Construction Environmental Management Plan

Project Name: Sydney Metro City & Southwest Northern Corridor Works Project (Portion 7a & 7b)

Location: Sydney, NSW, Australia

Project Number: K38

Client: Sydney Metro

Copy Number: Final (Rev 012) - Client Copy

Issued By:		
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Latest amendments are summarised in the table below.

Revisions

Revision	Description	Reviewed	Approved	Date
Rev 1	Preparation of Contractor Environmental Management Plan	MB	AD	10/07/2017
Rev 2	Revised the first draft based on initial comments from Sydney Metro	MB	AD	15/08/2017
Rev 3	Addressed ER and Sydney Metro comments	MB	AD	04/10/2017
Rev 4	Addressed ER and Sydney Metro comments	CS, MB	AD	27/10/2017
Rev 5	Final version submitted to DPE	CS, MB	AD	30/10/2017
Rev 6	Revised following comments from DPE	CS	AD	15/02/2018
Rev 7	Revised following comments from DPE	CS	AD	13/03/2018
Rev 8	Revised for Portion 7b and LOR HSEMS System Update	CS, CM	AD	25/09/2018
Rev 9	Addressed ER and Sydney Metro comments	CS, CM	AD	26/10/2018
Rev 10	Updated to include new signalling scope. Project team details have also been updated.	CM	KF	02/09/2019
Rev 11	Addressed Sydney Metro and ER comments	JT, CM	KF	16/09/2019
Rev 12	Updated in line with additional comments	CM	KF	18/09/2019

Management Reviews

Review Date	Details	Reviewed By

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Conditions of Approval relevant to the CEMP

CoA	Obligation	Document Reference
C1	A Construction Environmental Management Plan (CEMP) must be prepared in accordance with the Construction Environmental Management Framework (CEMF) included in the PIR and the Department's Guideline for the Preparation of Environmental Management Plans to detail how the performance outcomes, commitments and mitigation measures specified in Chapter 11 of the PIR, as amended by the documents listed in A1 will be implemented and achieved during construction.	NCW CEMP document NCW Compliance Matrix
C2	The CEMP must provide: (a) a description of activities to be undertaken during construction (including the scheduling of construction);	Section 2.2 – Scope of Works Section 2.4 – Indicative Construction Schedule
	(b) details of environmental policies, guidelines and principles to be followed in the construction of the CSSI;	Section 3 – Environmental Management System Section 4 – Legal and Other Requirements Appendix B – Project Permits and Approvals Register
	(c) a schedule for compliance auditing;	Section 17 – Environmental management System Audit
	(d) a program for ongoing analysis of the key environmental risks arising from the activities described in subsection (a) of this condition, including an initial risk assessment undertaken before the commencement of construction of the CSSI;	Appendix C – Risk Assessment Section 16 – Incidents, Complaints, Corrective and Preventative Action
	(e) details of how the activities described in subsection (a) of this condition will be carried out to: i. meet the performance outcomes stated in the EIS as amended by the documents listed in A1; and ii. manage the risks identified in the risk analysis undertaken in subsection (d) of this condition;	Appendix D - Operational Control Procedures - Environmental Risk Action Plans (ERAPs)
	(f) an inspection program detailing the activities to be inspected and frequency of inspections;	Section 15 – Monitoring and Measurement Appendix I – Environmental Inspection Report
	(g) a protocol for managing and reporting any: i. incidents; and ii. non-compliances with this approval and with statutory requirements;	Section 16 - Incidents, Complaints, Corrective and Preventative Action Appendix H – Environmental Incident Investigation Guidelines
	(h) procedures for rectifying any non-compliance with this approval identified during compliance auditing, incident management or at any time during construction;	Section 15 - Monitoring and Measurement Section 16 - Incidents, Complaints, Corrective and Preventative Action
	(i) a list of all the CEMP sub-plans required in respect of construction, as set out in Condition C3. Where staged construction of the CSSI is proposed, the CEMP must also identify which CEMP sub-plan applies to each of the proposed stages of construction;	Section 1 - Purpose of the CEMP Section 4.5 - Stakeholder Consultation and Approval of Plans Appendix S – NCW CEMP Sub-plans
	(j) a description of the roles and environmental responsibilities for relevant employees and their relationship with the ER;	Section 7 – Responsibilities and Authorities
	(k) for training and induction for employees, including contractors and subcontractors, in relation to environmental and compliance obligations under the terms of this approval;	Section 9 – Training, Awareness and Competence
	(l) for periodic review and update of the CEMP and all associated plans and programs.	Section 2.9 – Issue, Revision and re-Issue

C3	The following **CEMP sub-plans** must be prepared in consultation with the relevant government agencies identified for each **CEMP sub-plan** and be consistent with the **CEMF** and **CEMP** referred to in Condition C1. The Construction Traffic Management Plan must also be prepared in accordance with the **Construction Traffic Management Framework** as required by Condition E81. (a)Noise and Vibration (b)Biodiversity (c)Air Quality (d)Soil and Water (e)Groundwater (g)Heritage	Section 1 – Purpose of the CEMP Section 4.5 - Stakeholder Consultation and Approval of Plans Note: As per the Sydney Metro City and South West Staging Report. A Noise and Vibration sub plan must be prepared for the NCW project (this project).
C4	The **CEMP sub-plans** must state how: a) the environmental performance outcomes identified in the EIS as amended by the PIR as modified by these conditions will be achieved; b) the mitigation measures identified in the EIS as amended by the PIR as modified by these conditions will be implemented; c) the relevant terms of this approval will be complied with; and d) issues requiring management during construction, as identified through ongoing environmental risk analysis, will be managed.	Refer to individual sub-plans – Noise and Vibration.
C5	The **CEMP sub-plans** must be developed in consultation with relevant government agencies. Where an agency(ies) request(s) is not included, the Proponent must provide the Secretary justification as to why. Details of all information requested by an agency to be included in a **CEMP sub-plan** as a result of consultation and copies of all correspondence from those agencies must be provided with the relevant **CEMP sub-plan**.	Section 4.5 – Stakeholder Consultation and Approval of Plans
C6	Any of the **CEMP sub-plans** may be submitted to the Secretary along with, or subsequent to, the submission of the **CEMP** but in any event, no later than one (1) month before commencement of construction.	Relevant CEMP sub-plans will be submitted to the Secretary no later than one (1) month before the commencement of construction.
C7	The **CEMP** must be endorsed by the ER and then submitted to the Secretary for approval no later than one (1) month before the commencement of construction or within another timeframe agreed with the Secretary.	Section 1 - Purpose of the CEMP The CEMP will be endorsed by the ER and then submitted to the Secretary for approval no later than one (1) month before the commencement of construction or within another timeframe agreed with the Secretary.
C8	Construction must not commence until the **CEMP** and all **CEMP sub-plans** have been approved by the Secretary. The **CEMP** and **CEMP sub-plans**, as approved by the Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction. Where the CSSI is being staged, construction of that stage is not to commence until the relevant CEMP and sub-plans have been approved by the Secretary.	Section 1 - Purpose of the CEMP The CEMP and sub plans will be approved by the Secretary prior to the commencement of Construction Activities.
C9	The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each Construction Monitoring Program to compare actual performance of construction of the CSSI against predicted performance. (a)Noise and Vibration (b)Blasting (c)Water Quality (d)Groundwater	As per the Sydney Metro City and South West Staging Report. Noise and Vibration Monitoring Program required for Portion 7B scope of works. This has been endorsed by the ER and submitted to DP&E for approval

E81	The Proponent must prepare and implement a Construction Traffic Management Framework (CTMF). The CTMF must be prepared in consultation with TTLG(s) and submitted to the Secretary for approval no later than one (1) month before the commencement of construction (or within any other timeframe agreed with the Secretary). The CTMF will set out the approach to managing issues across the CSSI and include but not be limited to: (a)construction site access, including the efficient and safe egress and ingress of vehicles, consistent relevant Austroads, Australian Standards and RMS requirements; (b)the erection and maintenance of hoardings, scaffolds and associated structures on roads; (c)short and long term lane and road closures including those associated with plant, crane and other operations between the road reservation and construction site; (d)cumulative construction vehicle management from surrounding developments; (e)bus stop and associated facilities relocation and service rerouting; (f)short and long term works zones on roads adjacent to the construction site; (g)mail zone and associated facilities relocation; (h)short and long term works within the road reservation; (i)regulatory, advisory and other signage changes and modifications; (j)parking management, including on and off street and remote parking and access; (k)heavy vehicle management, the restriction (unless otherwise approved) of heavy vehicles to certain routes and the minimisation of heavy vehicle traffic in peak traffic periods; (l)special event management; (m)the retention and reinstatement of emergency and property access; (n)the retention of user and passenger safety, including pedestrians, cyclists, public transport users, including at stops and related facilities; (o)incident response planning around construction worksites; and (p)monitoring of transport and access related impacts attributable to the CSSI.	The CTMP has been prepared covering the requirements of E81 and the conditions specified in the CTMF.
E82	Construction Traffic Management Plans (CTMPs), consistent with the CEMF and CTMF required in Condition E81, must be prepared for each construction site in consultation with the TTLG(s), and submitted to the RMS for approval following Sydney Coordination Office endorsement before construction commences at the relevant construction site. A copy of any Construction Traffic Management Plans approved by the RMS must be submitted to the Secretary for information.	The Northern Corridor Works project CTMP has been prepared in consultation with the TTLG and TCG. The CTMP has been endorsed by RMS in consultation with Sydney Coordination Office and Willoughby City Council.

PIR Revised Mitigation Measures relevant to the CEMP

REMM	Requirement	Document Reference
T1	Ongoing consultation would be carried out with (as relevant to the location) the CBD Coordination Office, Roads and Maritime Services, Sydney Trains, NSW Trains, the Port Authority of NSW, Barangaroo Delivery Authority, local councils, emergency services and bus operators in order to minimise traffic and transport impacts during construction.	The NCW CTMP has been prepared in consultation with the TTLG and TCG, RMS, SCO CRS and WCC. The CTMP has been endorsed by RMS in consultation with Sydney Coordination Office and Willoughby City Council.
T4	In the event of a traffic related incident, co-ordination would be carried out with the CBD Coordination Office and / or the Transport Management Centre's Operations Manager.	Refer to the NCW CTMP

REMM	Requirement	Document Reference
T5	The community would be notified in advance of proposed road and pedestrian network changes through media channels and other appropriate forms of community liaison.	Refer to the NCW CTMP. Notification is firstly raised at the TCG meetings and then provided through the Sydney Metro Community Consultation Strategy.
T6	Vehicle access to and from construction sites would be managed to ensure pedestrian, cyclist and motorist safety. Depending on the location, this may require manual supervision, physical barriers, temporary traffic signals and modifications to existing signals or, on occasions, police presence.	Refer to the NCW CTMP – Section 2.1
T8	Access to existing properties and buildings would be maintained in consultation with property owners.	Refer to the NCW CTMP. Access to adjacent properties will not be impacted by the NCW project.
T9	All trucks would enter and exit construction sites in a forward gear, where feasible and reasonable.	Refer to the NCW CTMP – Section 2.1
T12	Construction sites would be managed to minimise construction staff parking on surrounding streets. The following measures would be implemented: • Encouraging staff to use public or active transport • Encouraging ride sharing • Provision of alternative parking locations and shuttle bus transfers where feasible and reasonable. Transport for NSW would work with local councils to minimise adverse impacts of construction on parking and other kerbside use in local streets, such as loading zones, bus zones, taxi zones and coach zones.	Refer to the NCW CTMP – Section 2.1 The NCW CTMP has been prepared in consultation with the TTLG and TCG, RMS, SCO CRS and WCC.
T13	Construction site traffic would be managed to minimise movements in the AM and PM peak periods.	Refer to the NCW CTMP – Section 2.1 The NCW CTMP has been prepared in consultation with the TTLG and TCG, RMS, SCO CRS and WCC.
T14	Construction site traffic immediately around construction sites would be managed to minimise movements through school zones during pick up and drop off times.	Refer to the NCW CTMP – Section 2.1 No schools are present around the NCW site.
T19	Where existing parking is removed to facilitate construction activities, alternative parking facilities would be provided where feasible and reasonable.	Refer to the NCW CTMP – Section 2.1.6
T21	The potential combined impact of trucks from multiple construction sites would be further considered during the development of Construction Traffic Management Plans.	Refer to the NCW CTMP – Section 2.1
NV4	Feasible and reasonable measures would be implemented to minimise ground borne noise where exceedances are predicted.	Section 4.6 Refer to Construction Noise and Vibration Management Plan
NV7	Alternative demolition techniques that minimise noise and vibration levels would be investigated and implemented where feasible and reasonable.	Refer to Construction Noise and Vibration Management Plan. Where possible alternative construction methods will be applied to the construction methodology.
LV1	Where feasible and reasonable, the elements within construction sites would be located to minimise visual impacts, for example materials and machinery would be stored behind fencing.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to CAFMP – Section 4.2
LV2	Existing trees to be retained would be protected prior to the commencement of construction in accordance with Australian Standard AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan

REMM	Requirement	Document Reference
LV3	Lighting of construction sites would be oriented to minimise glare and light spill impact on adjacent receivers.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan
LV4	Visual mitigation would be implemented as soon as feasible and reasonable after the commencement of construction, and remain for the duration of the construction period.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan
LV5	Opportunities for the retention and protection of existing street trees would be identified during detailed construction planning.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan
LV18	Noise barriers would be transparent where they are augmenting existing transparent noise barriers.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan
SCW3	Erosion and sediment control measures would be implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control
SO2	Specific consultation would be carried out with sensitive community facilities (including aged care, child care centres, educational institutions and places of worship) potentially impacted during construction. Consultation would aim to identify and develop measures to manage the specific construction impacts for individual sensitive community facilities.	Specific consultation with sensitive stakeholders has been/will be undertaken as part of the Sydney Metro City and South West – Early and Enabling Works Communications Strategy
B1	An ecologist would be present during the removal of any hollow-bearing trees.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Biodiversity
B3	The local WIRES group and / or veterinarian would be contacted if any fauna are injured on site or require capture and / or relocation.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Biodiversity
FH4	Where feasible and reasonable, detailed design would result in no net increase in stormwater runoff rates in all storm events unless it can be demonstrated that increased runoff rates as a result of the project would not increase downstream flood risk.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control
FH9	Design of the project would be reviewed to, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year annual recurrence interval event in the vicinity of the project. Detailed flood modelling would consider: • Potential changes to flood prone land and flood levels • Potential changes to overland flow paths • Redistribution of surface runoff as a result of project infrastructure • Behaviour of existing stormwater runoff • Potential changes required to flood evacuation routes, flood warning systems and signage. Flood modelling to support detailed design would be carried out in accordance with the following guidelines: • Floodplain Development Manual (NSW Government, 2005b)	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control

REMM	Requirement	Document Reference
	• Floodplain Risk Management Guideline: Practical Consideration of Climate Change (DECC, 2007b) • Floodplain Risk Management Guide: Incorporating Sea Level Rise Benchmarks in Flood Risk Assessments (DECCW, 2010c) • New guideline and changes to section 117 direction and EP&A Regulation on flood prone land, Planning Circular PS 07-003 (NSW Department of Planning, 2007). Flood modelling and consideration of mitigation measures would be carried out in consultation with the relevant local councils, the Office of Environment and Heritage and the State Emergency Services. Not worsen is defined as: • A maximum increase flood levels of 50mm in a 100 year Average Recurrence interval flood event • A maximum increase in time of inundation of one hour in a 100 year Average Recurrence interval flood event • No increase in the potential for soil erosion and scouring from any increase in flow velocity in a 100 year Average Recurrence Interval flood event.	
FH10	During detailed design, project infrastructure would be designed to meet the following criteria, where feasible and reasonable: • Locate station and service entrances to underground stations above the greater of the 100 year annual recurrence interval flood level plus 500mm or the probable maximum flood level • Provide site surface grading and drainage collection systems at the Chatswood and Marrickville dive structures to manage the risk of local catchment and overland flooding for events up to and including the probable maximum flood event • Locate aboveground rail system facilities (such as traction power supply sub stations) at least above the 100 year annual recurrence interval flood level plus 500mm • Protect facilities that are identified as being critical to emergency response operations from the probable maximum flood level.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control
AQ1	The engines of all on-site vehicles and plant would be switched off when not in use for an extended period.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
AQ2	Plant would be well maintained and serviced to minimise emissions. Emissions from plant would be considered as part of pre-acceptance checks.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
AQ3	Construction site layout and placement of plant would consider air quality impacts to nearby receivers.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
AQ4	Hard surfaces would be installed on long term haul routes and regularly cleaned.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
AQ5	Unsurfaced haul routes and work area would be regularly damped down in dry and windy conditions.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
AQ6	All vehicles carrying loose or potentially dusty material to or from the site would be fully covered.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
AQ7	Stockpiles would be managed to minimise dust generation.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality

REMM	Requirement	Document Reference
AQ8	Demolition would be managed to minimise dust generation.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
HR1	All hazardous substances that may be required for construction would be stored and managed in accordance with the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005) and Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (Department of Planning, 2011).	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 9 – Delivery and Storage of Chemicals
HR2	Dial before you dig searches and non-destructive digging would be carried out to identify the presence of underground utilities.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 9 – Delivery and Storage of Chemicals
HR3	A hazardous material survey would be completed for those buildings and structures suspected of containing hazardous materials (particularly asbestos) prior to their demolition. If asbestos is encountered, it would be handled and managed in accordance with relevant legislation, codes of practice and Australian standards.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 9 – Delivery and Storage of Chemicals
WR1	All waste would be assessed, classified, managed and disposed of in accordance with the NSW Waste Classification Guidelines.	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 4 – Waste & Resource Management, Environmental Risk Action Plan 7 – Hazardous / Contaminated Material, Environmental Risk Action Plan 8 – Trade Waste
WR2	100 per cent of spoil that can be reused would be beneficially reused in accordance with the project spoil reuse hierarchy.	Appendix D - Operational Control Procedures – Environmental Risk Action Plan 4 – Waste & Resource Management
WR3	A recycling target of at least 90 per cent would be adopted for the project.	Appendix D - Operational Control Procedures – Environmental Risk Action Plan 4 – Waste & Resource Management
WR4	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging.	Appendix D - Operational Control Procedures – Environmental Risk Action Plan 4 – Waste & Resource Management
SUS6	25 per cent of the greenhouse gas emissions associated with consumption of electricity during construction would be offset.	Refer to Construction Sustainability Management Plan. NCW will as part of Section 3.3 Carbon Energy and Management meet the requirements by; a. Purchasing Australian Carbon Offset Credits; and/or b. Purchasing renewable energy from an Accredited Renewable Energy Supplier.
CU1	Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time. Coordination and consultation with the following stakeholders would occur, where required: - CBD Coordination Office - Department of Planning and Environment - Roads and Maritime Services - Sydney Trains - NSW Trains - Sydney Buses - Sydney Water - Port Authority of NSW - Willoughby Council - North Sydney Council - City of Sydney Council	NCW will contribute to any interfacing as required by Sydney Metro. Consultation with relevant stakeholders has also has been undertaken through the development of the CNVMP, CTMP and CAFMP as detailed in the consultation section of each specific plan.

REMM	Requirement	Document Reference
	- Marrickville Council - Sydney Motorways Corporation - Barangaroo Delivery Authority - Emergency service providers - Utility providers - Construction contractors Co-ordination and consultation with these stakeholders would include: - Provision of regular updates to the detailed construction program, construction sites and haul roads - Identification of key potential conflict points with other construction projects - Development of mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve: (i) Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects (ii) Co-ordination of traffic management arrangement between other projects	

PIR Revised Environmental Performance Outcomes relevant to the CEMP

Item	Requirement	Document Reference
Construction Traffic and transport	The project would minimise impacts to the road network Pedestrian and cyclist safety would be maintained Effective coordination would be carried out to minimise cumulative network impacts Access to properties would be maintained.	The Northern Corridor Works project CTMP has been prepared in consultation with the TTLG and TCG. The CTMP has been endorsed by RMS in consultation with Sydney Coordination Office and Willoughby City Council.
Operational Traffic and transport	The project would appropriately integrate with existing and planned future transport infrastructure including active transport Access to properties would be maintained Metro customers would be provided with a safe and secure service The project would reduce station crowding, increase rail network reach and use, improve network resilience, and improve travel times within the global economic corridor.	Not applicable to NCW
Construction noise and vibration	Noise levels would be minimised with the aim of achieving the noise management levels where feasible and reasonable The project would avoid any damage to buildings from vibration.	Refer to Construction Noise and Vibration Management Plan – Section 8 'Mitigation Measures' Appendix D - Operational Control Procedures – Environmental Risk Action Plan 1 – Noise and Vibration No predicted vibration impacts to nearby buildings from NCW works - Construction Noise and Vibration Management Plan – Section 4 ''Vibration'
Operational noise and vibration	Noise levels would comply with the Rail Infrastructure Noise Guidelines (Environment Protection Authority, 2013). The project would avoid any damage to buildings from vibration.	Detailed design for NCW Portion 7a and 7b will incorporate the requirements of the RING in relation to operational noise. No predicted vibration impacts to nearby buildings from NCW works - Construction Noise and Vibration Management Plan – Section 4 ''Vibration'
Landuse and property	The project would be appropriately integrated into local landuse planning strategies The surface footprint of the project would be minimised The project would provide substantial future development opportunities.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan

Item	Requirement	Document Reference
Business impacts	The project would minimise impacts on businesses during construction During operation, the project would improve access to businesses for employees and customers, and connectivity between businesses within the global economic corridor.	It is noted that the impacts of NCW on adjacent business is to be minimal. Specific consultation with sensitive stakeholders has been/will be undertaken as part of the Sydney Metro City and South West – Early and Enabling Works Communications Strategy
Non-Aboriginal heritage	The project would be sympathetic to heritage items and, where feasible and reasonable, avoid and minimise impacts to non-Aboriginal heritage items and archaeology The design of the project would reflect the input of an independent heritage architect, relevant stakeholders and the design review panel.	Appendix D - Operational Control Procedures – Environmental Risk Action Plan 8 – Indigenous & Aboriginal Heritage
Aboriginal heritage	The project would be sympathetic to heritage items and, where feasible and reasonable, avoid and minimise impacts to Aboriginal heritage items and archaeology The design of the project would reflect the input of an independent heritage architect, relevant stakeholders and the design review panel.	Appendix D - Operational Control Procedures – Environmental Risk Action Plan 8 – Indigenous & Aboriginal Heritage
Landscape character and visual amenity	During operation, the project would make a positive contribution to the quality of the urban environment at each station site During operation, the project would minimise change to landscape character in the vicinity of the dive structures and Artarmon substation The project would be visually integrated with its surroundings.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Refer to Construction Ancillary Facilities Management Plan
Groundwater and geology	The project would make good any impacts on groundwater users The project would avoid any damage to buildings from settlement.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control
Soils, contamination and water quality	Erosion and sediment controls during construction would be implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008a) There would be no impacts on aquatic environments associated with the disturbance of acid sulfate soils during construction Any contamination on project sites would be remediated to suit future land use The project would protect or contribute to achieving the Water Quality Objectives, during construction and operation Construction water quality discharge would comply with the requirements of an environment protection licence issued to the project Operation water quality discharge would comply with a discharge criteria determined in consultation with the NSW Environment Protection Authority.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control
Socio-economic, land use and property	The project would avoid long term impacts (during operation) on the availability and quality of public open space and community facilities The project, during operation, would help to improve access to local facilities, services and destinations, supporting opportunities for community interaction	NCW will for the duration of the project minimize impacts to local amenity by limiting activities to the rail corridor. Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Further enhancement of local amenity after the project will be incorporated into the detailed design of NCW Portion 7a and 7b though the Early and Enabling Works Communications Strategy – Frank Channon Walk.
Biodiversity	The biodiversity outcome would be consistent with the Framework for Biodiversity Assessment The project would minimise impacts to biodiversity.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 2 – Biodiversity
Flooding and hydrology	Changes to overland flow diversions during construction would meet the following criteria: Not worsen existing flooding characteristics up to and including the 100 year annual recurrence interval event in the vicinity of the project (not worsen is defined as a maximum increase flood levels of 50mm in a 100 year Average Recurrence interval flood event, a maximum increase in time of inundation of one hour in a 100 year Average Recurrence interval flood event, and no increase in the potential for	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control

Item	Requirement	Document Reference
	soil erosion and scouring from any increase in flow velocity in a 100 year Average Recurrence interval flood event). Dedicated evacuation routes would not be adversely impacted in flood events up to and including the probable maximum flood. There would be no additional private properties affected by flooding up to and including the 100 year average recurrence interval event during operation Flood levels would be increased by a maximum of 470 mm during the 100-year average recurrence interval event in the vicinity of the Marrickville dive structure during operation The performance of the downstream drainage network would be maintained during operation.	
Air quality	Dust and exhaust emissions during construction would be minimised.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 3 – Dust and Air Quality
Hazard and risk	The storage, use and transport of dangerous goods and hazardous substances would comply with Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (Department of Planning, 2011) There would be no unplanned or unexpected disturbance of utilities.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 9 – Delivery and Storage of Chemicals
Waste Management	All waste would be assessed, classified, managed and disposed of in accordance with the NSW Waste Classification Guidelines 100 per cent of spoil that can be reused would be beneficially reused in accordance with the project spoil reuse hierarchy. A recycling target of at least 90 per cent would be adopted for the construction of the project.	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 4 – Waste & Resource Management, Environmental Risk Action Plan 7 – Hazardous / Contaminated Material, Environmental Risk Action Plan 8 – Trade Waste
Sustainability	The project would be carried out in accordance with the Sydney Metro City & Southwest Environment and Sustainability Policy 25 per cent of the greenhouse gas emissions associated with consumption of electricity during construction would be offset 100 per cent of the greenhouse gas emissions associated with consumption of electricity during operation would be offset.*	NCW will comply with these objectives and the Contract Management Requirements – Sustainability and the Sydney Metro City & Southwest Environment and Sustainability Policy. Refer to Construction Sustainability Management Plan. As part of Section 3.3 Carbon Energy and Management meet the requirements by; a. Purchasing Australian Carbon Offset Credits; and/or b. Purchasing renewable energy from an Accredited Renewable Energy Supplier. * Operational target not applicable to NCW project.

CEMF Requirements relevant to the CEMP

Item	Requirement	Document Reference
2.1	**Key Legislative Requirements** Table 1.1 of the CEMF identifies key NSW environmental legislative requirements and their application to SM C&SW construction works, current as at the date of this document. Sydney Metro and its Contractors should regularly review their legislative requirements.	Refer to Section 4 – Legal and Other Requirements
2.2	**Environmental Approvals** Sydney Metro City and Southwest is also classified as Critical State Significant Infrastructure and requires approval from a consent authority under the requirements of the Environmental Protection and Assessment Act 1997 (Section 115W). Two separate approvals will be sought: i. Sydney Metro City and Southwest - Chatswood to Sydenham ii. Sydney Metro City and Southwest - Sydenham to Bankstown The requirements of the 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 Sydney Metro will produce a Staging Report which sets out the applicability and allocation of approval requirements within the project¡¦s program of works.	NCW will comply with the project approval conditions of the approved CSSI project as allocated by the Sydney Metro Staging Report.
2.3	**Environment Protection Licence Requirements** Sydney Metro projects often meet the definition of a number of scheduled activities under Schedule 1 of the Protection of the Environmental Operation Act 1997 (POEO Act) and as such our contractors may be required to obtain an Environment Protection Licence (EPL) or work under the existing EPL held by Sydney Trains. Where required, Sydney Metro Principal Contractors will: a) Apply for and be granted an EPL from the EPA. b) Hold an EPL which covers their scope of works as necessary under the POEO Act. c) 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.	NCW is to work under the existing Sydney trains EPL – 12208 for the duration of the project.
2.4	**Standards and Guidelines** Numerous environmental publications, standards, codes of practice and guidelines are relevant to TfNSW construction and are referenced throughout this Construction Environmental Management Framework. A summary of these applicable standards and guidelines is provided in Table 1.3 of the CEMF.	Refer to Section 4 – Legal and Other 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 14001:2004 and to have transitioned this accreditation into AS/NZS ISO 14001:2015 by September 2018. b. Principal Contractors are required to develop a project based Environment and Sustainability Management System and will be consistent with the Principal Contractors corporate Environmental Management System and AS/NZS ISO 14001:2004 or 2015; and the SM C&SW Sustainability Strategy and Sydney Metro Environment and Sustainability Policy.	Refer to Section 3 – Environmental Management System
3.3	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, in particular those that relate to design management.	This Plan. Refer to Section 1 – Purpose of the CEMP.

Item	Requirement	Document Reference
	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	Refer to Section 1 – Purpose 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.	Refer to Section 4 – Legal and Other Requirements
	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 3.9(b); ix. Management strategies for environmental compliance and review of the performance of environmental controls; x. Processes and methodologies for surveillance and monitoring, auditing and review, and reporting on environmental performance including environmental compliance tracking; xi. Include procedures for emergency and incident management, non-compliance management, and corrective and preventative action; and xii. Include procedures for the control of environmental records.	Refer to Section 5 – Policy Refer to Section 2 – Project Overview, Scope of Works and Indicative Construction Schedule Refer to the Construction Noise and Vibration Management Plan – Consolidated Compliance Matrix Refer to Section 6 – Objective and Targets and Construction Noise and Vibration Management Plan – Section 1.3 Refer to Section 7 – Roles and Responsibilities Refer to Section 7 - Roles and Responsibilities (Project Leader) Refer to Section 10 Communication and Reporting (External, Community) Refer to Section 9 – Training, Awareness and Competency Refer to Section 15 – Monitoring and Measurement and Section 17 – Environmental Management System and Compliance Audit Refer to Section 13 – Operational Control Refer to Section 14 – Emergency preparedness and Response Refer to Section 15 – Monitoring and Measurement
	e. The CEMP and associated sub-plans will be reviewed by Sydney Metro and/or an independent environmental representative (see Section 3.11) 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 and Environment (DP&E).	Refer to Appendix R – Environmental Representative Endorsement
	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.	This plan and supporting documents have been written to meet the Sydney Metro project requirements. Furthermore NCW will utilise any Sydney Metro forms or systems documentation to facilitate works approval.
3.4	**Construction Environmental Management Sub-Plans** The Contractor must comply with the requirements of section 3.4 of the CEMF and in relation to Section 3.4 a. only the following issue-specific environmental Sub plans to the CEMP, are required: i. Construction Traffic Management Plan (and its sub-plans per section 8.2); ii. Construction Noise and Vibration Management Plan; and iii. Sustainability Management Plan in line with requirements of MR-minor Sustainability (MR-minor Sy).	The following plans have been developed to accompany the CEMP. - CTMP - CNVMP - CSMP
3.5	**Environmental Procedures and Control Maps**	Refer to Section 13.3 – Environmental Control Maps

Item	Requirement	Document Reference
	The principle 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.	
3.6	**Additional Environmental Assessments** Where the requirements for an additional environmental assessment is identified, this will be undertaken prior to undertaking any physical works.	Refer to Section 2.6 – Out of Hours Works
3.7	**Condition surveys** a) Prior to the commencement of construction the Principal Contractors will offer Pre-construction Building Condition Surveys, in writing, to the owners of buildings where there is a potential for construction activities to cause cosmetic or structural damage. 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.	a) NCW will undertake any pre construction building surveys if impacts are predicted as defined in the project CNVMP b) NCW will undertake a road dilapidation survey prior to construction as per the project CTMP
3.8	**Register of Hold Points** Principal Contractors will identify hold points, beyond which approval is required to proceed with a certain activity. Example activities include vegetation removal and water discharge. Hold points will be documented in relevant CEMPs. Table 1.4 of the CEMF provides the structure for the register of hold points as well as a preliminary list of hold points which will be implemented.	Refer to Section 13.2 – Hold Points
3.9	**Training Awareness and Competence** a) The principle will be responsible for demining the training needs of their personnel. b) Principal contractors will conduct a Training Needs Analysis.	Refer to Section 9 – Training and Competency
3.10	**Emergency and Incident Response** Principal Contractors will develop and implement a Pollution Incident Response Management Plan, in accordance with the requirements of the POEO Act. Contractors' emergency and incident response procedures will also be consistent with any relevant SMDO procedures and will include: The contractor will make all personnel aware of the plan and their responsibilities.	Refer to Section 16.1 – Incidents and Complaints
3.12	**Roles and responsibilities** In relation to the roles and responsibilities the CEMP will; i. Describe the relationship between the Principal Contractor, Sydney Metro, key regulatory stakeholders, the independent environmental representative and the independent certifier; 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 organization 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, the Independent Certifier and other regulatory stakeholders. All sub-contractors engaged by the Principal Contractor will be required to operate within the EMS documentation of that Principal Contractor.	Refer to Section 7 – Roles and Responsibilities

Item	Requirement	Document Reference
3.13	**Environmental monitoring, inspections and auditing** Issue specific environmental monitoring will be undertaken as required or as additionally required by any approval, permit or licence conditions. The results of any monitoring undertaken as a requirement of the EPL will be published on the Principal Contractor's, or a project specific, website within 14 days of obtaining the results. Regular site inspections Regular site inspections by the ERs and Sydney Metro representatives at a frequency to be agreed with the Principal Contractor. Principal Contractors must undertake internal environmental audits. Sydney Metro will also undertake (or independent environmental auditor) will also undertake periodic audits of the Principal Contractor's E&SMS and compliance with the environmental aspects of contract documentation, including this Construction Environmental Management Framework.	Refer to Section 15 – Monitoring and Measurement
3.14	**Environmental Non compliances** Principal Contractor will document and detail any non-compliances arising out of the above monitoring, inspections and audits. Sydney Metro will be made aware of all non-compliances in a timely manner. Principal Contractors will develop and implement corrective actions to rectify the non-compliances and preventative actions in order to prevent a re-occurrence of the non-compliance. Contractors will also maintain a register of non-compliances, corrective actions and preventative actions. Sydney Metro or the Environmental Representative may raise non-compliance against environmental requirements	Refer to Section 15.1 – Non Compliance sand Corrective Actions
3.15	**Environmental Records and Compliance Reporting** Principal Contractor will maintain appropriate records Records will be retained onsite for the duration of works. 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. Compliance reports detailing the outcome of any environmental surveillance activity including internal and external audits (refer to Section 3.13) will be produced by the Principal Contractors Environmental Manager or	Refer to Section 15.2 – Environmental Reporting
3.16	**Environmental Records and Compliance Reporting** Principal Contractor will ensure the continual review and improvement of the E&SMS. A formal review of the E&SMS by the Principal Contractor's Senior Management Team will also occur on annual basis as a minimum.	Refer to Section 15.2 – Environmental Reporting
4.1	**Stakeholder and Community Involvement** 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.	Specific consultation with sensitive stakeholders has been/will be undertaken as part of the Sydney Metro City and South West – Early and Enabling Works Communications Strategy. NCW will work with the Proponent to inform the community in relation to any construction works in line with the strategy.
4.3	**Complaint Handling** Community liaison and complaints handling will be undertaken in accordance with the Construction Complaints Management System	Refer to Section 16 – Incidents and Complaints
4.4	**Urban Design of Temporary Works** Temporary construction works including site hoardings and acoustic sheds consider urban design and visual impacts,: The design of all temporary works will require Sydney Metro approval in relation to urban design and visual impacts. 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.	Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity

Item	Requirement	Document Reference
	The principles of Crime Prevention Through Environmental Design will be applied to all works, including temporary works that have a public interface.	
4.5	**Building and Property Impacts** Principal Contractors will proactively work with potentially affected stakeholders to identify the likely impacts and put in place measures to minimise impacts. Principal Contractors will document in the CCS key issues relating to business impacts by locality with a particular focus on proactive consolation with affected businesses	Specific consultation with businesses and other stakeholders has been/will be undertaken as part of the Sydney Metro City and South West – Early and Enabling Works Communications Strategy. Sydney Metro will maintain a register of interactions with the proponent and stakeholders. NCW will comply with the requirements of the Communications Strategy.
5.1	**Working Hours** Standard working hours are between 7am – 6pm on weekdays and 8am – 1pm on Saturdays. 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 ii. 24/7. For example, tunneling and underground excavations and supporting activities will be required 24/7; iii. Works which are determined to comply with the relevant Noise Management Level at sensitive receivers; iv. The delivery of materials outside of approved hours as required by the Police or other authorities (including v. RMS) for safety reasons; vi. Where it is required to avoid the loss of lives, property and / or to prevent environmental harm in an vii. emergency; and viii. Where written agreement is reached with all affected receivers. Principal Contractors may apply for EPA approval to undertake works outside of normal working hours under their respective Environment Protection Licences.	Refer to Section 2.5 – Construction Hours Refer to Section 2.6 – Out of Hours Works
5.2	**Site Layout** 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; and v. Aim to minimise the requirement for reversing, especially of heavy vehicles.	NCW is restricted to construction works within the rail corridor between Brand St, Artarmon and Chatswood Station with access points at Drake Street and Hopetoun Ave fixed as the only access points. Noise and Vibration impacts will be manage in accordance with the project CNVMP Impacts from Ancillary Facilities will be applied as per the Ancillary facility Management Plan and Environmental Risk Action Plan 10 – Visual Amenity. Impacts from construction traffic will be managed in accordance with the project Construction Traffic Management Plan.
5.3	**Reinstatement** Mitigation measures for reinstatement will be produced in consultation with Sydney Metro, the community and stakeholders. 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;	NCW will for the duration of the project minimize impacts to local amenity by limiting activities to the rail corridor. Appendix D - Operational Control Procedures - Environmental Risk Action Plan 10 – Visual Amenity Further enhancement of local amenity after the project will be incorporated into the detailed design of NCW Portion 7a and 7b though the Early and Enabling Works Communications Strategy – Frank Channon Walk.

Item	Requirement	Document Reference
	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.	
6.1	**Spoil Management Objectives** 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.	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 4 – Waste & Resource Management, Environmental Risk Action Plan 7 – Hazardous / Contaminated Material, Environmental Risk Action Plan 8 – Trade Waste
6.2	**Spoil Management Implementation** Principal Contractors will develop and implement a Spoil Management Plan for their scope of works. The Spoil Management Plan Spoil management measures will be included in regular inspections undertaken by the Contractor, and compliance records will be retained	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 4 – Waste & Resource Management, Environmental Risk Action Plan 7 – Hazardous / Contaminated Material, Environmental Risk Action Plan 8 – Trade Waste
6.3	**Spoil Mitigation** Examples of spoil mitigation measures include: i. Implementing the spoil re-use hierarchy; ii. Handling spoil to minimise potential for air or water pollution; and minimise traffic impacts associated with spoil removal.	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 4 – Waste & Resource Management, Environmental Risk Action Plan 7 – Hazardous / Contaminated Material, Environmental Risk Action Plan 8 – Trade Waste
7.2	**Groundwater Mitigation** Implementing all feasible and reasonable measures to limit groundwater inflows to stations and crossovers; and Undertaking groundwater monitoring during construction (levels and quality) in areas identified as 'likely' and 'potential' groundwater dependent ecosystems.	Not applicable to NCW. Sydney Metro EIS – Groundwater and geology, Chapter 17. Groundwater levels are predicted to be 10-30 metres below ground level within the project area, as such groundwater inflow is unlikely. No excavation works during the project is expected to exceed 10 meters.
8.1	**Construction Traffic management** Construction traffic management will be managed using the following documentation, where relevant: i. Construction Traffic Management Plan; ii. Traffic Management Plan (for each work site); iii. Traffic Staging Plan (for road works); iv. Traffic Control Plan (for road works); v. Vehicle Movement Plan (internal to construction sites); vi. Pedestrian Management Plan (around construction sites); and vii. Parking Management Plan (loss of parking). Principal Contractors will develop and implement a Construction Traffic Management Plan for their scope of works The individual construction traffic plans listed in (a) are to comply with and address the requirements of RMS Traffic Control at Worksites Manual AS 1742.3 Manual of uniform traffic control devices Part 3: Traffic control for works on roads, relevant Austroads Guides and RMS Supplements to Austroads and Australian Standards; Sydney Metro and its Contractors will undertake liaison with agencies and the community regarding traffic management	Refer to the NCW CTMP – Section 2 The NCW CTMP has been prepared in consultation with the TTLG and TCG, RMS, SCO CRS and WCC.

Item	Requirement	Document Reference
9.2	**Construction Noise and Vibration Management Implementation** Principal Contractors will develop and implement a Construction Noise and Vibration Management Plan for their scope of works consistent with the Interim Construction Noise Guidelines (Department of Environment and Climate Change, 2009). Detailed Construction Noise and Vibration Impact Statements will be prepared for noise-intensive construction sites and or activities, to ensure the adequacy of the noise and vibration mitigation measures. Specifically, Construction Noise and Vibration Impact Statements will be prepared for EPL variation applications and works proposed to be undertaken outside of standard construction hours Noise and vibration monitoring would be undertaken for construction as specified in the CNVS and the EPL The following compliance records would be kept by Principal Contractors: i. Records of noise and vibration monitoring results against appropriate NMLs and vibration criteria; and ii. Records of community enquiries and complaints, and the Contractor's response.	Refer to the NCW CNVMP and the CNVIS – Section 8 for details on mitigations measures. A Noise and Vibration monitoring program has also been developed for NCW.
9.3	**Construction Noise and Vibration Mitigation** All feasible and reasonable mitigation measures would be implemented in accordance with the CNVS.	Refer to the NCW CNVMP – Section 8
10.1	**Heritage Management** Principal Contractors will develop and implement a Heritage Management Plan The Contractor's regular inspections will include checking of heritage mitigation measures. Compliance records will be retained by the Contractor	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 8 – Indigenous & Non-Indigenous Heritage
11.1	**Flora and Fauna Management** Principal Contractors will develop and implement a Flora and Fauna Management Plan 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). ii. The completion of the pre-clearing inspection will form a HOLD POINT requiring sign-off from the Contractor's Environmental Manager iii. The Principal Contractor's regular inspections will include a check on the ecological mitigation measures and project boundary fencing	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 2 – Biodiversity
12.2	**Visual Amenity Management Implementation** a) Principal Contractors will develop and implement a Visual Amenity Management Plan for temporary works b) Visual and landscape measures will be incorporated into the Principal Contractor's regular inspections including checking the health of retained vegetation around site boundaries, checking the condition of any site hoarding and acoustic sheds, and checking the position and direction of any sight lighting. c) The Contractor will retain compliance records of any inspections undertaken in relation to visual and landscape measures.	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 10 – Visual Amenity
13.2	**Carbon and Energy Management** a) Principal Contractors will develop and implement a Carbon and Energy Management Plan that will include, as a minimum: b) Reporting of carbon and energy will be undertaken throughout the construction works in accordance with the National Greenhouse and Energy Reporting Act 2007. c) The Contractors would be required to retain appropriate records and prepare carbon footprint assessments (inclusive of Scope 1, 2 and 3 emissions) at various stages of construction.	Refer to Section 15.2 – Environmental Reporting NCW will comply with these objectives and the Contract Management Requirements – Sustainability and the Sydney Metro City & Southwest Environment and Sustainability Policy.

Item	Requirement	Document Reference
14.2	**Materials Management** a) Principal Contractors will be required to develop and implement a Sustainable Procurement Policy b) The Contractors will be required to retain records detailing the consideration of sustainability in the procurement of all materials	Refer to Construction Sustainability Management Plan.
15.2	**Soil and Water Management** a) Principal Contractors will develop and implement a Soil and Water Management Plan 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 develop and implement Stormwater and Flooding Management Plans for the relevant construction sites. These plans will identify the appropriate design standard for flood mitigation based on the duration of construction, proposed activities and flood risks. The plan will develop procedures to ensure that threats to human safety and damage to infrastructure are not exacerbated during the construction period. e) 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 the parameters of the EPL. 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.	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 5 – Water Quality, Site Drainage and Erosion and Sediment Control
16.2	**Air Quality** a) Principal Contractors will develop and implement an Air Quality Management Plan	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 3 – Dust and Air Quality
17.2	**Waste Management and Recycling** a) Principal Contractors will develop and implement a Waste Management and Recycling Plan b) Principal Contractors will undertake the following waste monitoring as a minimum: i. Weekly inspections will include checking on the waste storage facilities on site; and ii. All waste removed from the site will be appropriately tracked from 'cradle to grave' using waste tracking dockets. c) Principal Contractors will report all necessary waste and purchasing information to Sydney Metro as required for Sydney Metro to fulfil their WRAPP reporting requirements	Appendix D - Operational Control Procedures; Environmental Risk Action Plan 4 – Waste & Resource Management, Environmental Risk Action Plan 7 – Hazardous / Contaminated Material, Environmental Risk Action Plan 8 – Trade Waste

DPE Guidelines of CEMP Preparation

Requirement	Document Reference
Introduction	1. Purpose of CEMP
Project Description	2. Project Overview: Scope of Works and Indicative Construction Schedule
EMP Context	3. Purpose of CEMP
EMP Objectives	4. 6. Objectives and Targets
Environment Policy	5. 5. Policy
Environmental Management Structure and Responsibility	6. 7. Responsibilities and Authorities
Approval and Licencing Requirements	7. Legal and Other Requirements
Reporting	8. 15.2 Environmental Reporting
Environmental Training	9. 9. Training, Awareness and Competence
Emergency Contacts and Response	10. 14. Emergency Preparedness and Response
Risk Assessment	11. 8. Risk Assessment and Control 12. Appendix C – Risk Assessment
Environmental Management Activities and Controls	13. 13. Operation Control
Environmental Control Plans or Maps	14. 13.3 Environmental Control Maps
Environmental Schedules	15. 15. Monitoring and Measurement
Environmental Monitoring	16. 15. Monitoring and Measurement
Environmental Auditing	17. 17. Environmental Management System Audit
Corrective Action	18. 16. Incidents, Complaints, Corrective and Preventative Action
EMP Review	19. 18. Management Review

Induction Record

This register provides a record that those with direct responsibilities within this plan understand their designated roles and accountabilities in the implementation of this plan.

Name	Role	Signature	Date
	Project Leader		
	Construction Manager		
	Commercial Manager		
	Design Manager		
	WHS Manager		
	Rail Safety Manager		
	Safety Assurance Manager		
	Signalling Construction Manager		
	Quality Manager		
	Quality Inspector		
	Environmental Manager		
	Signalling Project Engineer		
	Signalling Commissioning Engineer		
	Site Engineer		
	Site Engineer		
	Quantity Surveyor		
	Quantity Surveyor		
	Senior Site Administrator		
	Planning & Project Controls Manager		
	OHW Site Engineer		
	Supervisor		
	Supervisor		
	Community Communications Manager		

Terms and Definitions

The following terms, abbreviations and definitions are used in this plan:

Terms	Explanation
AA	Acoustic Advisor
CAR	Corrective Action Request
CBD	Central Business District
CCS	Sydney Metro Community Consultation Strategy
CEMP	Construction Environmental Management Plan
CEMF	Construction Environmental Management Framework
CNVMP	Construction Noise and Vibration Management Plan
CoA	Conditions of Approval
CRAW	Construction Risk Assessment Workshop
CRS	Centre for Road Safety
CSR	Combined Services Route
CWG	Compliance Working Group
DPE	Department of Planning and Environment
ECM	Environmental Control Map
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
ER	Environmental Representative
ERAP	Environmental Risk Action Plan
HSE	Health Safety and Environment
HSEQ	Health Safety Environment and Quality
ICNG	Interim Construction Noise Guidelines
IECA	International Erosion Control Association
iGATE	Laing O'Rourke Intranet
IMPACT	Laing O'Rourke – Incident Reporting Tool
JSEA	Job Safety Environmental Analysis
LOR	Laing O'Rourke
OEH	Office of Environment and Heritage
OHW	Overhead Wiring
OOHW	Out of Hours Works
OOHWA	Out of Hours Work Application
OSCIP	Overarching Stakeholder and Community Involvement Plan
MR-E	Management Requirements - Environment
PEM	Project Environmental Manager
PIR	Preferred Infrastructure Report
POEO Act	Protection of the Environment Operations Act 1997
PMF	Probable Maximum Flood
RBL	Rating Background Level (Noise)
RMS	Road and Maritime Services
SCO	Sydney Coordination Office
SDS	Safety Data Sheet

SMNW	Sydney Metro Northwest
SWMS	Safe Work Method Statement
TfNSW	Transport for New South Wales
TMP	Traffic Management Plan
Terms	**Explanation**
UDLR	Urban Design and Landscape Report
ULX	Underline Crossing
URX	Under Road Crossing
WMP	Waste Management Plan

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1. Purpose of the CEMP

The Construction Environmental Management Plan (this Plan) has been developed to:

- ensure that the needs and expectations of the client are met;
- ensure that the project meets contractual, legal and other environmental requirements;
- meet the requirements of ISO 14001 including the need for continual improvement;
- provide a link between the corporate and project management system; and
- provide all Laing O'Rourke personnel with systems, procedures and documentation necessary to undertake the construction of this project with environmental requirements.
- Minimise negative impacts on the community
- Identify reasonable and feasible opportunities to minimise the environmental impact of the project

This CEMP details how the performance outcomes, commitments and mitigation measures specified in Chapter 11 of the PIR (Preferred Infrastructure Report) will be implemented and achieved during construction.

The following CEMP sub-plan and/or plans required for the Northern Corridor Works, as required by Planning Approval (SSI 15 7400 Mod1, Mod2, Mod3 and Mod4) and the Staging Report as submitted to DP&E, which will be prepared separately to this document, will form the part of CEMP suite;

- Construction Noise and Vibration Management Plan
- Construction Traffic Management Plan
- Construction Ancillary Facilities Management Plan

Management of the following aspects during construction have been incorporated into the CEMP Environmental Risk Action Plans (ERAPs) seen in **Appendix D**;

- Noise and Vibration
- Flora and Fauna Management Procedure
- Air Quality
- Waste and Resource Management
- Soil Quality, Site Drainage and Erosion and Sediment Control
- Hazardous and Contaminated Material (including Land)
- Trade Waste
- Indigenous and Non Indigenous Heritage
- Dangerous Goods & Fuel Storage
- Visual Amenity

Management for blasting is not required for the Northern Corridor Works.

In addition, this Plan will provide continuity between a range of documents and specific requirements to ensure that the Northern Corridor Works (NCW) Project is carried out generally in accordance with;

- The Sydney Metro City and Southwest – Development Consent – Determination, dated 9th January 2017
- The Sydney Metro City and Southwest - Environmental Impact Statement , dated 3rd May 2016;
- The Sydney Metro Construction Environmental Management Framework v1.3;
- Department's Guideline for the Preparation of Environmental Management Plans;
- The Overarching Stakeholder and Community Involvement Plan (Sydney Metro Community Consultation Strategy (CCS));
- The Sydney Metro Construction Noise and Vibration Strategy (including out-of-hour works protocol)
- The conditions of all other environmental legislative requirements
- All other requirements of The Contract

Construction will not commence until all other pre-construction CoA C8 have been complied with and the CEMP and relevant Sub-plans are approved by the Secretary. All Pre-construction works will be undertaken under pre-construction minor works approval.

2. Project Overview, Scope of Works, Indicative Construction Schedule and Life Cycle Perspective

This plan applies to the construction phase of the Sydney Metro City and Southwest – Northern Corridor Works (NCW) project. This plan applies to all those activities, products and services on the site over which it has control or influence.

The project site as identified in the EIS is located within the rail corridor between Brand St, Artarmon and Chatswood Station. Areas South of Brand Street Bridge will also be required as ancillary facilities, which have been included within the DP&E approved Construction Ancillary Facilities Management Plan (CAFMP).

This Laing O'Rourke Australia Construction Pty Limited (Laing O'Rourke) CEMP has been developed for the Construction phase of the project, in compliance with the Client's requirements, Laing O'Rourke's environmental management system and the Minister's Conditions of Approval and Revised Environmental Mitigation Measures (REMMs)

2.1 Overview of the Sydney Metro Project

Sydney metro City and Southwest is a new 30km metro line extending metro rail from the end of Sydney Metro Northwest at Chatswood under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the capacity to run a metro train every two minutes each way through the centre of Sydney. The NCW Project forms part of the Sydney Metro City and southwest Project and includes the following scope of works.

2.2 Scope of Works

The intent of the Northern Corridor Works is the realignment of the T1 North Shore Line between Chatswood Station and Brand St, Artarmon, approximately 1 kilometre in length. This is to accommodate the new metro tracks to be constructed between the country and city rail lines, and the future construction of the Chatswood tunnelling dive site – which is not part of this CEMP. This scope of works relates specifically to the Northern Corridor Works and are described as permanent works. The works are described as 'Early and Enabling Works' as specified in the Staging Report.

The key construction activities associated with the Northern Corridor Works are:

Detention Basin Construction

The storm water flow rates resulting from the upgraded rail corridor drainage and the stormwater pumped from the new Sydney Metro dive will result in a significant increase in the stormwater flow at the site discharge point. The current detention basin that runs along the eastern side of the rail line, adjacent to Hawkins Street in Artarmon has a capacity of 150m^3 (See Sheet 1 of Figure 3 - Site Layout). This is deemed as inadequate to attenuate the increased flow. The construction of a bigger detention basin at the same location is required to be able to prevent stormwater flows entering the Chatswood Dive in storm events up to and including the PMF storm event. The intended size of the new detention basin will be 1680m3. This basin will be designed to attenuate the site discharge resulting from upgraded rail corridor drainage.

The detention basin will be discharged to the south and connected to the existing Willoughby Council stormwater system south of Brand Street resulting in an open cut of Brand Street. To minimise the disruption to the local traffic, the open cut will be completed in stages during night shifts.

Drainage works

Drainage systems along the rail corridor between Chatswood Station and Brand Street must ensure that additional runoff and stormwater spillage is not directed onto other properties. The impacts of the NCW works on flood levels upstream of, downstream of and around the NCW project site for any storm event must comply with the limits set in the Conditions of Project Approvals.

In general, the new drainage system along the rail corridor to accommodate Sydney Metro will be a combination of overland flow through cess drains and in ground systems consisting of pits and pipes. ULXs for the drainage system will be installed during possessions using open cut methodology. Stabilised sand will be used for backfilling of the ULX trenches.

It is noted that modifications to the hydrological behaviour of the rail corridor will be designed to meet the requirements of revised environmental mitigations measures FH 4 and FH9.

Hopetoun Ave Access Ramp removal

Hopetoun Avenue vehicle access ramp to the rail line for rail personnel is to be removed to accommodate for the track slew. To carry out these works, access from Hopetoun Avenue will be permanently closed. Once pile cap modification works are completed, the ramp will be excavated to subgrade level and the existing noise wall on the eastern side of the ramp will be demolished. This existing wall is required to be replaced with a higher noise wall. During the demolition work, care will be taken to protect the other existing retaining walls. Shotcrete will be placed with the excavation operation as required to ensure the structural integrity of the walls in the area is maintained. Also, any wall strengthening measures identified during site investigations and design phase will be undertaken as part of this work.

Placement of noise walls and construction of retaining walls

The placement and modification of noise wall panels will be carried out on the eastern side of the rail corridor commencing at Mowbray Road and ending at Albert Ave (See Sheet 2 of Figure 3 - Site Layout). Retaining walls, specifically at Hopetoun Ave are also required to be constructed. These will consist of piled and concrete walls.

Track Slews

Both the Up & Down tracks of Sydney Trains T1 North Shore Line will have to be temporarily slewed/re-aligned to accommodate for the works associated with the final slews of both tracks between Brand Street and Albert Avenue (See sheet 3, 4 and 5 of Figure 3 - Site Layout). The re-alignment of the tracks is required to enable a clear site for the construction of the Sydney Metro City and associated structures. Due to the restricted space, all temporary track works will have to be completed during possessions. For the new track alignment, prefabricated sections of the diverted track will be built at a supplier's off-site facility.

During a track possession the existing lines will be relocated laterally (or "slewed") into a new alignment. The interfaces at which the relocated track alignment joins the existing and retained alignment will be prepared. A track excavator machine will then be used to pull the track into its new location. The relocated track will be reattached to existing tracks temporarily using fishplates to enable tamping, regulating and final adjustments before the rails are welded. Marks on the rails to measure creep will be reinstated on the realigned section.

Due to the restricted access and tight corridor with minimal space to store/stockpile material, materials will be delivered to site by work trains. Work trains will also be used to cart spoil and redundant materials including tracks and sleepers off site.

Nelson St Bridge Demolition

Nelson Street Bridge is to be demolished entirely. This will involve the removal of three bridge spans and 2 bridge brick piers. The construction methodology will be to saw cut the existing slab, so the bridge can be lifted out via crane over 3 rail possessions. Permanent OHW will also be required to be relocated prior to the bridge demolition. A range of services including Sydney Water, Ausgrid and telecommunication services will be required to be transferred.

Prior to commencing these works, temporary traffic barriers and fencing will be installed on Nelson Street to ensure that the work site is securely separated from the local residents and the general public.

Mowbray Rd Bridge Modification

Mowbray Road Bridge will require widening for the provision of traffic barriers and anti-throw screens as well collision protection to the existing pier.

The deck strengthening and widening of Mowbray Road Bridge will require significant temporary works as well as changes to the current traffic configuration as at least one of the existing four lanes will have to be closed during construction activities.

Temporary works are also required. These include installation of formwork for the widening of the bridge as well as a working platform for access to the outer edges of the proposed works. These temporary works will be erected during rail possessions allowing for the follow on construction activities to be undertaken during non-possessions.

These works will be carried out during rail possessions and normal construction working hours. Due to the limited vertical clearance under the bridge, a piling rig suitable for the conditions will have to be used and the duration of this activity planned accordingly.

OHW works

Overhead wiring relocation will be required due to the track slewing (See sheet 3, 4 and 5 of Figure 3 - Site Layout). As the rail corridor will be widened by up to 3 meters, OHW structures will need to be replaced with broader structures. These works will be undertaken during rail possessions.

Structures will be delivered prior to possessions to designated laydown areas. They will be inspected for quality requirements and measured to ensure they match the AFC design drawings and standard Sydney Trains drawings. Due to the size of the structures, they will have to be transported via hi-rail into position and assembled on site during the possessions. To install the structures, Hi-Rail Telehandlers or Multicranes will be used. The base plates will be grouted with non-shrink grout and where required earthing and bonding will be installed.

Signalling works

The relocation of signals are required along the length of the track works. As well, the relocation of track circuits and train stops and the configuration of existing signalling is to be maintained.

Construction works of the NCW would commence following approval by DPE of this CEMP and associated Sub Plans for these Works.

Additional signalling works:

Trainstops SH7.32, SH7.33, SH7.38, SH7.55 and SH7.60 to be upgraded from air to electric between Chatswood Station and Wilson Street. The works will involve cable pulling and replacement of trainstop.

Northern Transfer Structure (NTS) additional works

To facilitate the construction of the NTS which connects the future Sydney Metro line through the tunnel, Northern Corridor Works Portion 7 have been awarded additional scope. The scope of works a consists of 18 bored piles (1200mm diameter) to be completed during day time hours (outside of danger zone) and during out of hours works (within danger zone).

Construction Compounds and Ancillary Facilities

The main NCW site compound and laydown area will be established at Cleland Road, Artarmon (Refer to Figure 1 – Northern Corridor Ancillary facilities) for the duration of the project. The Cleland Rd compound is located outside the project boundary as identified in the EIS, yet still within the rail corridor. This location is required due to the narrow and congested nature of the NCW project site, which does not provide adequate room for ancillary facilities. The use of this site will not commence until the CAFMP has been approved by DP&E.

Further site compounds and ancillary facilities will be established as required within the rail corridor, all these sites with the exception of the ancillary facility at Drake Street are located outside of the project boundary as identified in the EIS, a summary of which has been provided below;

- Cleland Road compound
- Brand Street ancillary facility
- Drake Street ancillary facility
- Brand Street Bridge to Artarmon Station laydown and storage area
- Francis Street to Gorehill Freeway laydown and storage area
- Gorehill Freeway to Artarmon Mosque laydown and storage area
- Chandos Street laydown and storage area
- Elizabeth Street ancillary facility
- 2 Orchard Road ancillary facility

Any associated Environmental Control Maps for these ancillary facilities will be prepared for approval by the ER.

2.3 Works Location and Site Layout

The NCW Site Layout and Works Location are highlighted in Figures 1, 2 and 3.

Figure 1 - NCW Site Layout

Figure 2 - NCW Ancillary Facilities

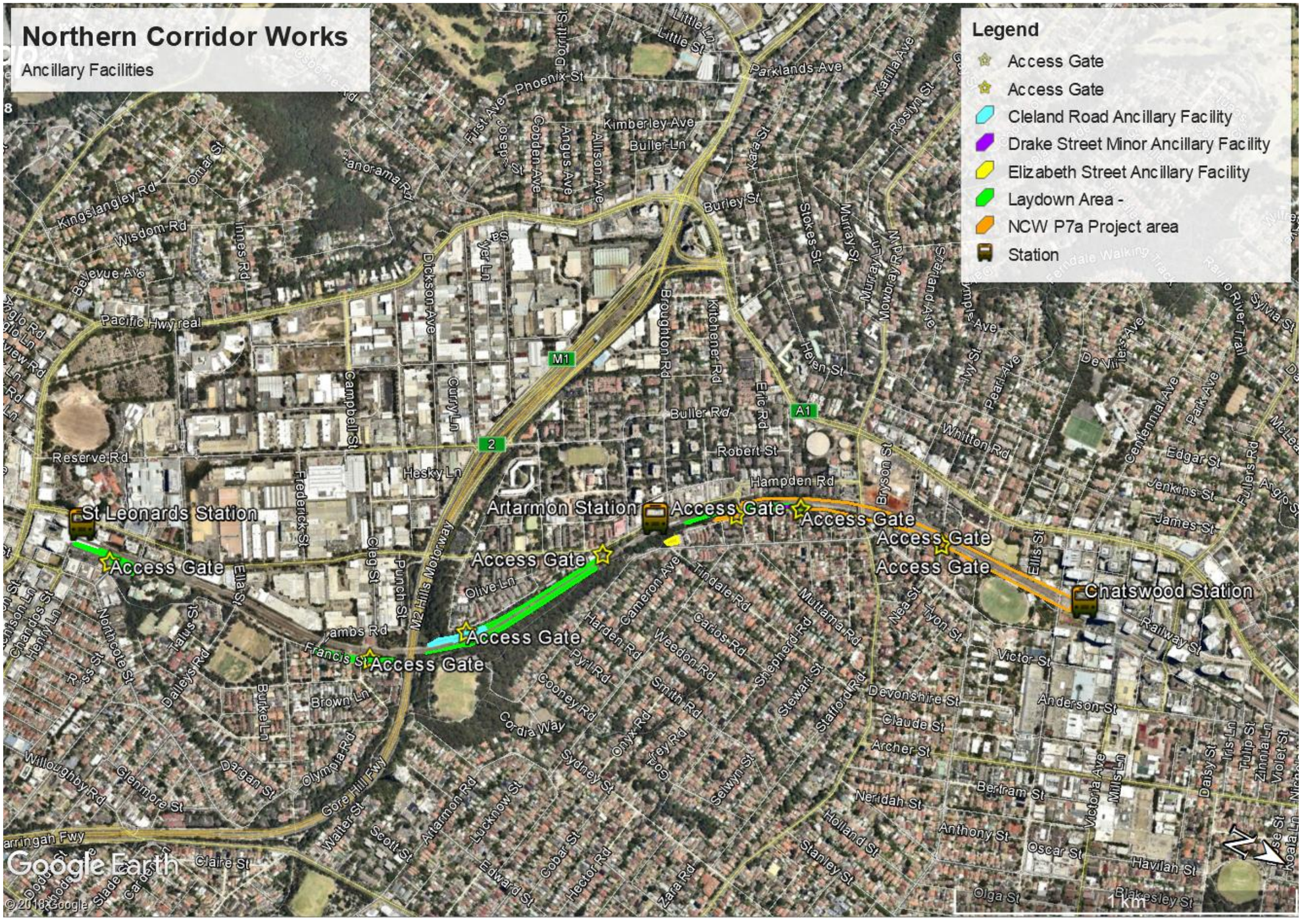
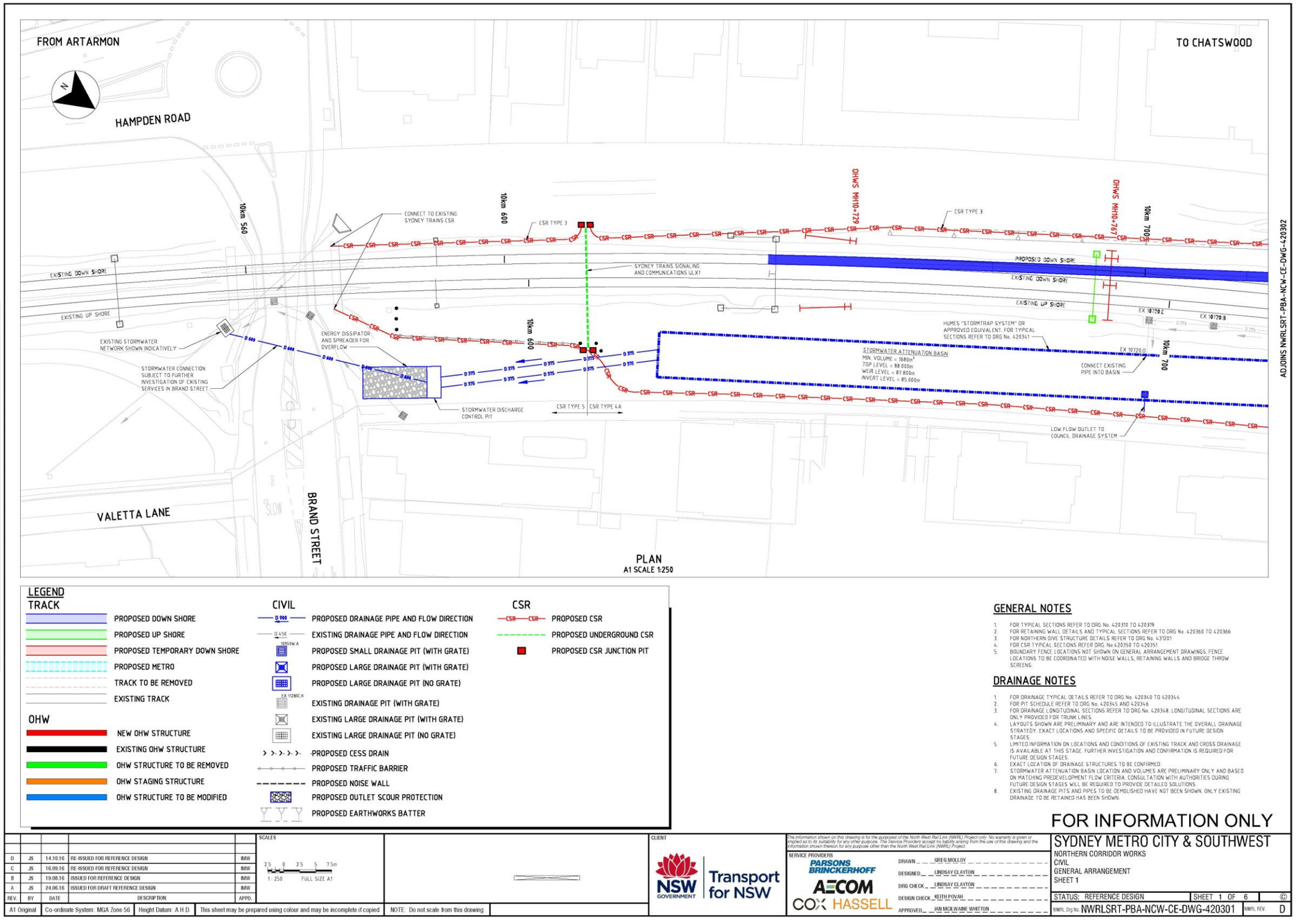
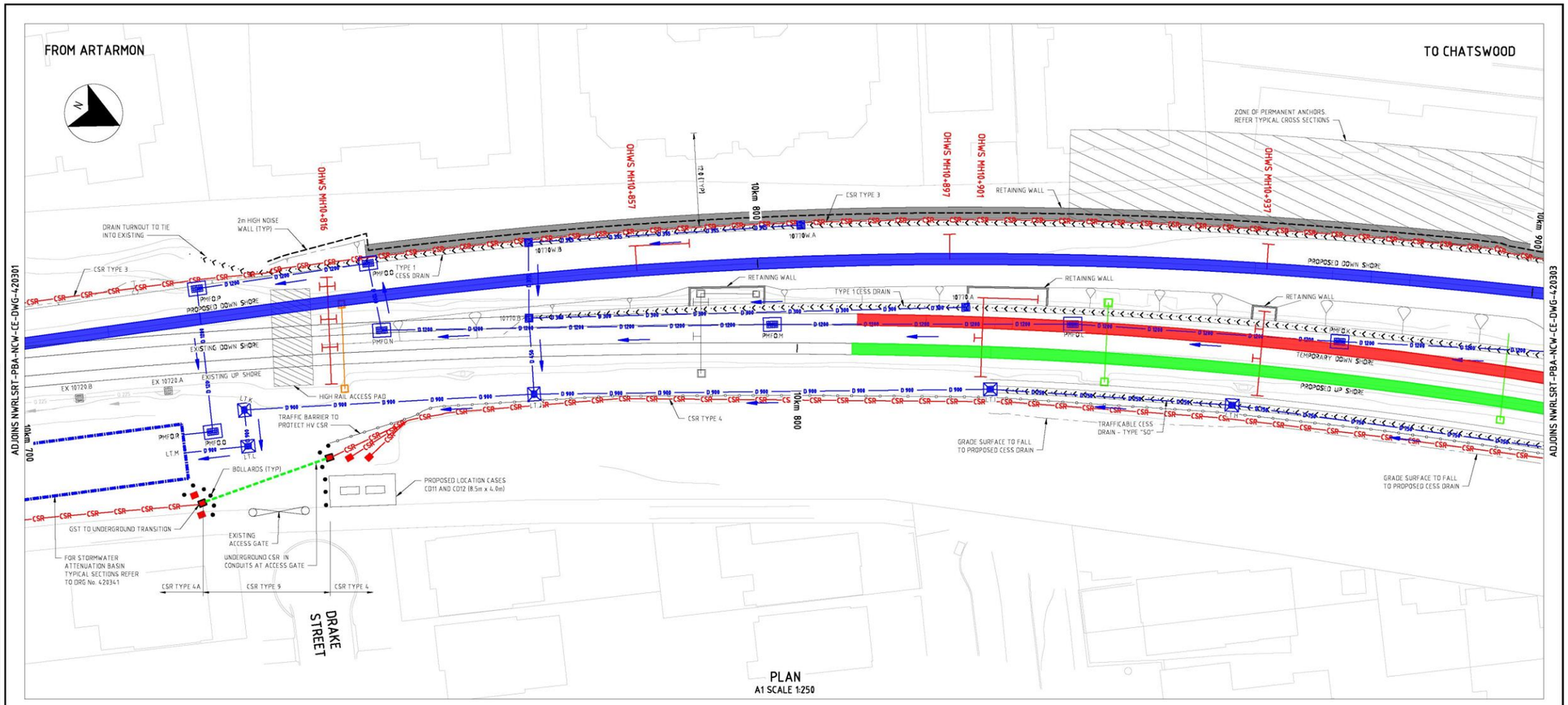


Figure 3 - Site Layout





LEGEND

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- TRACK TO BE REMOVED
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SYDNEY METRO CITY & SOUTHWEST
NORTHERN CORRIDOR WORKS
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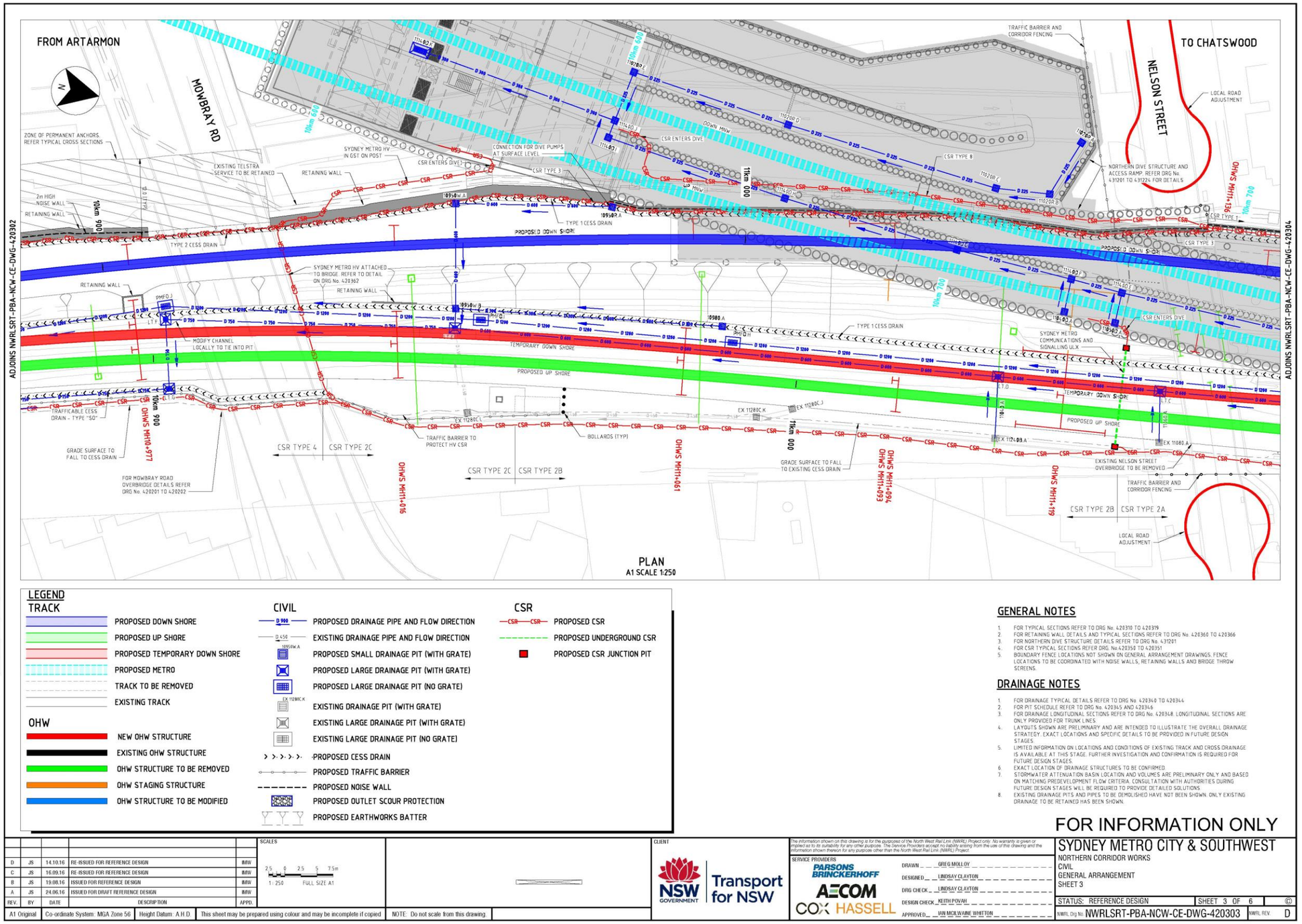

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SYDNEY METRO CITY & SOUTHWEST
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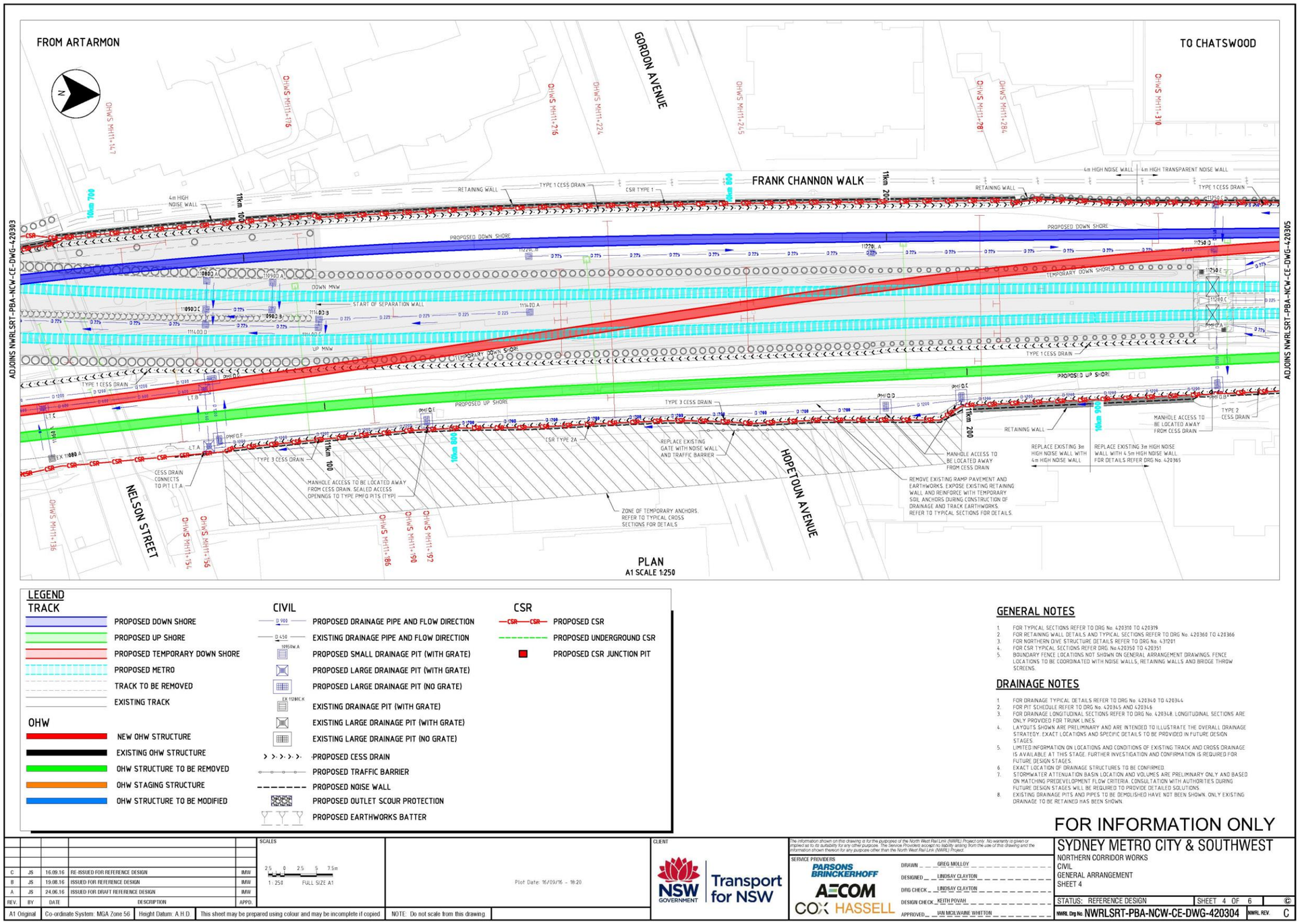

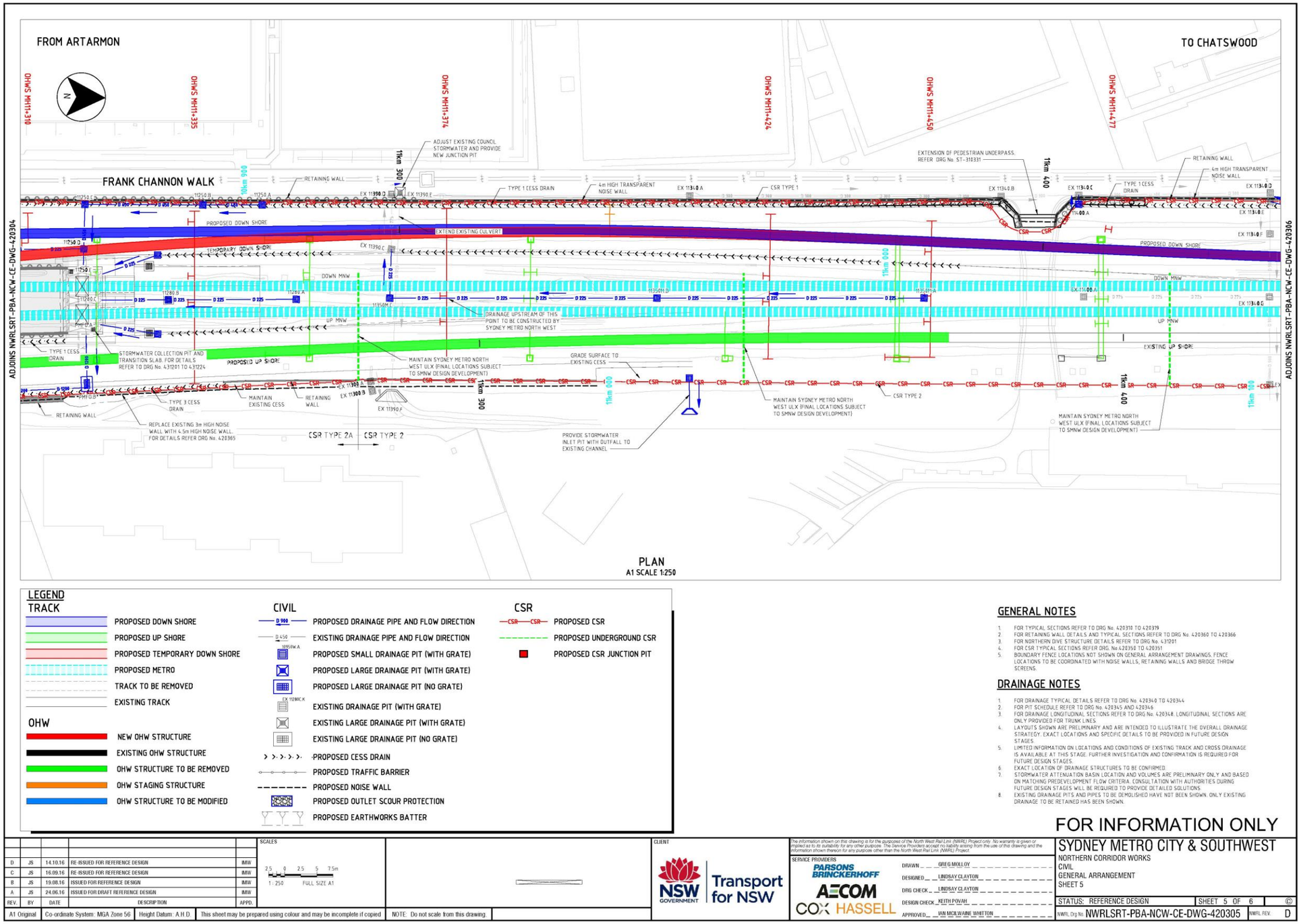

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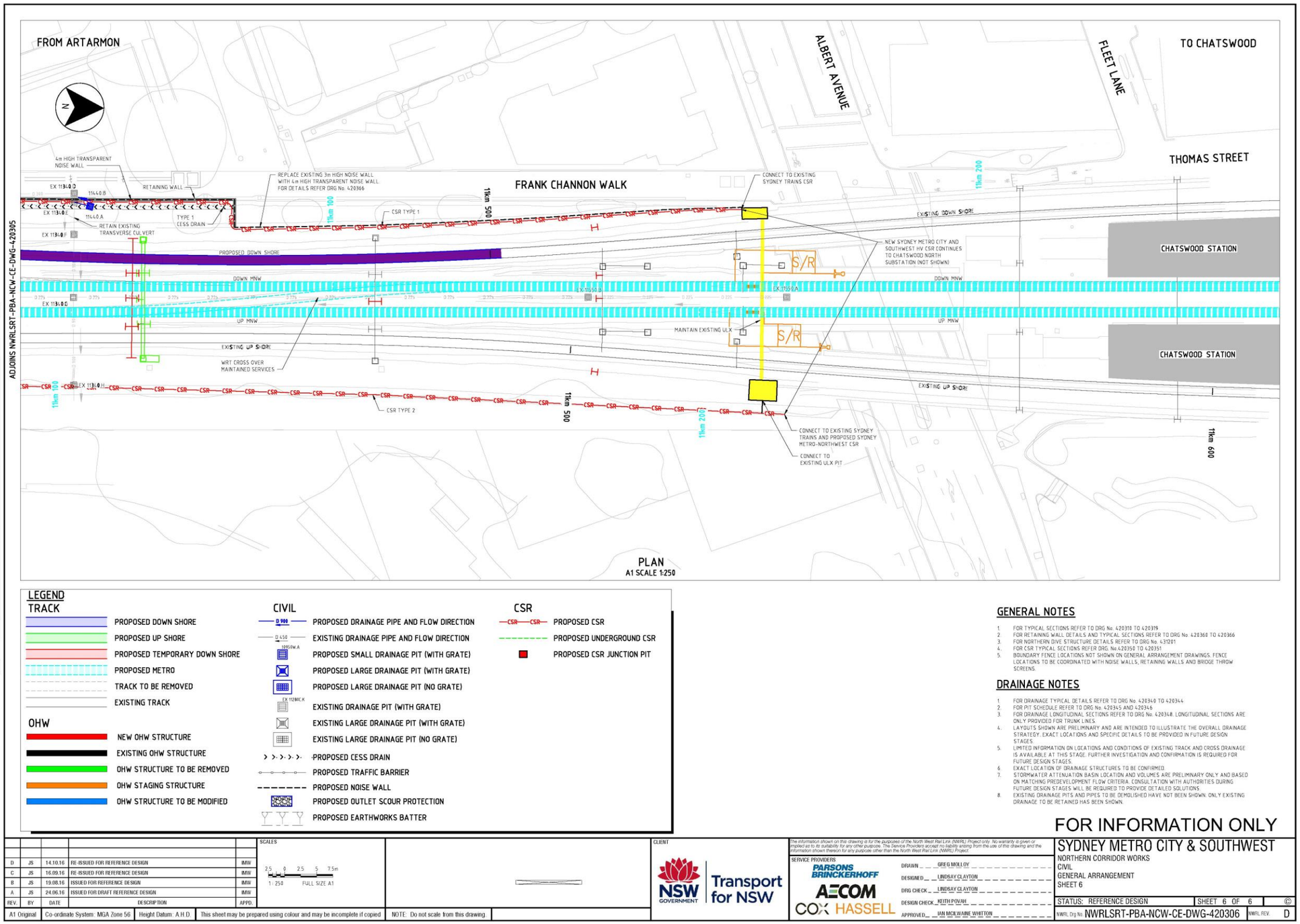

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3. FOR DRAINAGE LONGITUDINAL SECTIONS REFER TO DRG No. 420348. LONGITUDINAL SECTIONS ARE ONLY PROVIDED FOR TRUNK LINES.
4. LAYOUTS SHOWN ARE PRELIMINARY AND ARE INTENDED TO ILLUSTRATE THE OVERALL DRAINAGE STRATEGY. EXACT LOCATIONS AND SPECIFIC DETAILS TO BE PROVIDED IN FUTURE DESIGN STAGES.
5. LIMITED INFORMATION ON LOCATIONS AND CONDITIONS OF EXISTING TRACK AND CROSS DRAINAGE IS AVAILABLE AT THIS STAGE. FURTHER INVESTIGATION AND CONFIRMATION IS REQUIRED FOR FUTURE DESIGN STAGES.
6. EXACT LOCATION OF DRAINAGE STRUCTURES TO BE CONFIRMED.
7. STORMWATER ATTENUATION BASIN LOCATION AND VOLUMES ARE PRELIMINARY ONLY AND BASED ON MATCHING PREDEVELOPMENT FLOW CRITERIA. CONSULTATION WITH AUTHORITIES DURING FUTURE DESIGN STAGES WILL BE REQUIRED TO PROVIDE DETAILED SOLUTIONS.
8. EXISTING DRAINAGE PITS AND PIPES TO BE DEMOLISHED HAVE NOT BEEN SHOWN. ONLY EXISTING DRAINAGE TO BE RETAINED HAS BEEN SHOWN.

FOR INFORMATION ONLY

REV.	BY	DATE	DESCRIPTION	APPD.
D	JS	14.10.16	RE-ISSUED FOR REFERENCE DESIGN	IMW
C	JS	16.09.16	RE-ISSUED FOR REFERENCE DESIGN	IMW
B	JS	19.08.16	ISSUED FOR REFERENCE DESIGN	IMW
A	JS	24.06.16	ISSUED FOR DRAFT REFERENCE DESIGN	IMW

SCALES: 2.5 0 2.5 5 7.5m — 1:250 FULL SIZE A1

CLIENT: NSW GOVERNMENT Transport for NSW

SERVICE PROVIDERS: PARSONS BRINCKERHOFF, AECOM, COX HASSELL

The information shown on this drawing is for the purposes of the North West Rail Link (NWRL) Project only. No warranty is given or implied as to its suitability for any other purpose. The Service Providers accept no liability arising from the use of this drawing and the information shown thereon for any purpose other than the North West Rail Link (NWRL) Project.

DRAWN GREG MOLLOY
DESIGNED LINDSAY CLAYTON
DRG CHECK LINDSAY CLAYTON
DESIGN CHECK KEITH POVAH
APPROVED IAN MCILWAINE WHITTON

SYDNEY METRO CITY & SOUTHWEST
NORTHERN CORRIDOR WORKS
CIVIL
GENERAL ARRANGEMENT
SHEET 6

STATUS: REFERENCE DESIGN | SHEET 6 OF 6 | ©

NWRL Drg No. NWRLSRT-PBA-NCW-CE-DWG-420306 | NWRL REV. D

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing.

100mm AT FULL SIZE

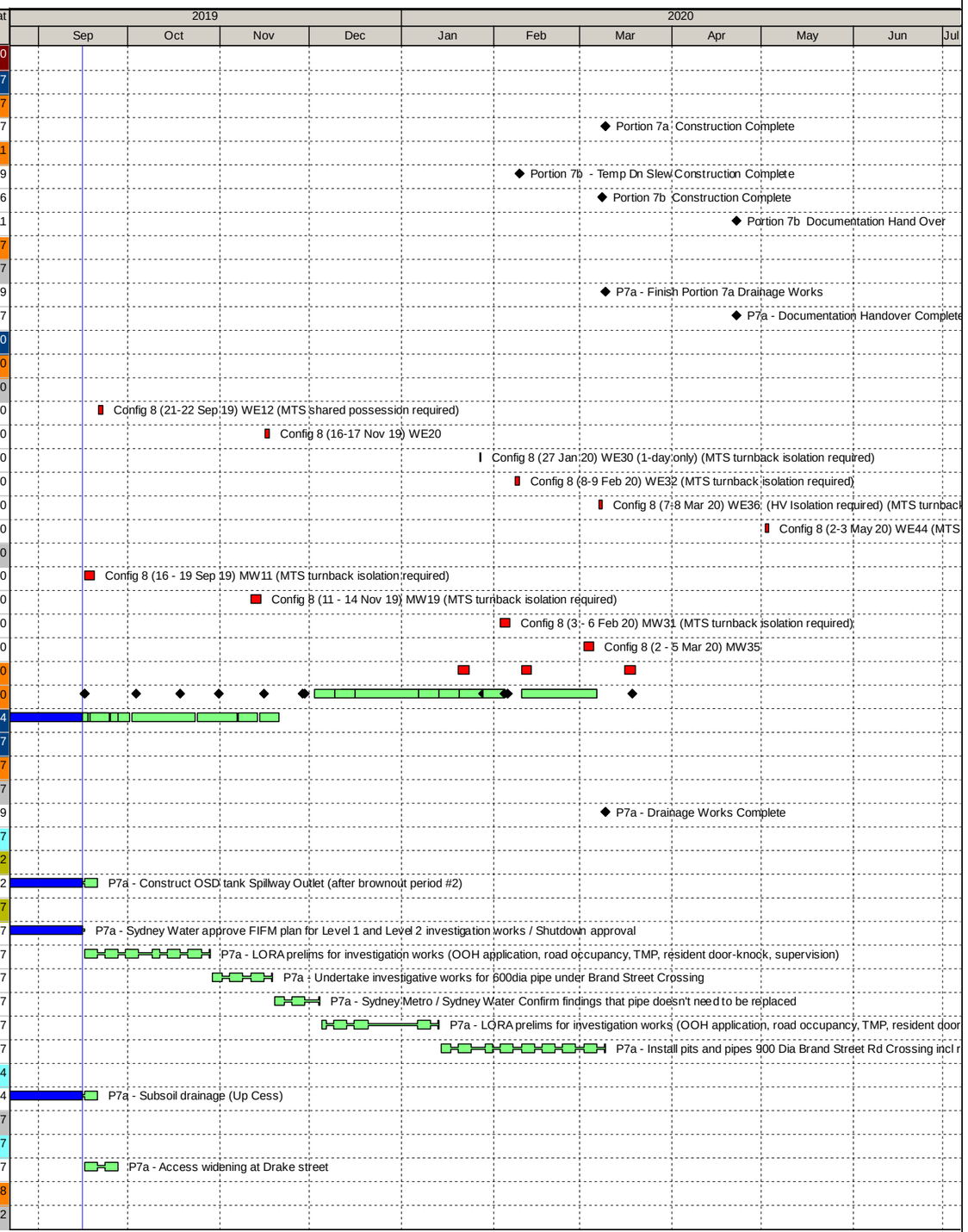
2.4 Indicative Construction Schedule

Table 1: Indicative Construction Schedule

LAING O'ROURKE

Sydney Metro City & Southwest
North Corridor Works (VPR057) Contract Programme (Portion 7A)

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
Sydney Metro City and Southwest - NCW Contract Programme - 15-09-2019 (Prg Update)		251	15.Apr.19 A	03.May.20	0
KEY MILESTONES		51	09.Feb.20	22.Apr.20	7
Contract Key Dates - 7A		0	09.Mar.20	09.Mar.20	7
CNCW-K1590	Portion 7a Construction Complete	0		09.Mar.20	7
Contract Key Dates - 7B		73	09.Feb.20	22.Apr.20	11
CNCW-K3160	Portion 7b - Temp Dn Slew Construction Complete	0		09.Feb.20	39
CNCW-K2630	Portion 7b Construction Complete	0		08.Mar.20	56
CNCW-K2720	Portion 7b Documentation Hand Over	0		22.Apr.20	11
Portion Specific Milestones		30	09.Mar.20	22.Apr.20	7
Portion 7a		30	09.Mar.20	22.Apr.20	7
CNCW-K2360	P7a - Finish Portion 7a Drainage Works	0		09.Mar.20	9
CNCW-K2320	P7a - Documentation Handover Complete	0		22.Apr.20	7
PROJECT MANAGEMENT		151	16.Sep.19	03.May.20	0
Available Possessions		151	16.Sep.19	03.May.20	0
ST Config 8 - Weekend Possessions		11	21.Sep.19	03.May.20	0
CNCW-K4760	Config 8 (21-22 Sep 19) WE12 (MTS shared possession required)	2	21.Sep.19	22.Sep.19	0
CNCW-K4770	Config 8 (16-17 Nov 19) WE20	2	16.Nov.19	17.Nov.19	0
CNCW-K5230	Config 8 (27 Jan 20) WE30 (1-day only) (MTS turnback isolation required)	1	27.Jan.20	27.Jan.20	0
CNCW-K2540	Config 8 (8-9 Feb 20) WE32 (MTS turnback isolation required)	2	08.Feb.20	09.Feb.20	0
CNCW-K2680	Config 8 (7-8 Mar 20) WE36 (HV Isolation required) (MTS turnback isolation required)	2	07.Mar.20	08.Mar.20	0
CNCW-K2710	Config 8 (2-3 May 20) WE44 (MTS turnback islation required)	2	02.May.20	03.May.20	0
ST Config 8 - Midweek Possessions		16	16.Sep.19	05.Mar.20	0
CNCW-K5150	Config 8 (16 - 19 Sep 19) MW11 (MTS turnback isolation required)	4	16.Sep.19	19.Sep.19	0
CNCW-K5160	Config 8 (11 - 14 Nov 19) MW19 (MTS turnback isolation required)	4	11.Nov.19	14.Nov.19	0
CNCW-K5180	Config 8 (3 - 6 Feb 20) MW31 (MTS turnback isolation required)	4	03.Feb.20	06.Feb.20	0
CNCW-K5190	Config 8 (2 - 5 Mar 20) MW35	4	02.Mar.20	05.Mar.20	0
Pending Possessions		12	20.Jan.20	19.Mar.20	0
Interface Dates & Documentation		121	16.Sep.19	18.Mar.20	30
PROCUREMENT		97	01.Jul.19 A	20.Nov.19	104
CONSTRUCTION		228	15.Apr.19 A	09.Mar.20	37
Portion 7a		203	15.Apr.19 A	09.Mar.20	7
Drainage		203	15.Apr.19 A	09.Mar.20	7
CNCW-C3855	P7a - Drainage Works Complete	0		09.Mar.20	9
Stormwater Attenuation System		183	03.Jun.19 A	09.Mar.20	7
OSD Spillway Outlet		30	03.Jun.19 A	20.Sep.19	112
CNCW-C11485	P7a - Construct OSD tank Spillway Outlet (after brownout period #2)	30	03.Jun.19 A	20.Sep.19	112
South of basin to connection to council system		150	08.Jul.19 A	09.Mar.20	7
CNCW-C12455	P7a - Sydney Water approve FIFM plan for Level 1 and Level 2 investigation works / Shutdown approval	35	08.Jul.19 A	16.Sep.19	7
CNCW-C12395	P7a - LORA prelims for investigation works (OOH application, road occupancy, TMP, resident door-knock, supervision)	29	16.Sep.19	28.Oct.19	7
CNCW-C11995	P7a - Undertake investigative works for 600dia pipe under Brand Street Crossing	15	29.Oct.19	18.Nov.19	7
CNCW-C12005	P7a - Sydney Metro / Sydney Water Confirm findings that pipe doesn't need to be replaced	10	19.Nov.19	04.Dec.19	7
CNCW-C11975	P7a - LORA prelims for investigation works (OOH application, road occupancy, TMP, resident door-knock, supervision)	18	05.Dec.19	13.Jan.20	7
CNCW-C11495	P7a - Install pits and pipes 900 Dia Brand Street Rd Crossing incl reinstatement + defect	38	14.Jan.20	09.Mar.20	7
Drainage System (10.980 - 11.390)		15	15.Apr.19 A	20.Sep.19	84
CNCW-C5155	P7a - Subsoil drainage (Up Cess)	15	15.Apr.19 A	20.Sep.19	84
Civil		10	16.Sep.19	27.Sep.19	107
Drainage Enabling works		10	16.Sep.19	27.Sep.19	107
CNCW-C5105	P7a - Access widening at Drake street	10	16.Sep.19	27.Sep.19	107
Portion 7b		189	08.Jul.19 A	08.Mar.20	38
OHW		7	16.Nov.19	08.Mar.20	2



Remaining Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Possession Normal
Possession Critical
Possession Complete - CNCW
Requested Possession Place holder (Date TBC)
Milestone

Current Date 17.Sep.19

Date	Revision	Checked	Approved
06-Jul-18	NCW Programme	HAleheidar	TD

LAING O'ROURKE

Sydney Metro City & Southwest
North Corridor Works (VPR057) Contract Programme (Portion 7A)

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
OHWS		7	16.Nov.19	08.Mar.20	2
Footings		2	16.Nov.19	17.Nov.19	2
CNCW-C10995	Install Footing MH10+975 Temp Dn (1 x Footing)	2	16.Nov.19	17.Nov.19	2
CNCW-C11005	Install Footing MH10+932 Temp Dn (1 x Footing)	2	16.Nov.19	17.Nov.19	2
CNCW-C11015	Install Footing MH10+895 Temp Dn (1 x Footing)	2	16.Nov.19	17.Nov.19	2
Structures		3	16.Nov.19	27.Jan.20	2
CNCW-C12325	Install Mast MH11+254 (x1) Temp Dn	1	16.Nov.19	16.Nov.19	4
CNCW-C5185	Install Mast MH10+895 (x1) Temp Dn	1	27.Jan.20	27.Jan.20	2
CNCW-C11035	Install Mast MH10+932 (x1) Temp Dn	1	27.Jan.20	27.Jan.20	2
CNCW-C11045	Install Mast MH10+975 (x1) Temp Dn	1	27.Jan.20	27.Jan.20	2
Removals		2	07.Mar.20	08.Mar.20	2
CNCW-C4545	P7a - Footing Removal MH11+476	2	07.Mar.20	08.Mar.20	2
CNCW-C4775	P7a - OHWS Removal MH11+175	2	07.Mar.20	08.Mar.20	2
CNCW-C4795	P7a - OHWS Removal MH11+109	2	07.Mar.20	08.Mar.20	2
CNCW-C12375	P7a - OHWS Removal MH11+063	2	07.Mar.20	08.Mar.20	2
CNCW-C12385	P7a - OHWS Removal MH10+765	2	07.Mar.20	08.Mar.20	2
OHW Wire Runs		3	27.Jan.20	09.Feb.20	2
Temporary Down Slew		3	27.Jan.20	09.Feb.20	2
CNCW-C8235	Install and tie-back cantilevers for Temporary Down NSL	1	27.Jan.20	27.Jan.20	2
CNCW-C8245	Temporary Down NSL MH10+715 to MH11+584 (Fixed mid-point arrangement @MH11+066 - two runs MHDS010A = 339r	2	08.Feb.20	09.Feb.20	2
Drainage		7	21.Sep.19	09.Feb.20	4
Cess Drainage		7	21.Sep.19	09.Feb.20	4
CNCW-C12465	Excavate and install 225mm dia pipe from TD\01\02-TD\01\03 (~15lm)	2	21.Sep.19	22.Sep.19	4
CNCW-C12475	Excavate and install 750mm dia pipe from TM01\14-TM\01\15 (~5lm)	2	21.Sep.19	22.Sep.19	4
CNCW-C10235	Cess drainage 10.820 - 11.050	2	16.Nov.19	17.Nov.19	4
CNCW-C11385	Cess drainage - 11.050 to 11.250	1	27.Jan.20	27.Jan.20	4
CNCW-C12215	Cess drainage - Tie-in slew	2	08.Feb.20	09.Feb.20	4
Civil		189	08.Jul.19 A	30.Jan.20	64
Enabling Works		2	16.Nov.19	17.Nov.19	3
CNCW-C9135	Hi Rail Access Pad ECRL - EW - Install Drake Street Hi-Rail Access Pad - 10.700 km	2	16.Nov.19	17.Nov.19	3
Access path Drake st to Mowbray Rd bridge		40	21.Nov.19	30.Jan.20	64
CNCW-C12365	Access Path between Drake st and Mowbray Rd bridge incl. landscaping	40	21.Nov.19	30.Jan.20	64
CSR / Local Routes		3	21.Sep.19	25.Sep.19	105
Temporary Down		3	21.Sep.19	25.Sep.19	105
ULX		2	21.Sep.19	22.Sep.19	5
CNCW-C10435	4 Track ULX Under Existing Up and Existing Dn and Temp Dn 11.335km	2	21.Sep.19*	22.Sep.19	5
Local Route and Signal Base		3	21.Sep.19	25.Sep.19	105
CNCW-C8845	Local Route (4x50mm conduits), Pit for Signal SH6.91, Signal Base 11.040km to 11.060km	2	21.Sep.19*	22.Sep.19	2
CNCW-C8855	Local Route between SH6.91AT TX to SH6.91BT RX, 2x50mm conduits 11.175km to 11.195km	2	21.Sep.19	22.Sep.19	7
CNCW-C10445	Local Route (4x50mm conduit) SH6.91 BT TX to Sh7.05AT RX and Pit for Signal SH7.05, signal Base 11.330km to 11.350l	2	21.Sep.19	22.Sep.19	5
CNCW-C10505	Local Route between SH6.67AT to SH6.67BT RX, 2x50mm conduits 10.890km to 10.905km	2	21.Sep.19	22.Sep.19	7
CNCW-C10455	Local Route (2x50mm conduit)SH7.05AT TX to SH7.05 BT RX 11.410km to 11.430km	3	23.Sep.19	25.Sep.19	97
Retaining Wall / Noise Wall / Security Fence		185	08.Jul.19 A	01.Oct.19	134
Retaining Wall at OSD tank to Drake St - MW130		30	19.Aug.19 A	01.Oct.19	95
CNCW-C12405	Construct MW130 at OSD tank	30	19.Aug.19 A	01.Oct.19	95
Noise Wall at Hopetoun Ave - MN300		10	08.Jul.19 A	20.Sep.19	64
CNCW-C10275	MN300 - Install panels and posts (11.165 to 11.180)	10	08.Jul.19 A	20.Sep.19	64
Security Fence Dn		5	16.Sep.19	20.Sep.19	141
CNCW-C11695	Dn Circa 10.880 -10.900 security 2.4m fence (Pending TSE access)	5	16.Sep.19	20.Sep.19	141
Signals & Comms		88	21.Sep.19	09.Feb.20	20

Remaining Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Possession Normal
Possession Critical
Possession Complete - CNCW
Requested Possession Place holder (Date TBC)
Milestone

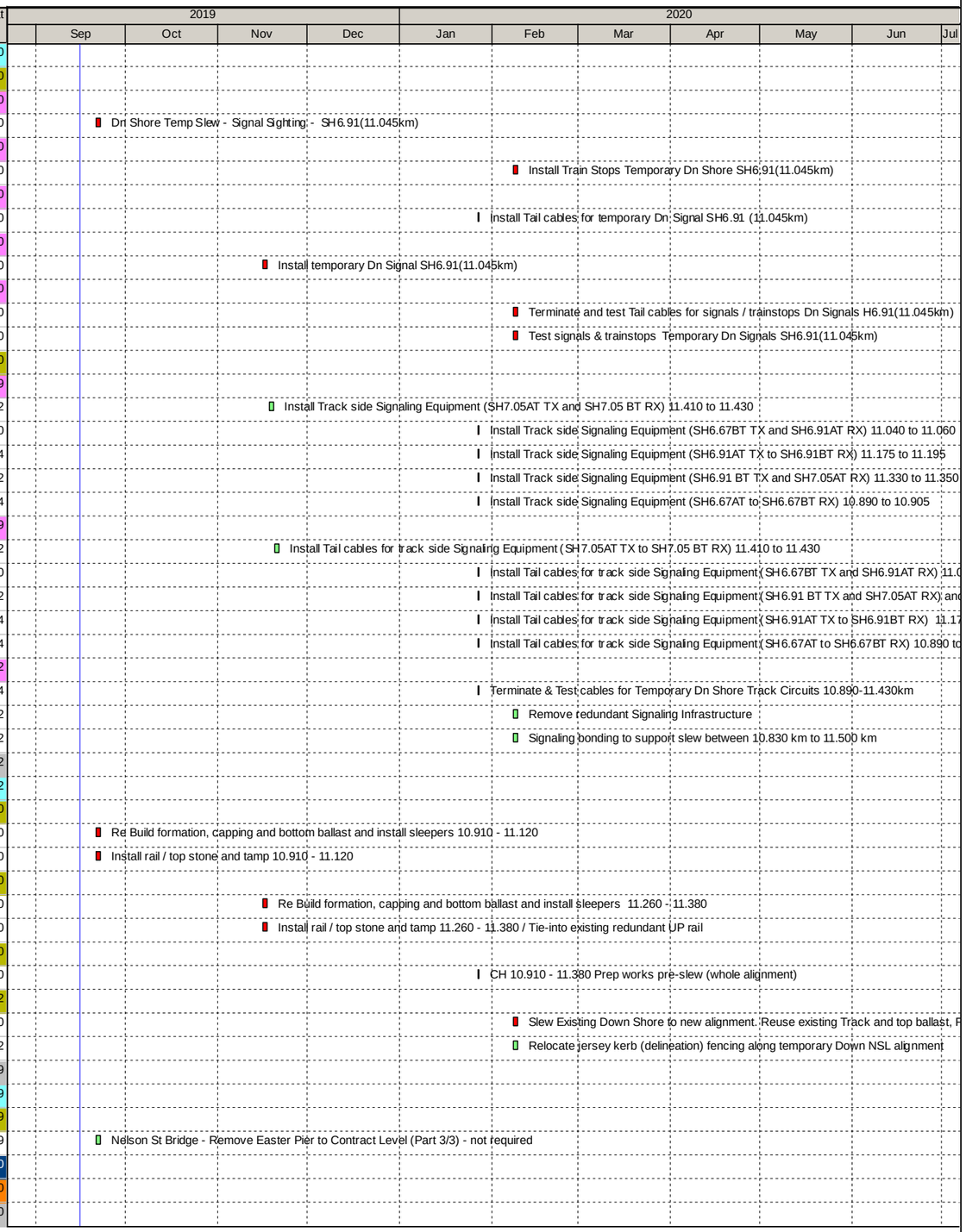
Current Date 17.Sep.19

Date	Revision	Checked	Approved
06-Jul-18	NCW Programme	HAleheidar	TD

LAING O'ROURKE

Sydney Metro City & Southwest
North Corridor Works (VPR057) Contract Programme (Portion 7A)

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
Temporary Dn Shore		88	21.Sep.19	09.Feb.20	20
Signal and Train Stop Temp Dn SH6.91(11.045km), SH7.05(11.356km)		7	21.Sep.19	09.Feb.20	0
Signal Sighting		2	21.Sep.19	22.Sep.19	0
CNCW-C8565	Dn Shore Temp Slew - Signal Sighting - SH6.91(11.045km)	2	21.Sep.19	22.Sep.19	0
Train Stop Installation		2	08.Feb.20	09.Feb.20	0
CNCW-C8575	Install Train Stops Temporary Dn Shore SH6.91(11.045km)	2	08.Feb.20	09.Feb.20	0
Cable Installation		1	27.Jan.20	27.Jan.20	0
CNCW-C8525	Install Tail cables for temporary Dn Signal SH6.91 (11.045km)	1	27.Jan.20	27.Jan.20	0
Signal Installation		2	16.Nov.19	17.Nov.19	0
CNCW-C8515	Install temporary Dn Signal SH6.91(11.045km)	2	16.Nov.19	17.Nov.19	0
Testing		2	08.Feb.20	09.Feb.20	0
CNCW-C8545	Terminate and test Tail cables for signals / trainstops Dn Signals H6.91(11.045km)	2	08.Feb.20	09.Feb.20	0
CNCW-C8555	Test signals & trainstops Temporary Dn Signals SH6.91(11.045km)	2	08.Feb.20	09.Feb.20	0
Track side equipment temporary Dn 10.890km to 11.430km		49	18.Nov.19	09.Feb.20	20
Equipment Installation / Relocation		40	18.Nov.19	27.Jan.20	29
CNCW-C10535	Install Track side Signaling Equipment (SH7.05AT TX and SH7.05 BT RX) 11.410 to 11.430	2	18.Nov.19	19.Nov.19	62
CNCW-C8695	Install Track side Signaling Equipment (SH6.67BT TX and SH6.91AT RX) 11.040 to 11.060	1	27.Jan.20	27.Jan.20	0
CNCW-C10475	Install Track side Signaling Equipment (SH6.91AT TX to SH6.91BT RX) 11.175 to 11.195	1	27.Jan.20	27.Jan.20	4
CNCW-C10495	Install Track side Signaling Equipment (SH6.91 BT TX and SH7.05AT RX) 11.330 to 11.350	1	27.Jan.20	27.Jan.20	2
CNCW-C10515	Install Track side Signaling Equipment (SH6.67AT to SH6.67BT RX) 10.890 to 10.905	1	27.Jan.20	27.Jan.20	4
Cable Installation		38	20.Nov.19	27.Jan.20	29
CNCW-C10545	Install Tail cables for track side Signaling Equipment (SH7.05AT TX to SH7.05 BT RX) 11.410 to 11.430	2	20.Nov.19	21.Nov.19	62
CNCW-C8665	Install Tail cables for track side Signaling Equipment (SH6.67BT TX and SH6.91AT RX) 11.040 to 11.060	1	27.Jan.20	27.Jan.20	0
CNCW-C8675	Install Tail cables for track side Signaling Equipment (SH6.91 BT TX and SH7.05AT RX) and cable through ULX 11.335	1	27.Jan.20	27.Jan.20	2
CNCW-C10485	Install Tail cables for track side Signaling Equipment (SH6.91AT TX to SH6.91BT RX) 11.175 to 11.195	1	27.Jan.20	27.Jan.20	4
CNCW-C10525	Install Tail cables for track side Signaling Equipment (SH6.67AT to SH6.67BT RX) 10.890 to 10.905	1	27.Jan.20	27.Jan.20	4
Bonding		3	27.Jan.20	09.Feb.20	2
CNCW-C8685	Terminate & Test cables for Temporary Dn Shore Track Circuits 10.890-11.430km	1	27.Jan.20	27.Jan.20	4
CNCW-C8365	Remove redundant Signaling Infrastructure	2	08.Feb.20	09.Feb.20	2
CNCW-C8705	Signaling bonding to support slew between 10.830 km to 11.500 km	2	08.Feb.20	09.Feb.20	2
Track		7	21.Sep.19	09.Feb.20	2
Temporary Dn Slew		7	21.Sep.19	09.Feb.20	2
CH 10.910 - 11.120 Reconditioning and build temporary down		2	21.Sep.19	22.Sep.19	0
CNCW-C9155	Re Build formation, capping and bottom ballast and install sleepers 10.910 - 11.120	2	21.Sep.19	22.Sep.19	0
CNCW-C9165	Install rail / top stone and tamp 10.910 - 11.120	2	21.Sep.19	22.Sep.19	0
CH 11.260 - 11.380 Reconditioning and build temporary down		2	16.Nov.19	17.Nov.19	0
CNCW-C9335	Re Build formation, capping and bottom ballast and install sleepers 11.260 - 11.380	2	16.Nov.19	17.Nov.19	0
CNCW-C9345	Install rail / top stone and tamp 11.260 - 11.380 / Tie-into existing redundant UP rail	2	16.Nov.19	17.Nov.19	0
CH 10.810 - 11.200 Prep works pre-slew (whole alignment)		1	27.Jan.20	27.Jan.20	0
CNCW-C10825	CH 10.910 - 11.380 Prep works pre-slew (whole alignment)	1	27.Jan.20	27.Jan.20	0
Temporary Down Commissioning		2	08.Feb.20	09.Feb.20	2
CNCW-C9255	Slew Existing Down Shore to new alignment. Reuse existing Track and top ballast, Final Tamp and Commission	2	08.Feb.20	09.Feb.20	0
CNCW-C9265	Relocate jersey kerb (delineation) fencing along temporary Down NSL alignment	2	08.Feb.20	09.Feb.20	2
Bridgeworks		2	21.Sep.19	22.Sep.19	9
Nelson St Bridge		2	21.Sep.19	22.Sep.19	9
Demolition		2	21.Sep.19	22.Sep.19	9
CNCW-C11455	Nelson St Bridge - Remove Easter Pier to Contract Level (Part 3/3) - not required	2	21.Sep.19	22.Sep.19	9
COMMISSIONING		24	31.Dec.19	09.Feb.20	20
Portion 7b		24	31.Dec.19	09.Feb.20	20
Temporary Down Slew		24	31.Dec.19	09.Feb.20	20



Remaining Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Possession Normal
Possession Critical
Possession Complete - CNCW
Requested Possession Place holder (Date TBC)
◆ Milestone

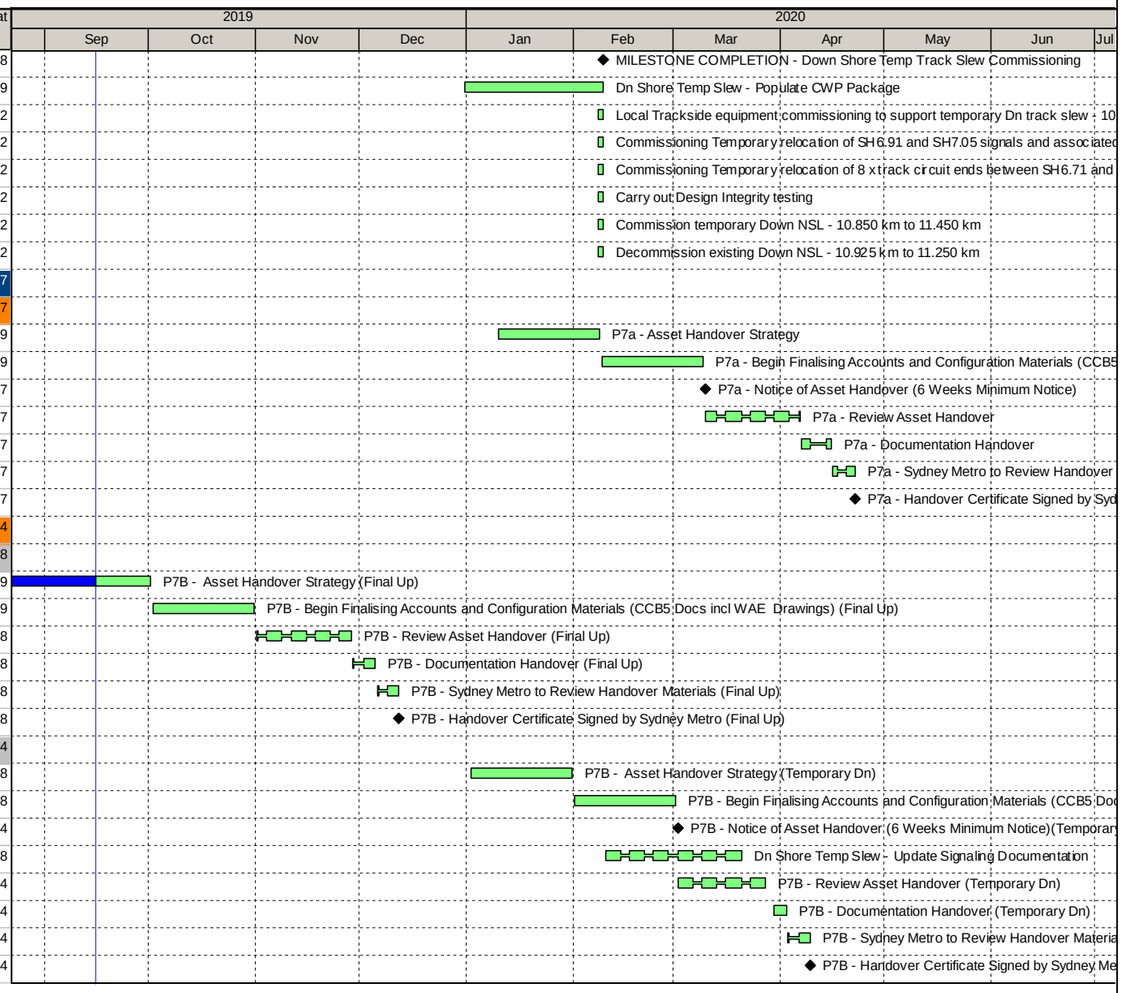
Current Date 17.Sep.19

Date	Revision	Checked	Approved
06-Jul-18	NCW Programme	HAleheidar	TD

LAING O'ROURKE

Sydney Metro City & Southwest
North Corridor Works (VPR057) Contract Programme (Portion 7A)

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
CNCW-C9735	MILESTONE COMPLETION - Down Shore Temp Track Slew Commissioning	0		09.Feb.20	28
CNCW-C9815	Dn Shore Temp Slew - Populate CWP Package	40	31.Dec.19	09.Feb.20	19
CNCW-C9825	Local Trackside equipment commissioning to support temporary Dn track slew - 10.830 km to 11.500 km	2	08.Feb.20	09.Feb.20	2
CNCW-C9835	Commissioning Temporary relocation of SH6.91 and SH7.05 signals and associated equipment	2	08.Feb.20	09.Feb.20	2
CNCW-C9845	Commissioning Temporary relocation of 8 x track circuit ends between SH6.71 and SH7.17 signals	2	08.Feb.20	09.Feb.20	2
CNCW-C9855	Carry out Design Integrity testing	2	08.Feb.20	09.Feb.20	2
CNCW-C9915	Commission temporary Down NSL - 10.850 km to 11.450 km	2	08.Feb.20	09.Feb.20	2
CNCW-C9925	Decommission existing Down NSL - 10.925 km to 11.250 km	2	08.Feb.20	09.Feb.20	2
HANDOVER / COMPLETION		244	25.Apr.19 A	22.Apr.20	7
Portion 7a Handover		71	10.Jan.20	22.Apr.20	7
CNCW-H1070	P7a - Asset Handover Strategy	30	10.Jan.20	08.Feb.20	9
CNCW-H1080	P7a - Begin Finalising Accounts and Configuration Materials (CCB5 Docs incl WAE Drawings)	30	09.Feb.20	09.Mar.20	9
CNCW-H1090	P7a - Notice of Asset Handover (6 Weeks Minimum Notice)	0	10.Mar.20		7
CNCW-H1100	P7a - Review Asset Handover	20	10.Mar.20	06.Apr.20	7
CNCW-H1110	P7a - Documentation Handover	5	07.Apr.20	15.Apr.20	7
CNCW-H1120	P7a - Sydney Metro to Review Handover Materials	5	16.Apr.20	22.Apr.20	7
CNCW-H1130	P7a - Handover Certificate Signed by Sydney Metro	0		22.Apr.20	7
Portion 7b Handover		237	25.Apr.19 A	09.Apr.20	14
Final Up		163	25.Apr.19 A	12.Dec.19	88
CNCW-H1280	P7B - Asset Handover Strategy (Final Up)	30	25.Apr.19 A	01.Oct.19	139
CNCW-H1330	P7B - Begin Finalising Accounts and Configuration Materials (CCB5 Docs incl WAE Drawings) (Final Up)	30	02.Oct.19	31.Oct.19	139
CNCW-H1290	P7B - Review Asset Handover (Final Up)	20	01.Nov.19	28.Nov.19	88
CNCW-H1300	P7B - Documentation Handover (Final Up)	5	29.Nov.19	05.Dec.19	88
CNCW-H1310	P7B - Sydney Metro to Review Handover Materials (Final Up)	5	06.Dec.19	12.Dec.19	88
CNCW-H1320	P7B - Handover Certificate Signed by Sydney Metro (Final Up)	0		12.Dec.19	88
Temporary Dn		68	02.Jan.20	09.Apr.20	14
CNCW-H1350	P7B - Asset Handover Strategy (Temporary Dn)	30	02.Jan.20	31.Jan.20	18
CNCW-H1400	P7B - Begin Finalising Accounts and Configuration Materials (CCB5 Docs incl WAE Drawings) (Temporary Dn)	30	01.Feb.20	01.Mar.20	18
CNCW-H1410	P7B - Notice of Asset Handover (6 Weeks Minimum Notice)(Temporary Dn)	0	02.Mar.20		14
CNCW-C9965	Dn Shore Temp Slew - Update Signaling Documentation	30	10.Feb.20	20.Mar.20	28
CNCW-H1360	P7B - Review Asset Handover (Temporary Dn)	20	02.Mar.20	27.Mar.20	14
CNCW-H1370	P7B - Documentation Handover (Temporary Dn)	4	30.Mar.20	02.Apr.20	14
CNCW-H1380	P7B - Sydney Metro to Review Handover Materials (Temporary Dn)	5	03.Apr.20	09.Apr.20	14
CNCW-H1390	P7B - Handover Certificate Signed by Sydney Metro (Temporary Dn)	0		09.Apr.20	14



Remaining Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Possession Normal
Possession Critical
Possession Complete - CNCW
Requested Possession Place holder (Date TBC)
Milestone

Current Date 17.Sep.19

Date	Revision	Checked	Approved
06-Jul-18	NCW Programme	HAleheidar	TD

2.5 Construction Hours

In accordance with Condition of Approval (CoA) – E36 - Construction, except as allowed by Condition E48 (excluding cut and cover tunnelling), must only be undertaken during the following standard construction hours:

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

CoA E37 places further restriction on the hours that 'high noise impact' generating activities may occur. Construction works and activities with the potential to generate high noise impact will be scheduled to occur between the hours of 7am and 8pm. CoA E37 provides for an extended daytime period as it may be preferred by commercial (or residential) receivers for high noise generating activities to occur after 5pm. As required in CoA E38, the relevant receivers have been identified throughout the Construction Noise and Vibration Management Plan (CNVMP) regarding the determination of hours of respite so that construction noise (including ground-borne noise) does not exceed the Highly Noise Affected Management Level (HNAML) outlined within the Interim Construction Noise Guideline (ICNG).

Table 2: Proposed Works Construction Hours

Scope of Works	Normal Construction Hours	Out of Hours
Detention Basin	Yes	Yes
Drainage Works	Yes	Yes
Hopetoun Ave Access Ramp removal	Yes	Yes
Placement of noise walls and construction of retaining walls	Yes	Yes
Track Slews	Yes	Yes
Nelson St Bridge Demolition	Yes	Yes
Mowbray Rd Bridge Modification	Yes	Yes
OHW works	Yes	Yes
Construction Compound and Ancillary Facilities	Yes	Yes
Signalling & Commissioning Works	Yes	Yes

2.6 Out of Hours Works Protocol

Out of Hours Works (OOHW) at this stage are proposed for a number of phases during construction of the NCW.

CoA E44 (f) and E47 requires the preparation of an OOHW Protocol when undertaking works outside of standard construction hours. The protocol must include:

a) the identification of low and high risk construction activities;
b) a risk assessment process in which the AA reviews all proposed out of hours activities and identifies their risk levels;
c) a process for the endorsement of out of hours activities by the AA and approval by the ER for construction activities deemed to be of:
i. low environmental risk; or
ii. high risk where all construction works cease by 9pm.

All other high risk out of hours construction must be submitted to the Secretary for approval unless otherwise approved through the conditions of EPL 12208.

An OOHW Protocol has been developed by Sydney Metro – OOH Work Application Form in **Appendix L**, which will be adopted in the Construction Noise and Vibration Management Plan (CNVMP) and will be referred to during the assessment, management and approval of work outside of standard construction hours (as defined in Condition of Approval E36).

It should be noted that to demonstrate compliance with the conditions of the approval, Clause 9.2 of the CEMF and EPL 12208, the OOHW application will be submitted to Transport for NSW for approval with the ER and AA to be consulted as required.

A summary of out of hours rail based possession works has been provided below. Most works will be concluded during weekend rail possessions due to the congested nature of the rail corridor. Some mid-week night rail possession works will also be required throughout the project.

Table 3: Schedule of Possession Work

WE	Date of Possession

33	10/02/18 – 11/02/18
35	24/02/18 – 25/02/18
47	19/05/18 – 20/05/18
08	25/08/18 – 26/08/18
14	06/10/18 – 07/10/18
17	27/10/18 – 28/10/18
18	03/11/18 – 04/11/18
20	17/11/18 – 18/11/18
24	15/12/18 – 16/12/18
34	23/02/19 – 24/02/19
38	23/03/19 – 24/03/19
51	22/06/19 – 23/06/19
03	20/07/19 – 21/07/19
05	03/08/19 – 04/08/19
12	21/09/19 – 22/09/19
20	16/11/19 – 17/11/19
32	08/02/20 – 09/02/20
36	07/03/20 – 08/03/20
44	02/05/20 – 03/05/20

2.7 Plant and Equipment

The following plant and equipment is proposed to be utilised during construction;

Table 4: Construction Activities and Typical Plant and Equipment

Work Phase	Noise and Vibration Generating Plant and Equipment	Details
Clearing and Grubbing for site establishment	Whipper snippers Mulchers Chainsaws Chipper	Mid –week works
Overhead Wiring Footings, Structures and Wiring	Excavators Hydrema Dump Truck Hi Rail Crane Truck Water Cart Elevated Work Platforms Wire Drum Trucks Utes Power Tools	Possession and mid-week works
Construction of Stormwater Detention Basin	Excavators Hydrema Dump Truck Hi Rail Crane Truck Water Cart Truck and Dog Utes	Possession and mid-week works
Drainage System Installation	Excavators Hydrema Dump Truck Hi Rail Crane Truck Water Cart Truck and Dog Utes	Mid-week works
Track Slew or Switch	Excavators Hydremas Hi Rail Crane Truck Water Cart	Possession works only

	Truck and Dog Utes Tamper Regulator Power Tools Work Trains Welding Rigs Grinder	
Removal of existing Tracks	Excavators Hydremas Hi Rail Crane Truck Water Cart Truck and Dog Utes Tamper Regulator Work Trains Power Tools Welding Rigs Grinder	Possession works only
HV Electrical Works	Hi Rail Crane Truck Water Cart EWPs Power Tools Wire Drum Trucks Utes	Possession and mid-week works
Construction of Combined Services Route (CSR)	Excavators Hydremas Hi Rail Crane Truck Water Cart Power Tools Crane	Possession and mid-week works
Under Line Crossing (ULX) Works	Excavators Hydremas Hi Rail Crane Truck Power Tools Water Cart Crane	Possession and mid-week works
Relocation and Termination of Utilities in Nelson St Bridge	Excavators Hydremas Hi Rail Crane Truck Water Cart Power Tools Crane	Possession and mid-week works
Bridges and Road Works	Excavators Hydremas Hi Rail Crane Truck Water Cart Crane Power Tools HGVs	Possession and mid-week works
Demarcation Fence Installation	Excavators Hydremas Hi Rail Crane Truck Water Cart Crane Power Tools HGVs	Mid-week works

Placement and replacement of Noise Walls	Crane Hi Rail Crane Truck Power Tools Hydremas	Mid-week works	***2.8***

Distribution Policy

The master 'controlled' CEMP document will be held within The Project's document management system where it can be accessed by personnel as necessary.

All paper copies of this CEMP will be considered as 'uncontrolled' unless they have been allocated a 'copy number' in a colour other than black.

Where required, controlled copies of this CEMP will be published as a hard copy, allocated a copy number (colour other than black), and distributed as follows:

Table 5: Distribution of CEMP

Copy No.	Issued To
01	Project Leader
02	Environmental Manager
03	Sydney Metro
04	Department of Planning and Environment

The personnel to whom these copies have been issued will be sent amendments as they occur, and it is their responsibility to discard superseded pages and insert new pages.

2.9 Issue, Revision and Re-issue

The initial issue of this plan has been reviewed by the HSE Leader to ensure it meets the requirements of the current Environmental Management System and policy, contract, specifications and standards. The plan is approved for use on the project by the Project Leader. Evidence of initial review and approval is by signatures on the cover sheet.

In accordance with CoA C7, the CEMP must be endorsed by the ER and then submitted to the Secretary for approval no later than one (1) month before the commencement of construction or within another timeframe agreed with the Secretary.

Revisions of this CEMP may be required throughout the duration of the project to reflect changing circumstances or identified deficiencies.

Revisions may result from:

- Management Review
- Audit (either internal or by external parties)
- Client complaints or non-conformance reports
- Changes to the Company's standard system

Revisions shall be reviewed and approved by the Project Leader prior to issue. Updates to this plan are numbered consecutively and issued to holders of controlled copies. Updates will be undertaken on a 6 monthly basis throughout the duration of the project between 2018 and 2021.

The ER in accordance with CoA A24 (j), must consider "minor" amendments to the CEMP, CEMP Sub plans and monitoring programs that comprise updating or are of an administrative nature, and are consistent with, the terms of this approval and the CEMP, CEMP sub-plans and monitoring programs approved by the Secretary and, if satisfied such amendment is necessary, approve the amendment. This does not include any modifications to the terms of this approval.

Minor amendments to the CEMP and associated environmental management system are those that;

- are editorial in nature (e.g. staff and agency/authority name changes);
- are in response to audit findings or periodic reviews;
- are not considered to contradict the project planning approval and associated conditions;

- do not significantly alter the outcomes of the project such that a planning modification would be required by the Department;
- are not considered to carry significant environmental risk, in excess of those outlined in the project EIS; and will not impact surrounding communities.

Furthermore, in accordance with CoA A27, (g) in conjunction with the ER, the AA must (iv) consider relevant “minor” amendments made to the CEMP, relevant sub-plans and noise and vibration monitoring programs that require updating or are of an administrative nature, and are consistent with the terms of this approval and the management plans and monitoring programs approved by the Secretary and, if satisfied such amendment is necessary, endorse the amendment. This does not include any modifications to the terms of this approval.

2.10 Client Review and Approval

This CEMP and associated sub-plans must be approved by Sydney Metro at least 30 days prior to the commencement of any construction work associated with the Project as required by The Contract.

2.11 Life Cycle Perspective

The life cycle perspective relates to the environmental aspects associated with each stage of Laing O'Rourke's project delivery. Project delivery can be divided into the following five broad categories:

- Work Winning (estimating & cost planning, business development, bids & proposals)
- Commercial (head & sub-contract formation)
- Engineering (feasibility studies, concept design, front-end engineering design, detailed design)
- Procurement (supply and delivery of goods and services)
- Delivery (construction, commissioning)

When applying a life cycle perspective Laing O'Rourke considers the:

- Stage in the life cycle of the product or service
- Degree of control the business has over the life cycle stages
- Degree of influence it has over the life cycle
- Life of the product
- Ability to influence on the supply chain

At each stage of project delivery Laing O'Rourke determines aspects and opportunities to influence lifecycle outcomes.

3. Environmental Management System

Laing O'Rourke Australia Construction Pty Limited operates an environmental system compliant with AS/NZS ISO 14001. This system is integrated with the health and safety management system and is known as the Laing O'Rourke's HSEMS. The system can be accessed through this weblink HSEMS – Environmental Requirements. The system includes 3 core components, System Requirements, Environmental Primary Standards and Severe Environmental Risk protocols.

The Company is currently certified (No. 4749) with SciQual.

SCI QUAL INTERNATIONAL

Environmental Management Systems

Certificate of Registration

Laing O'Rourke Australia Construction Pty Limited

Level 3, M & A Building, 825 Ann Street, Fortitude Valley QLD 4006
Level 2 – 5 100 Arthur Street, North Sydney NSW 2060
24 Sadgroves Crescent, Winnellie NT 0820
Level 20 HWT Tower, 40 City Road, Southgate VIC 3006
Level 1/3 Craig Street, Burswood WA 6100

In recognition of the implementation of a management system conforming to

ISO 14001:2015

The Scope of Certification covers the following activities:

Processes associated with the design, construction and project management of multi-discipline engineering construction and building projects including rail; commercial, residential and special purpose buildings; roads and bridges; gas; water and associated infrastructure and civil works.

Certificate No.	Date of Issue	Certification Date	Expiry Date
4749	30 October 2017	6 September 1991	30 October 2020

GENERAL MANAGER

Signed for and on behalf of
Sci Qual International Pty Ltd

JAS-ANZ

Suite 19, Building D, "The Lakes Centre", 8-22 King Street, Caboolture QLD 4510

The certificate of Registration, which remains the property of Sci Qual International Pty Ltd, is granted subject to the Regulations governing the certification scheme operated by Sci Qual International Pty Ltd and in respect of goods or services described in the schedule hereto, bearing the same number as this certificate.

Figure 4 - Laing O'Rourke ISO 14001 certification

All works carried out on the site will be in accordance with;

- Client requirements as detailed in the Contract;
- Laing O'Rourke Australia Construction Pty Limited Environmental System as detailed on iGATE;
- ISO 14001 Environmental Management System;
- The Construction Environmental Management Framework v1.3;
- The Overarching Stakeholder and Community Involvement Plan;
- Minister's Conditions of Approval (MCoAs);
- Revised Environmental Mitigation Measures (REMMs);
- All other legal requirements; and
- Laing O'Rourke's compliance obligations including mandatory and voluntary requirements.

This Plan references relevant parts of the Company's environmental management system and incorporates the additional elements necessary to satisfy TfNSW's environmental system requirements. An outline of Laing O'Rourke's Environmental Management System is provided below.

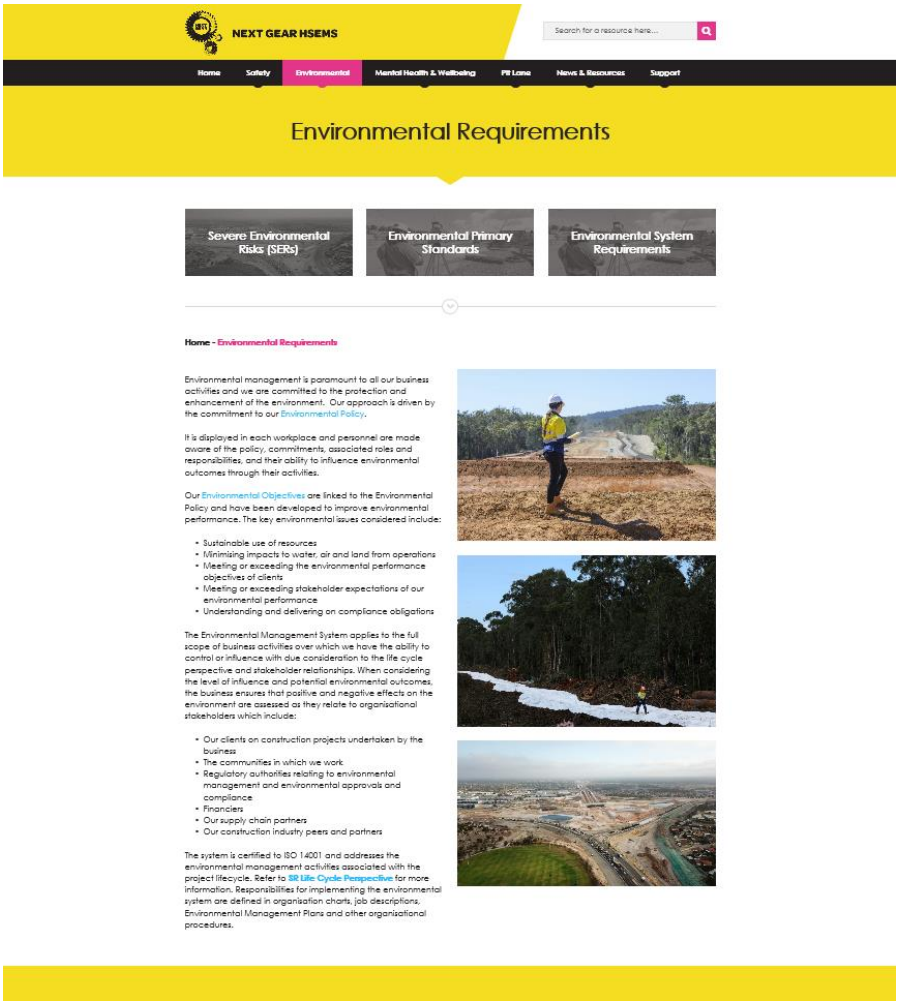


Figure 5 - LOR Environmental Management System

4. Legal and Compliance Obligations and Other Requirements

Mandatory compliance obligations and requirements relevant to the project are outlined below. Environmental System Requirement - Compliance Obligations outlines the process that the organisation uses to determine legal and other mandatory requirements.

All personnel associated with the project will comply with all relevant requirements including:

- The Conditions of Approval
- Laws – Acts, regulations, policies, etc.
- Environment Protection Licences and permits
- Development consents
- Relevant industry standards / codes

Licences, permits and approvals are outlined in **Appendix B** in the Project Permits and Approvals Register. The register will be developed, at or prior to, the commencement of the project to outline the full scope of the project's requirements for Government authority approvals. The register is to be reviewed in conjunction with the 6 monthly management review outlined in Section 17 or where there has been a change to relevant legislation. The Register is to be reviewed and updated as the project progresses and compliance with the relevant conditions reported.

Status of compliance conditions relating to items listed on the NCW Permits and Licenses Register will be tracked in a separate 'live' NCW Environmental Compliance Matrix, detailed in **Appendix R**. Specific details and controls are included in the associated sub- plans and Environmental Risk Action Plans.

An assessment of the relevant legislative instruments has been conducted and recorded in **Appendix A**. A copy of relevant Permits, Licences and any development approvals relevant to Laing O'Rourke's activities will be kept on site.

4.1 Project Approval and Development Consent

The works are to be delivered under the Environmental Planning and Assessment Act 1979 in accordance with the Critical State Significant Infrastructure Sydney Metro City & Southwest Chatswood to Sydenham Conditions of Approval (SSI 15_7400) issued for the Project under Section 115ZB. The approval process includes specific planning conditions and commitments that must be addressed in this CEMP and delivered during the project.

A Compliance Matrix for the project has been established in accordance with the Sydney Metro compliance tracking program to ensure the approval conditions are captured, addressed and closed out. The Matrix includes all conditions relevant to Laing O'Rourke's scope of works and will be updated as the works progress and reviewed on a monthly basis to verify compliance with each condition.

Specific conditions of approval relevant to construction activities are included in the project's Operational Controls in the aspect specific Environmental Risk Action Plans (ERAPs) seen **in Appendix D**.

Non-compliances with the conditions will be documented and addressed through Laing O'Rourke's 'Impact' Assurance application.

4.2 Environmental Authority / Licence

The NCW will be delivered in accordance with the Sydney Trains Environment Protection Licence (EPL) 12208 and all information required by the EPL will be submitted to Sydney Trains or relevant authority within the stipulated timeframes and subject to requirements of the interface agreement in place between Sydney Trains, RailCorp and Sydney Metro. Compliance with all relevant licence conditions will be tracked, monitored and ensured. If any inconsistencies between the EPL and planning approval arise, the planning approval will take precedence.

4.3 References, Standards, Codes and Regulations

The project will be constructed in accordance with relevant standards, codes, acts and regulations. **Appendix A** provides a register of applicable legislative instruments relevant to the project.

In addition to legislative requirements, the following environmental publications, standards, codes of practice and guidelines are relevant to the NCW Project and are referenced throughout this Plan. Other aspect specific guidelines are discussed in the relevant CEMP sub-plans and other project management plans.

4.4 Compliance Tracking Program

In accordance with CoA A28, A29 and A30, a compliance tracking program has been developed and submitted by Sydney Metro to DP&E to monitor compliance with the terms of the project approval.

The Compliance Tracking Register is being implemented for the Northern Corridor Works, incorporating CoA and other approvals relevant to the NCW to track issues and ensure compliance issues are addressed and closed out. NCW compliance tracking will be undertaken in accordance with the Sydney Metro Compliance Tracking Program.

The key elements of the Compliance Tracking Program are:

- Specific conditions of approval relevant to construction activities are included in the project's Operational Controls in the aspect specific Environmental Risk Action Plans (ERAPs).
- Non-compliances with the conditions will be documented and addressed through Impact's Assurance application.
- The Register is to be reviewed and updated as required (monthly) for TfNSW reporting (PECOMMS) and reported to DPE (6 monthly), following review in accordance with Section 21.
- Compliance conditions relating to items listed on the Permits and Licenses Register are incorporated into this CEMP.
- The Register is to be issued to the HSE Leader for incorporation in to the Regional Permit and Approval Register

4.5 Pre-Construction Compliance Report

In accordance with CoA A31 and A32, a pre-construction compliance report will prepared and submitted to the Secretary for information no later than one month before the commencement of construction or within another timeframe agreed with the Secretary. The report will include;

(a) details of how the terms of this approval that must be addressed before the commencement of construction have been complied with; and

(b) the commencement date for construction.

The report is to be prepared by Sydney Metro who will coordinate with the NCW contractor who will provide any relevant information required under the compliance tracking program to complete the report.

Table 6: Relevant Standards and Guidelines

Standard/Guideline	Relevant Authority
TfNSW Sustainable Design Guidelines	TfNSW
Sydney Metro City and Southwest Out-of-Hour Works Protocol (SM ES-FT-443 – 25/07/2017)	Sydney Metro
Sydney Metro Construction Noise and Vibration Strategy (CNVS) (NSW Govt, 2017)	Sydney Metro
Construction Noise Strategy (CNS) (TfNSW , 2013).	TfNSW
ISO 14001 Environmental Management Systems – Requirements with Guidelines for use	DP&E
Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources, 2001)	DP&E
Interim Construction Noise Guidelines (Department of Environment and Climate Change, 2009)	NSW EPA
Traffic Control at Worksites Manual Version 4 (NSW RMS, 2010)	RMS
AS1742.3:2009 Manual of Uniform Traffic Control Devices – Traffic Control Devices for Works on Roads	RMS
Guide to Traffic Management – Part 2 0 Traffic Theory (Austroads, 2008)	RMS
NSW Road Noise Policy (RNP) (NSW Department of Environment, Climate Change and Water, 2011)	OEH
NSW Environmental Noise Management - Assessing Vibration: a Technical Guide (the NSW Vibration Guideline)	OEH
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)	NSW EPA
Australian Rainfall and Runoff – Volume 1 (Engineers Australia, 2001)	
Best Practise Erosion and Sediment Control (International Erosion Control Association, 2008)	IECA Australasia
Managing Contaminated Land Planning: Planning Guidelines SEPP 55 – Remediation of Land (Department of Urban Affairs and Planning & Environment Protection Authority, 1998)	NSW EPA
Managing Urban Stormwater: Soil and Construction (Landcom, 2008)	NSW EPA
AS2436:1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites	NSW EPA
AS2436:2010 Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites	NSW EPA
AS1055-1997 Description and Measurement of Environmental Noise	NSW EPA
AS IEC 61672.1-2004 Electro Acoustics – Sound Level Meters Specifications Monitoring / AS1259.2-1990 Acoustic – Sound Level Meters – Integrating/Averaging (as appropriate to the device)	NSW EPA

Standard/Guideline	Relevant Authority
AS/IEC 60942:2004/IEC 60942:2003 Electroacoustic – Sound Calibrators	NSW EPA
AS/ NZS 1940: 2004 - The Storage and Handling of Flammable and Combustible Liquids	NSW EPA
Rail Infrastructure Noise Guidelines (EPA, 2013)	NSW EPA
Industrial Noise Policy (NSW Government, 2000)	NSW EPA
Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006)	NSW EPA
AS/NZS 3580.1.1:2007 Methods for Sampling and Analysis of Ambient Air – Part 1.1 Guide to Siting Air Monitoring Equipment	NSW EPA
ASNZS 3580.10.1:2003 Methods for Sampling Analysis of Ambient Air, Method 10.1 Determination of Particulate Matter – Deposited Matter – Gravimetric Method	NSW EPA
Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW Environmental Protection Authority, 2005)	NSW EPA
DIN 4150:3 (1990-2002) Structural Vibration – Effects of Vibration on Structures	German Institute for Standardisation
BS7385 – Evaluation and Measurement for Vibration in Buildings – Part 2 – Guide to Damage from Ground-borne Vibration (1993)	British Standard
AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting	OEH
Code of Practice for the Safe Removal of Asbestos 2nd edition (National Occupational Health and Safety Commission, 2005)	National OHS Commission
Code of Practice for the Management and Control of Asbestos in Workplaces (National Occupational Health and Safety Commission, 2005)	National OHS Commission
AS2601:1991 Demolition of Structures	DP&E
Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2008)	NSW EPA
Waste Reduction and Purchasing Policy (Environment Protection Authority, 1997)	NSW EPA
Code of Practice for the archaeological investigation of Aboriginal objects in NSW (2010)	OEH
Aboriginal cultural heritage consultation requirements for proponents (2010)	OEH
Due Diligence Code of practice for protection of Aboriginal objects in NSW (2010)	OEH
Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (2011)	OEH
Guide to Aboriginal Heritage Impact Permit processes and decision making (2011)	OEH
Assessing Heritage Significance (NSW Heritage Office, 2001)	OEH
Levels of Heritage Significance (NSW Heritage Office, 2008)	OEH
Assessing Significance for Historical Archaeological Sites and Relics (NSW Heritage Branch, Department of Planning, 2009)	DPE
Investigating Heritage Significance (NSW Heritage Office, 2001)	OEH
NSW Government's Aboriginal Participation in Construction Guidelines (2007)	NSW Govt.
How to Prepare Archival Recording of Heritage Items (Heritage Branch, 1998).	OEH
Photographic Recording of Heritage Items Using Film or Digital Capture (Heritage Branch, 2006)	OEH

Access to the latest Australian standards is available via the through iGATE (Laing O'Rourke Intranet).

4.6 Stakeholder Consultation and Approval of Plans

The Minister's Condition of Approval C7 requires that the CEMP be endorsed by the Environmental Representative (ER) and to be submitted to DPE for approval. The CEMP will be submitted to the ER for endorsement prior to approval by DPE.

CEMP sub-plans are required to be prepared in consultation with the relevant government agencies as listed in Condition of Approval C3 and in reference to Table 2 of the Staging Report. The sub-plans relevant to the NCW project and associated stakeholder consultation is listed below.

Table 7: CEMP sub-plan consultation requirements

Required NCW CEMP Sub-plan	Relevant government agencies to be consulted
Construction Noise and Vibration	EPA, Willoughby City Council
Construction Traffic	Willoughby City Council , RMS, Sydney Coordination Office, Sydney Metro Traffic and Transport Liaison Group

Comments received on the CEMP sub-plans will be considered and, where relevant, incorporated in the respective sub- plan and recorded in **the** Stakeholder Consultation section of that plan. Evidence of consultation is also attached to each individual sub plan.

All other CEMF aspects required for the NCW project in Table 2 of the Staging Report have been prepared as Environmental Risk Action Plans (ERAP). It is noted that due to the limited environmental risk associated with the NCW project, management of the following aspects are considered appropriate and effective as outlined in this CEMP document in **Appendix D** – Environmental Risk Action Plans:

ERAP 1 – Noise and Vibration
ERAP 2 – Tree Protection (Biodiversity)
ERAP 3 – Dust and Air Quality
ERAP 4 – Waste and Resource Management
ERAP 5 – Water Quality, Site Drainage, Erosion and Sediment Control
ERAP 6 – Traffic Management
ERAP 7 – Hazardous/ Contaminated Material
ERAP 8 – Indigenous and Non-Indigenous Heritage
ERAP 9 – Delivery and Storage of Chemicals, Fuels and Oils including Dangerous Goods Requirements
ERAP 10 – Visual Amenity

5. Policy

The Company maintains an Environmental Policy, which will be:

- Displayed at prominent locations on the Northern Corridor Works site;
- Communicated to site personnel during induction and training; and
- Made accessible to clients and concerned / interested members of the public.

All personnel associated with the Northern Corridor Works including subcontractors must comply with the spirit and intent of the policy.

Figure 6 - LOR Environmental Policy

ENVIRONMENTAL & ENERGY

Laing O'Rourke is an engineering enterprise, focused on major construction projects and strategic programmes, delivering certainty for clients from the earliest engagement and throughout the project lifecycle. Through a focus on certainty of delivery we will maintain an enduring and sustainable enterprise.

We are committed to the protection and enhancement of the environment, and to a continual improvement of energy performance. High environmental and energy performance is an ongoing priority and is achieved by our actions in line with this policy. This policy sits alongside our Sustainability policy and Supply Chain policy as part of our global policy framework, underpinned by our Global Code of Conduct.

Our goal is to minimise the negative environmental impacts of our operations and maximise the quality of the built environment for future generations. Through innovation and application of leading practice, we aim to steer the industry to design an environmentally sustainable and high-quality built environment through the whole asset lifecycle.

Our goal will be realised by:

- Demonstrating leadership of our environmental agenda by senior leaders
- Complying with relevant legislation and other requirements specific to the context of our business and regularly evaluating and reporting on our compliance obligations
- Preventing polluting emissions or discharges to the environment
- Proactively minimising environmental impacts, including minimising direct and embodied carbon emissions, and providing energy-efficient / low-carbon assets for our clients
- Continually improving the environmental and energy performance of our activities, products, services and associated management systems through clear objectives, targets and programmes
- Providing sufficient and competent resources and information to achieve our environmental and energy-related objectives and targets
- Exploring opportunities in the sourcing and lifecycle aspects of our products, services and supply chain to reduce carbon emissions, improve energy efficiency and demonstrate positive environmental outcomes
- Exploring opportunities for innovative technologies, products and processes that drive improved environmental outcomes / benefits and energy performance throughout the design, delivery and operation of the assets we build
- Communicating and addressing the risks and opportunities associated with the impacts of our activities, products and services
- Improving resource efficiency by reducing the use of natural resources and reducing waste, maximising resource recovery and diverting the waste we do produce away from landfill sites
- Reducing our water consumption and improving water efficiency in all of our operations
- Engaging our supply chain partners to improve their environmental performance and responsible sourcing of their materials, products and services
- Proactively protecting, preserving and exploring opportunities to enhance biodiversity and land quality
- Enhancing employee understanding of environmental sustainability by stimulating cultural change and providing clear direction
- Maintaining ISO 14001 certification for our principal businesses and progressing further certifications for our products and services as appropriate

The Board of Directors of Laing O'Rourke fully endorses this policy.

Ray O'Rourke
Chief Executive

6. Objectives and Targets

As a means of assessing environmental performance during construction of the Project, environmental objectives and targets have been established. These objectives and targets have been developed with consideration of key issues identified through the environmental assessment and risk assessment process. The objectives and targets are consistent with the Project environmental policy and will assist in monitoring whether the commitments of the policy are being met. High level objectives and targets for the Northern Corridor Works are as follows:

Table 8: Objectives and Targets

Objective	Target	Reporting / Monitoring
Effective site environmental controls	Set-up prior to starting work in the affected area; Maintain effective controls	Inspection checklists
Environmental performance	No breaches or environmental infringement notices No Class 1 or Class 2 incidents	Monthly reports
Environmental Lead Indicators	100% of weekly environmental inspections signed off by the Project Leader	Monthly reports
Effective implementation of the environmental system	No level 1 Corrective Action Requests <3 level 2 risks each report <20 level 3 risks each report Closure of CARs within the nominated timeframe. Timely release of Environmental Hold Points	Audit report
Community issues carefully managed	Complainant contacted within two hours. Matter closed out within one week.	Complaints form and Impact
Construct the Project in accordance with environmental approvals	Full compliance with statutory approvals and approved management plans	Audits, Construction compliance reporting,
Compliance with all legal requirements	No regulatory infringements (PINs) No formal regulatory warning All correspondence with regulators recorded and retained on-site	Audits, construction compliance reporting

Operational objectives and targets relating to significant environmental issues are contained in within the operational control procedures provided in **Appendix D**.

7. Responsibilities and Authorities

Authorities and responsibilities for all Laing O'Rourke positions are defined and communicated in Job Descriptions and project documentation. Project specific reporting lines are shown in the Organisation Chart (**Appendix F**).

Key responsibilities and authorities for Laing O'Rourke personnel include:

Table 9: Key Responsibilities and Authorities

Position	Key Responsibilities and Authorities
Director	• Reports to the Group General Manager and Board of Directors • Ensure that independent audits of the environmental management system are conducted • Review audit outcomes and take action as necessary • Review environmental performance through the monthly reporting cycle • Authorise resourcing on environmental issues • Resolve major issues which cannot be resolved by the Sector General Manager • Must complete corporate and project induction covering environmental responsibilities and LORs' environmental management system.
General Manager – Infrastructure	• Reports to the Director • Ensure that internal audits of the system are conducted • Review audit corrective actions and take action as necessary to ensure timely close out of issues • Authorise expenditure on environmental issues within limits of authority • Resolve major issues which cannot be resolved by the Project Leader • Must complete corporate and project induction covering environmental responsibilities and LORs' environmental management system
Project Leader	• Reports to the Sector General Manager • Ensure that project responsibilities and authorities are defined and communicated • Provide adequate resources to meet environmental objectives • Approve the CEMP • Ensure that the CEMP is effectively implemented and maintained • Appoint/nominate and provide support for the PEM • Report to senior management on the performance of the system and environmental breaches • Take action to resolve environmental non-conformances and incidents • Ensure suppliers and subcontractors comply with requirements • Must complete corporate and project induction covering environmental responsibilities and LORs' environmental management system • Report environmental incidents to the client / local authorities as required
Construction Manager	• Reports to the Project Leader • Supervise all site construction activities and personnel by ensuring that they meet environmental and other requirements • Organise and manage site plant, labour and temporary materials • Ensure that site environmental controls are properly maintained and provide support for the PEM • Report all environmental incidents • Take action to resolve non-conformances and incidents • Must complete corporate and project induction covering environmental responsibilities and LORs' environmental management system.
Procurement Personnel	• Reports to the Project Leader and Construction Manager • Carefully select suppliers and subcontractors based upon their ability to meet stated requirements • Ensure that purchase orders and agreements include environmental requirements as necessary • Where practical, select materials which are "environmentally friendly" • Must complete corporate and project induction covering environmental responsibilities and LORs' environmental management system

Position	Key Responsibilities and Authorities
Project Environmental Manager	• Reports to the Project Leader and HSE Leader • Ensure that the CEMP is effectively established, implemented and maintained at the project level • Ensure compliance with all relevant statutes, regulations, rules, procedures, standards and policies • Liaise with the Principal's Environmental Representative and/or Superintendent on environmental issues, including the written notification of non-conformances (incidents, emergencies or deviations from the CEMP) • Ensure that all personnel on site receive appropriate environmental induction and training and are aware of their environmental responsibilities under relevant legislation and the contract • Report to the Project Leader on the performance of the system and improvement opportunities • Provide support to the project team to enable them to meet their environmental commitments • Ensure that environmental records and files are collected and maintained • Regular compliance checking as required by this CEMP • Ensure that non-conformances and environmental incidents are recorded and written reports provided to the Client's Representative and Environmental Manager within 24-hours. Liaise with the required stakeholders to confirm the nature of the corrective action required and comply with the timeframe within which corrective actions must occur. • Ensure that environmental controls, materials and equipment are maintained • Ensure compliance checking as required by this CEMP • Ensure that non-conformances and environmental incidents are recorded and written reports provided to the Client's Representative and Environmental Manager within 24-hours. Liaise with the required stakeholders to confirm the nature of the corrective action required and comply with the timeframe within which corrective actions must occur • Ensure that environmental controls, materials and equipment are maintained • Must have tertiary qualifications in environmental engineering / science along with relevant experience working in environmental management roles in Australia. Infrastructure Sustainability Accredited Professional preferred • complete corporate and project induction covering environmental responsibilities and LORs' environmental management system • Provide training for required personnel as per training requirements in Section 9 of the CEMP.
HSE Leader	• Reports to the General Manager Infrastructure • Provide environmental support to the project team • Coordinate internal environmental audits • Must complete corporate and project induction covering environmental responsibilities and LORs' environmental management system
Community Place Manager	• Provide key stakeholders and the community with information about construction progress. • Ensure people understand the scope of the works and mitigation measures. • Ensure key stakeholders and the community understand the proposed timing of the works. • Take steps to minimise potential impacts from construction works. • Work closely with the Northern Corridor Works to coordinate consultation activities with the community and other stakeholders. • Be the single point of contact for affected stakeholder and the community and the project team, who will proactively doorknock properties and also respond quickly to any issues or complaints raised. • Be available at all times that any activities are being performed on any construction site to answer any questions, concerns, complaints or enquires in relation to activities. • Produce and distribute all community notifications relating to contractor activities. • Develop, produce and distribute site specific quarterly newsletters to inform the community of the progress and key milestones or activities taking place during the following three months. • Distribute newsletters to all affected commercial and residential properties within a minimum of 500m radius of the construction site. • Record all interactions with stakeholders on Consultation. • Provide an initial response to email/written correspondence (letters/faxes) within 48 hours. • Provide feedback to requests for information from the Sydney Metro Communication and Engagement team Sydney Metro Communication and Engagement team within two hours. • Refer enquiries not associated with contractor activities to Sydney Metro Project Communications team immediately. • Record all interactions with stakeholders on Consultation Manager in accordance with Consultation Manager data entry procedure within 48 hours. • Manage calls to the community information line and redirect to appropriate team members or contractors. • Provide at least an oral response to calls forwarded from the community information line within two hours unless otherwise agreed. • Lead or be involved in any consultation activities arising from community enquiries as notified by the contractor.

Position	Key Responsibilities and Authorities
Sub-Contractors	• Comply with all legal and contractual requirements • Comply with site environmental requirements • Comply with management / supervisory directions • Participate in induction and training as directed • Report all incidents • Environmental qualifications as required by contract • Must complete project induction covering environmental responsibilities and LORs' environmental management system
All Personnel	• Comply with the relevant Acts, Regulations and Standards • Comply with the Company's environmental policy and procedures • Promptly report to management on any non-conformances, environmental incidents and/or breaches of the system • Undergo induction and training in environmental awareness as directed by management • Report all incidents • Act in an environmentally responsible manner
Independent Environment Representative	• Receive and respond to communications from the Secretary in relation to the environmental performance of the Critical State Significant Infrastructure (CSSI); • Consider and inform the Secretary on matters specified in the terms of the planning approval; • Consider and recommend any improvements that may be made to work practices to avoid or minimise adverse impact to the environment and to the community; • Consider requests for out of hours construction activities and determine whether to endorse the proposed activities in accordance with Condition E47 • Review all documents required to be prepared under the terms of the planning approval, ensure they address any requirements in or under the planning approval and if so, endorse them before submission to the Secretary (if required to be submitted to the Secretary) or before implementation (if not required to be submitted to the Secretary); • Regularly monitor the implementation of all documents required by the terms of the planning approval for implementation in accordance with what is stated in the document and the terms of the planning approval; • Notify the Secretary of an incident in accordance with Condition A41 of the planning approval; • As may be requested by the Secretary, help plan, attend or undertake Department audits of the CSSI, briefings, and site visits; • If conflict arises between the Proponent and the community in relation to the environmental performance of the CSSI, follow the procedure in the Community Communication Strategy approved under Condition B3 of the planning approval to attempt to resolve the conflict, and if it cannot be resolved, notify the Secretary; • Review any draft consistency assessment that may be carried out by the Proponent, and provide advice on any additional mitigation measures required to minimise the impact of the work; • Consider any minor amendments to be made to the CEMP, CEMP sub-plans and monitoring programs that comprise updating or are of an administrative nature, and are consistent with the terms of the planning approval and the CEMP, CEMP sub-plans and monitoring programs approved by the Secretary and, if satisfied such amendment is necessary, approve the amendment. This does not include any modifications to the terms of the planning approval; • Assess the impacts of minor ancillary facilities as required by Condition A18 of the planning approval; and prepare and submit to the Secretary and other relevant regulatory agencies, for information, a monthly Environmental Representative Report detailing the ER's actions and decisions on matters for which the ER was responsible in the preceding month (or other timeframe agreed with the Secretary). The Environmental Representative Report must be submitted within seven (7) days following the end of each month for the duration of works and construction of the CSSI, or as otherwise agreed with the Secretary. • Must complete project induction covering LORs' environmental management system

Position	Key Responsibilities and Authorities
Acoustics Advisor	• Review all noise and vibration documents required to be prepared under the project approval and, should they be consistent with the CoA, endorse them prior to submission to the Secretary (if required to be submitted to the Secretary) or before implementation (if not required to be submitted to the Secretary); • Consider and provide recommendations on improvements that may be made to works practices to avoid or minimise noise and vibration impacts; • Regularly monitor the implementation of all noise and vibration documents required to be prepared under the project approval to ensure implementation is in accordance with what is stated in the document and the project approval; • Notify the Secretary of noise and vibration incidents in accordance with CoA A41; • In conjunction with the ER: • consider requests for out of hours construction activities and determine whether to endorse the proposed activities in accordance with Condition E47; • as may be requested by the Secretary or Complaints Commissioner, help plan, attend or undertake audits of noise and vibration management; • facilitate conflict resolution with the community in relation to noise and vibration management performance during construction as required; • consider relevant minor amendments made to the CEMP, relevant sub-plans and noise and vibration monitoring programs that require updating or are of an administrative nature, and are consistent with the terms of the project approval and the management plans and monitoring programs approved by the Secretary and, if satisfied such amendment is necessary, endorse the amendment; • assess the noise impacts of minor ancillary facilities as required by Condition A18 of the project approval; and • prepare and submit to the Secretary and other relevant regulatory agencies, for information, a monthly Noise and Vibration Report detailing the AAs actions and decisions on matters for which the AA was responsible in the preceding month and • Assess the noise impacts of minor ancillary facilities as required by Condition A18 of the project approval

8. Environmental Risk Assessment and Control

Laing O'Rourke has established a business wide Environmental Aspects and Impacts Register in accordance with System Requirement - Environmental Aspects and Impacts. The register outlines the environmental aspects that need to be assessed and effectively managed to meet the business's environmental obligations with respect to the context of the organisation and its projects.

System Requirement – Environmental Risk and Opportunity outlines the process by which environmental aspects and impacts are assessed at a project level. Project wide environmental risks and opportunities are assessed in the Project's Risk and Opportunity Register (C-T-3-0770). Site specific environmental aspects and impacts have been identified and assessed in **Appendix C**.

The key environmental risks as defined in **Appendix C** will be reviewed as and when required during the course of the contract when the following situations arise:

- Client recommendations for changes (particularly following initial review)
- Changes to the Company's standard system
- Opportunities for improvement or deficiencies in the project system are identified.
- Following an audit of the system or the occurrence of significant incidents and non-conformances.

This assessment must consider the following as a minimum as outlined in System Requirement – Risk and Opportunity:

- Obligations and requirements associated with the environmental approval conditions
- Emissions to air
- Releases to water
- Releases to land
- Waste management
- Contamination
- Emission of noise including vibration
- Impact on the natural environment including wildlife, biodiversity and cultural heritage
- Resource efficiency and the use of materials
- Consumption of energy

The assessment for significant environmental aspects is based on risk and opportunity assessment matrix established in C-P-3-0770 and C-T-3-0770 Risk and Opportunity Assessment.

Project risk and opportunity assessments are to be reviewed and updated as the project progresses and as a minimum as part of the Environmental Management Plan Management Review. The Project's Risk and Opportunity Register (C-T-3-0770) is to be maintained on a monthly basis or as required and must include project wide environmental risks and opportunities.

By way of definition, the following applies to this environmental risk and opportunity assessment process and the associated matrix.

Green Risk – environmental impacts associated with the action are generally constrained to the project site and in accordance with the environmental assessment documentation. There is a low probability of occurrence.

Amber Risk – environmental impacts associated with the actions have the potential to result in offsite impacts, where the environment recovers over the medium term. There is reasonable probability that the impact would occur with the absence of suitable controls.

Red Risk – environmental impacts that have significant offsite impacts. The environment recovers over the long term, there is impacts to the local community. There is a high probability that the impact would occur. Environmental impacts occur offsite are considered major. Impacts have resulted in the destruction of protected species, sensitive habits or other impacts not envisaged as part of the environmental assessment process. The environment is not able to recover without substantial intervention.

Significant environmental issues will be controlled to a degree which is commensurate with the level of risk and the level of influence which the Company has over these issues.

An Environmental Risk Action Plan (ERAP) (Appendix D) has been developed for aspects or impacts representing an amber or red risk after the initial risk assessment. The ERAP or Sub-Plan must reference and address the strategic mitigation and control measures determined following the initial risk assessment and as outlined in the Laing O'Rourke Environmental Primary Standards. In addition, an ERAP is required to be developed and implemented where an environmental obligation, environmental mitigation requirement or legal requirement dictates issues specific controls are required even though there may be a low risk to the environment. Activities, aspects and potential impacts considered to represent an extreme risk following the application of the strategic mitigation and control measures must be redesigned or re-sequenced or have the approval of the relevant HSE Leader or delegate.

If additional risks are encountered on site during the delivery phase, these will be addressed either by updating this EMP or by using separate Environmental Risk Action Plans (E-T-8-1200).

An overview of this process is contained in Appendix T.

8.1 Severe Environmental Risk Controls

The Severe Environmental Risks (SERs) Controls Standard describes the various minimum mandatory requirements which must be in place, demonstrated and working effectively with the intent of managing severe environmental harm risks on the project. Severe environmental risks relevant to the project are outlined in Appendix C.

Severe Environmental Risks relate to environmental harm caused by site operations which can result in long term damage to the environment. The focus of these risks is on high consequence environmental harm risks rather than regulatory exposure.

The SERs Control Standard provides clear guidance on the required controls and expectations relating to preventing high consequence environmental impact. Additional SER controls have been included as necessary to address site specific conditions.

The applicable SERs on this project as determined by the risk assessment are as follows.

- Biodiversity
- Heritage (Aboriginal and European)
- Water Quality and Wastewater Storage
- Erosion and Sedimentation
- Temporary Waterway Crossings
- Piling

The required elements for the successful completion of the monthly SER activities are described below.

- The monthly field check should be recorded on the SER Field Report and form part of evidence to meet the monthly SER review. The field check is to be completed by the Package Manager or delegate from the operational team.
- System-based controls are to be reviewed for application and effectiveness on a monthly basis with the bounds of the project's construction environmental management plan. System checks are assessed through the SER Planning and Control Report.
- The monitoring activity frequency will be dependent on occurrence of activities with the potential to cause high-consequence environmental impact on the project and reflect the current construction risk processes and methodologies.
- If all aspects of the performance criteria are working effectively in all areas where the risk applies, then the risk can be deemed to be managed and controlled.
- The SER Field Report and SER Planning and Control Report shall be completed on a monthly basis
- SER outcomes shall be monitored monthly during the Portion/Project Review
- Impact will be used to document the completed monitoring activities.

The Severe Environmental Risks Control Adequacy Assessment Tool is to be used as guidance for the implementation of the standard.

The Severe Environmental Risks Control Adequacy Assessment Work Instruction defines the procedural requirements for completing the monitoring activities.

8.2 Environmental Change Management

Change will be managed in accordance with SR Change Management. Consultation is necessary with key project stakeholders for any changes that have the potential to impact environmental controls or project environmental performance.

Change to resources for noise and vibration management, dust mitigation and air quality management, erosion and sediment controls, dewatering arrangements or other critical environmental controls, the relevant management plans, drawings or temporary

works design outputs must be updated and approved by the relevant authority. This must be completed prior to the implementation of the change.

Changes in work activity, scope or other elements that have the potential to impact on environmental performance must follow the change and approval process. This includes changes that impact the following:

- Erosion and sediment control plans and project catchment areas
- Work activities that impact project boundaries or clearing limits
- Dewatering procedures, discharge locations and water quality
- Noise and Out of Hours Working
- Dust management resources or air quality management measures
- Changes to heritage control measures
- Changes to SER controls and mitigation plans.

9. Training, Awareness and Competence

Requirements for training, awareness and competence for environmental aspects and impacts are outlined in System Requirement Onboarding, Training, Induction and VOC and this management plan.

All employees will receive suitable environmental induction / training to ensure that they are aware of their responsibilities and are competent to carry out the work before they commence their duties'.

Environmental requirements will be explained to employees during site induction and on-going training via toolbox meetings, briefings, notifications and the like.

All employees (including subcontractors) will receive induction/ training in the following:

- Environmental Policy
- Site environmental objectives and targets
- Understanding individual authorities and responsibilities
- Site environmental rules
- Potential consequences of departure from rules
- Emergency procedure and response (e.g. Spill clean-up)
- Basic understanding of their legal obligations

Personnel performing tasks, which can cause significant environmental impacts, will be competent based on appropriate education, training and / or experience.

All Laing O'Rourke staff on this project will be provided with training in the requirements and implementation of this Environmental Management Plan. CEMP training for new staff members shall be completed within 1 month of their commencement on the project.

Training in the operation and implementation of Laing O'Rourke's Environmental Management System shall be provided for all staff. Training in aspects outlined below shall be undertaken as the project progresses. An outline of the proposed training is provided below. The training shall be scheduled to reflect the requirements of the construction program.

It should be noted that upon commencement of new personnel, the induction process covers the environmental management and legislative requirements specific to the project.

Table 10: Training Requirements

Aspect	Training Inclusion	Personnel	Timing / Frequency/Means	Responsible Position
Emergency Spill Response	Use and location of spill kits Spill control Emergency response procedures Identification of hydraulic hose fatigue	Construction Personnel	Project Toolbox Talks ECM briefing	Project Environmental Manager
Erosion and Sediment Control	Standard erosion and sediment controls from the Landcom 'Blue Book' Implementation of controls on site Erosion and Sediment Control Plans	Construction Personnel	Project Toolbox Talks ECM briefing	Project Environmental Manager
Heritage Awareness	Stop works and reporting protocols for discovery of previously unknown heritage and archaeological items Archaeological monitoring requirements	Construction Personnel LOR Management Team	Project Induction Project Toolbox Talks Protocol posted on message boards	Project Environmental Manager

Aspect	Training Inclusion	Personnel	Timing / Frequency/Means	Responsible Position
Contamination Awareness	Contamination status of site Stop works protocols for unidentified potential contamination (hydrocarbons, asbestos, etc.)	Construction Personnel	Project Induction Project Toolbox Talks Protocol posted on message boards	Project Environmental Manager
Environmental Legal Obligations	POEO Act and other project requirements Applicable fines and prosecutions Planning Approval – Minister's Conditions of Approval	Construction Personnel LOR Management Team	Project Induction Project Toolbox Talks	Project Environmental Manager
Energy and Resource Usage	Awareness training of energy and resource efficiency in the workplace including office/compound and site	Construction Personnel LOR Management Team	Project Toolbox Talks	Project Environmental Manager
Community / Stakeholder Awareness	Adjacent community and Project involvement Relevant Project stakeholders Community engagement protocols Accepted behaviours Approved hours of work	Construction Personnel LOR Management Team	Project Induction Project Toolbox Talks	Project Environmental Manager
Biodiversity	Stop work and reporting protocols for injured wildlife Measures to stop feral animals coming to site	Construction Personnel	Project Toolbox Talks	Project Environmental Manager
Noise and Vibration	Work hours CNVMP and OOHW Protocol EPL Requirements POEO Act and other project requirements	Construction Personnel LOR Management Team	Project Induction Project Toolbox Talks	Project Environmental Manager
Water Discharge Procedure	Project water discharge procedure Discharge parameters	Construction Personnel LOR Management Team	Project Toolbox Talks	Project Environmental Manager

All required evidence of training is maintained on the On Site Track Easy System (Pegasus). The Site Induction Register is maintained on the projects K/; Drive. Staff qualifications are maintained on LOR's SuccessFactors portal.

All training and tool box meetings will be recorded. The name of trainee, when the person was trained, the name of the trainer, and a general description of the training content will be included in the recording of training and tool box meetings.

Note: Construction Personnel refer to all employees involved in construction e.g. Engineers, Labourers, Plant operators.

10. Communication and Reporting

Laing O'Rourke's HSEMS includes specific organisational requirements related to communication and reporting within the System Requirement – Communication and Reporting. With respect to the functioning of the project's environmental system, Company employees, the client and other interested parties will be kept informed as necessary with specific requirements outlined in the section below.

Internal

Internal Stakeholders include LOR employees/staff and subcontractors.

Internal communication methods include:

- Management reports (via the Digital Contract Review tab on LOR's iGate portal).
  - Includes monthly progress reports from each discipline and includes non-conformances, issues and corrective actions
  - Each section is prepared by the relevant discipline manager and submitted via the Digital Contract Review software for Project Leader review
  - Electronically submitted by the Project Leader to LOR senior management for information and action
  - Revisions are tracked electronically
- Site inspection reports (via LOR Fieldview software on computer tablets)
  - Weekly Environmental Inspection (refer to the template provided in **Appendix J**) are undertaken by the Environmental Manager
  - Submitted to the Project Leader, Construction Manager and Supervisor for information and action.
  - Closeout of Environmental Actions are tracked by the Environmental Manager
- Audit reports (via LOR SMS on LOR's iGate portal)
  - LOR EMS audits to be undertaken by external auditor
  - Project audits to be undertaken by the HSE Leader
  - Content to include Observations, Non-conformances, Corrective Actions and Issues identified on project performance against LOR's EMS and project CEMP
  - Audit reports submitted to LOR Senior Management, and the Project Leader, Construction Manager, Environmental Manager, Quality Manager, Safety Manager, and Supervisors for information and action.
  - Closeout of required actions is tracked by the Quality Manager and the Environmental Manager.
- Incident reports (via Impact on LOR's iGate portal)
  - Includes information on Action Required Target, Completion Date, Person Responsible, Risk Level and Closeout information / Date.
  - Submitted by the Environmental Manager
  - Issued by the Impact software to Senior Management
  - Tracked by Environmental Manager and the HSE Leader
  - Reported in Monthly Report
- Noticeboards to include:
  - Information on Next Gear safety program
  - Health and Well-being Information
  - Environmental Control Map
  - Site Contacts
  - Results of site inspections
  - Toolbox Information
  - Other information as required
  - Noticeboard content updated by the Environmental Manager, Safety Manager, Construction Manager and Site Supervisor
- Site meetings
  - Includes regular project meetings and issue specific meetings to discuss issues and track project performance
  - Managed by the Project Leader and Construction Manager or relevant discipline manager
  - Minutes to be saved on Project hard drive
- Employee induction
  - Includes LOR Corporate Induction and Project specific induction
  - Records maintained by LOR HR and the Safety Manager
- Training
  - Issue specific as required by roles and responsibilities
  - Records to be maintained on the project hard drive or On Site Track Easy (Pegasus) as required
- Tool box sessions

  - Conducted daily or prior to commencement of a new activity covering safety and environmental requirements relevant to the activity undertaken
- Briefings, notifications and alerts
  - Content defined by current issues
  - Prepared by the relevant Manager
  - Documents saved on Project hard drive

Templates, further details of required report content, responsibilities, communication protocols, and document controls are provided on LOR's intranet.

External

External Stakeholders include Sydney Metro (the Client), Department of Planning and Environment (DPE), EPA, OEH, Willoughby City Council, RMS, SCO, Members of Public (Community), Environmental Representative (ER), other relevant third party agencies, government authorities and organisations.

External communication methods include:

- Site meetings with the Client
- Incident notifications to all relevant authorities and the Client
- Project reports to client at progress meetings and in the Project Report
- Meetings and correspondence with interested parties (e.g. Local council and EPA) as necessary
- Discussions with adjoining land owners / neighbours and the community who may be affected by the project
- Site inspections conducted with the ER

Communication with Stakeholders is primarily to be through Sydney Metro Delivery Office.

LORAC's engagement strategy aims to inform and engage community and relevant stakeholders in a constructive, transparent and fair process. To ensure this happens, detailed and timely information will be provided to Sydney Metro to assist them with fulfilling the consultation and notification requirements. Further details of LORAC's commitment to community consultation can be obtained from the Sydney Metro Community Consultation Strategy – Early Works (CCS-EW).

The CCS-EW describes the approach Sydney Metro will use to manage engagement and ongoing consultation with stakeholders and the community with an interest in, or potentially affected by Sydney Metro City & Southwest early works between Chatswood and Sydenham.

Specifically the CCS-EW Section A.2 Chatswood to Artarmon rail corridor provides a summary of the potential issues and stakeholder overview for Northern Corridor Works project.

Community

Engagement before and during early works, will lay a good foundation for engagement throughout major construction by the Principal contractors. Engagement will focus on stakeholders and the community adjacent to construction sites who have an interest in, or who are likely to be affected by early works activities.

- Provide key stakeholders and the community with information about construction progress
- Ensure people understand the scope of the works and mitigation measures
- Ensure key stakeholders and the community understand the proposed timing of the works
- Take steps to minimise potential impacts
- Maintain and protect Sydney Metro's reputation.

A full suite of Sydney Metro's communication tools are outlined in the Overarching Community Communications Strategy. The stakeholder and community engagement tools to be used during early works will include:

- Place Managers to be the single point of contact for affected stakeholder and the community and the project team, who will proactively doorknock properties and also respond quickly to any issues or complaints raised;
- Notifications, signage, newsletters including maps to keep stakeholders and the community informed, explaining the purpose of the works, what they can expect, and any potential impacts (delivered in paper or electronic format);
- Newsletter to provide a three month look-ahead to properties within 500 metres of the construction site on a quarterly basis;
- Fact sheets (as required) to provide detail on aspects of the work and the project;
- Newspaper advertising to advise of work starting, the community contact facilities and road closures for example;
- Mobile community information centre;

Communications Management Control Group, Sydney Metro will establish a new group or attend existing forums to discuss project activities with neighbouring infrastructure projects.

11. System Documentation

Laing O'Rourke's integrated Health, Safety and Environmental Management System (HSEMS) is part of a business wide management system which is known as iGATE. The core elements of the system are described in this EMP with reference to relevant HSEMS System Requirements, Primary Standards and Severe Environmental Risk Protocols.

12. Document Control and Records

Document control requirements associated with the Laing O'Rourke Health, Safety and Environmental Management System shall be implemented in accordance with E-P-8-0136 Document Control – Records and Filing.

Workplaces and Projects shall establish a record management system that allows for the ready access to HSE information. This may include hard copy folders, server-based electronic systems or proprietary document management systems.

Individuals with responsibilities for work packages are responsible for the proper maintenance and upkeep of the workplace / project record management system to ensure:

- Files and records are kept up-to-date
- Records are not lost, damaged or inadvertently destroyed
- Records are maintained in accordance with the contractual, statutory requirements and timeframes
- Kept as objective evidence of compliance with environmental requirements
- Filed in accordance with -P-8-0136 Document Control – Records and Filing.

13. Operational Control

13.1 General

Activities and business processes that have the potential to significantly affect our environmental performance must be identified, planned, documented and controls measures implemented to ensure the Company's policy, objectives and compliance obligations are met.

Within Laing O'Rourke's HSEMS and with respect to the context of the business, operational controls are documented in Environmental Primary Standards. Environmental Primary Standards have been developed from aspects and impacts and compliance obligations. They provide the framework for eliminating or minimising risk of environmental harm as well as creating opportunity for innovation and enhancing environmental benefits.

At a project level, specific operational controls to manage environmental issues are defined in either or all of the following:

- ERAPs contained in Appendix D
- Sub-plans contained in Appendix S or standalone documents referenced below and in Appendix S
- SWMS, EWMS, JSEA's, HAZID, CRAW, Inspection and Test Plans / checksheets (as appropriate)
- Work instructions (e.g. refuelling and servicing)

Significant environmental issues as identified in the Risk and Opportunity assessment in Appendix C, will be controlled Environmental Risk Action Plans and issue specific Sub-plans as required.

Additional controls and criteria identified from the project's compliance obligations (conditions of approval, environmental mitigation measures and contract requirements) will be established and maintained where the absence of such could result in the environmental policy, objectives and targets not being met.

13.2 Hold Points

The activities outlined in the table below are not to proceed without objective review and approval by the nominated authority. These activities below are considered hold points. These hold points should be incorporated into the working plans for the project (SWMS, work instructions, construction methodologies, etc.)

Table 11: Hold Points

Item	Process Held	Acceptance Criteria	Approval Authority
Construction Environmental Management Plan and Sub Plans	Construction activities	Site specific Environmental Management Plan has been developed, reviewed and approved.	Department of Planning and Environment
Dewatering	Dewatering / pumping water off the site.	Verification that the water quality criteria have been met. Approval sought from Sydney Metro using the water discharge and reuse procedure form. Water Quality parameters must meet; • TSS: ≤ 50mg/L (~Turbidity 30NTU). If this cannot be achieved through natural settling, then the trapped sediment laden water is to be flocculated with gypsum applied at a rate of approx. 40kg/100m3. • pH: Between 6.5 and 8.5.	Environmental Manager
Sediment and erosion control measures	Construction activities involving ground disturbance.	Sediment and Erosion Control Plan has been developed, reviewed, approved and implemented as per the Blue Book	Environmental Manager

Item	Process Held	Acceptance Criteria	Approval Authority
Site clearing / vegetation removal	Commencement of site clearing or vegetation removal.	Ecology assessment is required for areas not covered within the Tree Report. Sediment and Erosion Control Plan has been developed, reviewed, approved and implemented as per the Blue Book Recommendations for removal must be conducted as per the Tree Report. Clearing limits must be verified against the project approval environmental assessment, limits have been set-out and vegetation to be retained has been delineated and or protected.	Environmental Manager Sydney Metro ER
Out of Hours Work (OOHW)	Works to be performed outside of approved standard construction hours	OOHW Protocol Application Form and Community Notification Noise Assessment must be conducted and endorsed by the AA	Sydney Metro / Acoustic Advisor (Endorsement) ER (Approval)
Dangerous Goods	Transport of dangerous goods	Verification that transport vehicles meet the EPA requirements and certification.	Construction Manager
Dangerous Goods	Storage of dangerous goods	Verification that bunded storage is provided and that offset distances are maintained for the storage area as per NOHSC: 2017	Construction Manager
Controlled/ Hazardous Waste	Transport of Controlled / Hazardous waste from the site	Verification that the waste has been classified in accordance with the NSW Waste Classification Guidelines, transport licensing in place and an EPA approved/licensed landfill can lawfully receive the waste type.	Environmental Manager
Spoil Transport	Removal of spoil from site	Verification that the spoil has been classified in accordance with the NSW Waste Classification Guidelines and the disposal location can lawfully receive the waste as an EPA approved/licensed facility	Environmental Manager
Traffic	Heavy vehicles travel on local roads	Road dilapidation report completed prior to heavy vehicles using roads and appended to the project CTMP	RMS
Building	Works to impact local buildings and structures	A building condition survey must be conducted for any predicted to be affected buildings and structures to the works	Environmental Manager Sydney Metro
Heritage	Prior to works at Artarmon Station	s170 exemption to be obtained from Sydney Trains	Environmental Manager
Heritage	Unexpected heritage finds within project footprint	s170 exemption to be obtained from Sydney Trains	Environmental Manager
Removal of Redundant Structures	Removal of structures made from varying components	Accepted waste disposal companies sources. Collection of waste dockets	Environmental Manager
Encounter of Unexpected Heritage Item(s)	Commencement of works in the affected area	A 'Stop Works' protocol to be developed and must be applied in the event of encountering unexpected/potential heritage items.	Construction Manager Environmental Manager

Proceeding past a specified Hold Point without authorisation is a system non-conformance.

13.3 Environmental Control Maps

The Northern Corridor Works project Environmental Control Map will be endorsed by the Environmental representative.

The project Environmental Control Maps are prepared to assist in the planning and delivery of the Northern Corridor Works. It is specific to the site or work area and outlines the location of protection measures, monitoring requirements, and environmentally sensitive areas. It is the practical application of the proposed control measures.

The Environmental Control Map will be used in Northern Corridor Works inductions, work site set-up, reviewing ongoing environmental performance, included as information in tender documents to subcontractors were applicable and in support of ancillary environmental approvals.

The site specific Environmental Control Map shall include but not limited to:

- The worksite layout and boundary, including entry/exit points and internal roads and clearing limits;
- Location of adjoining land-use and noise assessment at nearest noise sensitive receivers; to include noise management plans.
- Key contact names and phone numbers
- Location and type of sediment and erosion control measures, including size / capacity of detention basins and wheel wash facilities;
- Location of site offices;
- Location of spill containment and clean-up equipment;
- Location of worksite waste management facilities;
- Hours of work applicable to the worksite;
- Document control and approval details;
- Location of environmentally sensitive areas (e.g. threatened species, critical habitat, contaminated areas, heritage zones, etc.);
- Vegetation and trees to be protected;
- Dust control and management through the application and engagement of a water cart on site;
- Location of known heritage (indigenous and non-indigenous) items;
- Location of stormwater drainage and watercourses leading to / from the worksite;
- Specific environmental management requirements from licenses, approvals or permit conditions; and
- Key environmental risk issues and the specific mitigation measures.

The plan is in addition to any erosion and sediment control plans or other documentation that specify the location of environmental controls on site.

Figure 6 – Northern Corridor Works Environmental Control Map

NCW Portion 7a/7b

Environmental Control Map

Legend

- Access Gate
- Artarmon Heritage Conservation Area
- Business Development
- Commercial
- Drain protection
- Environmental Conservation
- Industrial
- Infrastructure
- Mixed Use
- Northern Corridor Works Project area
- Public Recreation
- Rail Corridor Noise Barrier
- Residential
- Residential - Environmental Living
- Sediment Fence
- Silt warden
- Temporary noise barrier
- TSE Site
- Underground Stormwater
- Urban_E/N: Urban Exotic/Native
- Vehicle access from site
- Vehicle access to site

Next Down ROSEVILLE

Access Gate

CHATSWOOD station

Next Up ARTARMON

Access Gate

Nearest creek (Flat Rock Creek) is approximately 500 meters away

Eddy Rd
Oliver Rd
Centennial Ave
McIntosh St
Brown St
Railway St
Thomas St
Fleet Ln
Freeman Rd
Ellis St
Critchett Rd
A1
Gordon Ave
Nelson St
Orchard Rd
Victor St
Parkside Ln
Tryon St
Young St
Saywell St
Devonshire St
Claude St
Archer St
Bertram St
Anthony St
Olga St
Cambridge Rd
Coree Rd
Hawkins St
Mutlama Rd
Endeavour St
Kay St
Daisy St
Iris Ln
Tulip St
Lane W124
Kirk St
Anderson St
Spring St
Mills Ln
Nerida St
Oscar St
Hercules St
Havilah St
Crowbray Rd
Hampden Rd

Google Earth

300 m

NCW Portion 7a/7b

Environmental Control Map

Legend

- Access Gate
- Artarmon Heritage Conservaion Area
- Drain protection
- Industrial
- Infrastructure
- Northern Corridor Works Project area
- Rail Corridor Noise Barrier
- Residential
- Sediment Fence
- Surface drainage
- Temporary noise barrier
- TSE site
- Underground Stormwater
- Urban_E/N: Urban Exotic/Native
- Vehicle access from site
- Vehicle access to site

Pacific Hwy reat

Mowbray Rd

Moriarty Rd

Fehon Rd

A1

Palmer St

Byson St

Nelson St

Frank Channon W

Next Down CHATSWOOD

Hampden Rd

Next Up ARTARMON

Access Gate

Visual screening to be implemented along rail corridor fence

Gilham St

Raleigh St

Hawkins St

Brand St

Elizabeth St

Heavy vehicles to enter exit from Elizabeth Street to Drake Street

Google Earth

100 m

NCW Portion 7a/7b

Environmental Control Map

Legend

- Access Gate
- Artarmon Heritage Conservaion Area
- Commercial
- Drain protection
- Industrial
- Infrastructure
- Mixed Use
- Northern Corridor Works Project area
- Public Recreation
- Rail Corridor Noise Barrier
- Recreation
- Residential
- Sediment Fence
- Surface drainage
- Temporary noise barrier
- TSE site
- Underground Stormwater
- Urban_E/N: Urban Exotic/Native
- Vehicle access from site
- Vehicle access to site

Critchett Rd
Eddy Rd
Freeman Rd
Crispe Ln
Fleet Ln
Thomas St
Albert Ave
A1
Pacific Hwy-real
Frank Channon Walk
CHATSWOOD station
Nelson St
Hopetoun Ave
Orchard Rd
Nea St
Chapman Ave
Johnson St
Victor St
Next Up ARTARMON
Google Earth
N
100 m

NCW Portion 7a/7b

Environmental Control Map

Legend

- Access Gate
- Business Development
- Commercial
- Industrial
- Infrastructure
- Mixed Use
- Northern Corridor Works Project area
- Public Recreation
- Rail Corridor Noise Barrier
- Residential
- Sediment Fence
- Surface drainage
- Underground Stormwater
- Urban_E/N: Urban Exotic/Native
- Vehicle access from site
- Vehicle access to site

James St
Fullers Rd
View Ln
View St
A1
McIntosh St
Brown St
Victoria Ave
Railway St
Thomas St
Katherine St
Albert Ln
Albert Ave
Orchard Rd
Cambridge Ln
Day St
Endeavour St
Post Office Ln
Anderson St
Victor St
Ferguson Ln
Wilson St
Access Gate
O'Brien St
Zinnia Ln
Tulip St
Iris Ln
Daisy St
Kirk St
Lane W124
Archer St

Next Down ROSEVILLE

Next Up ARTARMON

Google Earth

Environmental Control Map – Portion 7

Construction / Environmental Aspect	Description
Environmental Control Map	• This ECM is a supplementary document to Northern Corridor Works (Enabling works for Sydney Metro City and Southwest, Chatswood to Sydenham) CEMP and applies to the laydown area listed which will be used during construction phase of Northern Corridor Works (The Project). • The intent of the Northern Corridor Works is the realignment of the T1 North Shore Line between country side of Chatswood Station and Brand St, Artarmon, approximately 1 kilometre in length. This is to accommodate the new metro tracks to be constructed between the country and city rail lines, and the future construction of the Chatswood tunnelling dive site.
Construction Work Stages	• For key construction diagrams and staging refer to concept design working brief drawings detailed in the CEMP. • Laydown areas will be in use from July 2018 to December 2021
Possession Program	• Laydown areas will be in use mainly during possession activities, midweek night works and during standard construction hours from July 2018 to December 2021. Note: Possession staging plan may change during construction program.
Induction / General	• All staff and contractors to be trained on environmental issues and location of sensitive areas. • All staff and contractors are to be made aware of sensitive receivers (residential areas) adjacent to the work site. • All staff and contractors are to be made aware of heritage items present in the area. • Daily pre-start/toolbox meetings to include this Environmental Controls Map, relevant erosion sediment control plans and to address specific day to day environmental concerns. • Works will be subject to inspections by the EMR, Sydney Metro Environment and Planning Manager and LOR Environmental Manager. • This ECM along with erosion sediment control plans will be displayed on site sheds and Environmental Notice Board.
Contamination	• All workers would attend a site induction outlining the location, nature, type and concentration of contaminants present on site. • Unexpected contamination finds will be managed onsite by occupational hygienist in attendance. - If the following are found stop work immediately and contact the Project Environmental Manager - buried structures such as underground storage tanks and the associated pipe work - volatile contaminants - asbestos - uncovering of earth with visual signs or odour that indicates unexpected contamination • All plant used in a contaminated zone must be cleaned and a clearance certificate issued to ensure clear of all contamination before leaving the contaminated area. • Contaminated material to be stockpiled using controls identified in the ESCPs. • Air monitoring will be conducted during ground breaking works in asbestos contaminated zones as directed by the occupational hygienist
Air Quality	• All vehicles carrying loose or potentially dusty material to and from the site would be fully covered • Dust emissions from works controlled through wetting down using suitable method for works – this will include water cart, fine mist spray or hose • Weather monitored daily on site (BOM). • Stockpiles would be maintained and contained appropriately, which could include covering or regular watering to minimise dust • Haul roads will be maintained using dust suppression regularly, particularly in hot and windy conditions • Well maintained plant/ equipment and pre-start checks and servicing. • Non-compliant vehicles removed from site / repaired. • If required, dust monitoring will be completed to assess total suspended particulates. • All vehicle and machinery movements during construction is restricted to designated areas. Wheel cleaning controls such as cattle grids and ballast pad will be provided at the NCW site exit area to remove mud and dust from vehicles. All site vehicles and machinery would be switched off or throttled down to a minimum when not in use
Waste	• Construction waste is to be stockpiled in the designated area and is to be separated into material types and re-used or recycled where possible. • Waste to be placed within skip bins and covered prior to recycling or disposal offsite by a licensed contractor • Waste bins to be easily accessible for removal by contractor as required • No spoil to be removed from or imported onto site without approval • Waste register will be maintained for the site • Waste will be transferred to licenced waste facility only • All wastes would be assessed, classified, managed and disposed of in accordance with the NSW Waste Classification Guidelines • Removal of wastes from the site would only be undertaken by a licensed contractor as required by the POEO Act and with appropriate approvals, if required, for contaminated materials, etc.
Soils and water	• Erosion and sediment control plans will be designed and agreed upon by the Environmental Manager and Site Supervisor for each construction activity. All environmental controls outlined in the plans are to be installed. Practical control measures will be installed as per a progressive Erosion and Sediment Control Plans. • All stockpile and drainage lines to be protected. Control materials such as sediment fences, geo-fabric material and sandbags to be used where appropriate. During inclement weather, for example strong winds, stockpiles will be covered using geo-fabric material, plastic and/or sprayed with soil stabilising products. • No uncontrolled discharge of water. If dewatering is required on site then water to be tested prior to discharge or reuse on site. The form *Approval to discharge or reuse water 9TP-FT-160* is to be completed for all dewatering or reuse water options planned on site. The Environmental Manager is to approve all water discharging activities. • Concrete washout is to be installed for all concrete washout activities. The concrete washout is to be lined an impervious layer and bunded with earth-berms or sediment fence line. • Water carts will be used where required during the possession activities. • Sediment controls: sediment barriers are to be installed at lower elevation points of stockpiles, site boundary and stormwater pits.
Heritage	• If suspected heritage item encountered. Works to stop immediately and Environmental Manager contacted. • A number of items of heritage significance have been identified within the proposal area, the items include: • Artarmon Railway Station Group: listed on the RailCorp s170 heritage register (the Artarmon Station is 570m away from the Cleland Rd site compound and is unlikely to be impacted by the works in this area). Where works include excavation within the heritage cutilage, ensure that Archaeological Method Statement was developed in consultation with OEH. • If intact subsurface elements are uncovered during the works all work in the vicinity of the find must cease and appropriate advice would be sought from OEH and/or heritage consultants. Work in the vicinity of the find would not re-start until clearance has been received. • If previously unidentified Indigenous heritage items are uncovered during the work, all work in the vicinity of the find must cease and appropriate advice would be sought from OEH and/or heritage consultants. Work in the vicinity of the find would not re-start until clearance has been received. • Unexpected finds of heritage items must be reported to the LOR Environmental Manager and Sydney Metro. Stop work and implement the Unexpected Heritage Finds Procedure
Noise and Vibration	• All works will be completed in compliance with Sydney Metro CEMF, SSI 15_7400 Planning Approval, Construction Noise and Vibration Strategy and EPL 12208/EPA requirements. • All plant used regularly on site will have non-tonal alarms • Additional standard and additional mitigation measures and per the CNVMP should be considered for construction activities which are within close proximity to the sensitive receivers. This may include, but would not be limited to: ○ Consideration should be given to scheduling noisy construction activities in the vicinity of sensitive residential receivers during standard construction hours. ○ Turn off plant that is not being used. ○ Ensure plant is regularly maintained, and repair or replace equipment that becomes noisy. ○ Monitor noise levels (regular compliance monitoring during standard construction hours and during out of hours works i.e. rail shutdown possessions) to ensure compliance with project noise management levels and as additional mitigation measures for OOHW. ○ No banging of car doors. ○ Workers will be briefed to avoid shouting and yelling on site and when leaving and coming to the site ○ Community notifications will be drafted and sent to Sydney Metro Community Liaison team separately. ○ Vehicles leaving or entering site are to be staggered where possible. ○ Use of noise barriers adjacent to noise plant and equipment

	• Vibration criteria must be applied for any works adjacent t heritage structures • Works to be reassessed if noise levels exceed 20dB above the Rating Background Level. • All out of hours works require approval from the Sydney Metro. • For out-of-hours works, community notification is required no less than 7 days before activity commences
Traffic and Transport	• All delivery drivers will be given an induction showing the designated haulage routes. • All Site vehicles shall be parked within the rail corridor and not affect public parking area. • Additional traffic controls will be implemented in accordance with TCP(s) as approved by Willoughby City Council. • Plant movements are restricted to the designated traffic routes and will be in standard construction hours. If plant is required to be delivered outside of normal hours due to safety concerns contact Environmental Manager for approval via Sydney Metro. • Access requirements will be managed by using existing driveways and hard stand roads into the site areas. • All delivery drivers will be given an induction covering relevant environmental controls to their activities. • Car park areas have been designated for all staff and worker vehicles. The gate entry/exit supervisor will direct vehicles to designated car park areas. • Additional traffic control will be implemented as required. • All closures are expected to be for minor durations (less than 5 minutes). Any closure will be managed in accordance with the TCP. • All vehicles to enter rail corridor immediately on arrival to gate • Plant and vehicles engines to be switched off when not in use, with engine idling minimised as much as possible. • For details on designated parking areas, site access, traffic routes and traffic management requirements please refer to the projects **Construction Traffic Management Plan** and **TCPs**.
Utilities Management	• All works breaking earth, including posts for sediment fence, require an Authorised Permit to Disturb. Permits will be held on central database and permits controlled by an Authorised Permit to Disturb officer. • Permits to excavate will be kept on a register, time limited and must be approved by senior engineer / construction manager • If unexpected services are found stop work immediately and inform your supervisor / manager
Biodiversity	• Coastal Enriched Sandstone Dry Forest to be protected at all times. • If threatened flora or fauna species are identified on site, work in the vicinity of these species would stop immediately. A spotter/catcher would be engaged to survey the site and advise on species management. • Pre-clearance survey required prior to removal of any native vegetation. The Tree report to be updated, endorsed by the ER and submitted to DP&E for information prior to removal. • If any native fauna discovered contact the Project Environmental Manager. • Native vegetation shown in the ECMs is to be protected during construction phase of NCW. • Vegetation clearance is restricted to the area of works. No clearing or grubbing outside of the areas identified for these stages of work. • Cleared vegetation disposed of at appropriate facility as Green Waste or buried to the required depth to prevent seed germination. • Any vegetation clearance requires approval from Sydney Metro. Notification to project Environmental Manager is required at least four weeks prior to removal.
Visual Amenity	• Removal of graffiti along the fencing/hoarding around the laydown areas. Removal to be within the timeframe - for offensive graffiti (should be addressed with 24 hours) and non-offensive (to be within 7 days or as agreed) • Lighting orientated to minimise glare and spill and comply with AS: 4282:1997 • Noise and visual mitigation screening to be implemented prior to commencement at work location
Chemical and fuel storage and use	• Any chemicals brought onto site must be verified and registered in a SDS. SDS must be kept on site. • All chemicals or hazardous materials to be stored in the location identified in the ECM and in accordance with EPA regulations including 110% bunding • Spill kits located at site compound. Portable spill kits available in site vehicles • Refuelling is to be undertaken using suitable measure to prevent contamination – this should include the use of absorbent pads to prevent splash back spills. • All plant checked daily to ensure there is no leaking oil, fuel or other liquids
Imported materials	• All imported materials must be validated to ensure materials meet applicable criteria • All sources of imported materials must be approved • If you are required to import any materials onto site contact the Environmental Manager
Sensitive environmental receivers	• Environmentally sensitive areas located at close proximity to NCW site boundary, and areas identified to have potential impact from construction activities at the NCW. • Sensitive environmental receivers include; noise catchment areas as identified in noise and vibration assessment, and relevant community areas.
Noise catchment areas	• Noise monitoring will be carried out throughout the duration of construction work stages. Monitoring will occur at the noise catchment areas represented in the CEMP/CNVMP. Monitoring is to be completed to determine potential high noise impact works, plant and machinery compliance, NCW noise levels recorded at noise catchment areas, inaudibility and Out Of Hours works.
No-go zones	• Construction activities will be restricted to the rail corridor and areas identified within the project planning approval determination. Information will be made to the Environmental Manager prior to construction activities occurring outside the NCW site boundary and as identified in the CAFMP. • All construction activities outside the NCW site boundary and as identified in the CAFMP will undergo a review for potential environmental impacts and require approval from Sydney Metro. • Environmental controls will be designed and constructed for all works areas to prevent all potential risks associated to construction activities outside of the project boundary prior to undertaking any works.

Standard Working Hours

Audible construction works unless otherwise approved by the Environmental Manager will be restricted to:

- **7:00AM to 6:00PM - Monday to Friday**
- **8:00AM to 1:00PM - Saturdays**

No work on Sundays or public holidays

Any works outside of the hours above require OOHW and Sydney Metro and LOR Environmental Manager's Approval

"High noise impact works and activities must only be undertaken:

a) between the hours of 8:00am to 6:00pm Monday to Friday;
b) between the hours of 8:00am to 1:00pm Saturday; and
c) in continuous blocks not exceeding 3 hours each with a minimum respite from those activities and works of not less than 1 hour between each block"

ER Endorsement

Name	Date
Peter Hatton	05/09/19

Document Control

Document number	Version	Status

Contact Information

Position	Name	Phone
LOR Project Leader	Ken Falano	0437 022 668
LOR Construction Manager	Noel McCarthy	0428 935 784
LOR Environment Manager	Charlotte Malone	0407 061 932
LOR WHS Manager	James Latu	0417 637 135
ER	Peter Hatton	0436 451 153
Sydney Metro Communications Manager	Vanessa Lum	0412 480 116
Sydney Metro Environmental Manager	Andrew Hendy	0475 983 494
Sydney Metro Northwest Info Line		1800 019 989
Sydney Trains Info Line		131 500
Environmental Line / Pollution Incident Response Line		131 555
Office of Environment & Heritage Pollution Line		131 555
Emergency		000 or 112
WIRES		1300 094 737

13.4 Design

Environmental design requirements are to be managed in accordance with System Requirement Environmental Design. Where Laing O'Rourke has the responsibility for the completion of design activities, design risk and compliance obligations are to be included in the project environmental risk assessment and the project's risk and opportunity assessment.

The Northern Corridor Works is a managing contract in which Laing O'Rourke is responsible for the design functions.

The following environmental issues will be considered during the design of both the permanent and temporary works:

- How to minimise any adverse impacts on the environment including energy efficient operation, incorporation of sustainable or recycled materials;
- How to improve design efficiency to conserve natural resources;
- Temporary lighting used during construction shall be utilised and operated in accordance with accepted best practice and relevant Australian Standard;
- All surfaces having direct public access will be maintained free of all graffiti and advertising that has not been authorised by the proponent. Suitable and effective surface finishes shall be included as required;
- Address the requirements of Laing O'Rourke's sustainability agenda; and
- How to meet environmental codes, regulations and other requirements.
- Conditions of approval and development consent requirements
- Mitigation measures outlines in the environmental assessments
- Contractual environmental design requirements and Scope of Works and Technical Criteria (SWTC)

These issues should be considered, while taking into account the practicalities and economic realities of the project/site.

Design Execution plans are to outline the environmental compliance requirements necessary for the project to meet its environmental obligations. In particular, the Design Execution Plan is to describe the project specific design approach to minimising impact of the works on the surrounding ecology, water, flora, fauna and atmosphere, e.g. appointment of specialist consultants, carbon accounting, design environmental assessments.

Design Execution Plans are to outline the environmental design review process and nominate the environmental resources required to ensure environmental compliance obligations are addressed during the design phase. Environmental compliance obligations are to be reviewed and verified at each design stage.

13.5 Procurement

The supply of goods and/or services by suppliers and subcontractors will be managed in accordance with the System Requirement Procurement and Supply Chain and Core Process. In particular:

- During the tender phase, supply chain partners are to be evaluated for their ability to meet the project's environmental obligations. Environmental issues should be taken into account when selecting subcontractors and suppliers and as provided in E-P-3-0410 Procure Evaluate Select and using ET-3-0461e ITT Part 3 Supply chain HSES Evaluation.
- Supply, subcontract and consultancy agreements must address the relevant environmental compliance
- obligations. Agreements will outline the contractual requirements to be delivered by the supply chain through their scope of works and as outlined in the System Requirement Procurement and Supply Chain.
- Suppliers of chemicals and hazardous substances will be required to submit SDS's with delivery or prior to chemicals arriving at site. Prior approval to bring hazardous substances to site may need to be obtained from TfNSW.
- Supply chain partners are to be required to nominate relevant environmental risks and proposed mitigation measures associated with their scope of work within their project specific documentation. As a minimum subcontractors, SWMS must address the environmental risks associated with their site activities.
- The environmental performance of subcontractors will be monitored during site inspections and in accordance with the obligations in their agreements and contracts.

13.6 Handling, Storage, Packaging and Transport

The handling, storage, packaging and transport of goods will be controlled in accordance with the Procurement Swim Lane in Enabling process and E-P-3-0410 Procure Evaluate Select.

Dangerous Goods/Hazardous materials will be stored and handled in accordance with Safety Data Sheets and the requirements of the Australian Dangerous Goods Code.

The Dangerous Goods (Road and Rail Transport) Act 2008 includes specific requirements in relation to the transport of dangerous goods. Where dangerous goods are to be transported as a result of the project, the requirements of the Act must be complied with by Laing O'Rourke and third parties.

In particular, regardless of the quantity, appropriate transport documentation must be included with each load unless a specific exemption exists.

Transport documentation must include the following:

- Project/workplace name, contact number;
- Transporter name, contact number;
- Driver/operators name and contact number;
- Transport date, origin and destination; and
- Product name, classification, container type and/or size and quantity.

These materials will be stored in a safe area (e.g. bunded and/or store) which will prevent or contain accidental spillage and harm to the environment. Further details are provided in **Appendix D** in the ERAP - Delivery and Storage of Chemicals, Fuels & Oils and including Dangerous Goods requirements. (This is a new ERAP, not discussed before)

SDS's must be stored along with or at the point of storage.

13.7 Manufacture, Construction and Fabrication Processes

These processes will be carried out in accordance with LOR Quality & Process Rules and Processes. These processes will be controlled in accordance with the Project Team (Operations/Construction & HSEQ) Swim Lane and the procedures provided in 2237 Plan Workmanship, Quality Inspections and Commissioning.

Environmental requirements, relating to manufacture, construction and fabrication processes, are defined in:

- Construction methodologies, Safe Work Method Statements and JSEAs;
- Inspection and Test Plans, Task Complete Checklists and associated documents;
- Contract documents; and
- Environmental control procedures

13.8 Life Cycle Perspective

The life cycle approach (or life cycle perspective) means understanding the relevant stages of a product or service system, from raw material acquisition or generation from natural resources to final disposal. Laing O'Rourke's System Requirement Life Cycle Approach outlines the process for ensuing this approach is taken on our projects.

From a project perspective, the life cycle approach applies to the following:

- Work Winning (estimating & cost planning, business development, bids & proposals)
- Commercial (head & sub-contract formation)
- Engineering (feasibility studies, concept design, front-end engineering design, detailed design)
- Procurement (supply and delivery of goods and services)
- Delivery (construction, commissioning)

At each stage of project delivery Laing O'Rourke will determine the aspects and opportunities to influence lifecycle Outcomes including but not limited to:

- Stage in the life cycle of the product or service
- Degree of control the business has over the life cycle stages
- Degree of influence it has over the life cycle
- Life of the product
- Ability to influence on the supply chain

13.9 Planning for high environmental risk activities

Works site planning processes for high environmental risk activities is outlined in the System Requirement Environmental Planning which forms part of the Laing O'Rourke HSEMS. Details of specific activities considered high risk are provided in the system requirement. Additional activities may be identified in the project environmental risk assessment.

For all activities that have the potential to cause high-risk environmental impacts or are nominated as high risk activities as determined by the project environment risk assessment activity specific method statements are to be developed and implemented.

The activity specific method statement to address environmental high risk activities may be combined with existing construction planning documentation. It is to be developed in consultation with the environmental team, engineering team and relevant workplace supervisors.

Prior to the commencement of the activity, the site team shall be instructed on the key environmental risks and the required mitigation measures provided in the activity specific work method statement to address high risk activities.

This also applies to supply chain partners operating on the site. Supply chain partners involved in activities that represent a high risk to the environment are to address the above requirements in their activity methodologies and method statements. Supply chain partners involved in these activities are to complete an environmental risk assessment workshop prior to the commencement of the activity.

13.10 Plant and Equipment

Primary Standard Spill Prevention includes requirements related to the fuelling and servicing of plant and equipment. These requirements represent the minimum requirements within Laing O'Rourke HSEMS. Additional project specific requirements and specific controls may be included in the issue specific sub-plans or ERAPs.

Plant and equipment owned by Laing O'Rourke will be maintained in a safe and serviceable manner in accordance with Project Team (Operations/Construction & HSEQ) Swim Lane and the procedures provided in 2113 Plant Operational Control.

The following requirements apply:

- Plant will be inspected prior to operation on site. In particular fuel lines, hydraulic hoses or other items with the potential to impact the environment are to be inspected. Items found to be worn, damaged or otherwise degraded are to be replaced prior to operation;
- Plant will be serviced, re-fuelled and washed-down only in approved areas where hydrocarbons can be captured and then properly disposed;
- Fuelling will be carried out in bunded areas when fuelling from bulk tanks;
- Plant and equipment will be maintained to prevent / fix oil leaks;
- Plant will be driven and operated only in approved areas; and
- Plant will have effective pollution control and sound attenuation devices fitted.

Further information on environmental controls is contained **in Appendix D**.

14. Emergency Preparedness and Response

Environmental emergencies, and relevant preparations, are shown in **Appendix H**.

The client and relevant statutory and regulatory authorities (such as the EPA) will also be informed as necessary. Environmental emergencies will be handled as follows:

- Immediately report all incidents to the Project Leader and Construction Manager who will assess the situation and manage the following steps:
- Immediately take all reasonable steps to contain further damage or danger to personnel, public, property and the environment
- Inform relevant authorities in accordance with the regulatory requirements provided in Section 16 below.
- Contact emergency service personnel as necessary (eg. fire dept., spill clean-up services, etc.).
- Provide notification to the HSE Leader, HSE General Manager and Head of Legal immediately via phone and email.
- Inform the Client's Representative as necessary and in accordance with contractual requirements (nominated in **Table 10**)
- Complete a detailed report of the incident using IMPACT.
- Liaise with the Client's Representative and ER regarding corrective and preventive actions required and the timeframes within which these actions must occur.
- The designated personnel will undertake the corrective and preventive actions.

Information on the handling of hazardous materials is contained in the SDS file. Emergency Services contact numbers are to be displayed in the main site office. Project Emergency contact numbers are included in the table below:

Table 12: Emergency Contact Details

Contact	Phone Number	Address
EPA Pollution Hotline	131 555 or (02) 9995 5555 (if calling from outside NSW).	City of Parramatta, 10 Valentine Ave, Parramatta NSW 2150
Ministry of Health	(02) 9391 9000	73 Miller Street North Sydney NSW 2060 Australia
SafeWork NSW	13 10 50	Not Applicable
Fire and Rescue NSW	000	211-217 Castlereagh St, Sydney NSW 2000
Willoughby City Council	(02) 9777 1000	Level 4, 31 Victor Street Chatswood NSW
Sydney Metro 24-hour Enquiries Line (Sydney Metro Communications Manager)	1800 171 386	Not Applicable

The emergency response process is to be periodically tested via an environmental emergency drill at intervals not exceeding 12 months.

Specific system requirements related to environmental emergencies are outlined in System Requirement Emergency Planning and Response.

14.1 Site Shutdown Planning

Site shutdown periods must be planned and coordinated to ensure the risk of environmental impact is minimised. Shutdown periods are considered to be any period in which construction activities are not planned to take place on the site for more than 3 consecutive days. This includes public holiday and RDO periods. Site shutdown planning must be undertaken in accordance with System Requirement Environmental Planning. Planning activities must ensure that inspections, resources and contingency measures are agreed and implemented for the shutdown period. This is to be document in a specific Shutdown Go Pack.

15. Monitoring and Measurement

Key characteristics of the Northern Corridor Works operations and activities which have a significant impact on the environment will be regularly monitored and measured.

This will include:

- Recording of information to track performance;
- Monitoring operational controls; and
- Level of conformance with objectives and targets.

E-T-8-1227 Environmental Inspection Report (**Appendix I**) will be used to monitor environmental issues on site and issued to the Project Leader. The report will be completed on a weekly basis or as required for works under rail possession basis.

A supervisor's safety and environmental checklist E-T-8-0905 Management H & S and Environmental Checklist (**Appendix J**) will be completed by the project supervisors to monitor environmental issues on site and issued to the Project Leader for review and endorsement. Issues identified during environmental inspection requiring further action beyond normal practice or maintenance and are to be logged into IMPACT via the Assurance Application or retained in Fieldview as defined in the project procedures. IMPACT is a LOR software application which records, collates and distributes Health, Safety and Environmental (HSE) data. HSE Dashboards in Impact will be included as part of a Monthly Project Review and issued the Business Unit Managers on a monthly basis.

Non-conformance to operational control procedures or to the Environmental Management System that cannot be rectified immediately will be recorded and addressed by raising a E-T-8-0113 Non-conformance Report or logged into the Assurance application in Impact.

The following environmental issues/ non-conformances are to be included on IMPACT for the required corrective action.

- Internal inspection outcomes that cannot be rectified immediately actions nominated on E-T-8-1227 (**Appendix I**) and E-T-8-0905 (**Appendix J**)
- Incidents and associated corrective actions;
- Internal audit observations/non-compliance;
- Client audits or other notice of non-compliance; and
- Notices or action from regulatory authorities.

Where environmental inspection or monitoring outcomes will be recorded into IMPACT, a workplace visit is to be created and the associated actions generated. Where deemed necessary by the Project Environmental Manager and as a result of revisions to project scope or changes to project risks, additional Environmental Risk Action Plans to control potential impacts will be developed.

As required under CoA C9, Construction Monitoring Programs were prepared in consultation to the relevant government agencies. Each construction monitoring program has been incorporated into the relevant CEMP sub-plan and are included below:

- Construction Noise and Vibration Monitoring Program - A specific monitoring program has been prepared for Portion 7b and has been endorsed by the ER and submitted to DP&E for approval.

All monitoring data is to be made available to the relevant agencies, the ER, AA, Sydney Metro and the construction team in accordance with CoA C11.

It is noted that 'Blasting' (a feature of the broader Sydney Metro City and Southwest project) is not required for the NCW project. Blasting has not been addressed in the CNVMP and as a result, a construction monitoring program was not prepared.

The Environmental Manager would be in attendance at any ER site inspections and would be responsible for actioning and responding to any identified corrective actions in accordance with the CAR Register timeframes outlined in Section 15.1 and as agreed with the ER.

If monitoring and measuring equipment is required, then it will be calibrated, maintained and controlled in accordance with Project Team (Operations/Construction & HSEQ) and the procedures provided in Plan Workmanship, Quality Inspections and Commissioning. Records of calibration will be kept in the Contract Filing System.

15.1 Non-Compliances and Corrective Actions

Non-conformance arising out of the above monitoring, inspections and audit outcomes shall be recorded and addressed by raising a Non-Conformance Report F 0103 and logged within IMPACT. Sydney Metro or the Environmental Representative may raise non-compliances against environmental requirements. All communications from Sydney Metro (including CAR's and Audit reports) expressing concern or dissatisfaction with the implementation or operation of the CEMP shall be documented in the Assurance

application in IMPACT. Management system non-conformances and recurring environmental incidents will be handled in accordance with the LOR EMS – Corrective and Preventative Action Procedure by the Environmental Manager.

The Environmental Manager is responsible for the investigation, tracking and ensuring appropriate closeout of non-compliances, corrective and preventative actions.

Corrective and preventive actions may include:

- Site remediation and rehabilitation
- Increased site inspections and monitoring
- Increase environmental awareness (re-training, tool-box meetings)
- Review and improve existing environmental controls and job safety analyses/ work method statements

Corrective actions are differentiated by risk ranking. The nominated timeframes to resolve items on the Corrective Actions Requests (CAR) Register are as follows:

Table 13: Corrective Actions Timeframes

Risk Ranking	Timeframe for resolution
1	Action needs to be commenced immediately to resolve the issue
2	Action needs to be resolved within 1 week.
3	Action needs to be resolved within 1 month.

Actions will be resolved within the required timeframe and the CAR closed on Impact.

Refer to the Project Team (Delivery) Swim Lane in Core Process 66 Compliance and C-P-8-0107 Continual Improvement Corrective and Preventative Action for further detail.

Further monitoring and reporting activities against operational objectives and targets are listed in Section 9 of this Plan. If monitoring and measuring equipment is required, then it will be calibrated, maintained and controlled in accordance with Project Team (Operations/Construction & HSEQ) Swim Lane and the procedures provided in 2237 Plan Workmanship, Quality Inspections and Commissioning. Records of calibration will be kept in the Contract Filing System

15.2 Environmental Reporting

Laing O'Rourke's approach to environmental reporting is outlined in System Requirement – Communication and Reporting. Monthly environmental reporting is to be completed through Laing O'Rourke's Digital Contract Review process. The Project Leader or Workplace Leader is responsible for ensuring environmental performance information is included in each months Digital Contract Review such as the following as necessary:

- Summary discussion on project risks and opportunities – to be read in conjunction with the risk register
- Environmental performance outcomes, improvement initiatives or corrective measures
- Client and stakeholders engagement and interface. In particular, client feedback on project environmental performance.
- Environmental incident and event management including the outcomes from incident investigations and corrective actions
- Content for the environmental project dashboard

Client reporting requirements are to be included in this Construction Environmental Management Plan (CEMP).

Subcontracts and supply chain agreements must include supply chain reporting requirements as necessary. This may include the following:

- Environmental management reporting requirements and key performance indicators
- Waste management reporting
- Project specific conditions of approval or environmental compliance reporting requirements
- Greenhouse gas and life cycle reporting
- Supply chain environmental performance reporting shall be used as necessary to inform project and workplace environmental reporting.

The project shall complete on a monthly basis, the Sydney Metro City and Southwest Environmental and Sustainability reports **(Appendix M)**. Each report is to be included in the Monthly Project Review.

This would consist of the following:

- Compliance tracking program (MCoA A29)
- Construction compliance reports (MCoA A34)
- Environmental auditing program (MCoA A37)

- Construction monitoring programs (MCoA C9)
- Environmental Inspections undertaken by ER
- Environmental Inspections undertaken by Acoustic Advisor

15.2.1 Monthly Project Environmental System Self-check

On a monthly basis, the project will assess the performance and implementation of the project environmental system through the project Environmental System Self-check. Outcomes of the project environmental system self-check are to be retained in the project records.

The table below outlines the requirement and criteria to be revised and the relevant frequency.

Table 14: LOR Monthly Self-Check

System Requirement	Criteria	Frequency
Severe Environmental Risk Program	Program implemented and actions complete	Monthly
Site inspection implementation	Site inspections have been completed in accordance with the environmental management plan requirements.	Monthly
Event management	Environmental incidents have been reviewed, investigations completed and actions closed out.	Monthly
Environmental Monitoring Program	Environmental monitoring has been completed and reviewed for compliance. Non-compliances have been actioned and closed out	Monthly
Waste management	Project waste management register is up to date including spoil management and disposal	Monthly
Conditions of Approval tracking	Conditions of approval compliance matrix has been reviewed and updated demonstrating compliance with conditions	Quarterly
Environmental Licences	Environmental licence compliance has been reviewed and reporting completed as nominated.	Quarterly

15.2.2 Supply Chain Environmental Compliance Obligations Review

Suppliers and subcontractors operating on the project will be subject to environmental performance requirements.

Environmental performance requirements will apply to all suppliers and subcontractors in accordance with the supply or subcontract agreements.

To ensure supply chain environmental performance requirements are being met on the project the following will be implemented:

- Supply chain audits - audits of the implementation of supply chain environmental systems on projects will be undertaken. Supply chain audits will verify implementation of the environmental requirements from their respective agreements.
- Environmental inspections on the project will review supply chain performance.
- Monthly Environmental Reports - as required to report on environmental performance and as outlined in supply chain agreements
- Waste disposal reporting - all supply chain partners operating on site with obligations for waste disposal will maintain waste disposal records and provide reports on a monthly basis
- Environmental Monitoring - where required by their supply chain agreement environmental monitoring to verify environmental performance targets are being met is to be undertaken and reported.

If contractor work on the site is being performed contrary to the contractor's plan and / or applicable legislative requirements, action will be taken immediately. This may include a direction to stop work and issuing a relevant site instruction to address the non-compliance to works procedures and environmental controls.

15.3 Compliance Reporting

Reports on compliance with the approval or any other statutory requirements will be submitted to Sydney Metro for inclusion in the Construction Compliance Reports prepared and submitted by Sydney Metro to the Secretary for information every six (6) months from the date of the commencement of construction or within another timeframe agreed with the Secretary, for the duration of construction. The Reports will include:

(a) a results summary and analysis of environmental monitoring;
(b) the number of any complaints received, including a summary of main areas of complaint, action taken, response given and proposed strategies for reducing the recurrence of such complaints;
(c) details of any review of, and minor amendments made to, the CEMP as a result of construction carried out during the reporting period;
(d) a register of any consistency assessments undertaken and their status;

(e) results of any independent environmental audits and details of any actions taken in response to the recommendations of an audit;
(f) a summary of all incidents notified in accordance with Condition A41 and Condition A44 of this approval; and
(g) any other matter relating to compliance with the terms of this approval or as requested by the Secretary.

The Compliance Tracking Reports will be provided to the Environmental Representative for information

15.3 Complaints reporting

All complaints made by the community and stakeholders should be managed in accordance with the Sydney Metro City and South West Community Consultation Strategy – Section 8.14

Any information and/or monitoring data required to complete investigations into complaints by the Sydney Metro project communications team will be provided in accordance with Table 16 of the Sydney Metro City and South West Community Consultation Strategy.

16. Incidents and Complaints

The management, investigation, reporting and notification process for environmental events, including positive events is to be undertaken in accordance with the System Requirement Event Management and Reporting.

All incidents and complaints (including potential incidents) must be reported so that they can be investigated and prevented from recurring.

Form E-T-8-1222 Environmental Incident and Complaint Report shall be completed and issued to the Project Leader for all Potential or Actual Class 1 or Class 2 incidents. The completion of E-T-8-1222 Environmental Incident and Complaint Report for Class 3 incidents is at the discretion of the Project Leader. Notwithstanding Class 1, Class 2 and Class 3 incidents are to be recorded in IMPACT.

Incident Reporting & Investigation from the project sites is to be recorded in IMPACT, LORA's Online Incident Investigation Reporting Tool. IMPACT can be accessed from the LORA Intranet Home Page or remotely connected via the Internet where connection is possible and direct access to the LORA Intranet is not available. Incidents are to be logged in Impact within 48 hours of occurrence. For Class 1 and Class 2 incidents, an investigation must also be logged in Impact.

Incidents involving failures in hydraulic equipment shall have an E-C-8-1426 Hydraulic Incident Notification completed to identify the potential causal factors associated with the incident.

The HSE Leader, HSE General Manager and Head of Legal shall be notified by telephone as soon as practicable after any Actual or Potential Class 1 & Class 2 Incidents with the potential to result in regulatory action.

The classifications are explained in detail with examples in the Laing O'Rourke Environmental Incident Classification Guidelines which is available in the System Requirement Event Management and Reporting.

Class 3 Incidents

Where a Class 3 incident has occurred, the Laing O'Rourke Construction Manager or immediate supervisor is to be informed. Class 3 incidents must be logged directly into IMPACT.

Actual or Potential Class 2 Incidents

Where an actual or potential Class 2 incident has occurred, Group Management is to be informed via the Project Leader.

Class 1 Incidents

Where a Class 1 incident occurs the Laing O'Rourke HSE General Manager and the Head of Legal are to be informed immediately. The requirements of the Figure 1 in **Appendix H** and **Appendix I** are to be applied to all actual or potential Class 1 environmental incidents.

All Class 1 & Class 2 incidents will be reported to the relevant State & Federal Authorities as required under relevant Acts & Regulations. Further details are provided in the section 16.2 - External Incident Reporting.

See **Appendix H** and **Appendix I** for environmental incident investigation guidelines.

E-T-8-0951A HSE Internal Incident Notification shall be completed for all Actual & Potential Class 1 & Class 2 Incidents within 24 hours of the incident occurring and sent (email/fax) to the Distribution List as below:

- Project Environmental Representative
- Project Leader
- Director
- Environmental Leader
- Area Manager
- HSE General Manager
- Head of Legal

Complaints

All complaints made by the community and stakeholders should be managed in accordance with the Sydney Metro City and South West Community Consultation Strategy – Section 8.14

Correspondence with Sydney Metro Incident Classifications

All environmental incidents and non-conformances must also be reported to the ER and Sydney Metro in accordance with Sydney Metro Environmental Incident Classification Procedure SMNW ES-PW-303/1.0 to enable reporting to DP&E and/or the EPA within 24 hours of any incident. The corresponding Sydney Metro incident classifications are outlined below.

Table 15: Environmental Incident Classification

LOR Incident Classification					
Class 3			**Class 2 (including Potential)**	**Class 1**	
Class Three Environmental Incidents typically cause short term or nuisance damage. The damage is easily rectified usually within one day. Class 3 incidents do not cause medium or long term damage.			Class Two Environmental Incidents create short to medium term damage to the environment. This damage will result in the environment taking up to 12 months to return to pre-existing conditions. Potential for prosecution or infringement notice.	Class One Environmental Incidents create permanent or long term damage to the environment. This damage will result in the environment taking 12 months or more to return to pre-existing conditions. Major environmental investigation and potential for large prosecution.	
Corresponding Sydney Metro Incident Classification					
C6	**C5**	**C4**	**C3**	**C2**	**C1**
No appreciable changes to environment and/or highly localised event	Change from normal conditions within environmental regulatory limits and environmental effects are within site boundaries	Short-term and/or well-contained environmental effects. Minor remedial actions probably required	Impacts external ecosystem and considerable remediation is required	Long-term environmental impairment in neighbouring or valued ecosystems Extensive remediation required	Irreversible large-scale environmental impact with loss of valued ecosystems

16.1 Incident and Complaints Reporting

Environmental incidents and complaints are to be investigated, documented, actioned and closed out as per the details provided in the investigation process above.

The form E-T-8-1222 Environmental Incident and Complaint Report **shall be completed for all environmental actual and potential class 1 and 2 incidents and complaints** within **2 working days** of the incident and forwarded to the Project Leader.

Laing O'Rourke will provide notification of the incident to the Client's Representative as required and in accordance with Sydney Metro Environmental Incident Classification Procedure SMNW ES-PW-303/1.0. Sydney Metro incident reporting requirements are outlined in Table 14.

A Pollution Incident Response Management Plan (PIRMP) will developed in accordance with 3.10 of the CEMF. The PIRMP will include:

v. Categories for environmental emergencies and incidents;
vi. Notification protocols for each category of environmental emergency or incident, including notification of Sydney Metro and notification to owners / occupiers in the vicinity of the incident. This is to include relevant contact details;
vii. 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 the EPA);
viii. A process for undertaking appropriate levels of investigation for all incidents and the identification, implementation and assessment of corrective and preventative actions; and
ix. Notification protocols of incidents to the EPA, DP&E or OEH that are made by the Contractor or Sydney Metro.

In accordance with the contract requirements, the Client is to be notified as follows:

Table 16: Incident and Complaints Reporting Requirements (DPE Reporting requirements are stated separately in Table 17)

Notification Type	Contract Requirement	Timeframes of notifications						
		External Reporting Requirements					LOR IMPACT Reporting Requirements (LOR Internal Only)	
		Environmental Representative (ER)	Client (Sydney Metro Environmental Manager)	NSW EPA Environment Line 131 555	Sydney Trains	Relevant Council , The Ministry of Health SafeWork NSW Fire and Rescue NSW	LOR Business Unit Manager	LOR Head of Legal
Initial verbal notification requirements	Client's Environmental Representative and Sydney Trains, Client	Immediate verbal notification and email upon occurrence of a class 1, 2 or 3 environmental incident	Immediate verbal notification and email upon occurrence of a class 1, 2 or 3 environmental incident	Immediate verbal notification and email upon occurrence of potential/actual class 1 and class 2 environmental incident class 3 environmental incidents are not typically required to be notified to NSW EPA	Immediate verbal notification upon occurrence of a class 1, 2 or 3 environmental incidents (Sydney Trains to prepare a level 5 report)	Immediate verbal notification and email upon occurrence of a potential/actual class 1 and class 2 environmental incidents Class 3 environmental incidents are not typically required to be notified to local councils.	Immediate verbal notification and email upon occurrence of a potential/actual class 1 and class 2 environmental incidents	Immediate verbal notification and email upon occurrence of a potential/actual class 1 incident Class 2 and Class 3 environmental incidents are not typically required to be notified to Head of Legal.
Environmental Incident Report requirements	Client's Environmental Representative, Client and Sydney Trains	Commence investigation and generate a written report and submit it to the client's ER within 48 hours for actual/potential class 1, class 2 and class 3 incidents.	Commence investigation, implement preventative actions and generate a written report and submit it to the client within 48 hours for actual/potential class 1, class 2 and class 3 incidents.	Commence investigation, implement preventative actions, generate a written report, and submit it to EPA within 7 days via Sydney Metro for actual/potential class 1 and class 2 incident. If report is to be submitted directly to EPA by the LOR, then the same report must go to Sydney Metro at the same time. If it is to be submitted to the EPA by Sydney Metro, then it needs to come to Sydney Metro earlier than 7 days. Class 3 environmental incidents are not typically required to be reported to EPA	Immediate email to Sydney Trains upon occurrence of a class 1, class 2 or class 3 environmental incident with adequate details (Sydney Trains to prepare a level 5 report)	Written report within 24 hours for actual/potential class 1 and class 2 environmental incident. Class 3 environmental incidents are not typically required to be reported to local councils.	For potential/actual class 1 and class 2 environmental incidents, Business Unit HSE Manager must be notified immediately who will then commence investigation and allocate responsibilities. Lodgement of a class 3 environmental incident onto IMPACT within 48 hours. This will automatically notify LOR Business Unit HSE Manager.	For potential/actual class 1 and class 2 incidents, Business Unit HSE Manager must be notified immediately who will then commence investigation, report to the Head of Legal and allocate responsibilities. Lodgement of a class 3 environmental incident onto IMPACT within 48 hours. This will automatically notify LOR Business Unit HSE Manager. Class 2 and Class 3 environmental incidents are not typically required to be reported to Head of Legal.

Class 1 & Class 2 reportable incidents shall be reviewed by the HSE Leader, HSE General Manager and Head of Legal prior to the issue of formal correspondence to external parties or regulatory authorities.

Management system non-conformances and recurring environmental incidents will be handled in accordance with the Project Team (Delivery) Swim Lane in Core Process 66 Compliance and C-P-8-0107 Continual Improvement Corrective and Preventative Action.

Where an environmental non-conformance or incident is identified, Corrective and preventive actions shall be developed and may include:

- Review and improve existing environmental controls and job safety analyses/ work method statements
- Site rehabilitation
- Increased site inspections and monitoring
- Modify construction or installation methods
- Increase environmental awareness including re-training and tool-box meetings

Each incident shall be sufficiently investigated to allow specific and detailed corrective and preventative actions to be identified, actioned and closed out as outlined on Form E-T-8-1222 Environmental Incident and Complaint Report or suitable alternative (ICAM, etc).

Note: where a Class 1 Incident has occurred the HSE General Manager will initiate the investigation and allocate responsibilities, an external consultant may be engaged. Authorities are to be notified in accordance with the legislative time frames in the applicable state.

16.2 Senior Leaders Environmental incident review

For all Class 1 & Class 2 incidents, within 3 days the Project Leader will convene a briefing with the relevant Senior Business Leader/Area/Operations Manager to provide an update on the incident investigation and to allow the Area/Operations Manager to be actively involved in the investigation process. The briefing will include discussion on the progress of the investigation and any specific initial findings. A status report on any rectification work or maintenance activities to the relevant environmental controls will also be provided.

The following information relating to the incident investigation shall be forwarded to the Senior Business Leader/Area/Operations Manager and HSE Leader.

- The condition of the environment and the status of any rectification or remediation works,
- The completed incident investigation report, including appropriate causal analysis and corrective actions,
- Program for the implementation of the corrective actions and any maintenance activities,
- A completed HSE Learning Bulletin template to be included in the monthly Learning Bulletin,
- Any other relevant information.

16.3 External Incident Notification

DPE notification requirements are outlined in CoA A41-A44 as tabulated below. Any incidents will be notified to the Secretary in accordance with these requirements.

Table 17: Incident Notification to DPE

CoA	Requirement
A41	The Secretary must be notified as soon as possible and in any event within 24 hours of any material harm to environment.
A42	Notification of an incident under Condition A41 of this approval must include the time and date of the incident, details of the incident and must identify any non-compliance with this approval.
A43	Any requirements of the Secretary or Relevant Public Authority (as determined by the Secretary) to address the cause or impact of an incident reported in accordance with Condition A41 of this approval, must be met within the timeframe determined by the Secretary or relevant public authority.
A44	If statutory notification is given to the EPA as required under the POEO Act in relation to the CSSI, such notification must also be provided to the Secretary for information within 24 hours after the notification was given to the EPA.

16.4 State Matters

The EPA must be notified immediately of all pollution incidents that cause or threaten material harm to the environment.

As per the *Protection of the Environment and Operations Act 1997* (POEO Act) – EPA will be notified when "Harm to the environment is "material" if the effect (or potential effect) from an incident on the health or safety of humans or ecosystems is not trivial and or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000"

Incidents requiring notification to the EPA must also be immediately notified to the HSE Leader and the Head of Legal.

If an incident presents an immediate threat to human health or property, 000 is to be called in accordance with the procedures outlined in the Construction Health and Safety Management Plan.

The EPA Environment Line is to be contacted on 131 555. The notification will need to include information on:

– The time, date, nature, duration and location of the incident

– The location of the place where pollution is occurring or is likely to occur

– The nature, the estimated quantity or volume and the concentration of any pollutants involved

– The circumstances in which the incident occurred (including the cause of the incident, if known)

– The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution

– Other information prescribed by the regulations

In addition to notifying the EPA of pollution incidents other authorities as outlined below must also be notified immediately:

– The Ministry of Health (via the local Public Health Unit – (02) 9391 9000)

– SafeWork NSW (13 10 50)

– Willoughby City Council – (02) 9777 1000

– Fire and Rescue NSW on 000

Regardless of the actual or potential impact, these authorities must be notified under the amended legislation for all notifiable pollution incidents.

Further information in relation to the incident must be provided immediately if it becomes available after the initial notification.

Records of contact with and details of the information provided to external authorities must be maintained in the project records. IMPACT may be used to record contact with the regulatory authorities.

16.5 Commonwealth Matters

Environmental incidents relating to the *Environmental Protection and Biodiversity Conservation Act* must be notified to the Department of the Environment (DoTE) within 7 days of the event.

These types of incidents include the death or injury to the following:

– Migratory bird species

– Listed marine species

– Threatened species or listed ecological community (includes taking)

16.6 Complaints

All communications from the Client (including CAR's and Audit reports) expressing concern or dissatisfaction with the implementation or operation of the CEMP shall be documented in the Assurance Application in IMPACT.

Public Complaints shall be logged into IMPACT and are to be responded to in accordance with the Sydney Metro Community Communication Strategy (CCS). Environmental Management related complaints will be forwarded to the Environment Manager.

Management system non-conformances and recurring environmental incidents will be handled in accordance with the Environmental Management System – Corrective and Preventative Action.

Corrective and preventive actions may include:

– Site remediation and rehabilitation

– Increased site inspections and monitoring

– Increase environmental awareness (re-training, tool-box meetings)

– Review and improve existing environmental controls and job safety analyses/ work method statements

17. Environmental Management System Audit

Auditing of the project Environmental Management System will be carried out in accordance with the System Requirement Compliance, Review and Assurance. The audit will evaluate compliance with this EMP and associated documentation including legal, contractual and other requirements.

It is expected that the project will be audited within 3 months of commencing on site and approximately every 3-6 months thereafter and in accordance with the Laing O'Rourke Audit Schedule. The relevant HSE Leader, in consultation with the project leadership team, will decide on the frequency, scope and timing of project/site audits.

An audit report will be issued to management for action. Actions will be followed up for close-out of actions within 1 month of the issue of the audit report.

Audits shall be captured within the Assurance application in Impact. Actions associated with audits shall also be logged in the Assurance application in Impact.

An audit report shall be issued to management for action. Actions will be followed up for close-out of actions within 1 month of the issue of the audit report. Following the development and approval of the Pre Construction Compliance Report (PCCR) the Environmental Audit Program will be prepared in accordance with AS/NZS ISO 19011:2014 - Guidelines for Auditing Management Systems and submitted to the Secretary for information. The audit program will meet the intent of CoA A38 and A39 with Environmental Audit Reports as per A40 provided to the Secretary and any recommendations contained in the audit report within six (6) weeks of completing the audit, or within another timeframe agreed with the Secretary.

General Audit Scope:

- PCCR – Compliance to conditions of approval prior to the commencement of construction.
- CCR – Construction compliance report provided every six months after the commencement of construction
- Managing Contractor EMS Audit – Quarterly audit of aspects of Laing O'Rourke EMS.
- Sydney Metro Compliance Audit – Annual compliance audit undertaken by Sydney Metro in relation to compliance to the conditions of approval for Northern Corridor Works.
- Independent Environmental Audit – Annual independent audit undertaken by a third part auditor in relation to compliance to conditions of approval for Northern Corridor Works environmental performance and adequacy of documentation.

Table 18: Indicative timing of audits for NCW project.

	2018				2019				2020			
Audit Type	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
PCCR	X											
CCR			X		X		X		X		X	
Managing Contractor EMS Audit	X		X		X		X		X		X	
Sydney Metro Compliance Audit			X				X				X	
Independent Environmental Audit				X				X				X

18. Management Review

Project Management, will check the status and adequacy of the project Construction Environmental Management Plan (CEMP) to ensure that it meets current client and Company requirements as well as relevant environmental standards.

The Plan will be reviewed as and when required during the course of the contract when the following situations arise:

- Client recommendations for changes (particularly following initial review);
- Changes to the Company's standard system;
- Opportunities for improvement or deficiencies in the project system are identified;
- Regular monitoring of the implementation of the CEMP in accordance with Section 15 of the NCW CEMP by the Environmental Representative; and
- Following an audit of the system or the occurrence of significant incidents and non-conformances.

APPENDIX A - Legal and Other Requirements

The relevant legal and other requirements are shown in the table below. Access to this legislation is available on iGATE at LEGAL COMPLIANCE SERVICE

Table 19: Legal and Other Requirements

Legal and Other Requirements	Summary of Obligations	Relevance to the Project / Notes and System
Environmental Planning Legislation		
Environmental Planning and Assessment Act 1979 *Environmental Planning and Assessment Regulation* 2000	This Act and Regulation establishes a system of environmental planning and assessment of development proposals for the State.	**High Relevance** The approval conditions and obligations are incorporated into the specification documents and Laing O'Rourke's CEMP.
Local Government Act 1993 *Local Government (General) Regulation* 2005	The Local Government Act and Local Government (General) Regulation provide a legal framework for an environmentally responsible system of Local Government including the responsibility to administer various regulatory systems (e.g. Environmental Planning, Development Consents).	**Medium Relevance** The local Council (Willoughby City Council) has powers to control local issues and other than state significant development.
Roads Act 1993 *Roads (General) Regulation* 2000	This Act and Regulation primarily provide for such things as the opening and closing of public roads, identification of road boundaries and road widening, road levels, classification of public roads, road work, protection of public road and regulation of traffic, regulation of work, structures and activities.	**Medium Relevance** This Act is mostly an administrative Act for the RMS and has minor relevance to carrying out the works.
Soil Conservation Act 1938	This Act makes provision for the conservation of soil resources, farm water resources and the mitigation of erosion. The Act is binding on the Crown, however the Crown is not liable for prosecution. The Act provides for notification in the government gazette catchments where erosion is liable to cause degradation of rivers, lakes etc. (i.e. protected land).	**Low Relevance** This Act has low relevance, as the site is not located within "protected land". Further, such notification has not been given to the owner of the land.
Environment Protection and Biodiversity Conservation Act 1999 *(Cwth)*	The main purpose of this Act is to provide for the protection of the environment especially those aspects that are of national environmental importance and to promote ecological sustainable development. The Act binds the Crown. Do not take, use, keep or interfere with "nationally significant" cultural and natural resources, protected wildlife and protected plants without Approval.	**Low Relevance** This Act is of little relevance to the contractor on this project as it has been determined not to trigger the provisions of the act.
Biodiversity Conservation Act 2016 *Biodiversity Conservation Regulation 2017*	The Native Vegetation Act was repealed on 25 August 2017. Provisions dealing with the clearing of native vegetation in urban, peri-urban and environmental areas are contained in a new environmental planning instrument, administered by the Department of Planning and Environment, called the State Environmental Planning Policy (Vegetation in Non-Rural areas) 2017. .	**Low Relevance** The Act has low relevance as clearing of native vegetation is not required for the project.
Land and Environment Court Act 1979	The Land and Environment Court is constituted under this Act. The jurisdiction of the Court is divided into numerous classes. The relevant classes for the project covers matter such as the prosecution for offences under various environmental legislation and to appeal against permits or orders.	**Low Relevance**

		The relevance of this Act would only apply to work under the contract if Laing O'Rourke were prosecuted for an Environmental Offence.
Greenhouse Gas (GHG) Emissions National Greenhouse and Energy Reporting Act 2007	Corporations emitting more than 50kT of carbon dioxide equivalent units are required to register and report their Scope 1 and Scope 2 emissions for all Facilities in which they have Operational Control. Facilities emitting more than 25kT of carbon dioxide equivalent units must register and report Scope 1 and Scope 2 emissions.	**High Relevance** Laing O'Rourke Australia is a registered entity under this act. As such, where Laing O'Rourke has Operational Control, the Scope 1 and Scope 2 emissions associated with the project must be reported. This includes the collation and reporting of subcontractors site emissions. Laing O'Rourke **does** have Operational Control of this facility.
Contaminated Land Legislation		
Contaminated Land Management Act 1997	This Act provides for a process to investigate and remediate land that has been contaminated and presents a significant risk of harm to human health. Section 60 of the Act is a "Duty to Report Contamination". This duty applies to owners of land and persons who become aware their activities have contaminated the land.	**Medium Relevance** The relevance of this Act to the contractor will be in the event suspected or potentially contaminated ground is found during construction activities.
Fire Control Legislation		
Rural Fires Act 1997	This Act is intended to prevent, mitigate and suppress bush and other fires. It places a duty on Laing O'Rourke as the occupier of the site to extinguish fires during bush fire danger periods or if unable to do so notify appropriate firefighting authorities of the existence of the fire and its location.	**Medium Relevance** This project site and surrounding areas are prone to bush fires. Fire exemption would need to be obtained for hot works permits related to track welding works in the months of total fire bans.
Hazardous Substances Legislation		
Environmentally Hazardous Chemicals Act 1985	This Act prohibits the manufacturing, processing, keeping, distributing, conveying, using, selling or disposing of an environmental hazardous chemical or waste (prescribed activity) except under the provisions of a chemical control or a licence. The EPA is required to prepare inventories of environmentally hazardous chemicals and declared chemical wastes.	**Low Relevance** It is not anticipated any environmentally hazardous chemicals or declared chemical waste will be used or stored on the site. The Act therefore has little relevance to the site other than being aware of the existence of registers of declared chemical wastes and environmentally hazardous chemicals.
Dangerous Goods (Road and Rail Transport) Act 2008	The purpose of this Act is to regulate the transport of Dangerous Goods by road and rail in order to promote public safety and protect property and the environment. The transport of Dangerous Goods is required to be appropriately licensed (both vehicle and driver).	**Medium Relevance** The relevance of the Act is in respect to the transport of dangerous good to & from the site. The project will require the use of a variety of

	Depending on the quantities being transported, the Act outlines specific requirements for including appropriate placards on the transport vehicle, emergency procedures, PPE, manifest documentation and fire extinguishers.	dangerous goods. Laing O'Rourke will need to review and ensure Dangerous Goods requirements are addressed where transported by its vehicles, plant and equipment.
Water Management Act 2000 *Water Management (General) Regulation* 2004	This Act repeals the Rivers and Foreshores Improvement Act, 1948 and the Water Act, 1912. The provisions of both the aforesaid Acts are progressively rescinded as Water Management Plans are prepared and gazetted for catchment areas within the state. This Act and Regulation provide for the protection, conservation and ecologically sustainable development of water sources of the State and in particular to protect, enhance and restore water sources and their associated ecosystems.	**No Relevance** This Act has no direct relevance at this time to the construction work under this contract. The project approval does not trigger the provisions of this Act.
Dams Safety Act 1978	This Act constitutes the Dams Safety Committee and confers and imposes on the Committee functions relating to the safety of certain prescribed dams.	**Low Relevance** It is unlikely any action in respect to this project will endanger the safety of any prescribed dam
Coastal Protection Act 1979	This Act requires public authorities to notify the Coastal Council of NSW of any information, proposed activity or work that in the opinion of the public authority is relevant to the exercise of the function of the Coastal Council. It further empowers the Minister for the Department of Commerce to require public authorities to obtain consent prior to carrying out development in the coastal zone or giving consent to a person to occupy or carry out development in the coastal zone.	**No Relevance** The project is not located in areas associated with this act.
National Parks and Wildlife Act 1974	The relevance of this Act is firstly in respect to the protection and preservation of aboriginal artefacts. Discovery of material on site suspected as being of aboriginal origin must be reported and protected pending assessment and direction by TfNSW's Representative. Secondly, it is an offence under Part 8A of this Act to pick or harm threatened species. (Refer to the notes under the Threatened Species Conservation Act for more information)	**Low Relevance** No identified aboriginal artefacts have been identified within the construction area. The only relevance would be if new previous unknown artefacts were discovered during construction
Biodiversity Conservation Act 2016	This Act and Regulations provide for obtaining licenses to harm or pick threatened species populations or ecological communities whether plant or animal or to damage any critical habitat. The offence of picking or harming any threatened species is covered under the National Parks & Wildlife Act Part 8A. It is a defence under Part 8A of that Act if the offence was essential to carrying out development that is in accordance with a Development Consent within the meaning of the EP&A Act or an approval within the meaning of Part 5 of the EP&A Act.	**Medium Relevance** There is a potential for encountering threatened species of flora or fauna listed in the schedules of this Act within the area of the proposed works.
Fisheries Management Act 1994	This Act is applicable to all waters within the state including private and public waters and all permanent and intermittent waters. The Act is most relevant in respect to maintaining water quality and ensuring no polluted water from site works enters streams, creeks and waterways. In addition this Act also has relevance for the removal of marine vegetation.	**Low Relevance** Along with the POEO Act, water discharging from the site must not pollute the adjacent streams or watercourses.
Marine Pollution Act 1987	This Act creates offences for discharges of oil, oily mixtures and noxious liquid substances from ships into State waters.	**No Relevance** This Act has no direct relevance at this time to the construction work under this contract. The project approval does not trigger the provisions of this Act.

Biosecurity Act 2015 *Biosecurity Regulation 2017*	This Act relates to diseases and pests that may cause harm to human, animal or plant health or the environment, and for related purposes. Declared weeds are listed in Schedule 8 of the Biosecurity Regulation 2017.	**Low Relevance** The Act relates to the management of vegetation during and removal activities and the duty to notify should certain pests and diseases be identified.
Water Act 1912	This Act provides for licences to extract water for construction purposes either from surface or artesian sources. Should construction water be extracted from surface (other than sedimentation ponds) or artesian sources a licence will be required.	**Low Relevance** It is not proposed that construction water will be obtained from surface (e.g. creeks, lakes etc.) or artesian sources.
Heritage Act 1977	This Act provides for the preservation and conservation of heritage items such as building, works, relic, and places of historic interest, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance. Under this Act a relic means any deposit, object or material evidence which is 50 or more years old and relates to the settlement of the area (not being an aboriginal settlement). It is an offence under this Act to wilfully and knowingly damage or destroy items of heritage value. Do not demolish damage, move or develop around any place, building, work, relic, moveable object, precinct, or land that is the subject of an interim heritage order or listing on the State Heritage Register or heritage listing in a Local Environmental Plan without an approval from the Heritage Council (NSW) or local council.	**Medium Relevance** Works would be undertaken within the curtilage of a number of local heritage items listed on the RailCorp s170) heritage and conservation register. The proposed work would not affect any original building or station fabric or the heritage significance of these items.
Wilderness Act 1987	An Act to provide for the permanent protection of and proper management of Wilderness Areas and to promote the education of the public in the appreciation, protection and management of wilderness. The Act and associated Regulations provides a mechanism for the identification and declaration of Wilderness areas.	**No Relevance** This project is not within or immediately adjacent to a declared Wilderness area. This Act has little or no relevance to the project.
Plantations and Re-afforestation Act 1999	This Act is intended to facilitate the reforestation of land and development of timber plantations. It provides codified environmental standards together with a streamlined integrated scheme for the establishment and management and harvesting of timber and other forest plantation products.	**No Relevance** The location of work under this contract is not located within or adjacent to reforested or plantation forest land.
Australian Heritage Council (Consequential & Transitional Provisions) Act 2003 *Australian Heritage Council Act* 2003 *(Cwth)*	The Australian Heritage Council (Consequential and Transitional Provisions) Act 2003 repealed the Australian Heritage Commission Act 1975. The Australian Heritage Council Act 2003 establishes the Australian Heritage Council. The Council is required to identify places to be included in the National Estate and to maintain a Register of the National Estate of places.	**No Relevance** The site is not on Register of the National Estate of places.
Aboriginal and Torres Strait Islander Heritage Protection Act 1984 *(Cwth)*	This Act provides for the preservation and protection from injury or desecration to areas and objects of particular significance to Aboriginals. Areas and objects can be protected by Ministerial Declaration and it is then and offence to contravene such a declaration.	**No Relevance** No areas or objects within the works site have been identified as being subject to such a declaration and this Act is of little relevance to the project.

Ozone Protection Act 1989	This Act provides for a system of controls and to regulate and prohibit the manufacture, sale, distribution, use, emission, re-cycling & disposal of stratospheric ozone depleting substances and articles that contain these substances. The impact is that appropriately qualified people in accordance with this Act must undertake all servicing and maintenance of this type of equipment.	**Low Relevance** The relevance of this Act will relate to the use of refrigerators and air conditioning units in site buildings and vehicles which still contain CFCs. Such items are unlikely to be found on site.
Protection of the Environment Operations Act 1997	This Act is of most relevance to work being carried out under this contract. It integrates into one Act all the controls necessary to regulate pollution and reduce degradation of the environment, provides for licensing of scheduled development work, scheduled activities and for offences and prosecution under this Act.	**High Relevance** The Act provides for the issuing of environmental protection notices to control work and activities not covered by licences. Section 148 of the Act requires a pollution incident causing or threatening material harm to the environment to be notified to the EPA and other authorities immediately.
Sydney Water Act 1994	This Act establishes the Sydney Water Corporation as a statutory State owned corporation. The functions of the Sydney Water Corporation is to supply and store water, provide sewerage services, provide stormwater drainage and dispose of waste water within it area of operations.	**Low Relevance** Coordination may be required with Sydney Water during the works
Sydney Water Catchment Management Act 1999	This Act establishes the Sydney Catchment Authority as a statutory corporation representing the Crown. The role of the Sydney Catchment Authority is to manage and protect the catchment areas and catchment infrastructure works, be a bulk water supplier and to regulate activities within or affecting the catchment areas	**Low Relevance** This project is unlikely impact on areas regulated by the Sydney Catchment Authority.
Pesticides Act 1999 *Pesticides Regulation* 1995	This Act and Regulation establish a legislative framework to regulate the use of pesticides. They have the objective to promote the protection of human health, the environment, property and trade in relation to pesticides. It is an offence under this Act and Regulation to wilfully or negligently misuse pesticides.	**Low Relevance** It is not envisaged that pesticides will be used on the project by Laing O'Rourke.
Waste Avoidance and Resource Recovery Act 2001	This Act repeals the Waste Minimisation and Management Act, 1995.The purpose of the Act is to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecological sustainable development. The Act provides for the making of policies and strategies to achieve these ends. It is an offence under the Protection of the Environment Operations Act to wilfully or negligently dispose of waste in a manner that harms or is likely to harm the environment.	**Medium Relevance** The relevance of the Act to this project is to implement the strategies by adopting the hierarchy of avoidance; avoidance of unnecessary resource consumption; resource recovery (including reuse, reprocessing, recycling and energy recovery), disposal (as a last resort).

APPENDIX B – Project Permits and Approvals Register

Table 20: Permits and Approvals Register

Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
***Environmental Planning and Assessment Act* 1979**							
Sydney Metro City and Southwest	Yes	SSI 15_7400	January 2017	Duration of Project	N/A	Environmental Manager	
***Protection of Environment Operations Act* 1997**							
Environment Protection Licence	Yes	12208	June 2017	Duration of Project	N/A	Environmental Manager	
Water Act 1912							
Section 10 Surface Water Licence	No						
Part 5 Section 112 Groundwater Licence	No						
Part 8 Division 3 Approval of controlled work	No						
Water Management Act 2000							
Section 56 Access Licences	No						
Section 89 Water use approvals	No						
Section 90 Water management work approvals	No						
Section 91 Activity Approvals	No						
Fisheries Management Act 1994							

Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Division 3 (Sections 199, 200, 201) Dredging and Reclamation	No						
Section 205 Marine vegetation - regulation of harm Permit to Harm Marine Vegetation	No						
Section 220ZW Licence to harm threatened species, population or ecological community or damage habitat	No						
Sydney Water Act 1994							
Section 49 Offence to discharge into works - Trade Waste Permit	No						
Permit to Use Approved Metered Standpipes on Sydney Water Hydrants	No						
Hunter Water Act 1991							
Section 31 Offence to discharge into works - Trade Waste Permit	No						
Dangerous Goods (Road and Rail) Transport Act							
Section 6 Licensing of vehicles transporting dangerous goods	No						
Section 7 Licensing of drivers transporting dangerous goods	No						
Local Government Act							
Section 68 - What activities, general, require the approval of council	No						

Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Section 68A - Operation of a system of sewage management	No						
Roads Act 1993							
Section 138 Works and structures - permit to undertake works to roads	No						
Occupational Health and Safety Regulation 2001							
Section 174ZS Notification to WorkCover	No						
Section 175L Major hazard facility must be registered or provisionally registered	No						
National Parks and Wildlife Act 1974							
Section 90 Aboriginal heritage impact permit	No						
Heritage Act 1977	Yes						
Division 3 Applications for approval	No						
Section 139 Excavation permit	No						
Exemption approvals	Yes						
Marine Safety Act							
Section 29 Types of marine safety licences	No						
Management of Waters and Waterside Lands Regulations							

Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Division 3 Occupation of Waters	No						
Rural Fires Act 1997							
Section 89 Issue of permits (includes "hot works" which would constitute lighting a fire)	No						
Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)							
Include details of approvals under this Act where applicable	No						
Other							
List other relevant legislation here							
Road Occupancy Licences	Yes	As required – ROLs will be obtained prior to undertaking works which require ROLs to be in place					

APPENDIX C - Risk Assessment

All potential environmental issues have been assessed in accordance with the table below. The Aspect column identifies the specific issue and the Potential Environmental Impact is identified and the Initial Risk Ranking calculated on the basis of minimal or no environmental controls being in place. The intended Control Measures are described under that heading and the Residual Risk Ranking is then calculated for each aspect as though the identified control measures were in place. Therefore the risk ranking is recalculated accordingly.

The effectiveness of the individual risk controls is inspected weekly and reported monthly as part of the Northern Corridor Works overall reporting requirements.

The Risk Assessment Table is provided below:

P = Probability
C= Consequences

Risk Assessment Rankings: E = Extreme H = High M = Medium L = Low

Issues which have an initial Extreme risk will require the development and implementation of an issue specific sub-plan developed in *ERAPs*.

The risks must be reassessed following the consideration of control measures.

Issues or activities that represent an Extreme risk after the application of control measures are not to be undertaken.

Table 21: Project Risk Assessment

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating			Management of Residual Risk
		P X	C =	Risk		P X	C =	Risk	
Approvals and Licensing									
Not identifying appropriate approvals / licenses required or proceeding without them.	Works delayed, infringements, poor client relations, and reputational loss.	**U**	**1**	**H**	Check Environmental Assessment / REF / EIS and statutory documentation. Check contract documentation. Document requirement in CEMP Establish a register of approvals, licenses, permits. Pre-construction compliance report	**R**	**1**	**L**	Maintain compliance risk matrix Complete environmental audits as per Section 17 of this plan
Noise									
Noise from general construction activities resulting in impact to residents and other sensitive receivers	Disturbance to residents or neighbouring businesses. Potential for complaints.	**L**	**3**	**H**	Mitigation measures will be applied as per the Sydney Metro City and South West Construction Noise and Vibration Strategy, in accordance with E32 as approved by DP&E.	**P**	**3**	**M**	Noise performance will be continually monitored as per the requirements of the Construction Nosie and Vibration Management

					Implementation of Construction Noise and Vibration Management Plan Control Measures as per Appendix D – Noise and Vibration to be implemented. Consult with the community in relation to upcoming activities that may result in concern. Monitor noise for compliance as the works progress at receiver locations. Provide periods of respite for high noise generating activities. Apply noise mitigation measures during entire project. Noise efficient equipment to be used on site.				Plan. Where high impact noise is required, it will be restricted to the conditions of EPL 12208 with respite periods implemented.
Noise during works required to be undertaken out of standard construction hours.	Disturbance to residents or neighbouring businesses with potential for complaints.	**L**	**3**	**H**	Implement noise mitigation strategies for out of standard hours work. Monitor noise for compliance to project goals. Mitigation measures will be applied as per the Sydney Metro City and South West Construction Noise and Vibration Strategy, in accordance with E32 as approved by DP&E. Furthermore standard and specific mitigation measures for sensitive receptors around the NCW works will be applied as per the Construction Nosie and Vibration Impact Statement – Section 8	**P**	**3**	**M**	Noise performance will be continually monitored as per the requirements of the Construction Nosie and Vibration Management Plan. Where high impact noise is required, it will be restricted to the conditions of EPL 12208 with respite periods implemented.
Vibration									
Vibration intensive activities undertaken on the site such as impact piling, vibratory rolling, etc.	Disruption, annoyance and nuisance to residents. Potential damage to adjacent residential and commercial residences and structures. Disruption to businesses as a result of vibration nuisance	**U**	**3**	**M**	Control Measures as per Appendix D – Noise and Vibration to be implemented. Determine vibration limits and structure/receiver offset distances. Consult with potentially affected parties prior to commencement of works on their upcoming activities that may be impacted by construction vibration. Ongoing vibration monitoring during vibration intensive works.	**R**	**3**	**L**	Standard and specific mitigation measures for sensitive receptors around the NCW works will be applied as per the Construction Nosie and Vibration Impact Statement – Section 8.

Water Quality, Erosion & Sedimentation									
Sediment laden runoff from construction works leaving site.	Degradation of local watercourses. Increased turbidity in local water ways resulting in impact on aquatic life. Fines for sediment escaping site.	**L**	**3**	**H**	Control Measures as per Appendix D - Water Quality, Site Drainage and Erosion and Sediment Control to be implemented. As per Appendix D Water Quality, Site Drainage and Erosion and Sediment Control, implement sediment and erosion control measures including sediment basins, water collection and dispersal systems, etc. Ensure measures are inspected and maintained as the works progress and also prior to and post rainfall events. Provide training and awareness on the need to prevent pollution. Relevant people to undertake Erosion and Sediment Control training.	**U**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Stockpiling of vegetation and topsoil.	Wind and water erosion causing weed/seed dispersion offsite. Location of stockpiling next to waterways causing weeds/seeds to disperse from construction site.	**L**	**3**	**H**	Develop Environmental Control Plans to show stockpile areas. Appropriate locations for stockpiling (away from waterways, watercourses, drains). Designated vegetation stockpiling areas. Minimise stockpiling / Use temporary stockpiling Cover stockpiles if left for extended periods.	**U**	**3**	**L**	Implement stockpile controls pre work Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Non-compliant water from construction works discharged from site	Non-compliant water entering stormwater system waterways (i.e. polluting - not compliant with discharge criteria).	**L**	**3**	**M**	Induction and toolbox talks Toolbox training on site procedures for water discharge Educate site staff on licence conditions and consequences of prosecution Environmental Manager/representative to approve all water discharges from site Subcontractor to detail discharge procedure within their environmental plans. Agreed plan to be communicated to workforce via briefing. Signed attendance register to be submitted to LORAC prior to works commencing.	**U**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition. Discharge procedure to be discussed as part of pre-start briefing.

Ground water	Ground water entering excavations Without appropriate safeguards onsite could lead to ground water contamination	**P**	**3**	**M**	Induction and toolbox talks Toolbox training on site procedures for water discharge Educate site staff on licence conditions and consequences of prosecution Environmental Manager/representative to approve all water discharges from site	**U**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Waste									
Waste disposal during construction.	Incorrect disposal of waste, further costs incurred for classifications and disposal, fines may be issued.	**P**	**2**	**H**	Implement Project Waste Management Strategy as per Appendix L. Identify opportunities to incorporate recovered materials into the permanent works. Provide facilities on site for source separation and recycling. Ensure accurate waste records are retained. Removal of wastes from the site would only be undertaken by a licensed contractor as required by the POEO Act and with appropriate approvals, if required, for contaminated materials, etc. All material to be recovered off-site to be appropriately classified in accordance with the Resource Recovery Exemptions. All material that requires off-site disposal to be appropriately tested and classified against the Waste Classification Guidelines (DECC, 2008).	**U**	**2**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition. Monitor and ensure reporting of all movements of waste form the worksite
Earthworks spoil disposal.	Incorrect classification of waste (spoil) resulting in incorrect / illegal disposal/re-use.	**P**	**2**	**H**	Inductions, toolbox talks and training on recycling facilities and waste segregation practices. Separation of waste on site. Tracking of disposal processes. All contamination hotspots would be clearly marked in the field.	**U**	**2**	**L**	Regular inspections of work areas Monitor and ensure reporting of all movements of waste form the worksite
Washout of concrete in undesignated areas.	Sediment laden/alkaline water polluting surrounding stormwater system / watercourses.	**P**	**2**	**H**	Concrete washout areas clearly marked on Environmental Control Maps and delineated. Inductions on designated concrete washout areas. Subcontractor's agreements to include project compliant waste management principles.	**U**	**2**	**L**	Regular inspections of concrete washout areas and controls

Contamination									
Management of contaminated or untreated materials	Non-compliant material and contaminated water entering surrounding waterways. Decrease in health of nearby ecosystems.	**P**	**2**	**H**	Develop contamination management procedures and protocols. Identify any contamination hotspots and incorporate procedures for these locations into construction documentation. Develop unexpected finds procedures. Induct personnel on unexpected finds procedure.	**U**	**2**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition. Monitor and ensure reporting of all movements of waste form the worksite
Potential for discovery of unexpected contaminated spoil during construction.	Health effects resulting from airborne contamination, e.g. asbestos. Complaints received from odours released during excavations. Classification of spoil is changed and disposal options altered, costs incurred associated with disposal of higher classification of waste.	**P**	**3**	**M**	If contaminated soil is encountered, all works are to stop in the vicinity of the find and investigations commence. Induct personnel on location, type, nature, concentration of contaminants on site if found.	**U**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition. Complete regular toolbox talks on how to manage unexpected finds.
Encountering asbestos / contaminated material on site.	Transfer of material into previously uncontaminated area (outside work site) causing new contamination.	**P**	**2**	**M**	Inspections of excavated and filled surfaces would be made during construction to determine the presence of visible asbestos. Conduct further site investigations to determine the presence and extent of contamination prior to construction works commencing Contaminated soils would not be stockpiled on the structural fill layer or formation layers to avoid cross contamination.	**U**	**2**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition. Complete regular toolbox talks on how to manage unexpected finds.
Hazardous Materials									
Storage of hazardous substances, leaking plant and equipment and spillage from refuelling.	Localised ground contamination / pollution of stormwater and requiring clean-up and/or receiving fines. Risk of igniting volatile substances.	**U**	**3**	**M**	Induction, toolbox talks and training on appropriate handling and storage of liquids. All storm water drains should be identified prior to works. No fuels to be stored on site Storage areas to be away from sensitive areas and appropriately bunded.	**R**	**3**	**L**	Regular inspections of storage areas.

	Unauthorised access to site / potential vandalism/damage leading to pollution.				MSDS approved prior to bringing hazardous substances on site including risk assessment. Plans showing storage locations and associated controls e.g. spill kits, etc. (Environmental Control Maps). Training in use of spill kits Contingency plans would be developed to deal with any spills which might occur during construction. Clearly label containers. Regular auditing and inspection of storage areas and materials. Make storage areas restricted access areas. Reduce/eliminate need for hazardous substances. Ensure all work sites are secure before leaving the site. All liquids i.e. paint etc. are to be securely locked away at the end of each day.				
Fuel contaminated runoff from construction works leaving site	Fuel contaminated runoff entering stormwater or waterways (i.e. polluting - not compliant with discharge criteria).	**U**	**3**	**M**	All storm water drains should be identified prior to works and controls implemented. No fuels to be stored on site Appropriate bunding/storage of substances. Toolbox on site procedures for sediment controls and chemical storage. Educate site staff on project conditions and consequences of prosecution.	**R**	**3**	**L**	Regular inspections of works site to ensure all controls are in good health and working.
Biodiversity									
Vegetation trimming / clearing required outside approved work area.	Unauthorised works / removal of vegetation outside defined work area, possibility of removing threatened species, fines incurred.	**R**	**3**	**L**	Induction and tool box training on clearance zones and required protection measures If vegetation, other than grass and weeds, needs to be trimmed or removed, further assessment would be undertaken and approval sought from Sydney Metro prior to trimming or removal. Inspections during clearing activities. Fencing in place/ clear marking of trees to be retained and cleared / demarcation areas / plans showing clearing areas.	**R**	**3**	**L**	Sydney Metro vegetation removal permit system Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.

					Pre clearing checklist to be completed before any clearing of vegetation.				
Clearing and grubbing of vegetation within work site.	Erosion of soils, uncontrolled runoff, sediment deposited into surrounding vegetated areas and water courses, and invasion of weeds. Wrong vegetation removed. Potential for injury to native fauna.	**R**	**3**	**M**	Inductions and toolbox training on erosion and sediment controls. Where possible works to be staged so environmental controls can be implemented after clearance works. If vegetation, other than grass and weeds, needs to be trimmed or removed, further assessment would be undertaken and approval sought from Sydney Metro prior to trimming or removal. Approved Erosion and Sediment Control Plans in place prior to starting works. Where applicable, mature trees and other native vegetation to be retained would be clearly delineated, with all construction activities excluded from these areas. Pre clearing checklist to be completed before any clearing of vegetation.	**R**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Pest / rodent disturbance from site establishment	Potential to relocate into residential areas / cause of community complaint. Health associated risks with increased rodents/pests	**U**	**4**	**L**	Ensure site establishment has pest controls such as wire mesh around building bases to ensure pests do not use them for shelter. If issue is problematic during construction activities, pest control services to be implemented as soon as possible If vegetation, other than grass and weeds, needs to be trimmed or removed, further assessment would be undertaken and approval sought from Sydney Metro prior to trimming or removal.	**R**	**4**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition. Pest inspections completed regularly
Air Quality									
General construction works; site establishment, ULX excavations	Dust activity in close proximity to residential and commercial premises, complaints received.	**U**	**4**	**L**	Inductions and toolbox training on Dust and Air Quality Management. Provide dust mitigation measures through water sprays/misting. Erosion and Sediment Control Plans approved before works commence. Controls are then reviewed for maintenance.	**U**	**4**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.

Exhaust from plant and equipment.	Emissions resulting in air pollution.	**U**	**4**	**L**	Inductions and toolbox training on Dust and Air Quality Management. Well maintained plant/ equipment and pre-start checks and servicing. Non-complaint vehicles removed from site / repaired.	**R**	**4**	**L**	Review plant check list prior to operating on site. Undertake verification checks as required.
Heritage									
Unexpected heritage items encountered.	Work delays, additional studies, approvals required, damage to heritage item.	**U**	**3**	**M**	General inductions toolbox training on heritage management protocols. Label any known heritage items on Environmental Control Maps. If suspected heritage item encountered. Works to stop immediately and Environment Manager contacted.	**R**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Acid Sulphate Soils									
Disturbance of Potential Acid Sulphate soils and Actual Acid Sulphate Soils during excavations.	Mobilisation of metals within runoff to levels toxic to natural systems. Release of acidic runoff.	**R**	**3**	**L**	Assess risk for acid sulphate soils, and if the risk is determined to be high then develop and implement Acid Sulphate Soils Management Plan. Awareness training in the identification and management of ASS. Provide containment and treatment facility on site. Ensure ASS material is left underwater, disposed off-site or appropriately treated in a bunded area with sump.	**R**	**3**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Flora & Fauna									
Loss of threatened or endangered species.	Removal or death of threatened or endangered species.	**R**	**3**	**L**	All personnel attending site will be advised of controls and management during the onsite induction. A Toolbox talk will be carried out prior to ground disturbance /site clearing works to ensure onsite personnel are made aware of potential loss of endangered species If vegetation, other than grass and weeds, needs to be trimmed or removed, further assessment would be undertaken and approval sought from Sydney Metro prior to trimming or removal.	**R**	**4**	**L**	Sydney Metro vegetation removal permit system Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.

					If threatened flora or fauna species are identified on site, work in the vicinity of these species would stop immediately. A spotter/catcher/botanist would be engaged to survey the site and advise on species management.				
Damage or injury to endangered or threatened species.	Damage or injury to endangered or threatened species by plant and equipment.	**R**	**3**	**L**	All personnel attending site will be advised of controls and management during the onsite induction. A Toolbox talk will be carried out prior to ground disturbance /site clearing works to ensure onsite personnel are made aware of potential damage to endangered species	**R**	**4**	**L**	Sydney Metro vegetation removal permit system Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Removal of flora without approval.	Failure to identify flora prior to removal.	**R**	**3**	**L**	All personnel attending site will be advised of controls and management during the onsite induction. A Toolbox talk will be carried out prior to ground disturbance/site clearing works to ensure onsite personnel are made aware of approvals required	**R**	**4**	**L**	Sydney Metro vegetation removal permit system Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Traffic									
Loss of on-street car parking in adjacent residential streets and commercial areas during construction.	Loss of parking availability to adjacent residential and commercial properties could result in community complaints.	**P**	**4**	**M**	Community notifications. Site vehicles shall be parked within the rail corridor and not affect public parking area Develop Traffic Management Plan / Traffic control procedures.	**U**	**4**	**L**	Complete regular toolbox talks on how to minimise impacts in relation to traffic. Undertake regular inspections of worksite and adjacent streets. Supervisor and traffic controller to enforce traffic management requirements

General construction traffic disturbing public access between local roads.	Disturbance to local residents resulting in complaints being made, limited access, potential for delays at local road access points resulting in complaints.	**P**	**4**	**M**	Deliveries of plant and materials shall be undertaken outside of peak periods where possible Site vehicles shall be parked within the rail corridor and not affect public parking areas Scheduled road movements shall be minimised where possible Oversized deliveries would be undertaken in accordance with the requirements of NSW Police or Roads and Maritime Services. Approved Traffic Management Plans in consultation with relevant authorities. Detour routes to be advertised/ notified. Approved access routes, detailed Traffic Control Plans. Clear notifications / signage.	**U**	**4**	**L**	Complete regular toolbox talks on how to minimise impacts in relation to traffic. Undertake regular inspections of worksite and adjacent streets. Supervisor and traffic controller to enforce traffic management requirements
Management of heavy vehicles / access routes.	Complaints from sensitive receivers due to increased level and frequency of noise.	**P**	**4**	**M**	Delivery drivers provided with haulage routes prior to travelling to site and delivery times. Deliveries of plant and materials shall be undertaken outside of peak periods where possible Site vehicles shall be parked within the rail corridor and not affect public parking areas Scheduled road movements shall be minimised where possible Oversized deliveries would be undertaken in accordance with the requirements of NSW Police or Roads and Maritime Services. Designated access routes. Approved Traffic Management Plans. Community Notifications. Pedestrian management with traffic controller in place where required.	**U**	**4**	**L**	Complete regular toolbox talks on how to minimise impacts in relation to traffic. Permits from local council and/or RMS
Truck deliveries out of normal working hours (un-approved).	Non-conformance with project requirements. Noise impact to community / potential complaints.	**P**	**4**	**M**	Personnel training of noise awareness to community included in induction and toolboxes. Induction on Construction Hours for deliveries. Communication of delivery times to suppliers.	**U**	**4**	**L**	Delivery drivers provided with haulage routes prior to travelling to site and delivery times.

					Community Notifications on project activities occurring locally. Code of conduct / selection criteria in place for subcontractors. Out of hours works approval where required (Environmental Protection Licence/ Planning Approval/ Council) Approved traffic/access routes. Planning and staging of works in approved hours as much as practical.				Complete regular toolbox talks on how to minimise impacts in relation to traffic.
Resources and Energy Use									
Energy consumption by construction plant & operation of site compound facilities.	Inappropriate energy use, waste of energy recourses, energy wastage costs, increased greenhouse gas emissions.	**U**	**4**	**L**	Inductions and toolbox training on waste management and energy saving practices in construction plant and equipment and during office work. No idling of plant equipment where possible onsite. Equipment / plant equipment inspections must be undertaken prior to use on site.	**U**	**4**	**L**	Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition.
Water usage during construction activities.	Excess usage of potable water for site activities leading to wastage	**U**	**4**	**L**	Include water conservation measures and verifiable targets. Capture and reuse rainfall and runoff for site activities where possible	**U**	**4**	**L**	Complete monthly environmental/sustainability reporting.
Resource usage (e.g. building materials, water, fuels, packaging), waste generation and disposal	Depletion of resources due to wastage (e.g. wastage of water / no recycling, poor management of procurement, ineffective removal of off-cuts, waste, i.e. no recycling).	**U**	**4**	**L**	Inductions and toolbox talks on recycling facilities and waste segregation, training/education on how to recycle. Procurement of materials (selection of materials) to be considered. Subcontractor's agreements to include project compliant waste management principles. Waste management undertaken in accordance with the Waste Avoidance and Resource Recovery Act 2001.	**U**	**4**	**L**	Complete monthly environmental/sustainability reporting. Undertake regular inspections of work areas pre, during and after works to ensure controls are in good condition
Visual Amenity									
Ancillary facilities	Surrounding aesthetic temporary altered during construction	**U**	**4**	**L**	The work area shall be maintained in an orderly manner	**U**	**4**	**L**	Undertake regular inspections of work

Temporay storage containers Plant and equipment movement Stockpiles and laydown Lighting	Lighting towers used during out of hours works may spill on nearby residents				Lighting required during night works shall be directed towards the work area and are from adjacent sensitive receivers. Temporary acoustic fencing applied on boundary of ancillary facilities				areas pre, during and after works to ensure controls are in good condition

Environmental Risk Assessment Rankings

This table may be used as a guide in determining the level of risk for each environmental issue.

For each identified issue, consider the 'maximum credible' (not absolute worst case) risk that could result with **minimal or no controls** other than existing and using normal construction practices.

Note: Any one of the listed consequences must result in the use of the applicable consequence grading.

Select a letter and a number from each column. Plot letter and number selections on the Risk Ranking Matrix to determine applicable ranking:

Table 22: Environmental Risk Assessment Rankings

Likelihood (Probability and Frequency of Occurrence)			Consequence (Outcome or Severity of Occurrence)		
C	Certain	– Common or repeating occurrence – Consequence can reasonably be expected to occur in life of Project.	1	Severe	– Major pollution incident causing significant and widespread damage or potential to health or the environment – Persistent reduction in ecosystem function and value. – Ongoing disruption and loss of protected species. – Major prosecution likely, outcome in excess of $500,000
L	Likely	– Known to have occurred / "has happened" – Conditions may allow the consequence to occur on the Project during its lifetime – The event has occurred within the Business Unit within the previous 5 years.	2	Major	– Significant widespread and persistent changes to habitat, species or environmental media – Significant pollution incident causing damage or potential damage to health or the environment external to the site. – Potential for prosecution. Potential outcome between $50,000 - $500,000 – Numerous substantial complaints – Actual material environmental harm
P	Possible	– Could occur / "heard of it happening" – Exceptional conditions may allow consequences to occur on the Project, or has occurred nationally within the Australian Business.	3	Moderate	– Localised irreversible habitat loss or effects on habitat, species or environmental media – Reportable incident to the relevant environmental regulator or other authority. – Demonstrated breach of legislative, licence or guideline requirements. – Likely infringement notice or fine, potential for prosecution up to $50,000. – Will cause complaints.
U	Unlikely	– Not likely to occur – Reasonable to expect that the consequence will not occur on the Project. – Has occurred in industry but not in Business Unit.	4	Minor	– Localised degradation of habitat or short term impacts to habitat, species or environmental media. – Pollution incident that marginally exceeds licence conditions or guidelines for acceptable pollution. – Fine unlikely. – Potential for complaints.
R	Rare	– Practically impossible	5	Incidental	– Localised or short term effects on habitat, species or environmental media.

Likelihood (Probability and Frequency of Occurrence)			Consequence (Outcome or Severity of Occurrence)		
		– Not known to have occurred in industry or unheard of.			– Fully contained on site and can be fully remediated. Little potential for fine or complaints. – Insignificant or trivial incident

Probability ► ▼Consequence	CERTAIN	LIKELY	POSSIBLE	UNLIKELY	RARE
1 – Severe	E	E	E	H	M
2 – Major	E	E	H	M	M
3 - Moderate	H	H	M	M	L
4 – Minor	M	M	M	L	L
5 - Incidental	M	L	L	L	L

APPENDIX D - Operational Control Procedures - Environmental Risk Action Plans (ERAPs)

Environmental Risk Action Plans will be developed for each environmental issue, which has a risk ranking of Medium or High.

Significant environmental issues will be managed according to the Environmental Risk Action Plans below, which are completed in four phases;

1. The Risk is identified in the heading.
2. The ERAP then addresses the objectives for control measures to mitigate the identified risk.
3. The ERAP identifies the targeted outcomes for the control measures and is followed by the legal, contractual and other requirements such as licence conditions,
4. The ERAP identifies the acceptable level of impact for the identified risk.

Following from the targets and legal obligations the ERAP the controls that will be implemented to mitigate the risk, the person responsible for managing, monitoring and/or recording and reporting of the control outcomes to ensure compliance for the time of the application of those mitigation measures.

The control measures are inspected weekly and recorded, these results are published monthly as part of the Northern Corridor Works project reporting to Sydney Metro as per section 15.2 'Environmental reporting' and Appendix M.

Table 23: ERAPs - Operation Control Procedures

Actual Impact: Works for the Northern Corridor Works project will be conducted across weekends and during mid-week nights during Out of Hours. As such there will be am impact to residential receivers, however these will be managed through the NCW Construction Noise and Vibration Management Plan mitigation measures and controls. Furthermore controls are listed in the ERAP below.

ERAP 1 - Noise and Vibration	
Objective	– To comply with contractual requirements and ensure that noise and vibration from construction activities does not cause environmental nuisance. – To comply with the requirements of EPL 12208 and Sydney Metro City and Southwest CoAs.
Targets	– No valid noise / vibration complaints resulting from construction works. – No unreasonable noise or vibration. – No noise and vibration impacts on external receptors.
Legal, Contractual and Other Requirements	– Planning consent conditions – SSI 15_7400 – *Protection of the Environment Operations Act* 1997 – *Protection of the Environment Operations (Noise Control) Regulation* 2000 – AS2436 Guide to Noise Control on Construction, Maintenance and Demolition Sites; – Construction, except as allowed by Condition E48 (excluding cut and cover tunnelling), must only be undertaken during the following standard construction hours: a) 7:00am to 6:00pm Mondays to Fridays, inclusive; b) 8:00am to 1:00pm Saturdays; and c) at no time on Sundays or public holidays. – No work outside of these hours without approval – Construction activities that are inaudible external to the site may be undertaken outside of these hours where approved.
Site specific planning / approval conditions / licence conditions/REMMs and	CoA related to Construction Noise and Vibration – CoA - A16 – vii, A18(b) – I, A20, A25, A26, A27, C3, C9, E28, 29, 30, 31, 32, 33, 34, 36, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48 REMMs related to Construction Noise and Vibration

REPOs/Sydney Trains EPL Conditions/Contract clause	– NV1, NV2, NV3, NV4, NV6, NV7 Revised environmental performance outcomes committed in the PIR – Construction noise and vibration, visual amenity EPL 12208 Conditions – O5 – 5.1 to 5.7 – CEMF – 9.2	
Controls (means and resources)	– Refer to the NCW Construction Noise and Vibration Management Plan (CNVMP) and Construction Ancillary Facilities Management Plan (CAFMP) for detailed management and mitigation measures.	– A16, A18, C3, C9, EPL 12208, CEMF 9.2
	– A Construction Nosie and Vibration Strategy will be developed within mitigation measures to be applied to construction activities	– E32, E33, E36, NV3, CEMF 9.2
	– Works to be conducted in in accordance with the Interim Construction Noise Guideline (DECC 2009) and the British Standard BS 7385-2:1993	– A16, A18, A25, A26, E28, E43, REPO - structural
	– No work will be undertaken outside of the agreed hours without prior approval. Where work outside the hours nominated above hours is required, approval will be gained prior to the commencement of works.	– A25, A26, A27, E3, E39, E40, E41, E42, E42, E44, E47, EPL 12208
	– Where construction vibration is found to be causing a disturbance to, the construction methods shall be reviewed to reduce the impact where possible.	– E29, E30, E36, E48, NV1
	– Delivery operations or other noise generating activities at compound and storage areas will take place during the designated construction hours nominated above, unless specifically required by Police or RTA requirements.	– A16, NV2, NV6, CEMF 9.2
	– Where practical, substitution of excessively noise processes with alternative processes.	– E29, E30, E36, E46
	– Avoiding where practical the use of noisy plant simultaneously close together or adjacent to sensitive receptors.	– NV4
	– High efficiency mufflers must be fitted to all plant and equipment to minimise the generation of noise.	– NV4
	– All plant will be maintained in accordance with the manufacturer's requirements.	– NV4
	– Noise generating equipment to be orientated away from sensitive areas	– NV4, NV6, NV7, REPO - amenity
	– Undertaking loading and unloading activities away from sensitive areas and during designated construction hours.	– NV4, NV6
	– Select the most appropriate plant and equipment to minimise noise generation and include where necessary screening and enclosures.	– NV1, NV4
	– On-site generators and auxiliary power sources used during construction should be positioned away from existing buildings to buffer noise/ vibration.	– NV3
	– Boundary fencing and screening to be used around ancillary facilities	– A20, NV7, REPO - amenity
	– Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly. Checking should include: • engine covers; • defective silencing equipment; • rattling components; • and leakages in compressed air lines.	– NV4
	– Awareness training and information will be provided to project personnel in relation to the vibration requirements on the project and the need to minimise vibration when in close proximity to operational areas.	– NV1,
	– Plant, equipment and processes shall be selected so as to limit construction related vibration.	– NV1
	– Restrict or modify working hours to minimise impact if required. Include periods of respite where possible when vibration generating activities are being undertaken	– E36, E37, NV4
	– Consult with other parties to reduce cumulative noise impacts	– E39
Responsibilities	– The Construction Manager will ensure construction activities comply with these requirements and implement the control measures. – The Environmental Manager will obtain approval to work outside approved hours	

Timeframe	– Duration of site works.
Monitoring and Reporting	– Weekly inspections. – Complaints to be recorded on IMPACT. – Daily inspection (pre-start) checks and regular servicing of equipment. – Daily / weekly check sheets to be kept for engine-driven or other 'noisy' equipment. – Nosie and vibration monitoring of construction works as per mitigations measures specific in the CNVMP

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Biodiversity. There will be some vegetation removal required for the drainage excavation works and footings construction works. These will be conducted in accordance with the recommendations from the Tree report and the controls listed in the ERAP below. Any vegetation removal will be appropriately offset through the Sydney Metro City and South West offset strategy.

ERAP 2 – Biodiversity		
Objective	– To comply with contractual and Development Consent requirements and ensure that on-site trees are protected, where required from construction activities.	
Targets	– Compliance with Development Consent requirements in relation to protected trees from Local Council. – No damage/ death to trees marked as protected on the project. – All Laing O'Rourke staff and subcontractors are informed of the requirements of protected trees on the project.	
Legal, Contractual and Other Requirements	– Planning consent conditions – SSI 15_7400 – Heritage Act 1977 related to heritage listed trees	
Site specific planning / approval conditions / licence conditions/REMMS/Sydney Trains EPL Conditions	CoA related to Biodiversity – CoA – E6, E99 – REMMs - LV2, B1, B3 – CEMF 11.2 Revised environmental performance outcomes committed in the PIR – Biodiversity	
Controls (means and resources)	– Ensure Sydney Metro approval is in place prior to removal/trimming of trees – Appropriately trained and qualified tree removal contractors to be used. – An experienced ecologist would be used for any vegetation inspections and present on site during vegetation removal if any fauna is identified within the subject area – The Local WIRES group or veterinarian would be contacted in the event of any injured fauna on site in the event an ecologist is not present – Fauna would be captured and relocated by an experienced ecologist during if encountered during any vegetation removal – Awareness training in the need to preserve vegetation to be retained. – Barricading or other suitable protection measures to be provided for trees to be retained – Minimise vegetation removal where possible. Only vegetation located within areas of excavation to be removed.	– E6, E99, LV2 – B1 – B1 – B3 – B3 – E6, E99, LV2 – E6, E99, LV2 – Performance outcome
Responsibilities	– Site Manager, Project Leader and Laing O'Rourke Staff to ensure all targets are met.	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– Weekly inspections. – Complaints to be recorded on IMPACT. – Daily inspection (pre-start) checks and regular servicing of equipment. – Daily / weekly check sheets to be kept for engine-driven or other 'noisy' equipment.	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Air Quality. Any dust and emissions from any excavation and traffic movements will be managed in accordance with the controls listed in the ERAP below.

ERAP 3 – Dust and Air Quality		
Objective	– To comply with contractual requirements and ensure that dust and other air emissions from construction activities do not cause impacts on sensitive receivers and equipment.	
Targets	– No valid dust complaints from construction works. – No dust impacting on offsite activities or surrounding residences. – No release of contaminants, (odour, smoke etc.) into the air. – Comply with construction contract conditions.	
Legal, Contractual and Other Requirements	– Sydney Trains Environmental Protection Licence (EPL) #12208 – Sydney Metro City and Southwest Planning Approval Dated January 2017 – Contract specification clause – *Protection of the Environment Operations Act 1997* – *Protection of the Environment Operations (Clean Air) Regulation* 2002	
Site specific planning / approval conditions / licence conditions/REMMS/Sydney Trains EPL Conditions	– Contract Specification – *Protection of the Environment Operations Act* (1997) – Sydney Trains Environmental Protection Licence (EPL) #12208 is required for this Project. – CoAs A18b, E5, A20 – REMMs – AQ1 to AQ9 – CEMF 16.2 – Revised environmental performance outcomes committed in the PIR – Air Quality	
Controls (means and resources)	The following management and mitigation measures will be implemented to minimise impacts on air quality during construction of the proposal. The implementation of suitable mitigation and management measures would control and reduce the extent of impacts experienced at nearby sensitive receivers.	
	– Plant and equipment would be maintained in accordance with manufacturers specifications	– AQ1, REPO – air quality, CEMF 16.1 – AQ2, EPL 12208 - O
	– Regular inspection of plant and equipment would be undertaken to ascertain that fitted emission controls are operating efficiently	
	– Plant or machinery would not be left idling	– AQ1
	– Stockpiles would be maintained and contained appropriately, which could include covering or regular watering to minimise dust	– A18, AQ7, AQ8
	– Hard surfaces would be maintained/implemented as reasonable and feasible during the project to minimise air quality impacts from vehicle movements	– AQ4
	– Haul roads will be maintained using dust suppression regularly, particularly in hot and windy conditions	– AQ5
	– Trucks transporting spoil and other waste materials from site would be covered appropriately	– AQ6
	– Works areas will have adequate screening around ancillary facilities to minimise air quality impacts	– A20
	The following mitigation measures will be implemented during the construction phase of works:	– REPO – air quality, CEMF 16.1
	• dust minimisation measures (water carts and sprays) will be developed and implemented during construction;	– E5 – E5 – E5

	• methods for management of emissions would be incorporated into site inductions, training and pre-start talks; • apply water (or alternative measures) to all exposed surfaces that are causing dust generation; • apply water to works related to removal of redundant equipment. Application rates should be applicable to atmospheric conditions at the time; • dust-generating activities (particularly clearing and excavating) should be avoided or minimised during dry and windy conditions; • construction plant and equipment will be well maintained and regularly serviced so that vehicular emissions remain within relevant air quality guidelines and standards; • emissions from trucks and other heavy vehicles would be regulated by the operator in accordance with the requirements prescribed in the National Environment Protection Measure (NEPM) (Diesel Vehicle Emissions); all construction vehicles would be tuned to not release excessive level of smoke from the exhaust and are compliant with OEH's Smokey Vehicles Program under the POEO Act and (NSW) Protection of the Environment and Operations Regulations 2010	– E5, AQ6, AQ7, AQ8 – AQ1 – AQ1, AQ2
Responsibilities	– The Environmental Manager will ensure that appropriate action is implemented. – All personnel are required to ensure that the requirements of this ERAP are implemented for their operations.	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– Weekly inspections to be recorded on Form E-T-8-1227. – Incidents to be recorded on form Environmental Incident and Complaint Report (F1222).	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Waste and resources. There will be waste generation and removal from excavation activities for the drainage excavation works and footings construction works. These will be conducted in accordance with the relevant legislative requirements and the condition of approval with controls applied as listed in the ERAP below.

ERAP 4 - Waste and Resource Management		
Objective	– To comply with contractual and legislative requirements and ensure that waste from construction activities does not have the potential to escape from the site and cause an environmental nuisance / harm.	
Targets	– No incidences where waste is stored in a position where it has the potential to move off-site. – All off site movements of waste will be tracked. – The principles of the waste management hierarchy will be adopted, where practicable. – Target to reuse or recycle 90% by weight of construction waste. – Waste will be minimised wherever possible.	
Legal, Contractual and Other Requirements	– Contract Specification Clause – Sydney Metro City and Southwest CoAs – *Protection of the Environment Operations Act* 1997 – *Protection of the Environment Operations (Waste) Regulation* 2005 – *Waste Avoidance and Resource Recovery Act* 2001 – *Local Government Act* 1993 – *Local Government (General) Regulation* 2005	
Site specific planning / approval conditions / licence conditions	– Sydney Trains Environmental Protection Licence (EPL) #12208 – Waste Management condition. – E106. – REMMs – WM1 to WM4 – CEMF 6.2 and 17.2 – Revised environmental performance outcomes committed in the PIR – Waste Management	
Controls (means and resources)	Mitigation measures will include a waste management strategy, which has been prepared. Construction waste would be managed through the waste hierarchy established under the Waste Avoidance and Recovery Act 2001, which comprises the following principles:	
	– Avoidance of waste — Minimise the amount of waste generated during construction by avoiding unnecessary resource consumption (i.e. avoid the use of inefficient plant and construction equipment and avoid materials with excess embodied energy, waste and excessive packaging).	– E106, CEMF 6.1
	– Resource recovery — Reuse, reprocess and recycle waste products generated during construction to minimise the amount of waste requiring disposal.	– WR1, CEMF 6.1
	– Disposal — Where resources cannot be recovered, dispose of them appropriately to minimise the potential adverse environmental impacts.	– WR1, WR2, CEMF 6.1
	– All waste requiring off-site disposal would be classified in accordance with the OEH's Waste Classification Guidelines (DECCW 2009) prior to disposal. Upon completion of the job, all waste (including stockpiles) and surplus material will be removed from the corridor.	– WR1, EPL 12208-O4
	– A waste management strategy has been prepared to detail waste types and quantities as well as methods for segregation, handling, storing and disposal.	– WR2, WR3
	– All waste would be classified in accordance with the Waste Classification Guidelines (DECCW 2009) and transported to a place that can lawfully accept the waste.	

	– The following key waste mitigation and management strategies will be implemented throughout the construction of the Project: ● Where possible, construction wastes would be diverted from landfill and reused or recycled ● waste mitigation and management strategies will be implemented throughout the construction of the Project: ● where possible, construction wastes would be diverted from landfill and reused or recycled within the proposal areas or through appropriate contractors; ● construction materials that contain minimal embodied energy would be utilised; ● where possible, construction materials would be purchased in accordance with an established procurement strategy that prioritises the selection of materials that utilise best practice recycled material content and sustainability ratings; ● site disturbance and unnecessary excavation would be minimised; ● materials from any demolition works would be reused or recycled where practicable; ● formwork would be reused where possible; and ● sewage waste would be disposed of by a licensed waste contractor in accordance with relevant legislation and guidelines	– WR1, EPL 12208-O4, CEMF 17.1 – REPO-Waste, CEMF 17.1
Responsibilities	– Construction Manager will ensure waste is correctly stored, weighed, recorded, tracked and minimised at all times – Environmental Manager will ensure Waste Classifications are regularly conducted and recorded.	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– Skips monitored visually by the Construction Manager on a daily basis. – Environmental Checklist E-T-8-1227 – Waste disposal records to be recorded in Waste Tracker through IMPACT	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Water Quality, Site Drainage and ESC. Any excavation activities during the project will only be undertaken when controls are already in place and are continuously monitored. No water discharge is planned for the duration of the works. The detailed design of permanent structures in relation to modifications to the rail corridor drainage from the Metro Tunnel Dive to Brand Street will take into consideration the changes in flow, with structures designed accordingly, specifically meeting the requirements of FH4 and FH9 minimising impacts to existing infrastructure. Furthermore work will be conducted in accordance with the relevant legislative requirements and the condition of approval with controls applied as listed in the ERAP below.

ERAP 5 - Water Quality, Site Drainage and Erosion and Sediment Control		
Objective	– To comply with contractual and legislative requirements and ensure that water discharged off-site from construction and erosion and sediment control (ESC) activities does not cause environmental nuisance / harm.	
Targets	– No sediment impacts to the surrounding environment and waterways as a result of the works – Prevent water quality impacts off site as a result of erosion and sedimentation.	
Legal, Contractual and Other Requirements	– Sydney Metro City and Southwest CoAs – *Protection of the Environment Operations Act* 1997 – *Water Management Act* 2000 – *Local Government Act* 1993	
Site specific planning / approval conditions / licence conditions	– Sydney Trains Environment Protection Licence (EPL) #12208 is required for this Project. – CoA E65, E108 – REMMs – SCW1, SCW3, SCW4, FH4, FH9, FH10 – CEMF 15.2 – Revised environmental performance outcomes committed in the PIR – Soils, contamination and water quality, Flooding and hydrology, Groundwater and geology	
Controls (means and resources)	Soil and Water Management Measures as described below: – Design of permanent drainage structures to consider 100 year flooding events, changes in flow paths and capacity and existing infrastructure – Erosion and sediment control plans (ESCPs) will be developed and implemented prior to the commencement of topsoil stripping and earthworks. – The development of ESCPs will be guided by the Blue Book and other guidelines where required. – Particular attention will be paid to the design criteria for sediment fences, straw bales, catch drains, diversion drains, sandbags and similar controls – Permanent drainage to be installed as early in the program as possible – All water to be discharged in accordance with legislation and only after Laing O'Rourke approval. – Discharge quality must comply with: • TSS: ≤ 50mg/lt (~Turbidity 30NTU). If this cannot be achieved through natural settling, then the trapped sediment laden water is to be flocculated with gypsum applied at a rate of approx. 40kg/100m3. • pH: Between 6.5 and 8.5. • approval and sign off in accordance with *TfNSW Construction water discharge* procedure – Top soil/mulch stockpiles to be not greater than 2.0m in height. All stockpiles will be located clear of watercourses and drainage works. – Erosion and Sediment Control devices are to be maintained when their capacity has been reduced by 40%. – Under no circumstances will temporary stockpiles be placed within 3m of the site boundary or in position where it could impact adjacent property.	– FH4, FH9, FH10 – SCW3, CEMF 15.1 – E65, SCW4, E108, – SCW3, SCW4, CEMF 15.1 – SCW3, SCW4 – SCW4, EPL 12208-L1 – SCW4 – E65, E108, SCW3 – E65, E108, SCW3 – E65, E108, SCW3 – E65

	– Toolbox talks will be conducted for employees and subcontractors on the requirements of the Erosion and Sediment Control Plan. – The Erosion and Sediment Control Plan is to be maintained and up to date for the current site conditions – Use sand bag check dams to protect internal stormwater drains as required. – All ESC works will be removed immediately prior to final completion and all surfaces will be returned to pre-existing condition.	– E65, E108, SCW3 – E65, E108, SCW3 – E65, E108, SCW3
Responsibilities	– All staff to ensure adequate ESC devices are installed and maintained. – The Environmental Manager will undertake “at least weekly” inspections of on-site Erosion Sediment Control (ESC) devices, plus prior to expected rainfall and after rainfall. – The Construction Manager is responsible for the repair/ management of any damage or additional ESC devices, as required.	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– Visually monitored daily by the Construction Manager. – Weekly inspections to be documented on the Weekly Environmental Inspection Checklist Form E-T-8-1227. – Maintenance activities for ESCPs shall be documented – items that cannot be immediately repaired are to be documented on the project CAR Register. – All water quality data including quantity, quality and dates of water release will be maintained.	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Traffic Management. All activities for the project are to be conducted within the rail corridor. Haulage routes and access will be managed in accordance with the approved traffic management plan. Consultation with relevant stakeholders (RMS, SCO and WCC) will be ongoing throughout the project. Furthermore work will be conducted in accordance with the relevant legislative requirements and the condition of approval with controls applied as listed in the ERAP below.

ERAP 6 - Traffic Management		
Objective	– To comply with contractual requirements and ensure that noise and additional traffic from construction activities does not cause an environmental nuisance	
Targets	– No valid complaints resulting from congestion from construction traffic outside the approved Traffic Management Plan – Comply with traffic management standards – No visible queuing of vehicles due to the use of construction related vehicles in streets surrounding the site	
Legal, Contractual and Other Requirements	– Sydney Metro City and Southwest Planning Approval Dated January 2017 – *Protection of the Environment Operations Act* 1997 – *Roads Act* 1993 – RMS Traffic Control at Worksites – *Roads (General) Regulation* 2000 – *Local Government Ac*t 1993 – Construction traffic Management Framework	
Site specific planning / approval conditions / licence conditions	– Sydney Metro City and Southwest Planning Approval Dated January 2017 – EPL 12208 – Requires the preparation of a Traffic Management Plan. – Consultation with the existing Traffic and Transport Liaison Group – Access Arrangements – CoA – C3, E75 – E83, E85 – E88 – REMMs - T1 – T11, T19, T22 – CEMF 8.2 – Revised environmental performance outcomes committed in the PIR – Construction traffic and transport, Operational traffic and transport	
Controls (means and resources)	– A Construction Traffic Management Plan will be developed detailing the route to the site, times of activity, types of machinery, signage, traffic control measures, etc. – Ongoing consultation to be undertaken with relevant stakeholders – An approved Traffic Control Plan is required for any activity on/or immediately adjacent to public roads – Maintain vehicle monitoring equipment and inspection regimes – Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly. Checking should include: • defective silencing equipment; • rattling components; and • hydraulic hose or other fluid leaks. – A road safety audit would be completed prior to commencement of construction – Deliveries of plant and materials will be undertaken outside of peak periods where possible – Traffic controllers positioned at access gates adjacent to residential areas and access driveways point to direct vehicle movements, vehicle deliveries, pedestrians and cyclists, and for oversized deliveries and crane mobilisations where required	– C3, E75, E77, E78, E81, E82, E83, T1, CEMF 8.1 – E77, E78, E79, E95, T1 – E76, CEMF 8.1 – T7 – T7, E76 – T2 – E85, T13 – E86, E87

	– Road occupancy licences for temporary closure of roads would be obtained, where required	– E86, E87
	– Heavy vehicles would be restricted to the routes specified and route markers installed for heavy vehicles along designated routes	– E88
	– Signs would be provided at the site access point to assist in deliveries to the worksite	– E86, E87
	– Signs would be provided at the access point for pedestrian and cyclist guidance	– E88
	– An emergency response plan have been developed for construction traffic incidents	– T4
	– A pre and post-construction assessment of road pavement assets would be conducted in areas likely to be used by construction traffic	– E81, T22
	– Public communications would be conducted to notify the community and local residents of vehicle movements and anticipated effects on the local road network relating to the site works	– E81, E83, T19, T21
	– Access to all private properties adjacent to the works would be maintained during construction	– T6
	– During project inductions, all heavy vehicle drivers would be provided with the emergency response plan for construction traffic incidents	– T4
	– Project staging, vehicle movement and scheduling, equipment and resourcing would be coordinated.	– T13, T21
	– Site vehicles would be parked within the rail corridor and not affect public parking areas	– T12, T19
	– Scheduled road movements would be minimised where possible	– T13, T21
	– Oversized deliveries would be undertaken in accordance with the requirements of NSW Police or Roads and Maritime Services	– E85, E88,
Responsibilities	– The Construction Manager is responsible for ensuring traffic management plans and TCPs are developed, approved and implemented	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– E-T-8-1222 to be used to document complaints. – Daily inspection, checks and regular maintenance to traffic control measures.	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Contaminated Material. While there is no listed contaminated sites within the project boundary, it is recognised that the site is within a rail corridor with the potential for contamination. As such work will be conducted in accordance with the relevant legislative requirements and the condition of approval with controls applied as listed in the ERAP below. If any contamination is encountered work is to stop with controls applied and the unexpected finds procedure followed, the site is then remediated before work commences again.

ERAP 7 - Hazardous / Contaminated Material (including Land)		
Objective	– To comply with contractual and legislative requirements and ensure that hazardous material from construction activities does not cause an environmental nuisance / harm and is disposed of in accordance with legislative requirements.	
Targets	– No environmental incidences involving contaminated/ hazardous materials. – No pollution events of the surrounding environmental and waterways by contaminated material. – All off-site movement of any found contaminated material will be tracked.	
Legal, Contractual and Other Requirements	– Sydney Metro City and Southwest CoAs – Contract specification clause – *Dangerous Goods Safety Management Act* 2001 – *Dangerous Goods Safety Management Regulation* 2001 – *Contaminated Land Management Act 1997* – AS/ NZS 1940: 2004 - **The Storage and Handling of Flammable and Combustible Liquids Australian Dangerous Goods Code, 5th Edition**	
Site specific planning / approval conditions / licence conditions	– Sydney Trains Environmental Protection Licence (EPL) #12208 – CoA – A17, E4, E65, E69, E70 – REMMs - WR1, HR4 – Revised environmental performance outcomes committed in the PIR – Soils, contamination and water quality – Contamination (*Contaminated Land Management Act 1997*) – Storage and Use of Hazardous Material	
Controls (means and resources)	– Land Contamination will be managed in accordance with the Contaminated Land Management Act – All hazardous substances to be stored with compatible substances in bunded containers, adjacent to the site offices, with spill kits nearby. – Provide spill kits for hazardous substances storage and large machinery. – Spill kits to be located in readily available and accessible locations and signposted. i.e. hazardous materials storage locations, ins site compound and on specific construction vehicles – Have emergency procedures in place. – Have current MSDSs on site. – Manage any found Contaminated Material as per legislative/ EPA permit requirements	– E69, WR1 – E69, HR4 – A17, E4, – A17, E4 – E65 – E4 – E69, WR1, E4
Responsibilities	– Site Supervisors, Project Leader and Laing O'Rourke Staff to ensure all targets are met. – Environmental Manager to ensure Land Contamination is managed as per the Contaminated Land Management Act – Environmental Manger/Construction Manger to ensure spill kits are placed in readily available and accessible locations and signposted.	
Timeframe	– Contaminated Material: Duration of any contaminated material removal. – Hazardous Material: Duration of site works.	
Monitoring and Reporting	– Receipts for the disposal of any found hazardous material will be filed on site by the PEM. – The finding of any contaminated material on site will be reported monthly by the PEM using E-T-8-0908	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Trade Waste. There will be some trade waste generation due to the construction of concrete footings and overhead wiring structures, however the waste material will be managed in accordance with the relevant legislative requirements and the condition of approval with controls applied as listed in the ERAP below. Concrete wash out facilities will be provided at ancillary facility locations and maintain regularly.

ERAP 8 – Trade Waste		
Objective	To comply with contractual and legislative requirements and ensure that trade waste from construction activities does not cause an environmental nuisance / harm.	
Targets	All trade waste to be discharged in accordance with legislation and approvals. Educate Laing O'Rourke staff and subcontractors on the relevant legislation, the correct use of the washout system and the Laing O'Rourke Trade Waste Permit where required. Reduced impacts to the surrounding environment and waterways.	
Legal, Contractual and Other Requirements	– Sydney Trains Environmental Protection Licence (EPL) #12208. – Contract specification clause – CoA– E65, E106, E108 – REMMS – WR1 – WR4, SCW1, SCW3 & SCW4 – CEMF 17.2 – Revised environmental performance outcomes committed in the PIR –Waste Management – *Protection of the Environment Operations Act* 1997. – *Sydney Water Act 1994*	
Controls (means and resources)	– Provide a concrete washout system – Location of washout to be at least 20m away from any drainage line or stormwater system. – Washout to be constructed prior to commencement of concrete works. – Washout to be barricaded off on all sides when not in use to prevent unauthorised entry. – Washout area is to be inspected daily by the Construction Manager to ensure residual water levels don't exceed 75% of capacity. – Record of daily inspection to be kept in Construction Manager's/Supervisor's diary when concrete washout is being undertaken. – Washout area to be cleaned when the capacity has been reduced below 50%. – Cleaning of washout to involve, removal of spoiled geo-fabric material and disposed of to a licenced waste disposal facility. Records to be retained – Where possible waste concrete shall be returned to the batch plant or concrete recycler. – Concrete truck drivers are to be advised of the location of the washout area prior to arrival on site. – The requirements relating to concrete washout on site are to be provided to the supplier prior to the works.	– E65 – E65 – E108, SWC3 – E108, SWC3 – E108, SWC3 – E106, SWC3 – WR1, SWC3 – WR1, SWC3, CEMF 17.2 – WR3, WR4 – E106 – E106
Responsibilities	– The Construction Manager will ensure that an approved and prepared area for concrete washout is available. – All personnel are required to ensure that the requirements of this ERAP are implemented for their operations. – All onsite personnel are required to advise Laing O'Rourke site management team of any concrete spills. – The Construction Manager is responsible for confirming these requirements with the concrete supplier prior to the works.	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– Weekly inspections	

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Indigenous and Non Indigenous Heritage. While there is no listed heritage sites within the project boundary and the environment is generally a cut/full environment, it is recognised that the site is within a rail corridor with the potential for heritage items to be discovered. As such work will be conducted in accordance with the relevant legislative requirements and the condition of approval with controls applied as listed in the ERAP below. If any heritage is encountered work is to stop with controls applied and the unexpected finds procedure followed and signed off by a third party archaeologist before work commences again.

ERAP 8 - Indigenous & Non-Indigenous Heritage		
Objective	– To comply with contractual and legislative requirements in relation to any unexpected discoveries of Indigenous and Non-Indigenous heritage items.	
Targets	– Awareness of possible discovery. – No harm to any unexpected finds.	
Legal, Contractual and Other Requirements	– Sydney Metro City and Southwest Planning Approval Dated January 2017 – Contract specification clause – *Heritage Act* 1977 – *Protection of the Environment Operations Act* 1997.	
Site specific planning / approval conditions / licence conditions	– Contract Specification – CoAs – E10, E19, E20, E25, – REMMS –AH2 and AH4 – CEMF – Section 10.2 – Revised environmental performance outcomes committed in the PIR – Aboriginal Heritage – Protection of the Environment Operations Act (1997) – Sydney Trains Environment Protection Licence (EPL) #12208 is required for this Project. – Non-Indigenous and Indigenous Heritage – During Construction.	
Controls (means and resources)	For contractual and legislative requirements in relation to any unexpected finds of Indigenous and Non-Indigenous heritage items refer to Appendix B - Indigenous & Non Indigenous Heritage.	
	– Should Aboriginal heritage items be uncovered, all works in the vicinity of the find would cease and the Project Manager and Sydney Metro staff notified immediately. The Office of Environment and Heritage (OEH) would be notified in accordance with the National Park and Wildlife Act 1974. The relevant Local Aboriginal Land Council would be notified and an assessment by an archaeologist would be arranged to determine the significance of the objects and any other requirements before work resumes.	– E10, E19, E20, AH2, REPO – Heritage, CEMF 10.2
	– If suspected Aboriginal objects are located during construction, an archaeologist would be notified to assess the nature and significance of the find. If the find is an Aboriginal object, further investigation and permits may be required before works commence. If the find is an Aboriginal object Office of Environment and Heritage (OEH) and the Manager of the Local Aboriginal Land Council (MLALC) would be notified. Sydney Metro will be contacted as required.	– E10, E19, E20, AH1, AH4, CEMF 10.2
	– If suspected human skeletal remains were uncovered at any time within the study area, the following actions would need to be followed: • immediately cease all excavation activity in the vicinity of the remains; • notify NSW Police; • notify OEH via the Environment Line on 131 555 to provide details of the remains and their location; and • no recommencement of activity in the vicinity of the remains unless authorised in writing by OEH.	– E10, E19, E20, AH1, AH4, CEMF 10.2
Responsibilities	– The Environmental Manager will ensure that appropriate action is implemented. – All personnel are required to ensure that the requirements of this ERAP are implemented for their operations. – All onsite personnel are required to advise Laing O'Rourke's Site Management team of any unexpected finds.	

	– The Construction Manager is responsible for confirming site discovery details.
Timeframe	– Duration of site works.
Monitoring and Reporting	– Weekly inspections to be recorded on Form E-T-8-1227. – Incidents or finds of any items to be recorded on form Environmental Incident and Complaint Report (F1222).

Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Delivery and Storage of Chemicals. There will be minimal chemical storage at ancillary facilities during construction. Any deliveries will be undertaken in accordance with the project CTMP. Controls applied as listed in the ERAP below. Storage areas will be inspected on a regular bases at ancillary facility locations and maintained regularly.

ERAP 9 – Delivery and Storage of Chemicals; Fuels and Oils including Dangerous Goods Requirements		
Objective	– To ensure contractual and legislative requirements in relation to hazardous substances and dangerous goods are adequately addressed for all operations – there are specific additional requirements relating to the storage and transport of dangerous goods – To comply with contractual and legislative requirements in relation to the storage of chemicals, fuels and oils on the site. – To comply with contractual and legislative requirements in relations to the transport of dangerous goods	
Targets	– Zero spills or uncontrolled release of fuel, oils or chemicals associated with Laing O'Rourke's Operations – Compliance with relevant transport and storage requirements. – All vehicles transporting dangerous goods have appropriate placards, licenses and emergency equipment and procedures.	
Legal, Contractual and Other Requirements	– AS/ NZS 1940: 2004 – The Storage and Handling of Flammable and Combustible Liquids – *Dangerous goods (Road and Rail Transport) Act 2008* – *Dangerous goods (Road and Rail Transport) Regulation 2008* – Australian Dangerous Goods Code, 7th Edition.	
Site specific planning / approval conditions / licence conditions	– CoA – E4, E65, E80 – REMMs - HR1, HR2 and HR5, WR1 – Revised environmental performance outcomes committed in the PIR – Hazard and risk	
Controls (means and resources)	The following are the minimum general control measures to be implemented on the project, however additional control measures may be required following the completion of the construction process procedure/work method statement for the proposed activity	
	– Minimise storage of fuel, oil, chemicals or other dangerous goods on site, though efficient and timely ordering	– E4, HR1, HR5
	– The SDS and material risk assessment and including any specific control measures are to be submitted where required to the Client's Representative for each and every substance to be brought on to site	– E4, HR1
	– A risk assessment relating to the use of these materials is to be completed in accordance with the Construction Health and Safety Plan prior to the arrival of these goods to site	– REPO – Hazard and risk
	– SDS and associated documentation for each material to be reviewed prior to the completion of the risk assessment for the relevant construction process. A copy to be included with the SWMS	– E4, HR1, HR5
	– Ensure SDSs are available on site for all fuels, oils, chemicals and dangerous goods. Suppliers are to provide SDS prior to dispatch of the material	– E4, HR1, HR5
	– Chemicals, fuels and oils to be stored in a securely bunded area with appropriate signage, at all times when not specifically in use.	– E4, HR1, HR5
	– Chemicals fuels, oils and chemicals to be stored inside impervious bunds of sufficient capacity to contain 110% of the stored volume. Bunded areas must have sufficient cover to prevent ingress of rain	– E4, HR1, HR5
	– Materials removed from the bunded storage area for use are to be returned to the bund at the end of each shift	– E4, HR1, HR5
	– Storage sites are to be > 20m away from operational facilities, drainage lines, areas prone to flooding or on slopes > 1V:10H.	– E65
	– Driver or Supervisor to be in attendance at all times when unloading of fuel, oil or chemicals takes place on site.	
	– No water to be discharged from bunded areas into site drainage system. Contaminated water to be removed by appropriately licensed contractor & discharged to a suitably licensed waste facility.	– E4, HR1, HR5, WR1
	– Delivery drivers are to be provided with specific drop off and storage instructions.	– E80

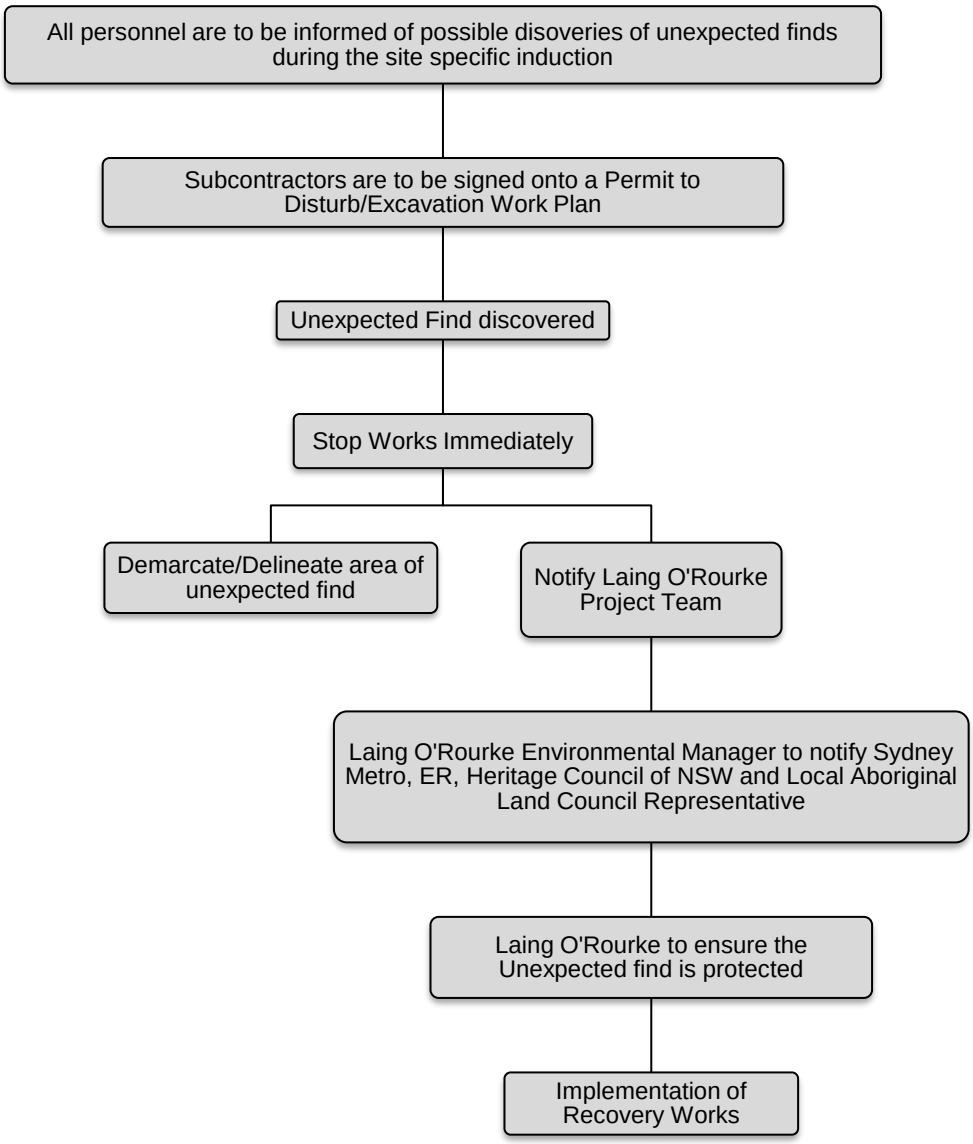
	– Spill kits & absorbent material to be located adjacent to storage bunds. – Training is to be provided to the workforce in the application of this ERAP and the use of spill kits. – Absorbent material used to clean up spills to be disposed of in accordance with the EPA Waste Classification Guidelines. – A register of Chemicals, Fuels/Oils and Hazardous materials is to be kept onsite and maintained for the duration of the project. – Each construction method statement shall identify the use of chemicals, fuels & oils and hazardous materials. – SWMSs to address the specific requirements relevant to the work to be undertaken and document relevant site control measures. The Environmental Manager will ensure that appropriate action is implemented.	– E4, HR1, HR5 – E4, E65, HR1, HR5 – E65, WR1 – E4, HR1, HR5 – E4, HR1, HR5 – E4, HR1, HR5
Responsibilities	**Dangerous Goods** − Ensure transporters of these materials are appropriately licensed. This includes relevant licenses for vehicles and drivers. − Dangerous goods that are to be transported in receptacles greater than 500lt/kg may require specific licenses and shall not be transported by Laing O'Rourke without the Project Leader/Workplace Manager's approval. − Where dangerous goods are transported by Laing O'Rourke, a SWMS must be developed and include dangerous goods requirements. − Transport information/manifest is required to be included with any quantity of Dangerous Goods transported by Laing O'Rourke – Form 1232 Dangerous Goods Transport Note is to be used unless it can be demonstrated that the activity is exempt. − The SWMS statement must address the requirement for Licensing, Placards or other specific regulatory requirements − Transport activities in quantities that trigger the requirements of a "Placard Load" under the regulations require the following: − Transport vehicle to have appropriate Dangerous Goods Placard − Transport documents including manifests − Emergency procedures and information in an appropriate holder − 30B fire extinguisher − Double-sided reflectors − Driver safety equipment and PPE − Goods must be secured and where required segregated from incompatible goods.	
Responsibilities	− Engineering personnel are responsible for identification of requirement to transport Dangerous Goods − Relevant Project Leader or Site Manager is responsible for ensuring all vehicles carry appropriate placards, licenses, emergency equipment and procedures − The Site Manager is required to ensure that sufficient bunds are available and that material is stored appropriately. − Engineering personnel are responsible for ensure SDS and other relevant documentation are obtained and where required submitted to the Client's Representative prior to the material arriving on site. Relevant documentation also includes appropriate risk assessment. − The Project Safety Advisor is responsible for ensuring the Chemicals, Fuels/Oils & Hazardous Substances register is maintained.Duration of site works.	
Timeframe	– Duration of operations. The requirements apply to goods transported by Laing O'Rourke and third parties.Weekly inspections to be recorded on Form E-T-8-1227.	
Monitoring and Reporting	− Plant / project risk assessments − Weekly inspections to be recorded on Form − Register of Chemicals, Fuels/Oils and Hazardous Materials	

	− Incidents or spills to be recorded on form Environmental Incident and Complaint Report (E-T-8-1222 Environmental Incident and Complaint Report). − Storage areas are to be inspected by the Supervisory personnel on a weekly basis.

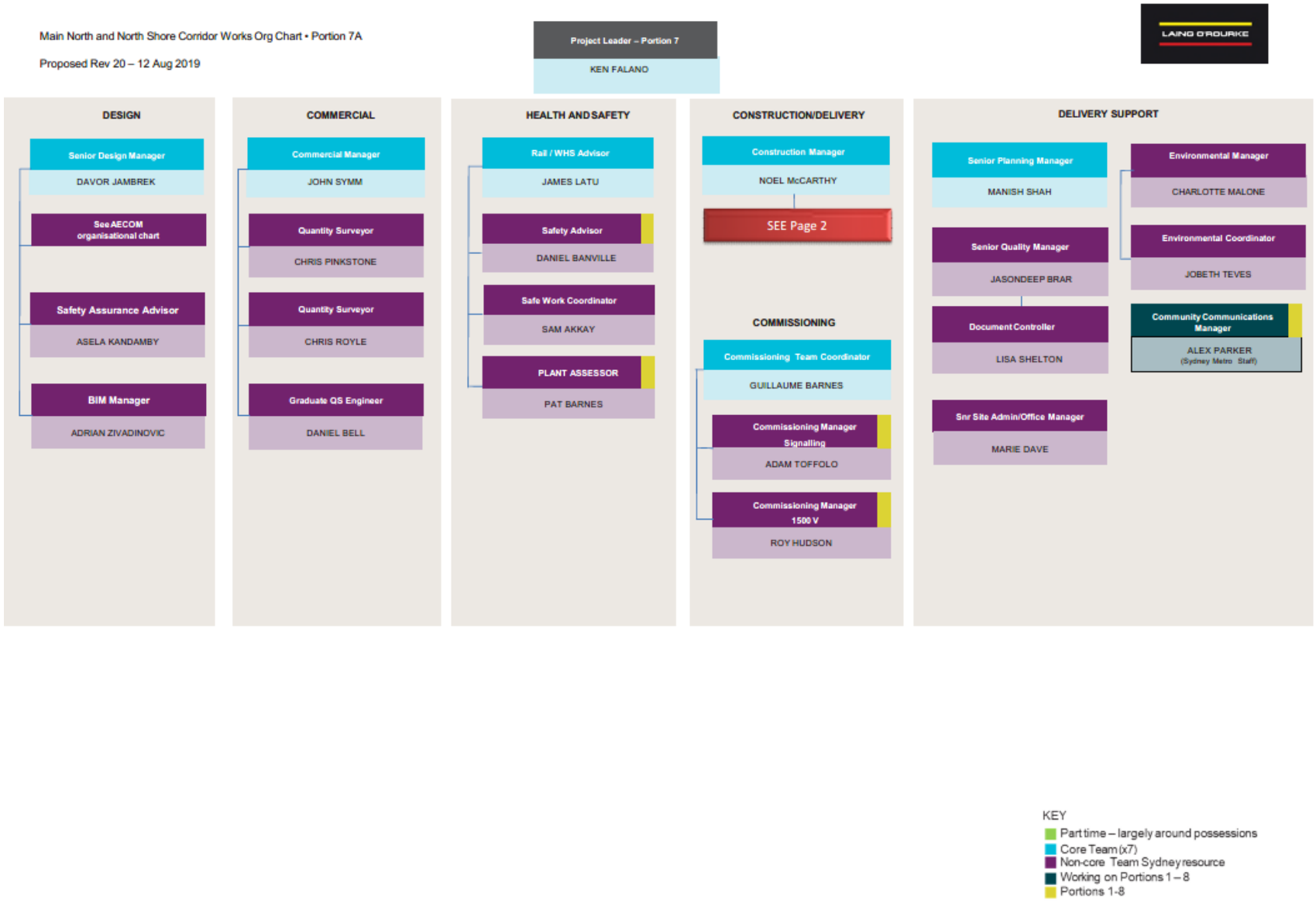
Actual Impact: Works for the Northern Corridor Works project are expected to be minor in relation to Visual Amenity. All activities for the project are to be conducted within the rail corridor. Existing rail corridor screening is present along the extent of corridor for the NCE project. Further acoustic barriers will be applied to mitigate impacts with lighting directed away from nearby residents. Any other impacts will be managed in accordance with the approved construction ancillary facilities management plan. Additionally controls applied as listed in the ERAP below. Storage areas will be inspected on a regular bases at ancillary facility locations and maintained regularly.

ERAP 10 – Visual Amenity		
Objective	– To ensure contractual and legislative requirements in relation to visual amenity are adequately addressed at all work locations.	
Targets	– Minimise impacts on existing landscape features as far as feasible and reasonable; – Ensure the successful implementation of the Landscape Design; and – Reduce visual impact of construction to surrounding community.	
Legal, Contractual and Other Requirements	– AS 4282-1997 – Control of the obtrusive effects of outdoor lighting	
Site specific planning / approval conditions / licence conditions	– CoA's - A18, A19, A20, E6 E99 – REMM's - NV1, LV1, LV2, LV3, LV4, LV5, LV18 – CEMF – Section 12.1 – Revised environmental performance outcomes committed in the PIR – Landscape character and visual amenity	
Controls (means and resources)	The following are the minimum general control measures to be implemented on the project, however additional control measures may be required following the completion of the construction process procedure/work method statement for the proposed activity;	
	– Minimal amenity impacts to surrounding residences and businesses, by applying visual mitigation and screening as soon as feasible and augment existing screenings	– A18, A19, LV1, LV18
	– Provision of noise barriers and/or visual mitigation measures around ancillary facilities adjacent to sensitive receivers	– A18, A19
	– Orientate lighting to minimise glare and light skill impacts	– LV3
	– Temporary site lighting, for security purposes or night works will be installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting.	– LV3, CEMF 12.1
	– Wherever feasible and reasonable, vegetation around the perimeter of the construction sites will be maintained	– LV2, LV5
	– Temporary construction works will be designed with consideration of urban design and visual amenity	– LV4
	– SWMSs to address the specific requirements relevant to the work to be undertaken and document relevant site control measures.The Environmental Manager will ensure that appropriate action is implemented.	– A19, LV3, LV4
Responsibilities	– The Environmental Manager will ensure that appropriate control is implemented. – All personnel are required to ensure that the requirements of this ERAP are implemented and maintained for the duration of the project. – All onsite personnel are required to advise Laing O'Rourke's Site Management team of any maintenance required on mitigation controls. – The Construction Manager is responsible ensuring visual mitigation controls are in place prior to operation of ancillary facilities.	
Timeframe	– Duration of site works.	
Monitoring and Reporting	– Weekly inspections to be documented on the Weekly Environmental Inspection Checklist Form E-T-8-1227. – Incidents or spills to be recorded on form Environmental Incident and Complaint Report (E-T-8-1222 Environmental Incident and Complaint Report). – Ancillary facilities are to be inspected by the Supervisory personnel on a weekly basis.	

APPENDIX E - Unexpected Finds Procedure

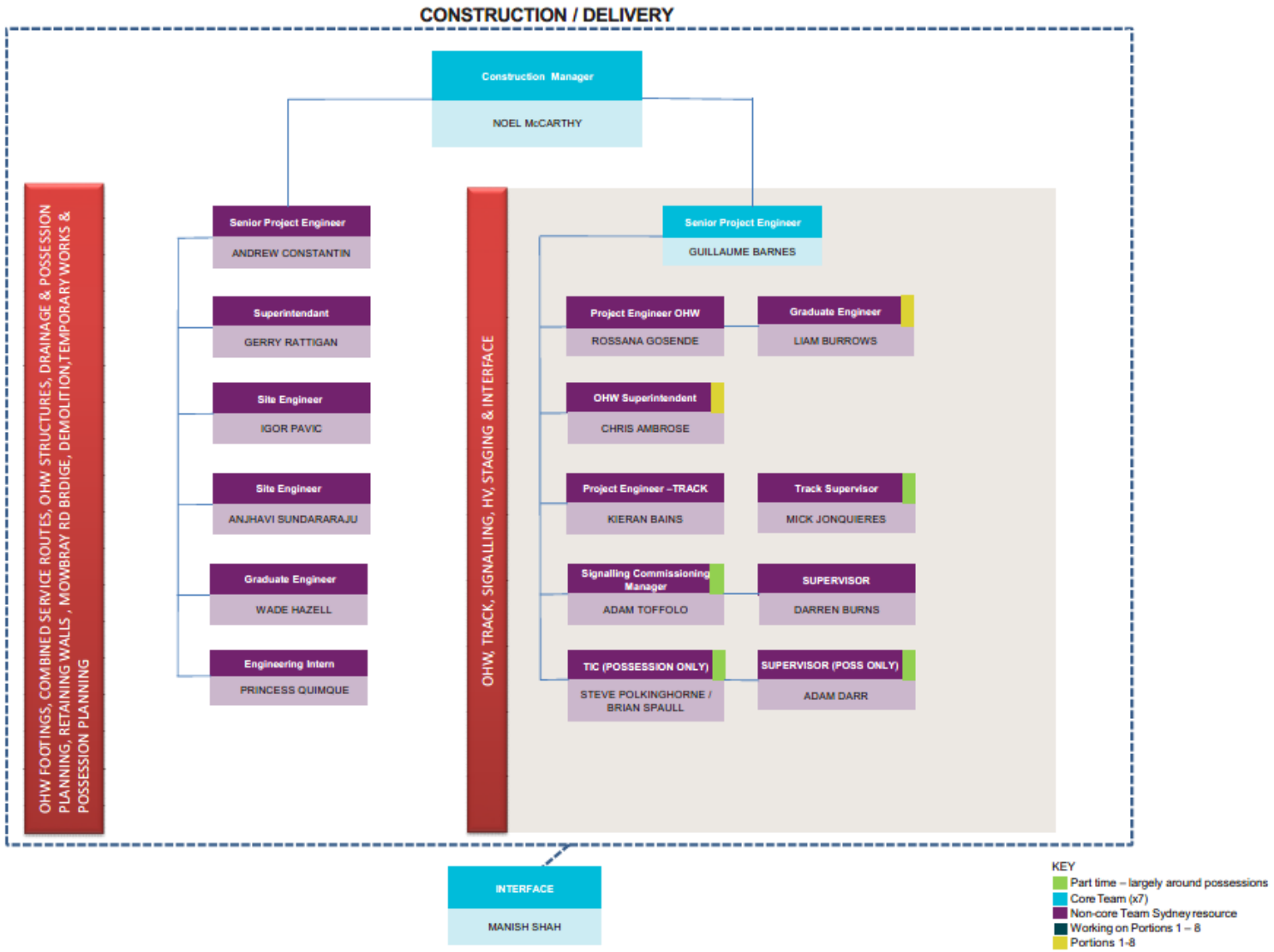


APPENDIX F - Organisation Chart



Main North and North Shore Corridor Works Org Chart • Portion 7A

Proposed Rev 20 – 12 Aug 2019



APPENDIX G – Staff Acknowledgement Register

Table 24: Staff Acknowledgement Register

Name	Role	Signature	Date
	Project Leader		
	Construction Manager		
	Commercial Manager		
	Senior Quantity Surveyor		
	Quantity Surveyor		
	Assistant Quantity Surveyor		
	Procurement Officer		
	Senior Site Administrator		
	Design Manager		
	WHS Manager		
	Rail Safety Manager		
	Quality Manager		
	Quality Inspector		
	Senior Environmental Advisor		
	Community Relations and Stakeholder Manager		
	Signalling Project Engineer		
	Signalling Commissioning Engineer		
	Planning & Project Controls Manager		
	OHW Construction Manager		
	OHW Site Engineer		
	Site Engineer		
	Graduate Engineer		
	Supervisor		

APPENDIX H - Emergency Preparedness and Response

The types of environmental emergencies that could occur on this site are tabulated below.

Note: This plan is designed to supplement TfNSW's site emergency response plan/s where available. In case of conflict, TfNSW's plan will apply to the extent the applicable measure in that plan is the most conservative action to address the emergency as compared to the CEMP. Incidents as defined in Table 1 of the SSI 15_7400 are to be managed in accordance with CoA A41 and A44.

Table 25: Emergency Preparedness and Response

No	Emergency	Preparation	Response	Responsibility
1	Significant adverse dust event due to weather conditions: High winds	– Monitor meteorological conditions for the area - develop contingency for wind speeds in excess of 16m/s (55km/hr) – High wind 'stop works' protocols in place – Establish contingency strategy for additional dust control measures, additional water carts, dust suppressants, stockpile covers etc.	– Dust generating activities will cease under direction of the Environment Manager or Site Supervisor until adverse conditions subside. – Deploy additional mitigation measures to exposed areas stockpiles and other dust generating items will be water sprayed or covered.	Environmental Manager Site Supervisor
2	Discovery of friable asbestos.	– Review previous land uses, environmental reports for potential for friable asbestos. – Include asbestos awareness in the site induction where the potential exists – Include contingency in relevant work procedures and SWMSs – Identify potential service providers for asbestos control and removal.	– Stop work – Quarantine suspected area – Cover or provide dust mitigation strategy – Engage licensed/approved removal and disposal organisation – Complete post removal verification	Project Leader Site Supervisor Health and Safety Manager Environmental Manager
3	Flooding	– Monitor meteorological conditions – develop contingency strategy for rainfall > 100mm in 24hours or potential for > 1in 5 ARI – All chemicals, fuels and other hazardous substances to be in secured containers and stored within a sealable shipping container – Remove plant and equipment from low lying areas – Secure plant that cannot be removed – Review site drainage flow paths: – Redirect site drainage to prevent flooding of residential/business premises – Ensure site drainage does not concentrate surface flow – Review and address the potential for excess water entering the site – Review and maintain erosion and sedimentation controls	– Recover materials washed from site including sediment and other waste. – Check effectiveness of erosion and sedimentation devices and other flood controls, maintain where required and safe to do so.	Site Supervisor Environmental Manager

No	Emergency	Preparation	Response	Responsibility
4	Major spill of hazardous or toxic substance off site or to environmentally sensitive area (> 20L)	– Awareness training of appropriate response and procedures to be incorporated into Environmental and Safety Induction – MSDS on site for all materials and kept up to date – Adequate supply of absorbent materials available in the site compound and on vehicles in work location – Emergency telephone numbers for Emergency Response organisations/fire brigade prominently displayed around office and issued to supervisors – Initial contact to be made with relevant organisations at project commencement – No fuels would be stored on site	– Report spill immediately to Project Leader and/or Construction Manager who will notify TfNSW – Attempts to be made to limit or contain the spill using sand bags to construct a bund wall, use of absorbent material, temporary sealing of cracks or leaks in containers, use of geotextile or silt fencing to contain the spill, transferring remaining material. – Implement procedures to notify the relevant authorities. – Construction Manager to coordinate the response, clean up – Fire brigade or emergency organisations should be called if spill cannot be controlled by site resources. – Evacuation procedures are to be implemented to remove non-essential personnel from the affected area – On site client personnel are informed of the incident, internal reporting as per potential Class 1 matter. – Access and egress to the area is established to ensure the appropriate vehicles have effective access and congestion is minimised. – Senior Officer from fire brigade /emergency organisation assumes control of the operation with Laing O'Rourke personnel assisting as required. – Commence data gathering and investigation once emergency is contained	Project Leader Site Supervisor Environmental Manager
5	Fire	– Awareness training of appropriate response and procedures to be incorporated into Environmental and Safety Induction – Fire extinguishers maintained, clearly labelled and distributed around site compound and vehicles – Training in the use of fire extinguishers and which one to use for each type of fire – First Aid supplies are stocked and adequate – Emergency telephone numbers for Emergency Response organisations/fire brigade prominently displayed around office and issued to supervisors – Initial contact to be made with relevant organisations at project commencement	– For small fires, attempts to be made to extinguish the fire or limit its spread with available fire extinguishers or water hoses if appropriate. – Supervisor is to be informed immediately. – Supervisor to contact client and external services where necessary (fire, ambulance) as a precautionary measure. – All personnel in the vicinity to be assembled in the Evacuation Assembly Area and a head count performed – Any resulting fuel or chemical spill to be handled as detailed above	Site Supervisor Environmental Manager

No	Emergency	Preparation	Response	Responsibility
			– Supervisor to coordinate with emergency services and provide assistance as required.	
6	Injury/death to protected/endangered/threatened fauna	– Identify potentially impacted species prior to commencement on site. – Identify species that may be impacted, include material within the project induction – Review/inspect vegetation to be cleared prior to clearing – utilise ecologist/spotter where there is the potential for endangered/threatened species – Engage with local vet/WIRES representative on the appropriate contact/procedure – Site procedure for the short term management of injured fauna – If threatened flora or fauna species are identified on site, work in the vicinity of these species would stop immediately. A spotter/catcher/botanist would be engaged to survey the site and advise on species management – Trenches/excavations would be covered at the end of each day and inspected before they are backfilled to ensure no fauna species are harmed.	– Immediately cease activities upon discovery of injured fauna – Implement procedure for short-term stabilisation and transport to Vet or WIRES – Undertake additional vegetation inspection to identify any remaining fauna prior to recommencement.	Site Supervisor Environmental Manager

APPENDIX I - Environmental Incident Investigation Guidelines

Incident Investigation (E-T-8-1222 Environmental Incident and Complaint Report**)**

Incident Notification: As per Condition A41 of this approval **a**ll incidents must be reported to Sydney Metro as soon as possible to notify DPE within 24 hours. Any notification given to the EPA as per CoA A44 must also be given to DPE within 24 hours. Refer to Section 16 of the CEMP for further information.

Note: Class 1 incidents shall be subject to an ICAM investigation.

The following section outlines the environmental incident and complaint investigation. The actual detail required will vary depending on the class of the incident. In any case, form E-T-8-1222 Environmental Incident and Complaint Report is to be used to document the incident.

Step 1- Identify the class of incident and obtain the incident or complaint details.

Step 2 - Observation and information gathering.

The first priority is to understand the incident and how the incident occurred.

- Take samples or obtain results (required for Class 1&2) - laboratory results or in situ samples (Note: for Class 1 & 2 incidents NATA certified laboratories may be required)
- Interview persons involved where required - Include witnesses / supervisors / experts
- Inspect the incident scene - Take measurements (do not guess), photos, videos, drawings, diagrams / sketches.

Collect related documentation - Attach additional material as appropriate such as Work Method Statements, JSEA's, Environmental Risk Action Plans (ERAPs), Erosion and Sediment Control Plans, Risk Assessments, induction records, toolbox talks, pre-start, environmental training records, subcontractor/client incident report, relevant design documentation, maintenance records.

Step 3 - Give detailed description of the incident

- Outlined exactly what happened and give the following details as applicable:
- Area or people affected and pollutant type as appropriate
- Time, date and weather conditions
- Plant, equipment, organisations involved
- Potential stakeholders involved
- Describe the nature of the incident including:
- Breach of licence condition, Act or regulation
- Discovery of cultural heritage item, artefact, etc.
- Unauthorised release of harmful substance to environment
- Penalty or fine imposed or protection order or notice issued.
- Performance of the environmental controls
- Describe the immediate remedial actions undertaken:
- Notify relevant parties
- Contain pollution or clean up affected area
- Repair to environmental controls
- Rectify damage and remediate the affected area

Step 4 - Undertaken basic level incident analysis

List the elements involved including people, equipment and environment (weather conditions) elements involved in the incident

List the essential and contributing factors for the items above.

Step 5 - Identify the corrective and preventative actions.

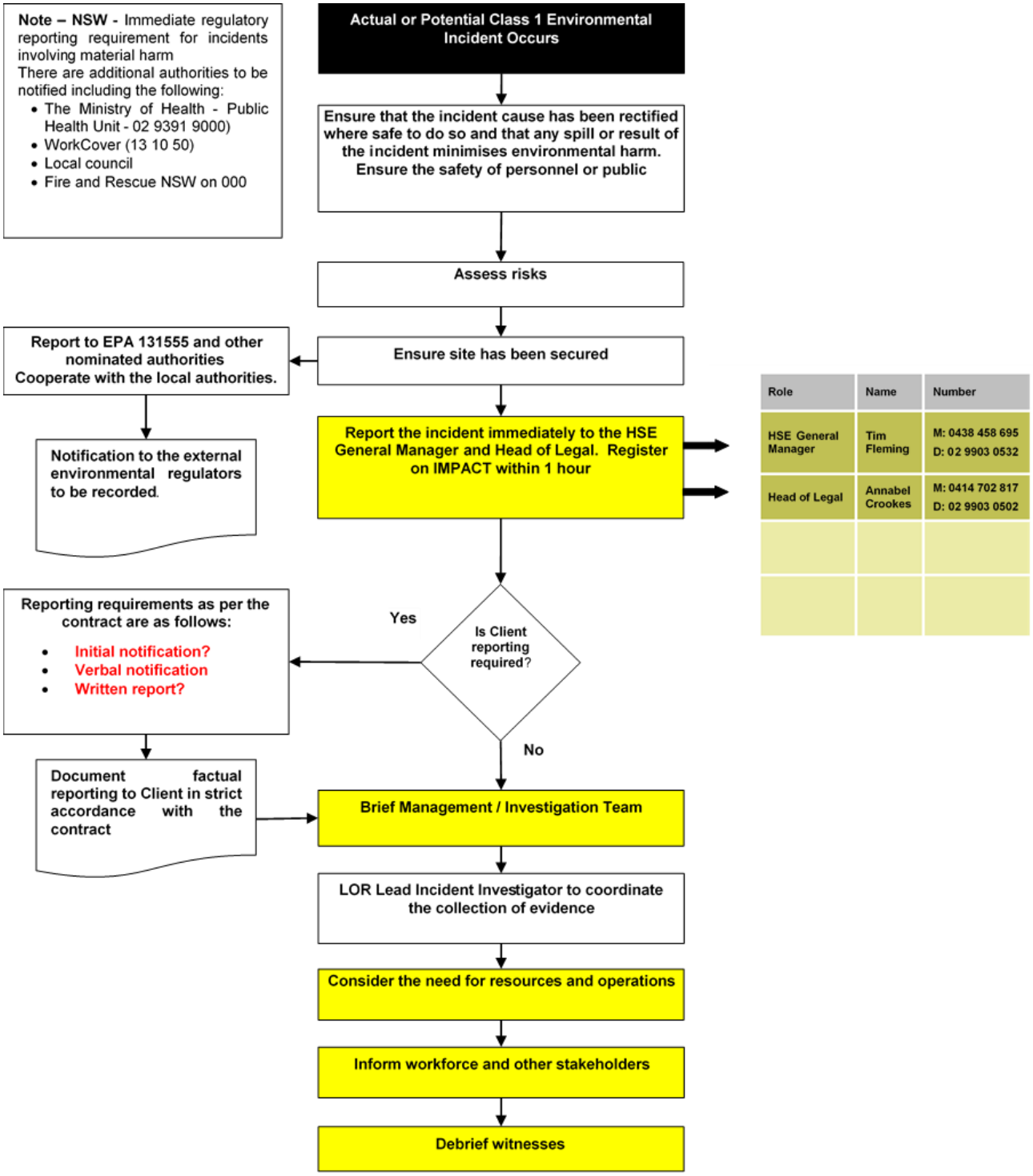
- Change to equipment/machinery design / maintenance
- Improve environmental control measures
- Implement additional resources
- Change to work methods or processes
- Change or additional induction training
- Additional ongoing training

Step 6 - Implement the corrective and preventative actions outlined above

- Outline responsibilities and accountabilities
- Obtain relevant approvals for the corrective and preventative actions (i.e. Regulatory Authority or Client requirement)
- Provide proposed completion dates for the approved actions
- Document actions implemented and close out

Note: where a Class 1 Incident has occurred the Corporate HSEQ Manager will initiate the investigation and allocate responsibilities, an external consultant may be engaged.

Figure 7 - Class 1 Incident Response Flow Chart



APPENDIX J – Environmental Inspection Report

Figure 8 - Site Environmental Inspection Report

Process	Document owner	Step	Gateways	Document type
Enabling Process	Project Team (Delivery)	2257 – Environmental Compliance	7 – 8	Template (T)

Environment Inspection

E-T-8-1227 ENVIRONMENTAL INSPECTION REPORT

CONTRACT/PROJECT No.:	WORK LOCATION:
DATE:	TIME:

A = ACCEPTABLE AR = ACTION REQUIRED N/A = NOT ASSESSED

No.	ITEM	CONFORMANCE A	CONFORMANCE AR	CONFORMANCE NA	RISK CLASS	DESCRIPTION OF NON-COMPLIANCE/ CORRECTIVE ACTION	CORRECTIVE ACTION REQUIRED	RESPONSIBLE	TARGET DATE
GENERAL									
1	Are good house-keeping practices in place in Work Areas?								
2	Vehicles parked in designated parking zones?								
3									
4									
FIRE CONTROLS									
5	Hot works conducted under Permit?								
6	Any evidence of unapproved fires onsite or offsite along Project boundaries?								
7	Fire extinguishers/equipment available and maintained? (vehicles/work areas)								
DUST									
8	Are fugitive dust emissions travelling beyond Project boundaries?								
9	Are agreed dust control measures being implemented to minimise dust emissions (e.g. – sufficient number of watercarts, handling/transport of materials, application of dust suppressants etc.)?								
10									
11									
AIR POLLUTION									
12	Do excessive black smoke emissions from vehicles and equipment occur >20 seconds?								
13									
MAINTENANCE / EQUIPMENT / REFUELLING									
14	Are vehicles, equipment and plant being serviced on time and according to manufacturer specifications? Maintenance logs up to date & available to view?								
15	All gen-sets and diesel tanks are self contained or in 110% capacity bund with no evidence of water or litter pooling within?								
16	Are refuelling activities taking place at designated zones with spill kits, drip trays and fire extinguishers present?								
WASTE MANAGEMENT									
17	Sufficient waste receptacles available to segregate waste streams (e.g. oily rags, plastics, wood, steel, 'butt out bins') & are they close to work areas?								
18	Are waste streams being segregated into clearly labelled receptacles?								
19	Do all waste receptacles have appropriate lids and/or coverings?								
20	Any evidence of unreported leaks/spills (e.g. – sewerage overflows/leaks, hydrocarbon spills and vehicle wash-down areas and chemical storage areas)?								
21	Are concrete washout areas installed in agreed locations and are they being maintained and emptied?								
22									
23									
CHEMICAL MANAGEMENT AND SPILLS									
24	Are hazardous chemicals/liquids store inside a bund that satisfies the criteria - 110% of the max. storage or 10% of double skinned tank?								
25	Are spill kits (hydrocarbon and/or chemical) located within each Work Area and/or with major vehicles? Are they free from litter and water?								
26	Hazardous materials segregated (no incompatible materials together) and have correct signage, fire extinguishers, ventilation, correct containers & labels)?								
27									
28									
EROSION AND SEDIMENT CONTROL									
29	Are Erosion Control Structures (ESCs) installed as per the current ESCP?								
30	Are all controls being installed correctly and maintained and have a minimum of 75% capacity?								
31	Is there evidence of erosion/sedimentation or surface water discharge occurring external to the Project Footprint?								
32	Are sediment basins of adequate size and constructed so that all water on-site is draining to them?								
33	Is there evidence of sediment tracking on external public roads?								
34	Is the ESCP up to date for the scope of works and catchment areas?								
35	Clean water diverted to approved locations and dirty/contaminated water contained? No evidence of contaminated water leaving site?								
36									
WATER QUALITY AND MANAGEMENT									
37	Collected water treated and tested prior to discharge offsite?								
38									

Process	Document owner	Step	Gateways	Document type
Enabling Process	Project Team (Delivery)	2257 – Environmental Compliance	7 - 8	Template (T)

Environment Inspection

No.	ITEM	CONFORMANCE A	CONFORMANCE AR	CONFORMANCE NA	RISK CLASS	DESCRIPTION OF NON-COMPLIANCE/ CORRECTIVE ACTION	CORRECTIVE ACTION REQUIRED	RESPONSIBLE	TARGET DATE
39									
FLORA / VEGETATION / WEEDS									
40	Do vehicles have Weed-free Certificates and are Weed Inspection Logs up-to-date?								
41	Are works being carried out within approved cleared boundaries with no unapproved ground disturbance? (i.e. tracks/turning circles etc.)								
42	Is there evidence of adverse impacts to vegetation on-site and up to 5m around site, along Project roads or infrastructure footprints (e.g. - overspray from dust suppression activities, dust settlement, unauthorised clearing)?								
43	Topsoil/ Vegetation/ Weeds are segregated and sign posted?								
44	Physical vegetation protection measures (fencing, flagging tape etc) in place and maintained?								
45									
FAUNA PROTECTION									
46	Are fauna egress points installed in sediment basins and other excavations/trenches?								
47	Is there evidence of vehicular activity or unapproved activities in off-limit areas, known fauna habitats?								
48	During night works is lighting facing downwards and illuminating work areas only?								
49									
50									
NOISE / VIBRATION									
51	Equipment is located/directed away from sensitive areas and where suitable are fitted with sound insulation and/or vibration suppression devices?								
52									
53									
Cultural Heritage									
54	Physical protection measures (fencing, flagging tape etc) in place and maintained?								
55	Is there evidence of unapproved activities or damage to known curltural heritage areas?								
56									
57									
Contaminated land/PASS/ASS									
58	Contamination remediation being undertaken in accordance with approved plan?								
59	Physical controls for known contaminated areas in place and maintained?								
60	All PASS/ASS treatment pads and sumps, maintained as per required specifications?								
61									
VEHICLES AND TRAFFIC									
62	Are vehicles and equipment operating within the approved Project Footprint?								
63									
ADDITIONAL COMMENTS / REQUIRED ACTIONS:									

INSPECTION TEAM:	Risk Class	Environment
SIGNATURE(S):	0	Requirement Complies with system or criteria.
Project Manager or Leader:	1	Major Noncompliance eg: Nil evidence of implementation, departure from documented system requirement, potential or pending failure leading to long term defect or immediate requirement for rectification or change of work method or construction details. Potential prosecution
SIGNATURE:	2	Minor Noncompliance. Eg: Issues with system or criteria requirement establishment or implementation, potential failure leading to possible long term defect or review of work method or construction details.
Note: This form MUST be signed and scanned as electronic copy and saved in the projects Environmental system folder (1430). Hard copy to remain in project file for no less then 12 months. All non-compliances must be uploaded into the Corrective Action Register (E-T-8-	3	Opportunity for Improvement (minor omissions, oversights, identification of recommendations to improve, etc)

APPENDIX K – Management HSE Inspection Report

Figure 9 - Management HSE Inspection Report

Process	Document owner	Step	Gateways	Document type
Enabling Process	Project Team (Delivery)	2257 – HSEQ Compliance	7 – 8	Template (T)

Management Site Safety and Environment Inspection

PROJECT / LOCATION / CONTRACT NO:									
No.	Item	Evidence Sighted	Risk Class	Responsible	Exact Location	Description of Non Compliance	Action Taken	Close Out**	
								Immediate	Follow up
1.	Access / Egress-Clear / Designated								
2.	Amenities – Clean / Adequate								
3.	Edge protection								
4.	Electrical Equipment – Tagged / Safeguards, leads								
5.	Excavation – Barricades, access								
6.	Fire Hose Reels / Fire Extinguishers (including on plant & contractor owned) Charged & In Test Date								
7.	Hazardous Substances – quantity storage, risk assessment								
8.	Housekeeping / Rubbish Removal								
9.	Ladders – Condition / Usage								
10.	Lighting / Levels acceptable								
11.	Manual Handling								
12.	Noise Management								
13.	Penetrations – Protected, marked								
14.	Plant / Equipment –								

Process	Document owner	Step	Gateways	Document type
Enabling Process	Project Team (Delivery)	2257 – HSEQ Compliance	7 – 8	Template (T)

Management Site Safety and Environment Inspection

PROJECT / LOCATION / CONTRACT NO:									
No.	Item	Evidence Sighted	Risk Class	Responsible	Exact Location	Description of Non Compliance	Action Taken	Close Out**	
								Immediate	Follow up
27.									
ENVIRONMENTAL CONTROLS									
28.	Sediment controls								
29.	Water Quality								
30.	Waste Management								
31.	Noise / Vibration								
32.	Air Quality								
Other issues / activities									
33.									
34.									
35.									
36.									
37.									
38.									
Comment / Description or Additional Items:									
	NOTE: The checklist to be completed by the designated person in the H&S Plan and forwarded to the Project / Workplace Leader and H&S Advisor for review. **CLOSE OUT**** Items identified for "Follow up" are to be registered on the Project C-T-8-**0116** Corrective Action Request Register								
	Personnel/Subcontractors Involved:								

	Risk Class	H&S		Environment

Process	Document owner	Step	Gateways	Document type
Enabling Process	Project Team (Delivery)	2257 – HSEQ Compliance	7 – 8	Template (T)

Management Site Safety and Environment Inspection

PROJECT / LOCATION / CONTRACT NO:									
No.	Item	Evidence Sighted	Risk Class	Responsible	Exact Location	Description of Non Compliance	Action Taken	Close Out**	
								Immediate	Follow up
Inspection undertaken by: …… Signature: …… Position: …… Date: …… Project/ Workplace Leader's Signature:……				0	Complies		Complies		
				1	Alters the future of an individual permanently, (risk of death or permanent disability.)		Permanent or long term damage to the environment. Damage will take 12 months or more to return to pre-existing conditions		
				2	Alters the future of an individual temporarily (risk of medical treatment.)		Short to medium term damage to the environment. Damage will take up to 12 months to return to pre-existing conditions		
				3	Does no more than inconvenience the person (1st Aid treatment,)		Easily rectified usually within one day. Class 3 incidents do not cause medium or long term damage.		
					DISTRIBUTION: Project/ Workplace Leader, Contract File			Refer: Cl	

APPENDIX L - Sydney Metro – OOH Work Application Form Template

Unclassified

Sydney Metro – Integrated Management System (IMS)

(Uncontrolled when printed)

Out of Hours Work Application Form

This form is to be used for formal review and approval of Sydney Metro Out of Hours (OOH) work as it may affect Residential and non-Residential receivers. This form can be used in accordance with the *SM ES-PW-317 City & Southwest Out of Hours Work Strategy / Protocol*. Each OOH application and all applicable appendices must be submitted to Sydney Metro as one PDF file at least 15 business days prior to the commencement of the proposed OOH work.

1. OOH Application	
Sydney Metro Project: E.g. Northwest, City & Southwest, West, etc.	
Contract:	
Contractor:	
Application Title: E.g. 'Smith St service relocation works'	
Application Number: E.g. 1, 2, 3, etc.	
Application Date: Original submission date (resubmission date in parentheses if applicable)	
Relevant Planning Approval:	
Environment Protection Licence (EPL): If subject to an EPL, state title and number.	

2. Proposed OOH Work Details	
Description of works, including: • Work methodologies. • List of plant / equipment to be used (worst case scenario). • Location Map (and/or Environmental Control Map) attached as Appendix 1, indicating location of works, plant / equipment locations and receivers (including distance to nearest receiver for noisiest plant / equipment). • Traffic Management Plan and/or Traffic Control Plan if applicable as Appendix 2.	
Timing of works: Including proposed dates / times works are planned to be undertaken outside standard hours.*	
Worst-case number of consecutive occasions affecting the same receiver: Refer to Section 4 for definition of 'occasion'.	
Justification: Demonstrate how the proposed OOH work has been scheduled in accordance with the OOH work period prioritisation list.* Program acceleration is generally not accepted as a justification.	

* Unless specified otherwise in project-specific documentation, the prioritisation of work time periods is as follows:

- **Standard Hours:** 7am to 6pm weekdays and 8am to 1pm Saturdays (note that Standard Hours for works subject to the City & Southwest Sydenham to Bankstown planning approval also include 1pm to 6pm Saturdays).
- **Daytime OOH:** 1pm to 6pm Saturdays and 8am to 6pm Sundays and Public Holidays.
- **Evening OOH:** 6pm to 9pm every day.
- **Night Time OOH:** 9pm to 7am weekday mornings and 9pm to 8am weekend and Public Holiday mornings.

Unclassified

3. Assessed Noise and Vibration Impacts and Standard Mitigation Measures	
Are the proposed works consistent with a prepared Construction Noise & Vibration Impact Statement (CNVIS)? (Y / N)	
If 'N', skip this section and move to Section 4.	
State the title of the CNVIS and attach the section(s) describing the noise and vibration impacts of the proposed works as Appendix 3.	
Quantitatively summarise the worst-case predicted noise and vibration impacts specific to the proposed OOH work for each OOH period on the nearest receivers and compare these against the respective management levels. **For Night Time OOH Period works, include a review of potential sleep disturbance impacts in accordance with Section 4.3 of the ICNG.**	Worst-case predicted noise impact summary: • • • Worst-case predicted vibration impact summary: • Potential sleep disturbance summary (for night time OOH periods only): •
Using Table 4 and Table 5, indicate in Table 6: • Which Additional Mitigation Measures (AMMs) are applicable for consideration, • Which of those applicable for consideration are planned to be implemented, • For AMMs that are applicable for consideration but not being implemented, justify why the AMM is not being implemented. • For AMMs that are being implemented, provide details on how the AMM is being implemented (e.g. which receivers being offered respite, alternative accommodation, etc.).	

4. Non-Assessed Noise and Vibration Impacts

Skip this section if Section 3 has been completed in full.

A quantitative noise assessment for OOH work is to be carried out in accordance with the *Interim Construction Noise Guideline* (DECC, 2009). This section allows applicants to address these requirements through the following steps:

1) Establishing Rating Background Levels (RBLs) and Noise Management Levels (NMLs).
2) Predicting the anticipated noise levels using a quantitative noise assessment:
   a. Works that are not likely to generate high noise impacts for a significant duration may use a preliminary quantitative noise assessment (facilitated within this form). This ensures that all applications, as a minimum, include a preliminary quantitative noise assessment in accordance with the *Interim Construction Noise Guideline* (ICNG).
   b. Works that are likely to generate high noise impacts for a significant duration may require a detailed quantitative noise assessment (e.g. Construction Noise and Vibration Impact Statement) to be undertaken.
   c. Works that are likely to generate ground-borne or structure-borne vibration and/or noise require specialist advice and assessment.
3) Comparing predicted noise levels against RBLs / NMLs and applying standard mitigation measures as appropriate (i.e. implementing 'all feasible and reasonable' mitigation measures in accordance with the ICNG).
4) Considering additional mitigation measures when predicted noise levels exceed RBLs / NMLs.

The need for a detailed quantitative noise and vibration assessment will be considered by Sydney Metro, the contractor and the Acoustic Advisor / Environmental Representative (if applicable) collectively when the predicted noise levels are anticipated to:

- Exceed an RBL at a residential receiver or an NML at a non-residential receiver by more than 10dBA, **AND**
- Affect the same receiver on 10 or more consecutive **occasions**. An occasion is anytime works are carried out:
  - Between 6pm on a weekday and the start of standard hours the next day, **OR**
  - Between 1pm on a Saturday and 8am on a Sunday (or between 6pm on a Saturday and 8am on a Sunday for works subject to the Sydenham to Bankstown planning approval), **OR**
  - Between 8am on a Sunday or public holiday and the start of standard hours the next day.

A detailed quantitative noise and vibration assessment should generally include:

- Derivation of RBLs for residential receivers and/or derivation of NMLs for non-residential receivers based on noise monitoring at representative locations and local sensitivities.
- Detailed noise predictions for daytime, evening and night time OOH periods (as applicable) in accordance with Section 4.5 of the ICNG (including an outline of timing, duration and predicted noise levels for each OOH period).
- For Night Time OOH Period works, a review of potential sleep disturbance impacts in accordance with Section 4.3 of the ICNG.
- Detailed predictions of vibration levels for sensitive receivers.

Please complete the following Steps 1 to 4.

Step 1: RBLs / NMLs	If RBLs for residential receivers or NMLs for non-residential receivers have already been established (e.g. in an Environmental Impact Statement, Review of Environmental Factors, detailed quantitative noise assessment or Construction Noise and Vibration Impact Statement for other work activities), enter into Table 3 and attach the supporting evidence as Appendix 3. If no RBLs / NMLs have been established, use Table 1 to estimate and enter into Table 3.
Step 2: Predicted Anticipated Noise Levels	If predicted anticipated noise levels have already been established (e.g. in an Environmental Impact Statement, Review of Environmental Factors, detailed quantitative noise assessment), enter the predicted anticipated noise levels into Table 3 and attach the supporting evidence as Appendix 3. If predicted anticipated noise levels have not already been established, use Table 2 to estimate anticipated noise aspects for the noisiest plant / equipment and enter into Table 3. In Table 3, use these values to calculate the anticipated predicted noise levels.
Step 3: Exceedances and Mitigation Measures	Compare the anticipated predicted noise levels to the applicable RBLs / NMLs, calculate the exceedances and enter into Table 3. In Section 5, provide a description of the standard mitigation measures that are planned to be implemented in order to mitigate the noise impacts (and vibration impacts if relevant) as much as 'feasible and reasonable' in accordance with the ICNG.
Step 4: Consideration of Additional Mitigation Measures	Use Table 4 and the exceedances in Table 3 to determine the applicable Additional Mitigation Measures for consideration. Use Table 6 to indicate which of these measures are applicable for consideration, which will be implemented and provide justification / details accordingly.

5. Standard Mitigation Measures	
Outline the standard noise mitigation measures that will be implemented during the proposed OOH work: I.e. Implementation of all 'feasible and reasonable' mitigation measures in accordance with the ICNG):	• • •
Outline the standard vibration mitigation measures that will be implemented during the proposed OOH work: I.e. Implementation of all 'feasible and reasonable' mitigation measures in accordance with the ICNG):	•

Table 1: Noise RBLs and NMLs

Skip this section RBLs and NMLs have already been established in other documentation.			
Sensitive Receiver Category	**Estimated RBLs (dBA)**		
Residential	**Daytime OOH**	**Evening OOH**	**Night Time OOH**
Urban (e.g. city hubs, near busy roads, near industrial activity)	55	50	45
Suburban	45	40	35
Quiet, rural or isolated	40	35	30
Non-Residential	**ICNG NMLs (dBA)**		
Industrial facilities	**75** (only applicable when in use)		
Offices or retail	**70** (only applicable when in use)		
Health and educational facilities	**55** (only applicable when in use)		

Table 2: Predicted Noise Level Aspects

Skip this section if predicted noise levels have already been established in other documentation.		
Noise Aspect	**Select the most applicable value for each noise aspect below and enter into Table 3.**	**dBA**
1. Plant / Equipment Noise Level at 10m 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) Underline indicates vibratory generating plant / equipment	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, tracked excavator, small front end loader	70
	Light vehicle, hand-tools (no impact), small cement mixer, attenuated generator (inside housing), tracked excavator	65

2. Multiple Plant	More than one of the noisiest plant being used simultaneously at roughly the same location	+5
3. 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
4. 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

Table 3: Predicted Noise Levels and Exceedances of RBLs and/or NMLs (dBA)

Skip this section if Section 3 has been completed in full.

Period (only complete as applicable for each period)	**Noisiest Plant / Equipment** (state the noisiest plant / equipment to be used during each applicable OOH period)	**Receiver Type** (state 'Res' or 'Non-Res' as applicable for closest receiver to noisiest plant / equipment)	Enter the most applicable values from Table 2, then add to determine the Predicted Noise Level				**Predicted Noise Level** (1 + 2 + 3 + 4)	**RBL** (for Res)	**NML** (for Non-Res)	**Exceedance** (Predicted Noise Level minus RBL for Res or NML for Non-Res)
			1. Plant / Equipment Noise Level	**2. Multiple Plant / Equipment**	**3. Local Screening**	**4. Distance Attenuation**				
Daytime OOH *										
Evening OOH *										
Night Time OOH *										

* Refer to OOH period timings under Section 2 of this form.

Table 4: Additional Mitigation Measures (AMM) requiring Consideration for Implementation

OOH Period	**AMMs that must be considered for implementation** (apply the exceedances from Table 3 to the two OOH period categories below as applicable)			
	<= 10 dBA Exceedance	**10 to <= 20 dBA Exceedance**	**20 to <= 30 dBA Exceedance**	**> 30 dBA Exceedance**
Daytime OOH Period	–	LB	M, LB	M, IB, LB, PC, RO, SN
Evening and Night Time OOH Periods	–	M, LB	M, IB, LB, PC, SN, RO	M, IB, LB, PC, SN, RO, AA*

* AA is only applicable to Night Time OOH periods.

Table 5: List of Additional Mitigation Measures (AMM)

AMM Abbrev.	AMM	AMM Descriptions and Guidance
LB	Letterbox-drop (generic to the project)	A newsletter is generally 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, inform and provide project-specific messages. The geographic extent of letterbox-drops is generally centred on the immediate surrounding community within 200 metres from the works site. For works that are subject to the Sydenham to Bankstown planning approval, these will include an indicative schedule of likely OOH work for at least the upcoming two month period.
M	Monitoring	Where it has been identified that specific construction activities are likely to exceed the relevant Rating Background Levels (RBL) and/or Noise Management Levels (NMLs), 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 RBL/NML has been exceeded so that additional management measures may be implemented.
IB	Individual Briefings	Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Communications representatives would 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.
PC	Phone calls (and/or emails)	Phone calls and/or emails (with specific notifications attached) detailing relevant information would be made to identified/affected stakeholders within seven days of proposed work. The objective of the phone calls and/or emails is to support letterbox-drop and specific notifications. 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.
SN	Specific Notifications (specific to the OOH work)	Specific notifications are letterbox-dropped to identified stakeholders no later than 7 days prior to out of hour construction activities commencing that are likely to exceed the RBLs/NMLs. Specific notifications may be produced by Sydney Trains or by Sydney Metro (or on behalf of Sydney Metro by a contractor as approved by Sydney Metro): - Sydney Trains specific notifications cover all works being undertaken by various parties (including Sydney Metro) during designated rail possession periods. These specific notifications are delivered 14 days prior to works commencing and are delivered to all properties located within 250m of the proposed works. - Sydney Metro specific notifications focus on proposed Sydney Metro works being undertaken outside of designated rail possession periods and are only produced in the absence of any Sydney Trains notifications covering the proposed works. These notifications are delivered 7 days prior to works commencing and are delivered to all properties located within 100m of day works and within 200m of night works. All notifications are emailed to all registered stakeholders on site-specific email distribution lists. For works that are subject to the Sydenham to Bankstown planning approval, these will include indicative information on the type of OOH work, location, duration, expected noise characteristics, expected noise level and likely mitigation and management measures.
RO	Respite Offer	The purpose of a project specific respite offer is to provide residents subjected to lengthy periods of noise and/or vibration impacts respite during OOH periods. Respite offers are offers made to affected receivers to provide a period of either no or limited noise impacts. This can be in the form of stopping or limiting works onsite or offering affected receivers dinner/movie vouchers. The first priority is to implement a period of no or limited noise impacts. If this cannot be achieved, dinner/movie vouchers may be offered on a case-by-case basis.
AA	Alternative Accommodation *(residential only)*	Alternative accommodation options may be provided for residents living in close proximity to construction works that are likely to incur unreasonably high impacts during night time OOH periods. Alternative accommodation will be considered on a case-by-case basis.

Table 6: Consideration of Additional Mitigation Measures (AMM)

Additional Mitigation Measures	Applicable for Consideration? Y / N (refer to Table 4)	To be Implemented? Y / N	Justification / Details For AMMs that are applicable for consideration but not being implemented, justify why the AMM is not being implemented. For AMMs that are being implemented, provide details on how the AMM is being implemented (e.g. which receivers being offered RO, AA, etc.).
LB			
M			
IB			
PC			
SN			
RO *			
AA			

* For OOH work that is subject to the Sydenham to Bankstown approval and RO is required for consideration, include in the 'Justification / Comments' column how community consultation influenced the decision to implement or not implement RO in accordance with Condition E23. If RO is being implemented, include how community consultation influenced the manner in which RO is being implemented.

6. Consideration Against Relevant Vibration Criteria		
Using Table 2, indicate whether any vibratory plant / equipment is planned to be used for the proposed works (Y / N)		
If 'N', skip this section and move to Section 7.		
'People' Criterion	Are the proposed works anticipated to have any perceptible sleep disturbance impacts? (Y / N)	
'Structures' Criterion	Are the proposed works anticipated to generate greater than 7.5mm/s vibration impacts on surrounding structures (generally within 25 metres of works)? (Y / N)	
'Sensitive Equipment' Criterion	Are the proposed works anticipated to impact sensitive equipment located in surrounding non-residential receivers? (Y / N)	
If 'Y' is answered to ANY of the above criteria AND the impacts affect the same receiver for more than one consecutive occasion (refer to Section 4 for 'occasion' definition), the need to prepare a detailed quantitative assessment will be considered collectively by Sydney Metro, the contractor and the Acoustic Advisor / Environmental Representative (if applicable).		

7. City & Southwest Construction Noise & Vibration Strategy Addendum Mitigation Measures
If the proposed OOH work is part of the City & Southwest project, identify any mitigation measures to be implemented that have arisen from the City & Southwest Construction Noise & Vibration Strategy Addendum.

8. Cumulative Impacts	
Document the relevant details of any other OOH work (Sydney Metro or otherwise) that will impact the same receivers as those being impacted by these proposed works either concurrently or within 3 days of the start or end of these proposed works.	
If other works have been identified in the row above, how have the proposed works been coordinated to ensure appropriate respite is provided?	

9. Community Consultation	
What community consultation has been undertaken already?	
What community consultation is planned to be undertaken?	
If drafted already, attach applicable Community Notification as Appendix 4.	

10. Contractor's Signature				
Contractor's Identification of Risk Level: If subject to the Chatswood to Sydenham (C2S) or Sydenham to Bankstown (S2B) planning approval and not subject to an EPL, provide Contractor's Identification of Risk Level (refer to the *City & Southwest OOH Works Strategy / Protocol* for guidance).	Circle:	LOW	or	HIGH
Contractor's Signature:				
Name:				
Title:				
Contact Number:				
Date:				

11. Contractor's Contact Details		
Contractor Personnel	**Name**	**Mobile**
Manager Environment:		
Manager Communications:		
Contractor's Representative:		
Contractor's 24hr contact person:		

Generic Determination Page (i.e. not subject to C2S or S2B planning approvals)

	Step 1 – Sydney Metro Director of Project Communications	Step 2 – Acoustic Advisor (may be optional depending on planning approval or contract requirements)	Step 3 – Environmental Representative (may be optional depending on planning approval or contract requirements)	Step 4 – Sydney Metro Director of Planning, Environment & Sustainability (only required if not approved already)
Action:	Endorsement	Circle: Endorsement or Approval	Circle: Endorsement or Approval	Approval
Signature:	*Approved Road Occupancy Licence / Road Opening Permit (if applicable) must be sighted prior to endorsement.*			
Name:				
Date:				
Comments:				
Conditions:				

Appendix 1: Map (and/or ECM)

Appendix 2: Traffic Management Plan or Traffic Control Plan

(if applicable)

Appendix 3: Supporting Evidence for Noise & Vibration Impacts (e.g. Construction Noise & Vibration Impact Statement, noise assessment, etc.)

(if applicable)

Appendix 4: Community Notification

(if applicable and already drafted)

APPENDIX M – SMCSW – Environmental and Sustainability Reporting Templates

Sydney Metro City & Southwest

Environmental Reporting Template

Contract:	
Instructions:	

Issues	This month	To date
Air quality issues raised	x	y
Community, stakeholder and business issues raised	x	y
Design issues raised	x	y
Flora and fauna issues raised	x	y
Heritage issues raised	x	y
Management systems issues raised	x	y
Noise and vibration issues raised	x	y
Soil and water issues raised	x	y
Traffic transport and access issues raised	x	y
Waste and spoil issues raised	x	y

An Issue or Non-compliance with a CEMP requirement where the issue or Non-compliance is relevant to multiple Sub-plans should be classified as Management Systems, for example:
- Failure to produce up to date Environmental Control Maps;
- Failure to deliver topic specific environmental training or toolbox talks; or
- Failure to maintain document control of environmental documentation.

An Issue or Non-compliance with a CEMP requirement where the issue or Non-compliance is unique to the CEMP should be classified as Management Systems, for example:
- Failure to follow the incident management process;
- Failure to conduct regular Management Reviews of the EMS;
- Failure to communicate environmental issues internally; or
- Failure to maintain ISO 14001 certification.

An Issue or Non-compliance with a Sub-plan requirement where the issue or Non-compliance is unique to that sub-plan should always be classified using the corresponding sub-plan category regardless of whether it could also be seen as a CEMP requirement, for example:
- Failure to maintain waste management records should be classified as Waste and Spoil;
- Failure to deliver topic specific Noise and Vibration training should be classified as Noise and Vibration;
- Failure to seeking approval to conduct works out of hours should be classified as Noise and Vibration; or
- clearing vegetation that is within a protected zone should be classified as Flora and Fauna.

Incidents	This month	To date
Number of Class 1 incident occurrences	x	y
Number of Class 2 incident occurrences	x	y
Number of Class 3 incident occurrences	x	y

Non-compliances	This month	To date
Number of non-compliances raised	x	y
Number of open non-compliances	x	y

Corrective and Preventative Actions (Incidents and Non-compliances only)	This month	To date
Number of open Corrective Actions	x	y
Percentage and number of closed Corrective Actions	x	y

Environmental Audit Findings		This month	To date
Number of audit findings on Environmental Requirements which since the audit date have been open	>120 days	x	
	between 120 and 60 days	x	
	<60 days	x	
Number (and percentage) of open environmental audit findings closed in the month		(x(y%))	

Environmental Protection Licence	This month	To date
Licence variations	x	y
Emergency out of hours work (OOHW) events	x	y
EPA Inspections	x	y

Environmental Approvals	This month	To date
Consistency Assessments Determined by Sydney Metro	x	y
Total ongoing Environmental Requirements	x	y
Total Completed Environmental Requirements	x	y

Environmental Training	This month	To date
Number of environmental training courses delivered	x	y

Sydney Metro City & Southwest Sustainability Reporting Template

Contract:	Northern Corridor Works				
Instructions:	The Contractor must provide the sustainability performance data specified below to TfNSW on a monthly basis.				
Reporting month/year:	(Contractor to complete)				
Metric	Type	Unit	Cumulative total to date	Monthly total	
Electricity consumed	-	kWh			
Electricity Offsets purchased	Contractor to specify	Contractor to specify			
Volume of fuel consumed	Petrol	kL			
	Diesel	kL			
	Other (Contractor to specify)	kL			
Types and Quantity of waste generated	Hazardous waste	tonnes			
	Construction and demolition waste	tonnes			
	Other non-hazardous waste	tonnes			
	Other (Contractor to specify)	tonnes			
Types and Quantity of waste reused or recycled	Construction and demolition waste	tonnes			
	Other non-hazardous waste	tonnes			
	Other (Contractor to specify)	tonnes			
Quantity of waste disposed to landfill	Hazardous waste	tonnes			
	Construction and demolition waste	tonnes			
	Other non-hazardous waste	tonnes			
	Other (Contractor to specify)	tonnes			
Quantity of spoil generated	Total	tonnes			
	Disposed to landfill	tonnes			
	Benficially reused	tonnes			
	Percentage benficially reused	%			
Greenhouse gas emissions	Scope 1	tCO2-e			
	Scope 2	tCO2-e			
	Scope 3	tCO2-e			
Quantities of materials used	Steel	tonnes			
	Concrete	tonnes			
Portland cement	Percentage replaced by supplementary cementitious materials	Percentage averaged across mixes			
Quantity of water consumed	Quantity of mains (potable) water consumed	kL			
	Quantity of water consumed from other sources	kL			
	Total water consumed	kL			

APPENDIX N - Project Waste Management Strategy

The following strategy is an indicative guide to identify and state the type of waste that is intended to be controlled and recycled where practical.

Table 26: Project Waste Management Strategy

Project Waste Management Strategy

LAING O'ROURKE

Project Waste Management Criteria

Project Start Up

OBJECTIVE

To comply with contractual and legislative requirements and ensure that waste from construction activities does not have the potential to escape from the site and cause an environmental nuisance / harm.

REQUIREMENTS/REGULATIONS

-Client Requirements
-TfNSW Approval Conditions
-Protection of the Environment Operations Act 1997
-Protection of the Environment Operations (Waste) Regulation 2005
-Waste Avoidance and Resource Recovery Act 2001
-Local Government Act 1993
-DECCW Waste Classification Guidelines, 2008

TARGETS

-No incidences where waste is stored in a position where it has the potential to move off-site.
-All off site movements of waste will be tracked.
-The principles of the waste management hierarchy will be adopted, where practicable.
-At least 90% of construction waste diverted from landfill and either recycled or reused.
-Waste will be minimised where ever possible.
-Compliance with the WRAPP targets

Project targets to be fed to procurement and design team
Targets provided to procurement and design team for adoption.

Waste Minimisation Strategies – Design & Procurement

Strategy Implementation and Monitoring

PROCUREMENT STRATEGY
Aspects to consider:

-Location of supplier and logistics (check operational licenses and storage requirement).
-Recyclability or recyclable content of item.
-Longer life spans and durability.
-Biodegradability/non-toxic.
-Environmental endorsements.
-Emergency response equipment requirements
-Sustainable site office fit-out

Procurement and Design Teams
Consideration of procurement strategy by each team.

RECYCLING STRATEGY
Assess viability to recycle based on:

-Carbon third party cost;
-Logistical costs;
-Sale price;
-Indirect savings; and
-Ongoing monitoring and improvement.

Procurement and Design Teams
Recycling strategy considered by procurement and design teams.

EDUCATION STRATEGY
-Toolbox talks
-Housekeeping
-Hazardous Substance Disposal
-Office Recycling
-Emergency Response and Spill Management
-Pre-starts
-Waste Posters
-Enviro Alerts
-Bin and Skip Signage

Environment Team
Delivery and presentation of environmental education strategy by the project Environmental Manager.

Waste Management Strategies – Construction

All Personnel on Site

GENERAL WASTE

General Solid (non-putrescible)	General Solid (putrescible)
-Non-recyclable waste materials -Broken Glass -Dried sediment collected from stormwater management systems -Garden waste -Drained oil filters -Rags and oil-absorbent materials that only contain non-volatile petroleum hydrocarbons and do not contain free liquids -Building rubble	-Food waste -Putrescible orga -Manure

Dispose to general waste skip bins or office bins

RECYCLABLE WASTE

General Solid (non-putrescible)

-Excess dried concrete
-Steel off cuts
-Reinforcing steel
-Timber
-Scrap Metal
-Paper and cardboard
-Comingled containers – milk bottles, drink bottles, cans, etc.
-Non-putrescible cleared vegetation may be mulched and reused for landscaping or ground stabilisation if no invasive weeds included

Place in labelled skip bins or office bins

HAZARDOUS WASTE

Liquid	Solid
-Waste oils -Paints	-Asbestos containing material including spoi from earthworks -Empty oil and paint containers -Oily rags -Contaminated soil

Dispose to specific hazardous waste bin on site.

Asbestos is only to be handled or removed by occupational hygienist or AS1/AS2 removal contractor.

Specific oily rag bin to be used for oily rags, used spill kit material, etc.

Decant waste oils/paint into labelled, bunded drums.

Licensed waste contractors only to collect and remove all wastes from site
Laing O'Rourke to ensure the waste facility is fully licensed to accept the types of waste being sent offsite
Transport and waste facility dockets required within 3 days of disposal from site
Laing O'Rourke to input and interpret data from waste tracking spreadsheet

Northern Corridor Works Specific Strategies

GENERAL WASTE

-Non-recyclable office waste will be placed in skip bins located at the project offices.
-Vegetation waste will be collected in the project site and if not mulched and reused onsite, will go to an appropriate waste facility.
-Any mixed building rubble such as bricks/plasterboard/etc. will be placed in a skip bin and sent to a resource recovery facility for sorting and recycling.

RECYCLABLE WASTE

-Office waste bins will be segregated into the following recycling streams; Comingled / Paper & Cardboard / Organics
-Steel waste will be collected site and go to an appropriate waste facility.
-Dried concrete waste will be collected and go to an appropriate waste facility Verified/classified spoil material diverted from landfill.

HAZARDOUS WASTE

-Any oily rags or used spill kit material to be placed in the oily waste bin and disposed of off-site.
-Asbestos containing waste is only to be handled or removed by occupational hygienist or AS1/AS2 removal contractor Bingo Waste Services
-Waste oil/paints will be stored in bunded drums on site as required

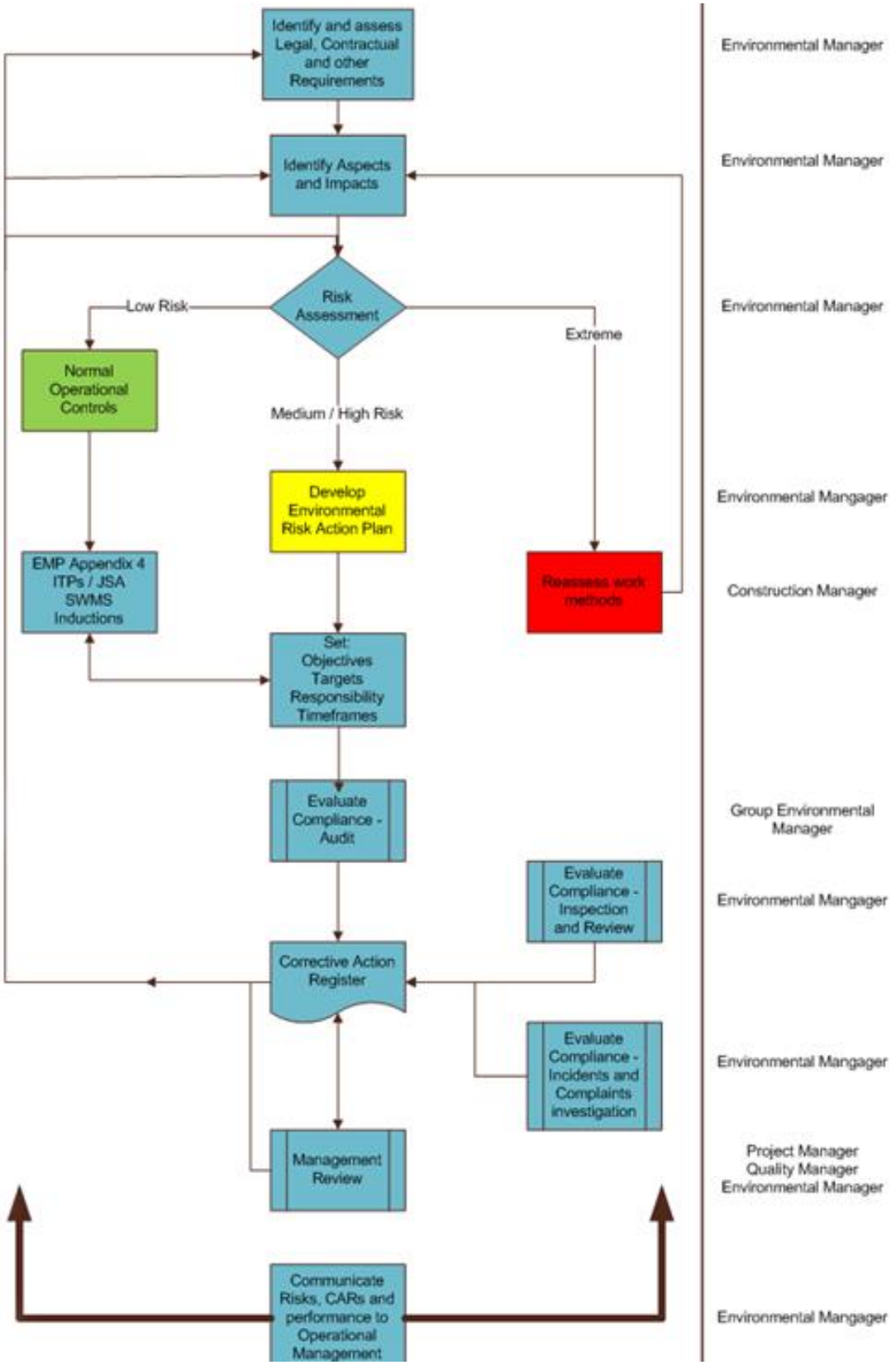
PROCUREMENT

-Identify procurement initiatives specific to the project including packaging reduction and return, bulk loads
-Incorporation of reusable temporary works such as proprietary formwork systems at site.

Waste to be tracked using the Waste Tracker in IMPACT or other suitable document, and all records maintained.

APPENDIX O - CEMP Flow Chart

Figure 10 - CEMP Flow Chart



APPENDIX P – Water Discharge and Reuse Form

Sydney Metro – Integrated Management System (IMS)

(Uncontrolled when printed)

Water Discharge or Reuse Approval Form

Location, quantity of water and proposed action					
Location of water to be removed:				**Reference No:**	
Approval requested by:				**Date:**	
Proposed discharge/reuse:	☐ Discharge to waters	☐ Discharge to land	☐ Reuse on site	**Quantity (L):**	
Details of discharge/reuse: (method, location, controls, etc)					

Test method			
☐	**Probe/meter:**	**Test record/Laboratory report No:**	
☐	**Grab sample:**	**Equipment calibration prior to test:**	Yes ☐ No ☐ (if no state why below):
Test performed/sample collected by:			

Test results

Location (specific descriptor)	Date	Time	Is this a re-test?	Oil & grease visible (Y/N)	pH 6.5 – 8.5 Reading	TSS/Turbidity <50mg/L /____NTU1 Reading	Option 2 A,B,C,D,E	Notes, actions or treatment required

1. Criteria for turbidity must be determined from site specific correlation between TSS and turbidity – refer to SM ES-PW-309 Water Discharge and Reuse Procedure for details.

2. Select one:	**A** = Remove to licensed facility	**B** = Reuse on site	**C** = Discharge to land	**D** = Discharge to waters	**E** = Treat and re-test

Option A: Remove to licensed facility	
Water to be collected and removed from site by:	
Water to be transported to (name & location of the licensed facility):	

Option B: Re-use on site (including into holding pits/tanks, dust suppression)	
Re-use will be applied to an area that is effectively secured with appropriate downstream sediment controls and will not generate off-site runoff:	Yes ☐ No ☐

Option C: Discharge to land	
Discharge location has complete ground cover, such that erosion will not occur and sufficient infiltration capacity to receive quantity of water: Will discharge generate any runoff or create the potential for runoff to reach any watercourse (on or offsite)?	Yes ☐ No ☐

Option D: Discharge to waters	
From visual inspection the quality of the water to be discharged is equally good or better than the quality of the receiving water?	Yes ☐ No ☐
Flow from outlet can be directed onto a non-erodible surface and will not cause scouring or erosion: Could the water come into contact with any exposed soil or potential contaminants before it reaches the water course or discharge point?	Yes ☐ No ☐

Option E: Treat the water then re-test	
Location to be treated (if not in situ):	
Parameter(s) to be treated:	
Detail the treatment to be used including products, quantities and methodology:	

Discharge authorised by:	Position/Organisation:	Signature	Date:

By signing this form the signatory confirms water to be discharged meets the relevant criteria as specified in accordance with the SM ES-PW-309 Water Discharge & Reuse Procedure

Copy to Manager Environment and Environmental Representative and any others as required. Attach site dewatering plan where applicable.

APPENDIX Q – Sydney Metro Environment & Sustainability Policy (SM SE MM 102)

Environment & Sustainability Policy

This Policy reflects a commitment in our delivery of the Sydney Metro program to:

- Align with, and support, Transport for NSW (TfNSW) Environment & Sustainability Policy.
- 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.

To deliver on these commitments, the Sydney Metro team will:

Industry leadership

- Implement coordinated and transparent decision making, by engaging with stakeholders and suppliers, encouraging innovation and demonstrating sustainability leadership.
- Explore new benchmarks for the transport infrastructure sector by requiring high standards from our designers, contractors and suppliers, building on experience gained through development of Sydney Metro Northwest.

Community and customer

- Provide accessible, safe, pleasurable, and convenient access and transport service for all customers.
- Establish positive relationships with community and stakeholders to maximise opportunities to add value to local communities.

Land use integration and place making

- Create desirable places, promote liveability, cultural heritage, and optimise both community and economic benefit.
- Balance transit oriented development opportunities with stakeholder expectations.

Embedding environmental and social sustainability

- Establish robust sustainability objectives and targets.
- Maintain an environmental management system that is integrated into all our project activities.
- Ensure thorough and open environmental assessment processes are developed and maintained.
- Develop and maintain an environmental management framework to embed best practice pollution management and sustainable outcomes during construction.
- Apply effective assurance processes to monitor performance against the project environment and sustainability objectives and identify appropriate reward or corrective action, as required.
- Apply environment and sustainability specific processes to the procurement of delivery activities.

Accountability

- Undertake public sustainability reporting.
- Hold employees and contractors accountable for proactively meeting their environmental and social sustainability responsibilities.
- Provide appropriate training and resources necessary to meet our responsibilities.

Rodd Staples
Program Director, Sydney Metro

SM ES-MM-102 Sydney Metro Environment and Sustainability Policy

Sydney Metro – Integrated Management System (IMS)

(Uncontrolled when printed)

Sydney Metro City & Southwest Sustainability Objectives

Theme	Objective
Governance	Demonstrate a high level of performance against objectives and appropriate benchmarks.
	Demonstrate leadership by embedding sustainability objectives into decision making.
	Be accountable and report publicly on performance
Carbon & Energy Management	Improve the shift toward lower carbon transport.
	Reduce energy use and carbon emissions during construction
	Reduce energy use and carbon emissions during operations
	Support innovative and cost effective approaches to energy efficiency, low-carbon / renewable energy sources and energy procurement.
Pollution Control	Reduce sources of pollution and optimise control at source to avoid environmental harm
Climate change resilience	Infrastructure and operations will be resilient to the impacts of climate change
Resources – Water Efficiency	Minimise use of potable water.
	Maximise opportunities for reuse of rainwater, stormwater, wastewater and groundwater.
Resources – Waste & Materials	Minimise waste through the project lifecycle.
	Reduce materials consumption.
	Consider embodied impacts in materials selection
	Maximise beneficial reuse of spoil
Biodiversity Conservation	Protect and create biodiversity through appropriate planning, management and financial controls
Heritage Conservation	Protect and promote heritage through appropriate design, planning, and management controls.
Liveability	Promote improved public transport patronage by maximising connectivity and interchange capabilities.
	Provide well designed stations and precincts that are comfortable, accessible, safe and attractive.
Community Benefit	Make a positive contribution to community health and well-being.
	Ensure community and local stakeholder engagement and involvement in the development of the project.
	Contribute to the delivery of legacy projects to benefit local communities.
	Create opportunities for local business involvement during the delivery and operations phases.
	Consider community benefit of residual land development.
	Minimise negative impacts on the community and local businesses during construction and operation.
Supply Chain	Influence contractors, subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.
Workforce development	Increase opportunities for employment of local people, participation of local businesses, and participation of SME's.

Theme	Objective
	Enable targeted and transferable skills development which resolves local and national skills shortages, supports industry to compete in home and global markets, and embeds a health and safety culture within all induction and training activities, promoting continuous improvement.
	Increased workforce diversity and inclusion, targeting indigenous workers and businesses, female representation in non-traditional trades, and long term unemployed.
	Inspire future talent and develop capacity in the sector, engaging young people via education and work experience, collaborating with higher education institutions to provide programs responding to rapid transit and other infrastructure requirement, and supporting vocational career development through apprenticeships and traineeships.
Economic	Consider adopting a Whole of Life Costing model to maximise sustainability benefits.
	Optimise development opportunities for residual land.
	Capture sustainability benefits in the business case for the project.

APPENDIX R – Environmental Representative Endorsement Letter

APPENDIX S – NCW CEMP Sub-plans

The below list outlines the CEMP sub-plans utilised for the NCW project. These sub-plans are standalone documents that will be used during the construction stage of the NCW project.

x. Construction Noise and Vibration Management Plan
xi. Construction Traffic Management Plan

APPENDIX T – ENVIRONMENTAL MANAGEMENT PLANS ENVIRONMENTAL SYSTEM REQUIREMENT

NEXT GEAR

HSE SYSTEM REQUIREMENT

SR Environmental Management Plans

PURPOSE

The purpose of this system requirement (SR) is to outline the process and requirements for the development of site or project specific Environmental Management Plans.

Environmental Management Plans outline the project or site specific approach to enable environmental obligations to be addressed.

ENVIRONMENTAL MANAGEMENT PLANS

Each project or operational facility is required to develop and implement an Environmental Management Plan (EMP) relevant to the site specific risks and opportunities. EMPs represent the project specific environmental management documentation to enable projects to plan and implement environmental management measures.

There is an EMP template for each state & Territory in which the Laing O'Rourke operates covering legislation.

ERAP's (Environmental Risk Action Plans) are provided and are to be used to document the proposed operational controls to address environmental risks and to realise opportunities. ERAPs are required for each environmental aspect identified in the environmental risk assessment.

The Project Leader or Workplace Leader must ensure relevant risks and information from the Environmental Management Plan is communicated to the project team and relevant and interested parties. These may include the client, subcontractors, employee representatives, workers and external stakeholders etc. via the induction process and notice boards.

The EMP must address the following:

- Environmental risk assessment, determining the significant environmental issues for the site
- Key roles and responsibilities associated with the EMP
- Client/Contractual requirements unique to the project (where required)
- Environmental Risk Action Plans (ERAPs) for environmental aspects relevant to the site detailing operational controls necessary to manage our risks
- Sub-plans including Soil and Water Management Plans, Waste Management Plans, Noise Management Plans, Air Quality Plans and Community Management Plans etc. may be required for high environmental risk activities as identified in the project environmental risk assessment or where nominated by contractual or other requirements
- Legal, contractual and other requirements relevant to the project
- Objectives and targets, monitoring program and who is responsible for achieving them
- Methods for monitoring, auditing, recording, communication and reporting

- Potential emergencies and recommended responses
- Site induction and training needs

The Environmental Management Plan must be approved by the Environmental Manager and Project Leader / Workplace Leader prior to construction/contract commencement and maintained for the duration of the contract.

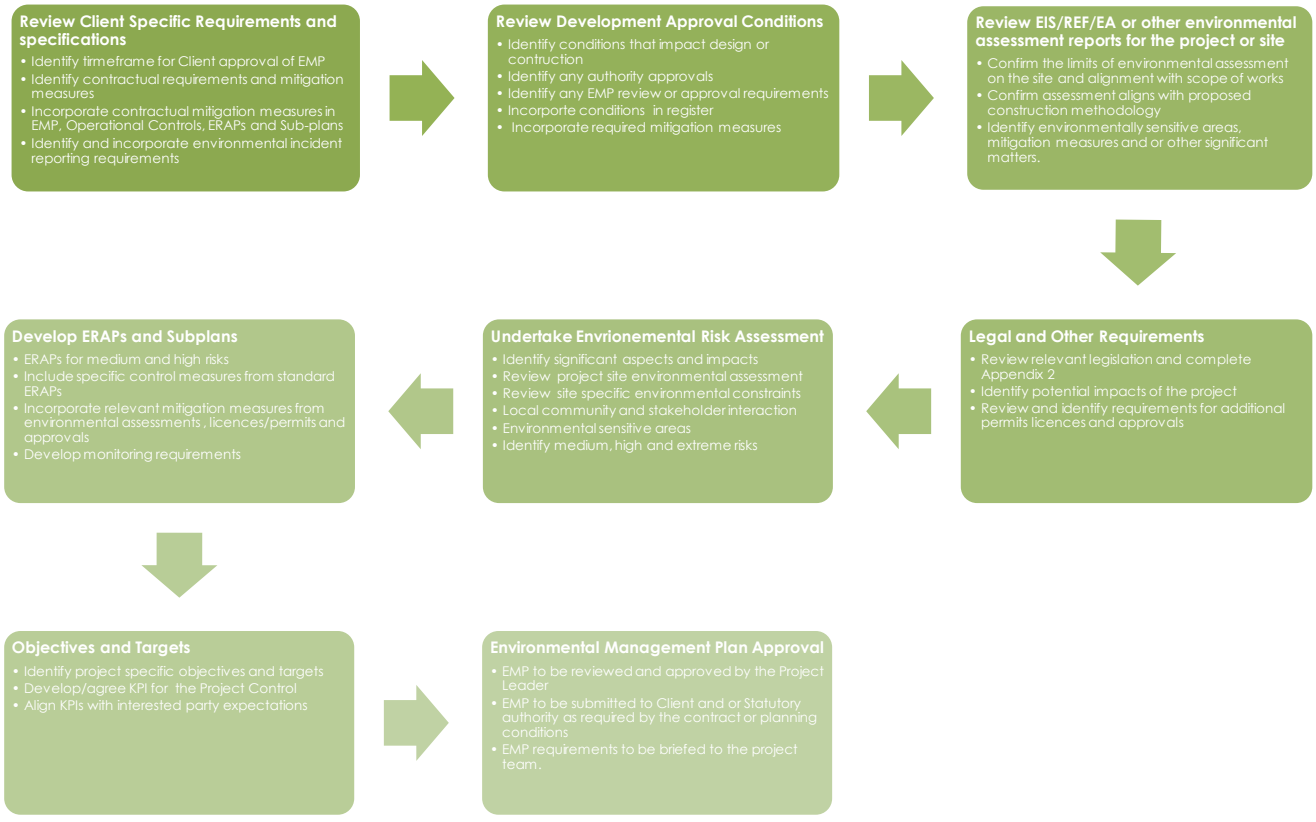
Should a dispute arise that prevents approval of the plan, the HSE General Manager shall be called upon to provide resolution.

ENVIRONMENTAL MANAGEMENT PLAN DEVELOPMENT PROCESS

Environmental management plans must be developed to address project or site specific environmental risks, opportunities and environmental obligations. Environmental obligations may include legal requirements, client specific requirements, stakeholders and community expectations and Laing O'Rourke policy, strategies and programs.

The flow diagram below outlines the process necessary for the effective development of an Environmental Management plan in accordance with the Laing O'Rourke Environmental Management System. The process must consider other systems requirements including the Environmental Aspects and Impacts System Requirement and associated business aspects and impacts register.

Sufficient time and resource must be allowed for the development and approval of the Environmental Management Plan such that the plan is approved and in place prior to commencement.



PROJECT RISK ASSESSMENT (PRA)

The Environmental Management Plan includes the project or site specific risk and opportunity assessment.

PERFORMANCE REVIEW

The Environmental Management Plan will be reviewed at least every six months. The review will determine whether the processes and procedures provided within the plan are suitable for the delivery of the environmental performance expectations and whether it supports the project or site meeting the respective environmental obligations.

FORMS AND TEMPLATES

Jurisdiction specific Environmental Management Plans

E-T-8-0938 Project & Workplace Risk Assessment

C-P-10-0135 Archiving

E-T-6-2000 PSUM Toolbox

HBI Healthy Buildings International Pty Ltd
A.C.N. 003 270 693 A.B.N. 39 003 270 693

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Stuart Hodgson
Director
Environment Planning and Sustainability
Sydney Metro
Transport for NSW
PO Box K659
HAYMARKET NSW 1240

19 September 2019

Ref: NCWP7B+7B CEMP Rev012

Dear Stuart

RE: Endorsement of Sydney Metro City & Southwest - Northern Corridor Works Project (Portion 7a & 7b) - Construction Environmental Management Plan Revision 12

Thank you for providing the following documents for Environmental Representative (ER) review and endorsement as required by the Condition of Approval A24 (d) (ii) and A24 (j), C7 of the Sydney Metro City & Southwest project (SSI – 15_7400 February, 2019).

- Sydney Metro City & Southwest - Northern Corridor Works Project (Portion 7a & 7b) - Construction Environmental Management Plan Revision 12

This Construction Environmental Management Plan document has been prepared by Laing O'Rourke Australia Construction Pty Ltd (LOR). It presents the methodology, for management of environmental impacts associated with the establishment and operation of the project.

As an approved ER for the Sydney Metro City & Southwest project, I considered the amendments made to the CEMP were minor in nature as defined in Section 2.9 of the CEMP. These amendments are consistent with the terms of this approval and the CEMP approved by the Secretary (May 2018) and the revised plan is now approved for implementation.

Yours sincerely

Peter Hatton
Environmental Representative – Sydney Metro – City and South West