
CALD **Newsletters and fact sheets**	Translating project milestone factsheets and newsletters into targeted languages where required.	SM/PDCT
Online tools		

Sydney Metro website	Information about the project will be uploaded to the Sydney Metro website.
	The website will be referenced in all communication materials as a source of information and will be updated on a regular basis. Information will include:
	• Description of the Sydney Metro
	• Project information including:
	  • description, current status and timing
	  • newsletters
	  • notifications
	  • up-to-date project information
	  • graphics and images on the project background and progress
	  • copies of relevant reports
	  • photos, images and maps
	  • links to documents as required under the relevant projects Conditions of Approval
	  • a link to Sydney Metro contractor webpages.
	• Contact information
	• Email subscription service
	• The Sydney Metro website is translatable into 58 different languages using the Google translate function at the bottom of the home page.
		SM

Project interactive portal	Sydney Metro may establish and maintain an online portal for the project displaying key project information including: • statutory planning information • project map(s) • graphics and images of the project • newsletters and other project information • specific project information displays • contact information.	SM
Contractor webpage	Each contractor will establish and maintain a web site to upload and maintain information to be published. Including copies of community, environmental, sustainability, transport, traffic and noise and vibration reports and plans. A link will be provided to the Sydney Metro website.	PDCT

Tool	Explanation and purpose	Responsibility
Social media	Facebook, Twitter and Instagram may be used to provide updates to stakeholders. Stakeholders should be offered the opportunity to join social media feeds via public materials produced for Sydney Metro.	SM
CALD **Sydney Metro and Contractor website**	Updating the Sydney Metro website with project information, which can be translated into 58 different languages. Ensuring that foreign language submissions can be received.	SM/PDCT
Face-to-face and interactive tools		
Mobile information displays	Mobile information displays can be used at locations like community events, shopping centres and local public spaces to provide information about Sydney Metro, statutory planning processes or construction.	SM/PDCT
Virtual information rooms	Virtual information displays can be used to highlight project milestones, provide information about construction or statutory planning processes.	SM/PDCT
Door knock meetings	Individual door knock meetings will be used as required to discuss potential impacts of Sydney Metro with highly impacted stakeholders, especially residents, businesses directly neighbouring construction sites and owners or managers of nearby social infrastructure or community facilities.	SM/PDCT
In person and/or virtual meetings with individuals or groups	Stakeholder meetings will be used as required to discuss Sydney Metro activities including work in progress and upcoming work or any issues in connection with the activities.	SM/PDCT
Site visits	Site visits will be used where appropriate to inform select stakeholders about the progress of Sydney Metro and any key milestones or activities taking place.	SM/PDCT
In person and/or virtual presentations and forums	Presentations and forums will be used where appropriate to inform stakeholders about the progress of Sydney Metro and any key milestones or activities taking place.	SM/PDCT
In person and/ or community and business based forums	Forums will be used to focus on key environmental management issues relating to construction activities with impacted community and business stakeholders.	SM/PDCT
CALD **In persons and/or virtual tools**	Providing translators for virtual and/or in person meetings and engagements as required. Working closely with local councils and community groups to utilise existing CALD relationships. Continued outreach with targeted CALD community groups, and virtual and/or face-to-face meetings and briefings with CALD communities as required.	SM/PDCT
CALD Presentations	Presentations will also be offered to local CALD community groups in multiple languages by bi-lingual team members or external translators.	SM/PDCT

Tool	Explanation and purpose	Responsibility
Notifications		
Emergency works – notification letter	An emergency works* – notification letter will be used to advise properties immediately adjacent to or impacted by emergency works, within two hours of door knock commencing work. Notifications must be delivered by the PDCT, issued on Sydney Metro letterhead and include the following: • scope of work • location of work • hours of work • duration of activity • type of equipment to be used • likely impacts including noise, vibration, traffic, access and dust • mitigation measures • contact information. * *Work required to repair damaged utilities and/or make an area safe after an incident outside standard construction hours.*	PDCT
7 day notification - Community Signage	Signage will be erected at least 7 days prior to any activity with the potential to impact stakeholders or the community. This includes: • work in public areas such as a park • making changes to pedestrian routes • impacting on cycle ways • changing traffic conditions • disrupting access to bus stops. Signage could include A-frames, mobile Variable Message Sign (VMS), hoarding or similar and be placed at either end of the corridor of work.	PDCT
7 day - Traffic alert email	Traffic alert email will be sent at least 7 days prior to any works requiring changes to traffic. Recipients should include: • relevant authorities • transport operators (including bus, coach and taxi operators). The notification audience and content will be guided by the Traffic and Transport Liaison Group and Traffic Management Plans.	PDCT
7 day – utility notification	A notification will be sent to relevant utility service authorities at least 7 days before utility service work, to provide detailed information for their relevant call centre messaging.	PDCT

Tool	Explanation and purpose	Responsibility
Notification letter	Notification letters will be used to advise the community and stakeholders of any activity with the potential to cause impacts. The notification should be sent at least 7 days prior to the activity occurring to an area of 100 metres around the construction site for day works and 200 metres around the site for night works. Wherever possible works notifications should be combined for the month to include all proposed site activities. Following up communication should be implemented for night works including the use of email, door knock or MetroConnect App reminders. Notifications are required for: • start of construction • significant milestones • changes to scope of work • night works • changes to traffic conditions • modifications to pedestrian routes, cycle ways and bus stops • out of hours work • changes to residential or business access • changes or disruptions to utility services • investigation activities. Notifications will be issued on Sydney Metro letterhead and include the following: • scope of work • location of work • hours of work • duration of activity • type of equipment to be used • likely impacts including noise, vibration, traffic, access and dust • mitigation measures • contact information.	PDCT
Advertisements	Display advertisements will be used to notify the community prior to the start of construction, update on construction activity, notify of exhibitions and events and announce Sydney Metro and milestones. Advertisements will be used as required, to fulfil the requirements of any planning approval, or licences and that required by law. Advertisements in local newspapers, if possible (that cover the geographical areas of the contractor's activities) will be used to notify of significant traffic management changes, detours, traffic disruptions and work outside any working hours contained in the environmental documents at least **7 days before** any detour, disruption or change occurs.	SM
Notification email	Email notifications via Consultation Manager distribution lists are utilised once on the ground notification distribution has been completed.	SM/PDCT
MetroConnect App	A native digital application may be utilised to provide brief construction information updates to the community. Stakeholders will be offered the opportunity to sign up for 'App' updates. MetroConnect is expected to be available from late 2020.	SM
CALD Advertisements	Advertising project milestones in foreign language newspapers.	SM

Tool	Explanation and purpose	Responsibility
Briefings and media		
MP, local elected members and Ministerial briefings	MP, Local elected members and Ministerial briefings will be used to update these stakeholders on major Sydney Metro milestones.	SM
Media briefings and releases	Media releases, briefings and events will be used to update the community on major Sydney Metro milestones.	SM
Schools		
School education program	A school education program developed by Sydney Metro will be used to engage with primary and high school students.	SM
Other requirements		
Site inductions	Site inductions will include communication and engagement requirements to ensure all members of the Sydney Metro and contractor teams are aware and respectful of our residential and business neighbours.	PDCT
Stakeholder database	A web-based program used for the collection and recording of details regarding stakeholder and community contact and correspondence.	PDCT
Communication Interface Coordination Group	Members would include communications representatives from interfacing projects with project sites shared or adjacent to Sydney Metro. The role of the Communications Interface Coordination Group 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.	SM/PDCT

7 Site establishment communication

Establishing relationships with stakeholders and the community, including determining suitable forums for engagement is a key priority prior to site establishment for construction. During this stage of engagement the PDCT should prioritise face-to face communication as much as possible. Sydney Metro will provide support for these activities as outlined in Table 4.

Activity	Responsibility
Pre-construction communication planning	
Prepare Community Communication Strategy (CCS) DRAFT for Sydney Metro	Project Delivery Communication Team
Set up site specific community email and 1800 phone number to receive correspondence	Project Delivery Communication Team
Set up project delivery webpage	Project Delivery Communication Team
Set up communication management system (Consultation Manager)	Project Delivery Communication Team
Prepare start of construction advertisement	Sydney Metro
Establish Community Complaints Mediator (CCM)	Sydney Metro
Establish area coordination groups	Sydney Metro
Early site engagement/post planning approval	
Ministerial, stakeholder and government agency briefings	Sydney Metro
Council briefings	Sydney Metro / Project Delivery Communication Team
Prepare and seek approval from Sydney Metro for introductory communication material for community engagement	Project Delivery Communication Team
Initial doorknock and introductory material delivered and follow up meetings established for consultation	Project Delivery Communication Team
Conduct initial consultation with neighbouring properties, businesses and stakeholders to establish specific needs	Project Delivery Communication Team
Refine CCS and submit to Sydney Metro	Project Delivery Communication Team
Establish forums for business and community engagement based on needs assessment	Project Delivery Communication Team
Publish start of construction advertisement	Sydney Metro
Host coordination meeting with relevant projects	Sydney Metro / Project Delivery Communication Team
Pre-construction engagement	
Prepare and distribute introductory newsletter and email noting early engagement outcomes, project update, and forums available to attend prior to construction starting	Project Delivery Communication Team
Prepare and seek approval for forum collateral including project A0 boards, factsheets and presentations	Project Delivery Communication Team
Hold first forums (prior to construction starting) inviting relevant local project representatives at each site	Project Delivery Communication Team
Erect temporary site signage and shadecloth (prior to hoarding being erected)	Project Delivery Communication Team

KEY
Sydney Metro
Project Delivery Communication Team

Table 4 Pre-construction engagement priorities

8 Managing issues

8.1 Issue identification

It would be expected that the PDCT would work collaboratively with SM during pre-construction communication planning to understand the key themes arising from the environmental assessment process. This includes gaining knowledge of the relevant environmental impact statement(s) or other planning approvals documentation, key mitigation measures, potential cumulative impacts, community or stakeholder issues raised during the statutory planning process.

Sydney Metro expects the PDCT would appoint dedicated place managers and use the following methods during early site engagement, pre-construction engagement and delivery to identify potential issues for their communities:

- Gather information about community, stakeholder and business needs and requirements to guide delivery communication approaches.
- Build relationships with local communities, stakeholders and businesses, particularly those in close proximity to the site with a priority on personal and face-to-face communication to encourage open communication about concerns.
- Communicate early and often providing accurate information about upcoming project works and potential impacts.
- Share information with other projects in the area (see cumulative impacts).

The PDCT would be expected to work collaboratively with their environmental and construction counterparts, the Sydney Metro project implementation group, the project Environmental Representative and/or Airport Environment Officer to understand potential issues and agree on appropriate management approaches prior to escalating any issues as per the Sydney Metro Construction Complaints Management System.

The CCS must identify strategies for proactively identifying issues and appropriate mitigation measures.

8.2 Tools to manage issues

There are a number of tools available to assist projects in managing issues relating to construction and environmental impacts. These can be found in the following plans:

- Construction Environmental Management Framework
- Construction Traffic Management Framework
- Construction Noise and Vibration Standard
- Applicable contract specific management plans.

8.3 Key issues and mitigation measures

The following communication and mitigation measures are considered a guide to managing potential issues. The PDCT must identify the unique issues related to individuals and outline tailored mitigation measures which would also incorporate mitigation measures from the project's relevant planning approvals documentation.

Table 5 Key issues and mitigation measures

Issue	Communication and mitigation measures
Information about construction	
• **Lack of information** • **Coordination with other Transport Agencies** • **Temporary station closure at locations along the alignment where train possessions occur** • **Train replacement**	• Regular notifications and newsletters (including contributions to other project notifications including Sydney Trains notifications for work during possessions) • On on one meetings on request • Doorknocks as required - both prior to works and as stakeholder checks after works • Attend stakeholder meetings to communicate Project information to their client base • Community contact facilities • Coordinate with projects and existing transport operations in close proximity to Sydney Metro works, regarding replacement services and temporary transport plans
• **Coodination of information for tenants and property owners (including business owners)**	• Strata/building managers and owners notified of scheduled and emergency work in the area when necessary • Meetings arranged with strata/building managers and owners • Strata/building managers and owners informed of works before they commence • Coordinate communications through communication interface groups • Implement the Small Business Owners Engagement Program as required
Utility relocation and continuity of supply	
• **Utility works affecting footpath or road access**	• Detailed briefings for businesses potentially affected • Timing works, particularly service cutovers, to minimise potential impacts • Provide alternative service where necessary to maintain essential supply
Visual amenity and visibility	
• **Impacts to visual amenity (overlooking or directly next door to sites)** • **Vandalism of site hoarding** • **Visibility of retail signage and shopfronts**	• Retain vegetation where possible or for as long as practical • Protection of trees to be retained • Hoarding designed in line with Sydney metro Brand Style Guidelines • Prompt graffiti removal from hoarding, buildings, plant and surroundings kept well maintained and clean • Hoarding designed to maximise visibility of retail signage and shopfronts • Explore opportunities for signage and wayfinding to maintain business visibility • Implement Small Business Owners Program to promote local businesses
Cumulative impacts	
• **Multiple works in the one location** • **Adjacent projects**	• Coordinate communications through the communication interface group
Transport interruptions	
• **Temporary station closures**	• Rail replacement services • Advertisements, notifications and station attendants redirecting passengers to alternative services

Issue	Communication and mitigation measures
Noise and vibration	
• **Effects on sensitive receivers** • **Effects on sensitive equipment** • **Effects on quiet enjoyment (particularly for food and beverage businesses)** • **Construction traffic noise (deliveries and spoil movements)** • **Vibration generated by construction activities**	• Early engagement with neighbouring stakeholders on likely noise and vibration impacts • Implementation of mitigation measures in the Construction Noise and Vibration Management Plan, Minor Works Approval, Out of Hours Approval and other documents and plans where relevant • Noise minimised through use of appropriate plant, tools and techniques and adaptive programming, where possible. Information on specific noise and vibration reduction outcomes for each site can be found in the relevant Construction Noise and Vibration Impact Statement. Noise reduction strategies to be implemented with consideration given hours of operation and sensitive periods. • High impact noise works staged with respite periods as required by any applicable Environment Protection Licence or planning approval • Temporary noise screens used around equipment, where appropriate • Staff induction and toolbox meetings prior to noisy activities to highlight acceptable work force behaviour • Noise and or vibration monitoring offered in response to complaints • Vibration monitoring undertaken on any adjoining heritage structures if outlined in the relevant Construction Noise and Vibration Impact Statement • Referral to Small Business Owners Engagement Program for advice on small business complaints where appropriate
Dust	
• **Dust generated by construction activities** • **Concern about health impacts of dust**	• Dust minimised by using water carts, water sprayers, street sweepers, chemical and organic ground cover, hard stands and limiting activities on windy days where necessary
Access	
• **Access for deliveries and customers** • **Traffic changes on local roads** • **Impacts to local street parking** • **Traffic modifications including changes to footpaths** • **Utility works affecting footpath or road access**	• Coordination of works with deliveries and business priorities, where possible • Installation of suitable signage to direct pedestrians, delivery drivers and customers where appropriate
Construction traffic	
• **Heavy vehicle movements on local roads**	• Implement site specific Traffic Management Plans • Coordinate traffic management with Sydney Coordination Office • Construction traffic movements minimised in peak times, where possible • Heavy vehicle specific access and egress locations and routes to minimise local congestion • Truck driver toolbox meetings on localised conditions • Out of hours deliveries to minimise impacts of oversized vehicles on local roads • Traffic Control Groups

Issue	Communication and mitigation measures
Property acquisition	
• **Concerns about property acquisition**	• Personal Manager involvement and support • Detailed meetings with supporting Centre for Property Acquisition information and Sydney Metro newsletters and fact sheets
Property impacts	

• **Concerns about potential property damage**
• **Potential effects of vibration and settlement**
	• Property Condition Surveys offered where eligible in line with relevant CNVIS for each site
	  • Vibration modelling information
	  • Distribute fact sheets
	  • Protection of heritage items using hoarding

9 Cumulative impacts

Sydney Metro will ensure coordination with interfacing projects to manage community and stakeholder issues. Specifically, on the Sydney Metro – Western Sydney Airport project, coordination with Western Sydney Airport is essential for issues raised about work on sites within shared project areas.

Sydney Metro recognises that communities and stakeholders may be experiencing or have experienced impacts relating to other projects in their local area. This section outlines approaches to ensure cumulative impacts are considered in communication and engagement.

9.1 Coordination for effective communication

Sydney Metro will host Communications Interface Coordination Groups for areas where projects interface. The purpose of these groups will be to provide a forum for exchange of information, understand any emerging concerns across the projects and to coordinate communication and engagement activities as appropriate.

Coordination and consultation with other projects will generally include:

- Provision of regular updates about the detailed construction program, construction sites and haul routes.
- Coordination of traffic notifications between projects.
- Coordination of engagement activities such as community information sessions, newsletters and notifications and complaint resolution.

This approach will support a range of other coordination forums to address coordinating works with traffic and noise impacts and identifying potential conflicts in construction programs.

All enquiries and complaints made by the community and stakeholders will be managed in accordance with the Sydney Metro Construction Complaints Management System. It would be expected that the place manager on call would have general knowledge of other projects in the area to provide a personal approach and knowledge of who the complainant should contact for further information.

All phone calls to the Sydney Metro's call centre, will be managed in accordance with the Sydney Metro call handling procedure. Community enquires that do not relate to Sydney Metro projects, will be forwarded to the relevant project.

Figure 7 illustrates the process for complaint and enquiry management across projects in similar areas.

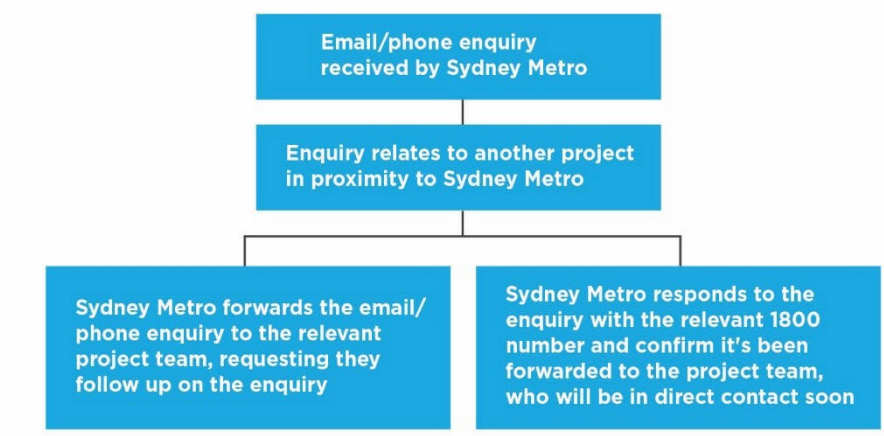

Figure 7 Project related email / phone coordination

9.2 Occurrence of cumulative impacts

The Contractor CCS must identify projects that Sydney Metro may interface within their project area including further opportunities for coordinated communication.

This may include:

- Other parts of Transport for NSW
- Local Councils
- State Government agencies
- Federal Government agencies
- Western Sydney Airport
- Sydney Coordination Office
- Department of Planning, Industry and Environment
- Sydney Trains
- NSW Trains
- Sydney Buses
- Sydney Water
- Water NSW
- Port Authority of NSW
- Sydney Motorways Corporation
- Emergency service providers
- Utility providers
- Construction contractors.

10 Crisis and incident communication processes

In the unlikely event that a crisis or incident occurs, the Sydney Metro Crisis Communications Management System will be in place. Any communication management system prepared by the PDCT as part of the Emergency Management Plan should align with Sydney Metro's Crisis Communications Plan.

Contract teams are required to invite the Director, Communications and the Deputy Executive Director, Communication and Engagement to attend and participate in formal incident and crisis communication exercises when they are conducted.

The CCS must reflect Sydney Metro's Crisis Communications Management Plan and Incident notification process.

The PDCT has the following responsibilities in relation to crisis communication:

- Immediately notify the Director, Communications within 10 minutes of any incident or issue that may have an impact on the community, environment, personnel, subcontractors or other stakeholders or may attract the attention of the media, the Minister for Transport, a local MP, council or the broader community. For any other incidents notify the Director, Communications within one hour of the incident occurring.
- Obtain approval from the Director, Communications before contacting or providing information to any person, other than that which is required to directly manage the incident or to comply with Law, including stakeholders, the media or the public.
- Make available suitably qualified and experienced personnel to support the Director, Communications in responding to the community, the media and other stakeholders.
- Provide all necessary communications materials that may need to be disseminated as a result of such incidents.

11 Monitoring, evaluation and reporting

The PDCT is responsible for monitoring the effectiveness of strategies to inform and to minimise impacts of construction on the community, including businesses. The PDCT is required to provide detailed information to Sydney Metro each month on performance criteria outlined in this plan and the site specific CCS including:

- Enquiry and complaint trends and how lessons learned are being applied across the project to avoid issues recurring, highlighting sensitive receivers and small businesses.
- The status of complaints and details of any escalation required.
- Communication tools used to engage with stakeholders and the community including doorknocks, meetings, presentations, notifications and newsletters.

11.1 Audit and review – site specific CCS'

Evaluation of the performance and effectiveness of the site specific CCS' will be undertaken every six months or as required. Key elements of the evaluation will include examining the adequacy of the CCS and its implementation in achieving the intent of the consultation as evidenced by the items in table 6.

Table 6 Six monthly CCS audit requirements

Performance Parameters	Measures	Reporting
Identifying all potential local community, businesses and stakeholders that may be impacted by or have an interest in the project (based on the stakeholder categories provided in this plan)	Inclusion in the CCS of: • A thorough stakeholder scan of local community, businesses and stakeholders including maps.	Accurate and up-to-date listings of local businesses noting changes of leases and ownership at least every six months.
Appropriateness of communication and engagement tools	Inclusion in the CCS of: • A communication tool matrix and/or table detailing communication tools to be used for which stakeholders and why.	Communication matrix and/or table to be updated at least every six months to adjust approach to community needs and lessons learned.
Identifying appropriate mitigation measures to address issues	Inclusion in the CCS of: • Mitigation measures that would be used in response to identified issues • A detailed complaint investigation process to ensure mitigation measures are considered before escalating complaints to the next level (as per the CCMS).	Appropriateness of mitigation measures to accommodate community needs and lessons learned to be reviewed at least every six months and the CCS to be updated accordingly.
Cumulative impacts process	Inclusion of: • Identified nearby projects and tools/forums to engage with projects • Processes for coordination of communication, including project collateral and face-to-face events.	Nearby project information to be reviewed regularly and updated as part of the CCS review, included any new processes, at least every six months.

11.2 Audit and review - businesses

The PDCT is required to compile monitoring data on a bi-annual basis and include lessons learned based on the items in table 7.

Table 7 Six monthly monitoring program and performance measures for businesses

Performance Parameters	Measures	Monitoring	Reporting
Awareness of construction activity and likely impacts.	• Notifications issued within required timeframes on 100% of occasions, unless otherwise agreed with Sydney Metro. • Number of business briefings, building-based information sessions and face-to-face meetings prior to works. • The objective is to make contact via these measures with 100% of businesses within 50 metres prior to works that have the potential to impact the owners.	• Records in Consultation Manager database on number and timing of notifications. • Records in Consultation Manager database on number of (and attendance at) briefings, information sessions and completed doorknocks/face-to-face meetings. • Feedback from meetings, presentations and briefings (documented in Consultation Manager). • Records in Consultation Manager database on complaints received from businesses relating to lack of information about construction activities and impacts.	• Number of notifications issued. • Percentage of notifications issued on time. • Number of briefings, information sessions and completed doorknocks. • Percentage of businesses within 50 metres contacted prior to works. • Number of complaints received from businesses relating to lack of information about construction activities and impacts. • Lessons learned.
Measures implemented to maintain business vehicle and pedestrian access, parking, visibility and amenity during construction activity.	• Potential issues identified in advance and mitigation measures implemented in consultation with affected businesses to address access, parking, visibility and/or amenity issues. • The objective is 100% implementation of agreed mitigation measures relating to access, parking, visibility and other amenity aspects.	• Consultation with businesses on potential impacts and mitigation measures (documented in Consultation Manager). • Feedback on effectiveness of mitigation measures (documented in Consultation Manager). • Records in Consultation Manager database on complaints received from businesses relating to vehicle and pedestrian access, parking, visibility and amenity, including details of any repeat complaints about the same issue.	• Number of businesses with mitigation measures agreed in advance to address access, parking, visibility or amenity issues. • Percentage of businesses where mitigation measures were implemented as agreed. • Details of mitigation measures implemented. • Business feedback on effectiveness of mitigation measures. • Number of repeat complaints received from businesses relating to vehicle and pedestrian access, parking, visibility and amenity. • Lessons learned.

Performance Parameters	Measures	Monitoring	Reporting
Agreed measures to minimise noise and vibration impacts on noise and vibration sensitive businesses.	• Agreed mitigations implemented, including agreed respite, work methods, proactive engagement and ongoing communication. • Businesses identified as potentially affected by high noise for extended periods, and requests for at property treatment or relocation, referred to Sydney Metro if all negotiated solutions offered under the scope of the contract fail to provide an acceptable solution to the impacted businesses. • The objective is for zero referrals to Sydney Metro over a six-month timeframe during standard construction.	• Consultation with businesses on noise and vibration impacts and mitigation measures documented in Consultation Manager. • Documentation of affected businesses impacts and mitigation measures in site specific CNVIS reports. • Feedback on effectiveness of mitigation measures (documented in Consultation Manager). • Records of businesses referred to Sydney Metro for additional assessment / treatment. • Records in Consultation Manager database on noise and vibration complaints from businesses.	• Number of businesses with agreed mitigation measures to address noise and vibration impacts. • Summary of non-standard mitigation measures implemented. • Number of referrals to Sydney Metro. • Number of repeat complaints from noise sensitive receivers relating to noise and vibration impacts. • Lessons learned.

12 Low impact or preparatory activities process

12.1 Purpose

This implementation process describes the approach Sydney Metro will use to manage engagement and ongoing consultation with stakeholders, and the community and businesses with an interest in, or potentially affected by Sydney Metro low impact or preparatory activities.

Low impact work is generally defined within State significant infrastructure conditions of approval for Sydney Metro projects as work that is not considered main construction works but will support main construction activities. Preparatory activities is a term defined within the Western Sydney Airport Plan and may apply to the variation to the Airport Plan for on-airport works for Sydney Metro – Western Sydney Airport. Each of these terms are described in more detail in table 8 below.

This low impact or preparatory activities plan must be implemented in conjunction with the overarching requirements outlined in this strategy.

12.2 Relationship to plans

The intention of this low impact or preparatory activities implementation process is to cover low impact or preparatory activities prior to the main construction works starting. Low impact activities may be conducted by Sydney Metro or its Contractors.

At the commencement of Construction, Contractor activities will be covered by the Contract Specific Community Communication Strategy.-

12.3 Low impact and preparatory activities

For the purposes of this process, low impact activities are defined as:

- Survey, survey facilitation and investigations works (including geotechnical investigations, road and building dilapidation survey works, drilling and excavation).
- Treatment of contaminated sites.
- Establishment of ancillary facilities including construction of ancillary facility access roads and providing facility utilities.
- Operation of ancillary facilities that have minimal impact on the environment and community.
- Clearing and relocation of vegetation (including native).
- Installation of mitigation measures, including erosion and sediment controls, temporary exclusion fencing for sensitive areas and acoustic treatments.
- Property acquisition adjustment works, including installation of property fencing and utility relocation and adjustments to properties.
- Utility relocation and connections.
- Maintenance of existing buildings and structures.
- Archaeological testing under the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010) or archaeological salvage and clearance undertaken in association with other Minor Works to ensure there is no impact on heritage items.
- Any other activities that have minimal environmental impact.

Preparatory activities are generally defined in the Western Sydney Airport Plan as the following:

- day to day site and property management activities
- site investigations, surveys (including dilapidation surveys), monitoring and related works (e.g. geotechnical or other investigative drilling, excavation, or salvage)
- establishing construction work sites, site offices, plant and equipment, and related site mobilisation activities (including access points, access tracks and other minor access works, and safety and security measures such as fencing but excluding bulk earthworks)

- enabling preparatory activities such as demolition or relocation of existing structures (including buildings, services, utilities and roads) and the disinterment of human remains
- any other activities which are determined Preparatory Activities.

Prior to low impact or preparatory activities taking place, a pre-construction work form will be completed for approval by the PDCT.

12.4 Monitoring and reporting

Due to the short-term and intermittent nature of low impact activities to businesses, business monitoring as outlined in Section 8 of this OCCS will not be undertaken for work covered by section 12.

Feedback received during proactive doorknocks and incoming correspondence (emails and phone calls) will be informally monitored and any dissatisfaction from businesses recorded and managed in accordance with the Construction Complaints Management System in the first instance. Complaints are reported on daily through the Daily Complaints Report and quarterly in the Construction Compliance Report.

Table 8 Communication tools for low impact or preparatory activities

Activity	Communication tools	Stakeholder	Timing
Survey and site investigations, including geotechnical investigations	Notification letter[1]	Delivered to properties within 50m or work in standard construction hours, 100m for out of hours work[2]	7 days prior to work starting
	Metro app connect	Sent to stakeholder distribution email lists for	
	Doorknock (if intrusive or loud)	Immediate neighbours	
Site establishment (including vegetation clearing, fencing, controls etc.)	Newsletter	Local council Local member Senior stakeholders Local groups Delivered to properties within 500m	At site establishment As required
	Notification letter	Delivered to properties within 200m for night work and 100m for day work[3] Local groups	7 days prior to work starting
	Site signage Hoarding banners Directional signage	People passing by the site	As required
	Doorknock	Properties within 50m Educational and religious institutions	7 days prior to work starting
Out of hours work	Notification letter[2]	Delivered to properties within 200m[3] Local groups	7 days prior to work starting
	Doorknock	Properties within 50m	7 days prior to work starting

1 Where work is undertaken wholly within the rail corridor, during a possession, the notification will be distributed by Sydney Trains. See explanation for 'Work during rail possessions'.
2 This 200m area will expand if the noise assessment shows a wider impact radius.

Activity	Communication tools	Stakeholder	Timing
Planned service disruptions	Included in notification letter	Delivered to properties within 200m[3]	7 days prior to disruption
Emergency work	Notification letter Doorknock	Affected properties	Within 2 hours
Work during rail possessions	Sydney Trains notification	Sydney Trains delivery area (250m on either side of the rail corridor)	Delivered prior to possession period by Sydney Trains
Construction milestones	Included in notification letter	Delivered to properties within 100m or work in standard construction hours, 200m for out of hours work[3]	7 days prior to new milestone
	Doorknock	Properties within 50m Educational and religious institutions	7 days prior to new milestone
	Briefings	Local council Local member Senior stakeholders Local groups Government agencies Specific businesses as required	As required or requested
Traffic changes, including any public transport changes	Included in notification letter	Delivered to properties within 100m or work in standard construction hours, 200m for out of hours work[3]	7 days prior to work starting 7 days prior to new milestone
	VMS Traffic alert Bus stop notices	Road users	7 days prior to work starting 7 days prior to new milestone
Emergency work	Notification letter Doorknock	Affected properties	Within 2 hours
Transport infrastructure disruptions	Notification letter Bus stop notices Directional signage	Transport users Local council Transport agencies	As required