

# Independent Environmental Audit on Laing O'Rourke Australia

## Final Report

**Contract works: Sydney Yard Access Bridge**  
**Scope: Heritage and Noise & Vibration Management**

**Reference: SM17.18-036-SYAB-LORA-ENV**

December 2017

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## 1. Executive Summary

### 1.1 Introduction

In accordance with Planning Approvals issued by the Department of Planning & Environment and related Compliance Tracking Program requirement, Sydney Metro Delivery Office (SMDO) Safety, Sustainability & Environment (SSE) commissioned QEM Consulting Pty Ltd to conduct an Independent Environmental Audit to assess compliance with Planning Approvals associated with the enabling Sydney Yard Access Bridge Design & Construct (D&C) contract works.

### 1.2 Background

A D&C contract was awarded to Laing O'Rourke (LORA) in January 2017 for the design and construction of a new permanent road bridge providing maintenance and emergency access to the non-public operational component of Central Station. Being one of a package of enabling works, the Sydney Yard Access Bridge (SYAB) will extend from Regent Street over the Mortuary Station line and intercity tracks into the existing Sydney Yard used by Sydney Trains. As further background, the Critical State Significant Infrastructure (CSSI) Chatswood to Sydenham Planning Approval SSI 15\_7400 condition A39 requires that independent environmental audits assess the environmental performance of the project, its effects on the surrounding environment and compliance with terms of the approval.

### 1.3 Objective and Scope

The objective of the audit was to assess the implementation of Heritage Management plans and controls, including processes to address visual amenity criteria prescribed for Mortuary Station. In addition, the effectiveness of plans, procedures and controls to mitigate Noise & Vibration impacts were also assessed. Audit Criteria included relevant conditions from the Chatswood to Sydenham Planning Approval (SSI 15\_7400) and related requirements documented in the LORA Construction Heritage Management and LORA Noise & Vibration Management Plans. The Audit Scope included the following processes and activities:

- Design review processes, focussing on Minister Condition of Approval (MCoA) E11;
- Design inputs including PIR 2.6 Design Principles & Objectives;
- Heritage protection measures, management and monitoring;
- Heritage related stakeholder consultation and supervision;
- Noise & Vibration (N & V) assessment and mitigation measures; and
- Sensitive N&V Receiver notifications and targeted mitigation measures.

The scope of this audit excluded heritage-related planning obligations retained by Sydney Metro such as archival recording and heritage architect provision to the Sydney Metro Design Review Panel.

## 1.4 Summary of Findings

The table below provides a summary of key findings noted in this audit and the priority assigned to these findings.

Ref	Description	Priority*
1.	<b>Noise monitoring equipment calibration.</b> Noise monitoring equipment should be calibrated on a more frequent basis to ensure the validity of performance data generated, especially hand-held equipment subject to potential rough handling and/or harsh site conditions.	Low

\* Priority Definition enclosed as Appendix 2

## 1.5 Overall Assessment

An Independent Environment Audit of the Sydney Yard Access Bridge (SYAB) enabling works was conducted on 4<sup>th</sup> December 2017, this including participation in the Environment Representative (ER) site inspection and an assessment of documentation and records conducted at Laing O'Rourke's (LORAs) site office.

Implementation of the Heritage Management Plan was assessed as compliant with relevant Minister's Conditions of Approval (MCoAs). There was demonstrated awareness of Archaeological Management zones, with implementation of required management measures including archaeological monitoring / test / salvage in red zone CS4; use of Archaeological Method Statements / investigation in amber zones CS2 & 4; and use of the Unexpected Finds Protocol in the remaining green zones. There had been a few expected and unexpected archaeological finds, the latter artefacts subsequently assessed by the project heritage specialist and deemed to be not reportable and/or of low significance. Several Archaeological Method Statements (AMSs) had been produced by suitably qualified Historical and Aboriginal Excavation Directors (MCoA E18 required) who, together with heritage consultants, had attended site and conducted monitoring when required. Records were available of consultation with the Heritage Council of NSW on AMS's as required by MCoA E17, as well as consultation with Registered Aboriginal Parties.

The SYAB Design Review process was assessed in the context of the MCoA E11 obligation to "*minimise its impact on the heritage value of Mortuary Station*". This Approval also made reference to specific Design Principles and Guidelines including visual unobtrusiveness; heritage sympathetic; integration with surrounds; and minimising impacts of existing views of significant heritage. The assessed design review process appeared to be quite robust based on documentation evidenced, including independent Design Review Panel (DRP) reviews and presentations; Stakeholder Response worksheets; Design Review Reports and Critical Design Reviews, the latter evidencing heritage compliance conformance statements. Although Planning Approval requirements were documented as design input, a number of conflicting other inputs and restraints affecting visual amenity and heritage criteria were noted, these including vehicle and train safety standards, a tight site footprint and structural performance of the bridge beam. On this front, a SYAB Heritage Impact Statement was evidenced, reporting a few moderate to major indirect heritage impacts, but recognising that the 2016 Environmental Impact Statement had determined that views and vistas would significantly detract from the setting of the heritage item.

The report concluded that due to the number of rigid site constraints, the bridge design did not meet all Preferred Infrastructure Report requirements. Recognising the subjectiveness of these intended heritage outcomes, the Independent Environmental Auditor observed that the final design and/or build of the SYAB and Regent Street entrance were quite “noticeable” and of a modern / contemporary design and not entirely reflective of pre-existing viaducts, brickwork and steelwork. Notwithstanding, it was noted that the LORA Project team had gone to extraordinary lengths to satisfy feedback, clarifications, comments and inputs from a number of stakeholders, including heritage specialists.

The audit also determined that the SYAB Construction Noise & Vibration Impact Statement (CNVIS) and Construction Noise & Vibration Management Plan were reflective of systems of management, mitigation, monitoring and control implemented to minimise impacts on identified noise sensitive receivers (NSRs), as well as vibration impacts affecting human comfort and heritage building structure. Real-time noise and vibration monitoring obligations had been implemented, results demonstrating compliance with vibration minimisation obligations required by MCoA E30 for the heritage-listed Mortuary Station building. Specialist advice had also been solicited in determining the location of this particular vibration logger. Associated records demonstrated occasional spikes exceeding established alarm levels based on CNVIS vibration management goals, this leading to stoppage of works and subsequent investigation, determining that these results were random anomalies. There was also an acute awareness of the closest NSR to site (identified as R4 A); consultation had taken place per Planning Approvals and implementation of the Out-of-Hours Approval (protocol required by per MCoA E47) reflected identification of additional mitigation measures such as Alternative Accommodation offers. The LORA Environment Manager had also used an enhanced noise assessment calculator to confirm activity specific noise impacts, with occasional predictions higher than the CNVIS predictions, again resulting in additional mitigation measures being deployed. Internal building noise assessments had also been undertaken at R4 (A) to facilitate understanding of actual impacts and required mitigation measures.

From a practical site perspective, the site inspection process and prior ER reports confirmed an ongoing high standard of compliance with requirements, with only a few minor observations on the day. Works on the day included jack-hammering of temporary crane footings no longer required, this activity being understandably noisy. Use of non-tonal reverse alarms were evident, with an audible delivery vehicle reverse alarm at the time noted as being of short duration and temporary arrangement not requiring so-called quackers. The heritage-listed Mortuary Station was also noted as being physically protected by chain-mesh fencing and project staff access to site through this building was along rubberised matting. Additionally, direct impact avoidance of the Shunters Hut required by Revised Environmental Mitigation Measure NAH11 was in place, this item temporarily relocated to nearby Yard 15.

In conclusion, the above mentioned indicated a high level of compliance with Planning Approvals. As a result only one (1) Audit Finding was noted as requiring action and tracking through this independent audit process, this deemed to be of low priority. A second finding concerned missing protection and signage for the heritage Shunters Hut observed during the site inspection (albeit off-site to the LORA works), this evidenced as captured in the ER Inspection Report (referenced in Appendix 3) to ensure timely attention

**Report certified by:**




**Larry Weiss**

Exemplar Global accredited Lead Auditor (12355).

## 2. Detailed Findings and Agreed Action Plan

The following section of this report provides details of findings and the agreed action plan, including allocation of responsibility and timeframes.

Ref	Finding	Risk/Impact	Priority*	Action Plan
1.	<p><b>Noise monitoring equipment calibration</b> Records were not available to reflect that noise monitoring equipment used by LORA was checked before and after each measurement survey, with the variation in calibrated levels to not exceed <math>\pm 0.5</math> dBA, as required by the Sydney Metro Construction Noise &amp; Vibration Strategy developed to address Ministers Condition of Approval E32.</p> <p><i>It is acknowledged that the sound &amp; vibration analyser used for unattended monitoring was externally calibrated by a NATA accredited laboratory in April 2017, around the commencement of the works. However, hand-held noise meters are known to be subject to frequent handling and damage risks, with an internal calibration function built into such equipment. Whilst being undertaken, these calibration checks were not recorded though.</i></p>	<p>Damaged and/or uncalibrated noise monitoring instrumentation could adversely affect the validity of performance assessment results and compliance reporting</p>		<p><b>Agreed Action:</b> Noise Monitoring Reports produced as a result of required attended-monitoring associated with Out-of-Hours noise assessments to record before and after calibration data.</p> <p><b>Responsible person:</b> LORA Environmental Manager</p> <p><b>Timeline:</b> 31<sup>st</sup> January, 2018</p>

\* Priority Definition enclosed as Appendix 2

## Appendix 1: Personnel Consulted and Timeline

We would like to extend our appreciation to the following individuals involved this audit:

Name	Title
Chris McCallum	Environment Manager, LORA
Huw Griffiths	Project Manager, LORA
David Garrod	SYAB Project Manager, ENE
Ben Armstrong	Senior Environment Manager, C&SW
Adam Koutsamanis	Environment Manager, C&SW
Joe Rivas	Manager, Audit & Reporting SSE
Ron Turner	Heritage Manager, C&SW
Annabelle Reyes	Independent Environmental Representative
Dave Anderson	Independent Acoustics Advisor
Rob Barber	Environmental Manager, Sydney Trains

The timeline is shown in the table below.

Milestone	Date
Issuance of Terms of Reference	21 November 2017
Briefing Meeting	22 November 2017
Desktop Audit	29 November 2017
Site Audit Opening Meeting	4 December 2017
Fieldwork	4 December 2017
Issuance of Draft Report	15 December 2017
Issuance of Final Report	10 January 2018

## Appendix 2: Priority Definition

The priority for findings raised in this report is described in the table below.

Priority	Definition	Guidelines for Implementing Actions
<b>Very High</b>	A significant control weakness / issue or fundamental non-compliance that exposes the project or area under review to a very high level of risk	Requires immediate management attention, with actions plans to be developed and enforced within an agreed time frame. The matter will be escalated immediately to senior management from all parties
<b>High</b>	A control weakness / issue or non-compliance that may expose the project or area under review to a high level of risk	Action plans to be developed and implemented within an agreed time frame. The matter will be escalated to relevant senior executives where it is deemed necessary
<b>Medium</b>	A control weakness / issue or non-compliance that may expose the project or area under review to a moderate level of risk	Action plans to be developed and implemented within an agreed time frame
<b>Low</b>	A control weakness / issue or non-compliance that may expose the project or area under review to a low level of risk	Action plans to be developed and implemented within an agreed time frame
<b>OFI</b>	Opportunity For Improvement (OFI) – opportunity to implement a good or better practice to improve efficiency or further reduce exposure to risk	Suggestion to be considered for implementation
<b>Observation</b>	Good Practice – process / system in place and implemented effectively across business.	Maintain to current standard. Share with other areas of business.

## Appendix 3: Audit information

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

Documentation	Information / Records
Chatswood to Sydenham Planning Approval SSI 15_7440 dated 9/1/2017	SYAB Heritage Impact Statement dated August 2017
SPIR Revised Environmental Mitigation Measures Table 11.1; NV1-7, NAH10,11 and AH1, 3	Critical Design Reviews 1 and 2 for Bridge and Regent Street exit/entrance
Design Guidelines NWRLSRT-PBA-SRT-UD-REP-000003	Artefact Archaeological Monitoring Reports dated 1/12/2017
LORA Heritage Management Plan rev 06 dated 5/07/2017 incl.	Correspondence on removal of Shunters Hut
LORA Construction N & V Management Plan v.07 dated 5/07/2017	Records of consultation with the Heritage Council of NSW
CN&V Impact Statement F02 dated 18/04/2017	Design Review Panel #1 presentation 14/02/2017
Archaeological Method Statement, Piling Works dated June-July'17	Design Review Panel #4 presentation 22/05/2017
Archaeological Method Statement, Excavation Works dd Sept-Oct'17	Design Review Panel #5 presentation 4/07/2017
Archaeological Method Statement, Regent Str. dated June-Sept'17	SYAB Design Response spreadsheet DM-RGS-000001 rev C
	OEH emails dated 12/07/17 and 10/10/17 re AMS acceptability
	SYAB Induction Package and Induction Records
	Construction Notifications dated 18 Novemeber and Decmber 2017
	ERM Internal-External Noise Monitoring Report dated 6/07/2017
	Sydney Trains EPL 12208 variation dated 27/10/17
	OOHW 023 Application for Regent Street Utility Works and Crane dismantling, updated 6/11/17
	Noise monitoring data re OOHW #15 of 15/11/2017 for Regent Street Utility Works - excavation
	ARL Calibration Certificate C16666 of ARL Ngara noise level meter used by ERM dated 28/11/16
	ACU-VIB Electronics calibration record of site handheld noisemeter dated 27/4/17
	ACU-VIB Electronics calibration record of sound & vibration analyser dated 21/4/17
	ER Inspection Report #13 dated 4/12/2017



## Audit information, cont'd



Photo 1



Photo 2

### Design evolution information:

Photo 1: Tender design concept, Mortuary Station visible above deck.  
(Source: Design Review Panel presentation #1)

Photo 2: Current design depiction, Mortuary Station visible below deck.  
(Source: Design Review Panel presentation #4)

Photo 3: Construction as at 4/12/17, view from Regent Street entrance.

Note: The Auditor observed that the deck profile and Mortuary Station views were not as slim and unobtrusive as perhaps expected - technical and safety reasons for this were noted in review and related reports sighted in this audit assessment. In particular, the beam design was indicated as being the lowest profile possible structurally for the chosen concept



Photo 3

## Audit information, cont'd



Photo 4 of 4

Photo 4: Shunters Hut in nearby Yard 15 (missing protection and warning signage.  
(Required action captured as item 13.3 of ER Report cited in Appendix 3 above)

Appendix 4: Audit attendance register

Sydney Metro – Integrated Management System (IMS)  
(Uncontrolled when printed)



Attendance Sheet

SM17.18-036-SYAB-LORA-ENV TSE Independent Environmental Audit Brief

Date: 4/12/2017

Time: 8:30AM

Location: SYAB Office, Regent St, Chippendale

Name	Organisation	Role	Signature
JOE RIVAS	TFNSW	Manager Auditing	
ANNA BEUVE REYES	HSI	ER	
Larry Weiss	QEM	IE Auditor	
Adam Koutsamanis	TFNSW	Environmental Manager	
DAVID GARROD	TFNSW	SMDO – P.M.	
Chris McCullum	LOR	Environmental Manager	
Ben Armstrong	TFNSW	Env Enviro Manager	
How Griffiths	LOR	P.M LOR	
RON TURNICK	TRINSEE	HEALTHIER MANAGER	
Rod Barber	Sydney Trains	ENVIRO MANAGER	
Dave Anderson	Arctic Studio	Arctic Advisor	

## Appendix 5: Audit Credentials

### Audit process

The Independent Environment Audit comprised a desktop review and subsequent site audit of one (1) day duration and was conducted by Larry Weiss, of QEM Consulting Pty Ltd. The audit comprised a collaborative site inspection undertaken with a routine Environment Representative (ER) inspection on the day, followed by an assessment of documentation and records conducted at Laing O'Rourke's (LORAs) site office. The audit utilised an assignment specific Audit Checklist based on project Management Plans and related documentation, focussing on relevant Planning Conditions and Revised Environmental Mitigation Measures. Requirements were then verified as being implemented and/or compliant, based on records and objective evidence, the entire process undertaken in accordance with AS / NZS / ISO 19011:2014 – Guidelines for Auditing Management Systems.

### Auditor information

<b>Audit Organisation:</b>	QEM Consulting Pty Ltd
<b>Auditor &amp; Report Author</b>	Larry Weiss
<b>Auditor Qualification</b>	EMS Auditor, Exemplar Global Certification 12355
<b>Affiliations</b>	Member, Engineers Australia 938517

### Auditor certification

The Auditor certifies as having 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 has exercised due diligence and professional judgement in conducting the audit. The signed Statement of Interests and Association in our terms of engagement with Sydney Metro confirm his 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 evidence, and does not purport to be a definitive confirmation of overall compliance or vice-versa.