

INDEPENDENT ENVIRONMENTAL AUDIT

FINAL REPORT



Proponent:	Sydney Metro
Project:	City & South West, Chatswood to Sydenham
Scope:	Noise & Vibration Management Plan Implementation
Works / Process:	Northern Corridor Works (NCW) Portion 7b
Auditee:	Laing O'Rourke

Audit Organisation:	QEM Consulting Pty Ltd
Auditor:	Julie Dickson
Registration	Exemplar Global EMS Auditor Accreditation no. 13573
Audit References:	QEM 1803-A14 SM18.19-069-CSW-NCW-IEA
Audit date:	11 February 2019
Report date:	22 March 2019

EXECUTIVE SUMMARY

An Independent Environment Audit was conducted of the Northern Corridor Works to assess compliance with relevant Planning & Assessment Approvals. The audit was conducted at the Laing O'Rourke project office in Chandos Street St Leonards on 11 February 2019, and included a site visit, interviews and a sampling of formal project records maintained by the principal construction contractor Laing O'Rourke Australia (LORA).

The majority of the project works are conducted within the rail corridor and during out of hours rail possessions, however a daytime site visit was conducted to provide an overview of physical controls in place and locations of sensitive receptors relative to the work locations. Appropriate physical controls were observed including barriers, hoardings, noise blankets, signage, and use of non-tonal reversing alarms, silenced (solar) light towers and real-time monitoring apparatus.

Evidence was sighted to verify that Out of Hours Works (OOHW) applications were completed and approved for each possession. Attended noise monitoring had been undertaken during every OOHW possession and monitoring measurements / observations were used to address any noise issues immediately and to plan for future possessions. As an Improvement opportunity, it was suggested at this audit that Rating Background Levels (RBLs) for night time "shoulder periods" 10pm to midnight should be derived from monitoring data to inform future decisions on timing of night time works. Vibration monitoring was conducted during tamping activities indicating results were within required limits.

Unattended real-time noise monitoring stations had been set up for OOHW possessions with access provided to the construction team, however this had not been made available to Sydney Metro and other specified stakeholders in accordance with CoA C11, and has been raised as a non-compliance.

Appropriate communication of noise and vibration requirements to project personnel was demonstrated through various means including inductions, provision of supervisor packs, possession pack presentations and notes, Safety Task Analysis Risk Reduction Talks (STARRT cards) pre-starts and toolbox talks.

Extensive records of stakeholder communications in Consultation Manager provided evidence of appropriate responses to enquiries and complaints, pro-active management of consultation with the community, and implementation of alternative mitigation measures, including door knocking, offers of accommodation and respite for high impact night-time works. Goodwill offers above and beyond formal project requirements such as custom earplugs had also been offered. Cumulative impact has been addressed through lessons learnt early in the project when working adjacent to other construction works and is also discussed at Monthly Communications Management Control Group meetings.

In summary, one (1) non-compliance, and one Improvement Opportunity was raised. The key issues and outcomes of the audit are discussed below and are summarised in the table in Section 2.1 and detailed in Section 2.3 of this report.

Report Author (& Auditor):

J Dickson

Julie Dickson

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1.0 AUDIT DETAILS

1.1 Purpose

The purpose of this Independent Environmental Audit was to assess Principal Contractor Laing O'Rourke compliance with the relevant Planning and Assessment Approvals City and Southwest (C&SW) Northern Corridor Works (NCW) focusing on noise and vibration management plan implementation.

1.2 Context

Planning Approvals issued by the Department of Planning & Environment require Sydney Metro (formerly Transport for NSW) to develop an Environmental Audit Program for independent annual environmental auditing against the terms the City & Southwest (C&SW) Critical State Significant Infrastructure (CSSI) Project Approvals.

QEM Consulting Pty Ltd have been engaged by Sydney Metro Delivery Office (SMDO) Safety, Sustainability & Environment (SSE) to deliver a program of Independent Environmental Audits. As required by C&SW Planning Approval CSSI 15_7400 (A39) and the associated Environmental Audit Program, an Independent Environmental Audit was undertaken to assess compliance with Planning Approvals requirements in the Northern Corridor Works Portion 7b between Chatswood and St Leonards Station.

The NCW comprises the realignment of the T1 North Shore Line between Chatswood Station and Brand Street Artarmon to accommodate new metro tracks and the future construction of the Chatswood tunnelling dive site. The NCW project works include enabling and temporary works, earthworks, and construction of permanent new infrastructure and modifications to existing infrastructure.

1.3 Audit Objectives, Criteria & Scope

The Audit Objective was to assess Planning Approval compliance for mitigation and monitoring of noise impacts on sensitive noise receivers, as well as corrective action and improvement.

Audit criteria included implementation of the Construction Noise & Vibration Management Plan and CNVIS including noise assessments, out-of-hours work compliance, cumulative noise impact mitigation measures, interface management (with other contractors), community & business engagement, plus the following Project Environmental Planning Approvals:

- CSSI 15_7400 Conditions C3 a), C9 a), C10, C12, C15, E28-31, E33-34, E38, E39, E41, E42;
- Revised Environmental Mitigation Measures NV1, NV4

The focus of the audit was on strategies, planning, controls and monitoring implemented to minimise noise and vibration impacts from Northern Corridor Works (Portion 7b), particularly during out of hours works and/or when other contractors also generate noise. The audit scope included implementation of the Construction Noise & Vibration Management Plan and CNVIS.

1.4 Audit Process and Methodology

The audit comprised an off-site desktop review, a Principal Contractor audit, a site inspection and a post audit assessment of documentation and records. The audit process including scoping and planning was undertaken in accordance with the principals of AS / NZS / ISO 19011:2018 – Guidelines for Auditing Management Systems.

Further details on Auditor credentials, independence and disclaimer can be found in Appendix 2 to this report.

1.5 Auditees and Participation

Refer to full Audit Attendance list in Appendix 3.

1.6 Audit Definitions & Abbreviations

The following abbreviations and definitions apply throughout this report:

Item	Explanation
AA	<i>Acoustic Advisor</i>
AMM	<i>Additional Mitigation Measures</i>
AMMM	<i>Additional Mitigation Measures Matrix</i>
C&SW	<i>City & Southwest</i>
CNVIS	<i>Construction Noise and Vibration Impact Statement</i>
CNVMP	<i>Construction Noise and Vibration Management Plan</i>
CNVS	<i>Construction Noise and Vibration Strategy (Sydney Metro)</i>
CSSI	<i>Critical State Significant Infrastructure</i>
EPA	<i>Environment Protection Authority</i>
ERM	<i>Environmental Resources Management Aust Pty Ltd</i>
EPL	<i>Environmental Protection Licence</i>
MCoA	<i>Minister's Conditions of Approval</i>
NCW	<i>Northern Corridor Works</i>
NML	<i>Noise Management Level</i>
OOHW	<i>Out of Hours Works</i>
PPV	<i>Peak Particle Velocity (measured in mm/s)</i>
RBL	<i>Rating Background Level</i>
REMM	<i>Revised Environmental Management Measure</i>
SM	<i>Sydney Metro</i>
SMDO	<i>Sydney Metro Delivery Office</i>
Non-compliant	<i>Refer Section 2.1 overleaf</i>
Observation	
Improvement Opportunity	
Compliant	
Notable Practice	

2.0 AUDIT FINDINGS

2.1 Audit Summary

This table provides a summary of compliance against audit criteria and area of focus, indicating the number of actions required:

Focus Area	Key Criteria	STATUS			
		Compliant			Non-Compliant
		NP	IO	OBS	NC
Planning approvals, endorsement	C3 (a), C9 (a), C10, C12, C15, E33,				
Site management (inspection)	NV1, NV3, NV4, E36, SM CNVS Table 9				
Noise and Vibration monitoring, alerts, OOHV	E28-29, CNV Monitoring Plan		1		
Real-time monitoring access	C11, CNV Monitoring Plan 4.1				1
Community and Stakeholder communication, cumulative impact, complaints, sensitive receivers	E34, E38, E39, E42				
Induction / awareness –noise	C2, CNV1 SM CNVS 7.1.2, Table 13, CNVMP Sec.9				
Compliance records, reporting	C11, E34, E35, E39, E40				

Audit Findings are classified as follows:

Status	Explanation
Notable Practice (NP)	Outstanding positive observation about a system, process or practice, for recognition and/or sharing purposes.
Improvement Opportunity (IO)	A suggestion or opportunity to implement a good or better practice to improve efficiency, further reduce exposure to risk or improve information management. When specifically stated as a Recommendation, this requires a formal response as to a considered action, alternative action or management decision in the negative.
Observation (OBS)	Documented requirement and/or implementation issue which may not strictly affect required performance or compliance outcomes. Also termed a non-conformance (as opposed to non-compliance) in the industry, observations could be an early indication of potential non-compliance and/or an adverse performance outcome.
Non-compliant (NC)	The intent of one or more specific requirements of a condition or obligation have not been met, based on insufficient objective evidence to demonstrate required outcomes or deliverables being achieved and/or complied with.

Note: The status of 'Compliant' is determined where sufficient verifiable evidence demonstrates that intent, specific requirements or elements of a condition / obligation have been met within the scope of the Independent Audit. Consequently, there may be no resulting actions, otherwise actions commensurate with the Improvement or Observation status above will be required.

2.2 Site Inspection details/outcomes

A site inspection was conducted on the rail corridor between Artarmon and Chatswood, however, at the time of the audit, minimal works were being undertaken due to a prior storm event stopping excavation works. The site compounds and work site areas were reviewed and it was noted that hoarding, noise blankets and signage was generally adequate and appropriate, and a real-time noise monitor was sighted at the site compound visited.

It was noted that augured piles have been installed in preference to sheet piling to reduce noise impacts.

	
<p>Augured piles installed (in preference to sheet piling)</p>	<p>Nelson Street Bridge – due for removal at next rail possession weeks 33 and 34 (Feb 2019)</p>

2.3 Detailed Findings and Agreed Action Plan

Ref	Audit Finding	Status	Priority	Agreed Action Plan
1.	<p>Access to real-time web accessible noise and vibration monitoring has not yet been made available to the specified stakeholders in accordance with CoA C11.</p> <p>Condition C11 requires that <i>"The real time data must be available to the construction team, Proponent, ER and AA in real time. The Department and EPA must be provided with access to the real time monitoring data in real time"</i></p>	NC	MEDIUM	<p>NCW 7b Agreed Action:</p> <p>Provide real-time web accessible noise and vibration monitoring to Sydney Metro, who will make it available to the ER, AA and regulators.</p> <p>Status as at 21 March 2019:</p> <p>Access to NSW real-time loggers via the "Noise Cloud" has now been provided by the noise and vibration consultants to the relevant stakeholders.</p> <p>Responsible person:</p> <p>Chris Standing</p> <p>Completed date: 21/03/2019 (closed)</p>
2.	<p>It is considered that it would be beneficial for works planning and OOWH applications that Rating Background Levels (RBLs) for night time "shoulder periods" 10pm to midnight are derived from monitoring data.</p> <ul style="list-style-type: none"> In consultation with project Acoustic Advisor it is recommended that these RBLs need to be extracted from periods when no construction / maintenance works are taking place, i.e. during normal rail operations but no construction. <p><i>This will determine whether pre-midnight background noise levels are elevated when compared with hours after midnight. One way to mitigate sleep disturbance risks from night time works is to schedule noisier activities to times when people are more likely to be awake, and / or times when the local background noise levels are elevated</i></p>	IO	LOW	<p>NCW 7b Agreed Action:</p> <p>Derive Rating Background Levels for night time "shoulder periods" 10pm to midnight from the monitoring data.</p> <p>ERM noise and vibration consultants have processed the unattended noise monitoring data from Raleigh Street monitoring to provide daily and overall L90 PM-Shoulder values.</p> <p>Responsible person:</p> <p>Chris Standing</p> <p>Completed date: 1/3/2019 (closed)</p>

Appendix 1: Audit documentation

The following indicates key systems, documents, reports, information and records that were reviewed, accessed or sighted during the audit process:

Documentation	Information / Records
1. Project documentation – Management Plans (general)	
Sydney Metro City and Southwest – North Corridor Works - Construction Noise and Vibration Management Plan (CNVMP) MNNSCW – Portion 7b V0.5 dated 09/11/2018	
Main North and North Shore Corridor Works Project (MNNSCW): Portion 7b Northern Corridor Works Construction Noise and Vibration Impact Statement 27 September 2018	
2. Site controls, mitigation, review of practices, induction, training communication	
	Presentation – CEMP Northern Corridor Works 27/03/18
	Main North and North Shore Corridor Works Health, Safety, Environment Quality Community and Industrial Relations Induction material (online induction)
	Email – NCW Environment Manager to LORA team 4/02/2019 – reiterating approved working hours, OOHW requirements, ensure delivery team including subbies is across what is assessed and approved.
	Main North and North Shore Corridor Works Project Tool Box Talk 25 January 2019
	Possession Notes WE34 – 23rd and 24th February 2019
	MW26+WE27 Config 8 Whiteboard Pack Meeting – 20 Dec 2018 Environmental section with noise issues and behaviour issues mentioned
	Main North and North Shore Corridor Works MW26+WE27 Possession Information Pack (includes notes on OOHW, Enviro and Community)
3. Noise and Vibration Out of Hours, noise and vibration monitoring, corrective action / feedback loops, performance outcomes and reporting	
Sydney Metro City and Southwest – North Corridor Works (NCW P7b) - Construction Noise and Vibration Monitoring Program V0.4 dated 27/09/2018	Sydney Metro City and Southwest – North Corridor Works P7 Technical Report - Vibration Monitoring P7-MW44-MW45 - 30 April – 11 May 2018 (attended and unattended monitoring of vibratory rolling activities)
	NCW Drake Street vibration levels – 030518 (email)
	NCW Drake Street vibration levels – 040518 (email)
	OOHW - City & Southwest Out of Hours Work Application NCW - 014 – Week 08: P7a – Augered piling, Underline crossings and Overhead wiring footings construction between Brand Street and Albert Avenue Chatswood 25-27th August 2018

Documentation	Information / Records
	Sydney Metro City and Southwest – North Corridor Works Technical Report - Noise Monitoring – OOHW P7a 25 to 26 August 2018
	NCW - OOHW- WE08 - Noise Monitoring Summary (email dated 26/08/18) – commentary on noise monitoring by ERM noise consultant (with results)
	OOHW - City & Southwest Out of Hours Work Application NCW – 018 Week 14: Portion 7a – Footing construction, standing steel and grouting at footing locations and survey between Brand Street and Albert Avenue Chatswood 6 -12 Oct 2018.
	Sydney Metro City and Southwest – North Corridor Works WE14 OOHW Technical Report - Noise Monitoring – OOHW P7a: 06 to 07 October 2018
	NCW WE14 Noise Monitoring Summary (Day 1) (email dated 7/10/18)
	OOHW - City & Southwest Out of Hours Work Application NCW-022 - Weekend 20: Portion 7a – Track earthworks, Overhead wiring (OHW) install, Hopetoun Ave ramp removal between Mowbray Road and Nelson Street, Chatswood
	Sydney Metro City and Southwest – North Corridor Works Technical Report - Noise Monitoring – OOHW P7: 17 to 18 November 2018
	Sydney Metro City and Southwest – North Corridor Works P7 - Technical Report - Vibration Monitoring: P7-WE20 - 17 to 18 November 2018
	NCW WE20 Shift 1 Summary (email) 18/11/18 – commentary on noise and vibration monitoring
	OOHW - City & Southwest Out of Hours Work Application (Rev 5) 1/2/19 - Week 27 – Weekend 34: Portion 7 (Approved) – Cable removal, shotcreting, Hopetoun ramp removal, excavation of track formation and compaction, GST and cable install, Brand Street crossing, Onsite storm water detention (OSD) works and preparation works for Nelson Street Bridge removal between Cleland Road and Albert Avenue, Chatswood. 7th January 2019 to the 22nd February 2019
	NCW WE16 Noise monitoring summary (email) (Day 2) 21/10/2018
	NCW WE16 Noise monitoring summary (Day/Night 1) (20 – 21/10/2018)
	NCW Noise monitoring summary 24/12/2018
	Spreadsheet showing alternative accommodation and respite offers (extracted from Consultation Manager – Nelson Street.
	*Post Audit Verification: Emails from Noise and Vibration consultants (ERM) dated 20 March 2019 confirming that access to NCW real-time noise loggers has been provided to the relevant stakeholders (ER, AA, DP&E and EPA), including screenshot of recipients.

Documentation	Information / Records
4. Consultation and interface management, community engagement, cumulative impact, impact mitigation	
City & Southwest Community Communication Strategy – Northern Corridor Works (Sydney Metro document) Rev 1.0 dated 21/11/2018	20181221 - Notification - Northern Corridor 7a - WE26 (3)
	20181230 - Notification - Northern Corridor 7a - MW27 - WE34.docx (2)
	20190123 - Notification - Northern Corridor 7a - WE31
	20190216 - Notification - Northern Corridor 7a - WE33
	20181012 - Notification - Northern Corridor 1-7 and NRT- WE16-MW17
	Sydney Trains notifications (incorporating Sydney Metro works information) WE14 (6-8 Oct 2018); WE 14 (8-12 Oct 2018); WE16 (20- 22 Oct 2018); WE18 (3 – 5 Nov 2018);
	Sydney Trains Draft Scope of Work 8-12 Oct 2018 (advising of activities in rail corridor including NCWP7A)
	Sydney Trains Draft Scope of Work 17-19 Nov 2018 (advising of activities in rail corridor including NCWP7A)
	Meeting Minutes Environment Northern Corridor Works - Portion 7 and Community Team Meeting 8 January 2019 (attended by 4 persons – LOR SM Place Mgr & Enviro Mgr and NRT ER)
	Chatswood and Artarmon tunnelling contract update presentation – Sub-North Communications Management Control Group (CMCG) – LOR 4/02/2019
	Northern Corridor Update (presentation) Chatswood CMCG subgroup and distribution list (includes TSE, various SM and NRT recipients)
	Snapshot Report from Consultation Manager – complaint dated 17 Nov 2018 – details of how noise complaint was managed – confirmation that Alternative Accommodation offered (not accepted); mitigation measures in place and noise monitoring confirmed works compliant.
	Snapshot report – complaint(s) dated 6 - 11 Oct 2018 – detailed account of complaint, actions taken, consultation with NRT etc
	Snapshot report – 20 Dec 2018 – complaint – worker behaviour, parking and respite offer acceptance
	Sample email dated 12 Nov 2018 – offer of temporary alternative accommodation
	Various Consultation Manager (electronic) examples of alternative mitigation measures offered, complaints, enquiries etc
5. Compliance tracking, records and information systems	
	20190117 NCW 2018 Q4 CTR Template – combined comments, Includes comments by ER and SM Environmental Manager (latest draft – not yet finalised)

Appendix 2: Audit Credentials

Audit process

This Independent Environment Audit comprised an off-site desktop review, an onsite and office audit and a post audit assessment of documentation and records. The audit assignment was undertaken by the identified QEM Consulting Pty Ltd Auditor below, with the second Auditor not directly involved in the audit conducting a peer review of the report prior to finalising.

The audit process including scoping and planning was undertaken in accordance with the principals of AS / NZS / ISO 19011:2018 – Guidelines for Auditing Management Systems.

Auditor information

Audit Organisation:	QEM Consulting Pty Ltd
Auditor & Report Author:	Julie Dickson
Auditor Qualification:	Exemplar Global EMS Auditor Accreditation no. 13573
Affiliations:	EIANZ Certified Environmental Practitioner, Reg. no. 221
Report Reviewer:	Larry Weiss
Auditor Qualification:	Exemplar Global EMS Auditor Accreditation no. 12355
Affiliations:	Member, Engineers Australia 938517

Auditor certification

The abovementioned Auditor certifies as having personally undertaken this Independent Audit and preparing the contents of this Independent Audit Report; and that the findings of the audit are reported truthfully, accurately and completely; and that he / she has exercised due diligence and professional judgement in conducting the audit. The signed Statement of Interests and Association in our services agreement with Sydney Metro confirm our Auditor's independence and absence of pecuniary interest in the audited project.

Audit disclaimer

It should be noted that this report is a snapshot in time, based on selected and supplied documentation, as well as observations on the day only, and does not purport to be a definitive confirmation of overall or potential compliance or vice-versa.

Appendix 3: Audit Attendance Register

AUDITEE: Laing O'Rourke AUDIT: SM18.19-069-CSW-NCW-IEA SITE: Northern Corridor Works Portion 7b (site) and Level 1 39 Chandos Street St Leonards			11/02/2019	
NAME (print)	POSITION & ORGANIZATION		ENTRY (Initials)	EXIT (initials)
Julie Dickson	Lead Auditor -	QEM	JD	JD
Sav Shimada	Acoustic Advisor (as Subject Matter Expert)	Acoustic Studio	SS	SS
Chris Standing	Environment Manager	LORA	CS	CS
Gerry Rattigan	Site Supervisor	LORA	(site)	
Nathan Lynch	Acoustics consultant	ERM	NL	
Alex Parker	Communication Place Mgr - SM	Sydney Metro	AP	
Andrew Hendy	Environment Manager, C&SW	Sydney Metro	AH	AH

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