

# **SYDNEY UNIVERSITY SUSAN WAKIL HEALTH BUILDING STAGE 1 DEVELOPMENT - SSD 7974**

## **Independent Environment Audit 4 Report**



18329  
Sydney University Susan Wakil  
Health Building Stage 1  
Development, Independent  
Environment Audit 4 Report  
0.2  
19 May 2020

## REPORT

### Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
0.1	Draft Audit 4 Report	Lana Assaf	Gareth Thomas	Gareth Thomas	19/05/20
0.2	Final for issue	Lana Assaf	Gareth Thomas	Gareth Thomas	19/05/20

### Approval for issue

Gareth Thomas



19 May 2020

This report was prepared by RPS within the terms of RPS' engagement with its client and in direct response to a scope of services. This report is supplied for the sole and specific purpose for use by RPS' client. The report does not account for any changes relating the subject matter of the report, or any legislative or regulatory changes that have occurred since the report was produced and that may affect the report. RPS does not accept any responsibility or liability for loss whatsoever to any third party caused by, related to or arising out of any use or reliance on the report.

Prepared by:

**RPS**

Lana Assaf  
Senior Executive - Environment

Level 13, 255 Pitt Street  
Sydney NSW 2000

T +61 2 8099 3200  
E Lana.Assaf@rpsgroup.com.au

Prepared for:

**Laing O'Rourke Australia**

Sarah Blagrove  
Laing O'Rourke Australia Pty Ltd  
Environment Manager

Level 4, 100 Arthur St  
North Sydney NSW 2060

T 02 9903 0300  
E SBlagrove@laingorourke.com.au

## Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Project details.....	1
1.2	Background .....	1
1.3	Site location.....	1
1.4	Audit scope.....	2
1.4.1	Audit program and justification .....	2
1.4.2	Audit attendees .....	3
1.4.3	Audit background and scope .....	3
<b>2</b>	<b>INCIDENTS AND COMPLAINTS .....</b>	<b>6</b>
<b>3</b>	<b>AUDIT FINDINGS .....</b>	<b>7</b>
<b>4</b>	<b>PREVIOUS AUDIT ACTIONS.....</b>	<b>13</b>
<b>5</b>	<b>CONCLUSION AND FOLLOW UP .....</b>	<b>15</b>
	Construction Compliance Matrix .....	16

## Appendices

### Appendix A Construction Compliance Matrix

# 1 INTRODUCTION

## 1.1 Project details

Project Name:	University of Sydney Susan Wakil Health Building Stage 1 Development – Camperdown Campus
Project Application Number:	SSD 7974

## 1.2 Background

This Independent Environment Audit is the fourth audit conducted to confirm compliance with the NSW Department of Planning and Environment (DPE) State Significant Development Approval (SSD 7974) for The University of Sydney's proposal to redevelop the first stage of the 'Health Precinct' at The University of Sydney's Camperdown Campus and is legally described as Lot 1 in DP 1171804 (shown as Stage 1 in Figure 1 below). The project is a State Significant Development because it is development for the purposes of an educational establishment and will have a capital investment value of approximately \$146,113,000 pursuant to clause 15 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*.

The Project, which is Stage 1 of Sydney University Health Precinct, involves the construction of an eight-level building that will provide a range of teaching and support spaces for the co-location of the Faculty of Nursing and Midwifery, the Faculty of Health Sciences and the Central Clinical School. The Stage 1 building will be constructed adjacent to the Royal Prince Alfred Hospital (RPAH). The site is bound by the University Oval Grandstand to the north, the Bosch Building to the south, Western Avenue to the east and the Royal Prince Alfred Hospital site to the west.

Clause 226(1) of the *Environmental Planning & Assessment Act Regulation 2000* (the Regulations) provides that a development carried out by an Australian University (under the meaning of the *Higher Education Act 2001*) is a Crown development. The University is listed as an Australian University under Schedule 1 of the *Higher Education Act 2001*. Consequently, this SSD is a Crown development for the purposes of Division 4 of the *Environmental Planning and Assessment Act 1979* (the Act).

This independent environment audit has been prepared in accordance with Conditions B37, B38 and B39 of the planning approval. The project appeared to be well resourced with environmental, compliance and approval systems for inspections and administration, the Construction / Site Environmental Management Plan requirements were of a professional standard.

## 1.3 Site location

The site is located to the east of the Royal Prince Alfred Hospital and accessed off Western Avenue, refer to Figure 1 below.

The site office is located at Sydney University, Bosch 1B, Blackburn Circuit, Camperdown 2006.



Figure 1.1 Sydney University Susan Wakil Health Building Stage 1 site location

## 1.4 Audit scope

### 1.4.1 Audit program and justification

Based on the scope of the audit and current construction program, four audits are planned at the following timings (this Independent Environment Program was submitted to the Department of Planning, Industry and Environment by Laing O'Rourke as part of the preconstruction documentation in accordance with Condition C46).

Date	Justification
18 December 2018 Audit 1 – complete	Close to the beginning of the construction works and therefore will determine whether relevant management plans and procedures are being implemented. Also coincides with the construction of the substructure, which is when the noise assessment is required, and sediment controls must be installed and maintained as excavation works would still be occurring.
9 May 2019 Audit 2 – complete	Within 6 months of the previous audit. Also coincides with the construction of the superstructure and façade works (which have elevated potential of noise exceedances) as well as commencement of fit-out works.
23 October 2019 Audit 3 – complete	Within 6 months of the previous audit. Continuation of fit out works and façade installation (which have elevated potential of noise exceedances) as well as external works/landscaping (therefore multiple work areas and contractors in the public eye).
May 2020 – this report	Operation Completion is to be confirmed, anticipated to be in the third quarter of 2020, as per the request of Department of Planning, Industry and Environment, an audit will be completed close to completion. This audit will provide an assessment of the final phase of the project as well as provide a summary of the previous three events including identification of: <ul style="list-style-type: none"> <li>• Compliance with construction completion conditions</li> <li>• Compliance with any ongoing monitoring and reporting requirements</li> </ul>

\*These timings are based on the current construction program but may be adjusted if delays are evident.

### 1.4.2 Audit attendees

The audit took place on Wednesday 24 April 2020 at the University of Sydney construction site (Sydney University, Bosch 1B, Blackburn Circuit, Camperdown 2006).

Audit interview attendees included:

- Lana Assaf, Senior Executive – Environment, RPS (Independent Environment Auditor)
- Valerie Donat, Consultant – Environment, RPS (Audit observer)
- Sarah Blagrove, Senior Sustainability and Environment Advisor, Laing O'Rourke
- David Gill, Construction Manager, Laing O'Rourke.

Prior to the audit, RPS was provided with copies of construction documentation for review. The interview questions focused on issues associated with construction.

### 1.4.3 Audit background and scope

The audit scope has not been defined within the conditions and therefore this audit reverts to the commitments that are made within the relevant management plans which should incorporate best practice.

The scope of the audit is comprised of:

- A review of site documentation, including:
  - Review of contractor documents:
    - Induction material
    - CEMP (Document No. K34-LOR-PRM-PLN-00007, Rev 6, Issue date 23/09/2019, signed by Sarah Blagrove on 23/09/2019) and sub-plans
    - Environmental policy (signed by Ray O'Rourke)
    - Environmental Constraints Map and Incident Reporting Flowchart (as per the above CEMP).
  - Relevant approvals documents:
    - Development Consent SSD 7974, dated 11 September 2018 and Modification 2 dated 6 May 2020. SSD-7974-Mod-2 was for the modification of conditions to extend and manage extended construction hours.
    - Other permits and licences
- Evidence of implementation of the CEMP, sub-plans.
- Evidence of Pre-start/Toolbox talks/Induction training – records and content.
- Evidence of incident management reporting – incident register and follow-up actions.
- Evidence of environmental monitoring, inspections and reporting.
- Evidence of consultation, where required.
- A site visit to observe on-site the implementation of the management and mitigation measures required by the CEMP.

- A close-out meeting to review key findings and follow-up actions with audit attendees.

RPS was provided with the following key documents by Laing O'Rourke related to the development:

- University of Sydney Health Precinct Stage 1 – Environment Impact Statement, dated September 2017 Final, prepared by URBIS
- University of Sydney Health Precinct Stage 1 SSD 7974 SEARs, dated 7 October 2016
- Construction Environment Management Plan, Revision 6, 23 September 2019
- Waste Management Plan, Version 2, 7 May 2019
- Construction Noise and Vibration Management Plan by Resonate, Revision C, 12 September 2018
- Arboricultural Impact Assessment Tree Protection Specification, prepared by Tree IQ, Revision C, 11 September 2017
- Urban Arbour Pty Ltd, Arborist Pruning Certificate, 2 April 2019
- ETP Environment Control Map, Revision 4, October 2019
- Erosion and Sediment Control Map and Toolbox Talk Records
- Community Communication Strategy (Version 3, dated 12 February 2019)
- Noise Monitoring Report prepared by Resonate, dated 21 October 2019
- The University of Sydney Newsletters from April – October 2019
- Chemical Safety Data Sheets
- Waste Tracking Register and Material Dockets
- Environmental Site Inspection Reports
- Environmental Incident Register, provided to RPS by LoR on the 5 November 2019, via email
- Risk Review dated March 2019
- University of Sydney Sustainability Framework Tool v2-1 Gateway 3, dated 19 October 2018
- Bonnaci Group Campus Flood Risk Management Masterplan Addendum, 1 April 2019
- Construction Traffic and Pedestrian Management Plan, GTA Consultants, dated 5 March 2020 (updated following access incident highlighted in section 2 below).

**Additional information requested post Audit 4 and provided on Saturday 9th May 2020:**

- Final Conditions Compliance Matrix (excel)
- Bonnaci Group Civil & Stormwater Design Report, dated 20 September 2018
- SSD 7974 Modification 2 - Extension to construction hours report, Urbis, dated 23 March 2020
- Appendix A: Addendum Construction Management Plan prepared by Laing O'Rourke Australia
- Appendix B: Stakeholder Consultation Summary prepared by Laing O'Rourke Australia
- Appendix C: Acoustic Assessment prepared by Resonate
- Appendix D: Temporary Lighting Specifications prepared by Stowe
- SSD 7974 Approved Modification 2 for the modification of conditions to extend and manage extended construction hours, dated 6 May 2020
- AFC Landscape Plans and Planting Schedule, Arcadia Landscape Architecture, dated 1 April 2020.
- Nov 2019 to April 2020 Laing O'Rourke Noise Monitoring Results

## INDEPENDENT AUDIT REPORT

---

The environmental performance of the project was reviewed by assessing compliance against Schedule 2 of the project's conditions of approval (SSD 7974 granted on 11 September 2018). Refer to Appendix A for the compliance register which provides a review of the compliance status of the site including actions required for compliance. Further detail will be provided by the University as the project progresses to the operational phase.

## 2 INCIDENTS AND COMPLAINTS

The Laing O'Rourke Australia (LORA) Incident Event Reporting database was reviewed during the audit. One minor environmental incident was reported during the period between Audit 3 (23<sup>rd</sup> October 2019) and Audit 4 (24<sup>th</sup> April 2020), where a concrete truck entered the emergency access gate, rather than the main gate. As listed in the Actions below a Traffic Guidance Scheme has been prepared to alert delivery drivers of the approved access gates, with a Pedestrian Management Plan also included in Appendix C of the Construction Traffic and Pedestrian Management Plan, dated 5 March 2020. The follow up close out actions were delivered as stated and evidence was provided during the audit.

Event Details

Event Reference Number	33651	Sub Project	CSBB - University of Sydney Health Precinct
First Name	Sarah	Date of Event	22 Nov 2019
Last Name	Blagrove	Time of Event	15:17
Event Type	Environmental Incident	Event Status	Closed
Investigation Status			

Event Summary

Summarise the Event Details

On Friday 22 November, a concrete truck accessed the Susan Wakil Health Building project site from the emergency access gate along Lambie Dew Drive adjacent to Royal Prince Alfred Hospital (RPAH), rather than the main gate accessed via Western Avenue.

This gate is not approved for access for concrete trucks within the project's Traffic Management Plan (TMP).

Actions (2)
People Involved (1)
New Investigation (0)
Investigation (0)
Documents (0)
Damage (0)

Create new Actions
Search Actions

Action Ref No:	Date Action Raised	Action Required	Target Completion Date	Action Status
<a href="#">27716</a>	25 Nov 2019	Deliver toolbox talk to broader construction team regarding approved Traffic Man...	29 Nov 2019	Closed
<a href="#">27717</a>	25 Nov 2019	Update of Traffic Management Plan	07 Jan 2020	Closed

The project Complaints Register was reviewed, no additional complaints were received during this audit reporting period.

Community consultation is ongoing with the Susan Wakil Health Project Stage 1, newsletters are provided on a monthly basis, through the Sydney University Campus Infrastructure Services (CIS), via email. Laing O'Rourke also provide Weekly Works Update Summary Reports to the University of Sydney.



### 3 AUDIT FINDINGS

Weather conditions on Wednesday 29<sup>th</sup> April 2020 for the audit were sunny, dry and warm (22°C). A summary of audit findings with follow up corrective actions are presented below. It was noted that no penalty notices or environmental incident reports had been received during the audit period (23<sup>rd</sup> October 2019 to 29<sup>th</sup> April 2020). BKH and Stowe Australia remain LOR's main construction subcontractors, a number of additional subcontractors were on site for electrical fit out, lift build (Kone), lagging of services, shaft riser services, west stair ductwork (Fredon and Austem), Polyseal membrane for the southern wall. Concrete floor plinth pours are complete. Internal fit out works are progressing with ceiling, wall sheeting and bathroom installations, electrical switchroom fit out will commence in the coming months, with Lecture Theatre fit out works almost complete. The Façade panel installation is complete with services rough-in completion. It was noted six CCTV cameras have been installed around the site for security and for confirmation of the daily start and finish time of site works to differentiate this construction site from other Sydney University contractors on site (e.g. FDC works), with time lapse photography also in place.



Laing O'Rourke's SSD 7974 Condition Compliance Matrix is provided in Appendix A for reference, prepared by MBC Modern Building Certifiers, no non-compliances were identified within this matrix, outstanding actions for CC3 and prior to occupation are highlighted in red. Following Modification 2 recently received on the 6<sup>th</sup> May the Condition Compliance Matrix should be updated to reflect these conditions.



Audit scope	Comment
Availability of documentation – including ensuring hard copies of the following are kept on site: <ul style="list-style-type: none"> <li>• Project approval</li> <li>• CEMP (and all sub plans)</li> <li>• Complaints and waste registers</li> <li>• Other permits and licences</li> <li>• Environmental policy</li> <li>• Environmental Controls Map (ECM)</li> <li>• Erosion and Sediment Control Map (ERSED)</li> <li>• Incident reporting flowchart</li> </ul>	<ul style="list-style-type: none"> <li>• Project approvals, CEMP and other documents were provided by the Senior Sustainability and Environment Advisor Sarah Blagrove.</li> <li>• Hard copies were available on site, the ECM and ERSED Map were available on the noticeboard with the Environment.</li> <li>• The LoR team advised that no complaints had been received during this audit period related to construction of the Susan Wakil project.</li> <li>• Approved Modification 2 noted, signed on 6 May 2020 for the modification of conditions to extend and manage extended construction hours.</li> </ul>

Audit scope	Comment
Storage and handling of dangerous goods, spill kits and general housekeeping	<div></div> <div></div> <p>Signage for Dangerous Goods cabinets was in place during Audit 4 and fuels were stored in labelled colour coded jerry cans. Three spill kits were observed on site.</p>
Hazardous material (ACM) management / unexpected finds	No Unexpected ACM Finds reported for this audit period.

Audit scope	Comment
Evidence of Landscape Management Plan and Planting Schedule implementation	<div>A photograph showing a paved area with a metal gate and some landscaping. The gate is partially open, and there are some plants and a person on a bicycle in the background.</div> <div><p><b>Stabilisation of landscaping around the site to adhere to the landscaping design report and planting schedule. Including outside the site perimeter, but within the project boundary.</b></p></div>
Evidence of stormwater drainage implementation	<div>A photograph showing a stormwater drainage system with a red and white striped barrier. The barrier is placed over a concrete structure, and there is some debris and a green bag nearby.</div> <div><p><b>Evidence of stormwater protection in place during construction. Stormwater drainage under the building at the basement level to be monitored to make sure drains are clear of debris/blockages post construction. It is recommended that these stormwater drains are monitored during operational site inspections in the future.</b></p></div>

Audit scope	Comment
Evidence of CEMP implementation – dust implementation	<div></div> <div></div> <p>Continued movement of stockpiles was taking place, where possible stockpiles were covered and perimeter ERSED was in place. Mud shaker was in place at site entry, with stockpile segregated, compacted, and covered.</p>

Audit scope	Comment
	<div></div> <p>Asphalting of the access road was conducted after Audit 4 for dust mitigation, photo provided by Laing O'Rourke on 9<sup>th</sup> May 2020.</p>
<p>Evidence of incident management reporting (i.e. incident register and follow up actions)</p>	<p>One incident report was provided to RPS for this audit period, the Senior Sustainability and Environmental Adviser provided evidence of close out, refer to Section 2 for further details.</p>
<p>Evidence of implementation of the CEMP and sub plans (i.e. erosion and sediment control plans, waste/materials tracking register/waste dockets, noise and vibration monitoring records, out of hours works approvals, asbestos checklist).</p>	<div></div> <p>Irrigation hosing hung around the perimeter fence to be monitored for leakages and spray onto pathways to be rectified, by potentially lowering and turning the spouts onto site.</p>

Audit scope	Comment
Tree Protection Zones	<div>An aerial photograph showing a large, mature tree with a dense canopy of green leaves. A rectangular metal fence, likely a Tree Protection Zone (TPZ) fence, encircles the base of the tree. The ground around the tree is disturbed, with exposed soil and some construction equipment visible. In the background, there are buildings and a parking lot.</div> <p>The Tree Protection Zone (around the over 100-year-old Jacaranda) was still intact and in place in Audit 4.</p>
Backflow Prevention	<div>A photograph of a red banner or wall with the text 'Humanity at work' in white. Below the text are logos for 'The University of Sydney' and 'INSPIRED'. The banner is set against a background of trees and foliage. In the foreground, there is a green pipe or hose lying on the ground.</div> <p><b>Recommendation for the Backflow Prevention Containment Device at the perimeter entrance to be installed and tested to <i>Water Supply - Backflow Prevention Australian Standards</i> by a qualified plumber.</b></p>

## 4 PREVIOUS AUDIT ACTIONS

There are four ongoing opportunities for improvement raised in Audit 2, while Audit 3 identified no non-compliances and identified a further seven opportunities for improvement, regarding management of the working site. RPS have recommended actions for each opportunity for improvement identified. These actions are summarised in the audit action table below. This table will be maintained and updated by Laing O'Rourke to track actions as they are closed out.

No.	Category	Action	Responsibility	Timing	Status/LoR Response
1	Audit 2: Opportunity for improvement	Evidence of Toolbox Talks <b>signed</b> attendee records within the next month (particularly Tree Protection Zones, hold points and Spill Response).	Laing O'Rourke	Ongoing	Tree protection zones and LoR controls are integrated into the project induction for all workers. Site signage and physical protection surrounding these zones are inspected during the weekly environmental inspection.
2	Audit 2: Opportunity for improvement	Recommend reinstalling the Tree Protection Zone and stabilising/levelling the ground where utility work was recently conducted from a safety perspective.	Laing O'Rourke	Ongoing	The area specified is outside the management and control of the project, however the safety hazards identified will be addressed.
3	Audit 2: Opportunity for improvement	Recommend continued awareness training to all staff in Tree Protection Zones and LoR to provide follow up Arborist report following pruning of damaged Jacaranda branches.	Laing O'Rourke	Ongoing	Tree protection zones and LoR controls are integrated into the project induction for all workers. Site signage and physical protection surrounding these zones are inspected during the weekly environmental inspection.
4	Audit 2: Opportunity for improvement	Recommend that handheld noise monitoring takes place during out of hours works to make sure noise thresholds are not triggered.	Laing O'Rourke	Ongoing	LoR are undertaking an analysis of the noise generated from site activities in alignment with the DPIE conditions of consent to ensure quantifiable evidence is available prior to establishing controls.
5	Audit 3: Opportunity for improvement	Recommendation for the fire extinguisher stored in the Dangerous Goods cabinet shown below to be removed and stored outside the DG cabinet.	Laing O'Rourke	Closed	Closed out in Audit 4, inspection of DG cabinet noted no fire extinguishers in the cabinet.
6	Audit 3: Opportunity for improvement	Recommendation regarding general housekeeping to move wheelbarrow away from Spill Kit and DG Storage for ease of access.	Laing O'Rourke	Closed	Closed out in Audit 4. Wheelbarrow removed from spill kit access area.
7	Audit 3: Opportunity for improvement	Recommendation for LoR to work with Sydney University to establish anti-dumping measures around the site perimeter.	Laing O'Rourke	Closed	Closed out in Audit 4, the Hospital had removed the litter surrounding the project site perimeter and uplifted this area with landscaping and an area for staff to meet.
8	Audit 3: Opportunity for improvement	Stabilisation/landscaping of the area leading to and from the basement drainage canal is recommended, once earthworks are complete.	Laing O'Rourke	Immediate	Open, to be completed.

## INDEPENDENT AUDIT REPORT

9	Audit 3: Opportunity for improvement	Recommendation for the Backflow Prevention Containment Device at the perimeter entrance to be installed and tested to Water Supply - Backflow Prevention Australian Standards by a qualified plumber.	Laing O'Rourke	Ongoing	Open, to be installed once construction is complete.
10	Audit 3: Opportunity for improvement	Recommendation for reuse of pallets and wooden spools from materials delivery, LoR advised the manufacturer would not accept these for recycling, potentially investigate other avenues such as Reverse Garbage or Palletable Furniture, Marrickville ( <a href="https://reversegarbage.org.au/">https://reversegarbage.org.au/</a> ).	Laing O'Rourke	Ongoing	Open, Laing O'Rourke are looking into this.
11	Audit 3: Opportunity for improvement	Recommendation for lead wall sheeting offcuts to be recycled as metal waste through a registered waste facility.	Laing O'Rourke	Closed	Closed out in Audit 4, Laing O'Rourke advised the waste contractor will recycle these.

## 5 AUDIT 4 CONCLUSION AND FOLLOW UP ACTIONS

In conclusion, Laing O'Rourke is implementing the management and mitigation measures required by the CEMP and has the appropriate documentation available electronically stored on-site to comply with their environmental management obligations. It is noted that 200-300 tonnes of tested spoil will be beneficially reused for the Badgerys Creek Airport project. It is also noted that an extension to the construction program is being sought and this needs to be discussed with NSW DPIE, to advise of the revised competition date due to potential COVID 19 delays with supplies and construction.

This audit identified no non-compliances and identified four opportunities for improvement, regarding management of the working site. RPS have recommended actions for each opportunity for improvement identified. These actions are summarised in the audit action table below. This table will be maintained and updated by Laing O'Rourke to track actions as they are closed out during construction completion.

No.	Category	Action	Responsibility	Timing	Status
1	Opportunity for improvement	Stabilisation of landscaping around the site to adhere to the landscaping design report and planting schedule. Including outside the site perimeter, but within the project boundary.	Laing O'Rourke	Immediate	Open
2	Opportunity for improvement	Irrigation hosing hung around the perimeter fence to be monitored for leakages and spray onto pathways to be rectified.	Laing O'Rourke	Immediate	Open
3	Opportunity for improvement	Stormwater drainage under the building at the basement level to be monitored to make sure drains are clear of debris/blockages post construction. It is recommended that these stormwater drains are monitored during operational site inspections in the future.	Laing O'Rourke	Immediate	Open
4	Opportunity for improvement	The compliance matrix in Appendix A is to be updated to include Modification 2 conditions and the outstanding CC3 actions are to be closed out, with evidence to provided to NSW DPIE.	Laing O'Rourke	Immediate	Open

**Appendix A**

**Construction Compliance Matrix**