Report

RPS

6 FEBRUARY 2019

Sydney University Construction Environment Audits

Susan Wakil Health Building Construction Independent Environment Audit 1

RPS

Document status

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Approval for issue

Name	Signature	Date
Gareth Thomas		6/02/19

Prepared by: **RPS MANIDIS ROBERTS PTY LTD**
Level 13, 255 Pitt Street
Sydney, NSW 2000
Australia

T: +61 2 9248 9800

E: Lana.Assaf@rpsgroup.com.au

Prepared for: **LAING O' ROURKE AUSTRALIA CONSTRUCTION PTY LTD**
Level 4, 100 Arthur St,
North Sydney NSW 2060 Australia

T: 02 9903 0300

E: chrispaul@laingorourke.com.au

W:

Author: Lana Assaf

Reviewed: Gareth Thomas

Approved: Gareth Thomas

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1 Introduction

This Independent Environment Audit was 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 a 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 & 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. It was noted the current project's dedicated Senior Environmental Advisor (Swathi Gowda) had just taken maternity leave and her position was currently being advertised advised to be filled in late Jan 2019, in this interim period Chris Greenaway the Laing O'Rourke Environment Lead advised he was fulfilling this project environment role.

1.1 Site Location

The site is located to the east of the RPAH and accessed off Western Avenue.

Figure 1 Stage 1 Susan Wakil Health Building Project Stage 1 Site Location

1.2 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 and close out of previous audit actions.
- A review of site documentation, including:
- Review of contractor documents:
    - Induction material
    - CEMP (Document No. K34-LOR-PRM-PLN-0007, Rev 3, dated 2/7/18) and sub-plans
    - Environmental policies
    - Environmental Constraints Map and Incident Reporting Flowchart (as per the above CEMP).
- Relevant approvals documents:
    - Development Consent SSD 7974, dated 11/9/18
    - Other permits and licences, with focus on EPL 20788.
- Evidence of implementation of the CEMP, sub-plans and EPL 20788.
- 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 of 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.

Prior to the audit RPS was provided the following documents by Laing O'Rourke related to the development:

- Draft Construction Noise Management Plan (Resonate, June 2018)
- Operational and Construction Waste Management Plan (Waste Audit, July 2018)
- Arboriculture Impact Assessment and Tree Protection (Tree IQ, September 2017)
- Construction Environmental Management Plan (Laing O'Rouke, June 2018)
- Environmental Impact Assessment (Urbis, September 2017)
- Secretary's Environmental Assessment Requirements (October 2016)
- Summary Construction Program (July 2018)

From the Construction Program, key milestones and phases are:

Activity	Current Scheduled Date
Construction Certificate (CC) achieved and construction works commence	28 September 2018
Substructure (Footings, foundations, etc)	October 2018
Framework, Superstructure and Façade	November 2018 to July 2019
Fit out	May 2019 to late February 2019
External works	October 2019 to February 2020
Occupation Certificate (OC) achieved	March 2020

1.2.1 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 and Environment by Laing O'Rourke as part of the preconstruction documentation in accordance with Condition B37).

Date*	Justification
December 2018	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.
May 2019	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.
October 2019	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	Operation Completion is scheduled for March 2020, as per the request of Department of Planning and Environment, an audit will be completed post completion. This audit will provide an assessment of the final phase of the project (i.e. to completion) as well as provide a summary of the previous three events including identification of: • Compliance with construction completion conditions • Compliance with any ongoing monitoring and reporting requirements

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

1.2.2 Audit Attendees

The audit took place on 18 December 2018 at the Sydney University construction site (Bosch 1B, Blackburn Circuit, Camperdown 2006), attendees included;

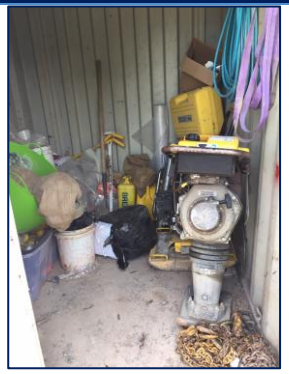
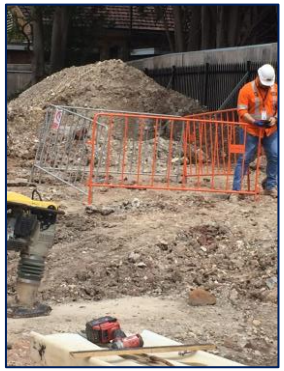
- Lana Assaf, Senior Executive Environment, RPS (Independent Auditor)
- Angus King, Senior Manager, RPS audit observer
- Chris Greenaway, Environment Leader, Laing O'Rourke
- Chris Paul, Senior Project Engineer, Laing O'Rourke
- Danielle Ryan, HSE Advisor, Laing O'Rourke
- Luke Allman, Site Manager, Laing O'Rourke
- Christopher Stone, Structures Project Engineer, Laing O'Rourke
- Jannaya Ashelford, Graduate, Laing O'Rourke

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

2 Audit Findings

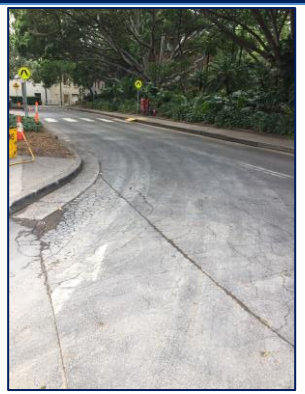
Weather conditions on Tuesday 18th December 2018 for the audit were sunny and warm (26˚C), with a light wind. The audit findings are outlined below. The Laing O'Rourke (LoR) attendees were very cooperative and provided full access to the construction site and documentation required with regards to this audit. A summary of these findings with follow up corrective actions are located in Section 3 below.

Audit scope	Comment
Availability of documentation - including ensuring hard copies of the following are kept on-site: Project Approval CEMP (and all sub plans) Complaints and Waste Registers Other permits and licences Environmental policies Environmental Constraints Map Incident Reporting Flowchart	Project approvals, CEMP and other documents were provided by the Senior Project Engineer Chris Paul. **It is recommended that all documents be displayed in hard copy on site for reference by the construction team and subcontractors BKH Group and Brefni Civil Engineering.** The following LoR forms were provided; Continual Improvement, Environment Incident Complaint Report, Non-Conformance Report (NCR), Management Site Safety and Environment Inspection Template, Plant and Equipment Premobilisation Checklist examples were provided and explained the monthly reporting traffic light system that was sent to senior LoR management. During the audit the LoR team completed inspection forms in the Laing O'Rourke Australia Construction management system (LORAC) and provided appropriate Road Occupancy Licences for wide loads such as the piling and tower rig.
Storage and Handling of Dangerous Goods and General Housekeeping  	Photos show BKH Chemical storage unlabelled chemical containers (identified as Release Agent to stop concrete sticking), DG 2 aerosols stored with DG 3 flammables – Non-compliant storage. **Non-Conformance with CEMP, pg 20, Section 16.8 Handling, Storage, Packaging, Transport. Recommendation that LoR separate DGs from combustibles, label all chemical containers, train all staff and contractors in the storage and handling of Dangerous Goods.** **General housekeeping could be improved on site with the removal of empty boxes and debris from construction material delivery strewn across the site.**

Audit scope	Comment
 	Photos on the left show a white unlabelled Brefni storage container, storing fuels with combustibles – **Non-compliant storage and DG signage.**
Hazardous Material (ACM) Management/Unexpected Finds 	During the audit inspection a suspected unexpected asbestos find was identified by the audit team. LoR immediately isolated the area and notified all staff working on site. LoR advised post audit that ADE Consulting Group was engaged and provided a Visual Clearance Certificate on 19/12/18 (identified the sample as bonded asbestos containing material ACM) and a disposal docket was provided from Suez Recycling and Recovery Pty Ltd on 20/12/18 for a chargeable weight of 0.50t. **Recommendation as above to train all staff and contractors in hazardous materials unexpected finds.**
Evidence of CEMP implementation - Dust Suppression 	Construction internal site access road was not stabilised and had loose fine sandstone sand like material, dust was mobilised during the audit in a light breeze and during high winds would mobilise even more dust**. Recommend stabilisation of internal access road and training in dust control by site staff and contractors.**

Audit scope	Comment
Evidence of CEMP implementation - Spill Kits  	Two general purpose spill kits were observed on site. Spill kits had some litter inside and weren't placed directly near the chemical storage containers below. **Recommend spill kit lids be secured with cable ties to avoid littering and placed closer to chemical storage areas.** **Toolbox Talk register to be provided by LoR. Induction presentation was provided to the audit team (two WHS toolbox talks were provided for Heat Stroke and Nurse Call). It is recommended that ALL LoR staff and contractors are trained in the Environment Incident Procedure and Spill Response, in accordance with Conditions A20, A21, A22. It is recommended that Environment Incident, Spill Response and Chemicals/Dangerous Goods storage are included in the project Induction presentation.**
Evidence of incident management reporting (i.e. incident register and follow up actions).	The Hazchem Spill Kit was sighted in the vicinity of the Dangerous goods storage container. **It is recommended that LoR train staff and contractors in spill response procedure and asbestos unexpected finds, evidence of training to be provided by LoR.** LoR advised no environmental incidents occurred from construction commencement September – December 2018. RPS requested a copy of the incidents and complaints reporting templates, this was provided by LoR on 9/1/18.
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). 	The CEMP was provided with all sub-plans present. **Complaints Register** LoR provided the Complaints Register for future complaints. LoR and a Sydney University representative advised no complaints were received to date. **Water Quality Testing and Discharge** LoR advised no dewatering has been undertaken to date, this may need to occur for high intensity rainfall. **LoR to provide water quality testing and discharge testing procedure. Also advise the frequency of stormwater drains geofabric clean out (noting a frequency of 2-3 weeks is inadequate) in accordance with CEMP section 16.12 and 16.3, recommend a greater frequency of clearing of stormwater drains.** **Waste Disposal and Materials tracking register**

Audit scope	Comment
	Waste disposal on site is comingled, LoR advised all waste was sorted by Bingo waste, **suggest LoR request Bingo waste receptacles with lockable covers to avoid overspill/dumping**. The waste tracking register was available on site, provided to RPS. **Out of Hours Works Community Notification** for removal of piling rig out of hours dated 30 October 2018 was provided. The piling rig was removed from site from 10pm on Wednesday 31 October 2018. **Noise monitoring for Out of Hours Works on 30 October 2018 to be provided by LoR.** Noise monitoring equipment was observed during the audit in the vicinity of Wesley College opposite the construction site, as per the NVMP. Resonate Noise and Vibration Monitoring Report dated 26 September – 24 November 2018, S180787RP1 Revision 0 was provided by LoR. The report summarises the results of the noise and vibration monitoring conducted by EHO Consulting and considers the results against the requirements of the CNVMP. Throughout the monitoring period at RPAH, measured noise levels exceeded the NML of 70 dB(A) Leq,15min for a total of 11 occasions during working hours throughout the entire monitoring period. It is noted that some of these occurrences may be the result of extraneous events as a number of exceedances of the NML occurred outside of working hours. Given the relatively small number of isolated exceedances that occurred throughout the entire monitoring period, it is not considered that noise levels from the construction works are significantly impacting on RPAH. However, **reasonable and feasible noise mitigation measures should be implemented on site as per the approved CNVMP (Resonate CNVMP M17183RP4, Rev C, dated 12/9/18, Section 6).**
	It is noted that while significant data was available at both RPAH and Bosch 1B across the monitoring period, **1-2 weeks of data was not available at each location**. Data was also unavailable for extended periods at Wesley College but it is noted that continuous monitoring was not required at this location under the CNVMP. **Vibration alert trigger levels for RPAH and Bosch 1B were set at 4 mm/s PPV and 2 mm/s PPV respectively, whereas more stringent trigger levels were required in the CNVMP.** This was identified as a non-conformance and would mean that some vibration alerts would have been missed.

Audit scope	Comment
  	**Further vibration monitoring results to be provided; as works continue, reasonable and feasible noise and vibration mitigation measures should be implemented on site as per the CNVMP.** However, it is noted that the works generally complied with the vibration management levels specified in the CNVMP. **Suggest preparation of a separate stand-alone ERSED Map that can be updated easily and is accordance with condition B9 and as per CEMP Appendix 5 listing key ERSED control measures. Site stockpiles are to be stabilised.** **Mud tracking is to be monitored by LoR with stabilisation of the additional area/soil between the site and road to be considered. A road sweeper is suggested post commissioning, prior to Practical Completion.** No water cart on site was observed for dust suppression, however hoses for dust suppression were observed. RPS suggested that LoR reinstate sandbags, or salvage coir logs (that were compromised) to act as energy dissipaters to reduce the flow of dirty water offsite down the road through the site hoarding. Historical white residue seepage from site was observed staining the pedestrian footpath adjacent to the oval. This could not be explained by LoR. **LoR to reinstall compromised sand bags along the site perimeter and make sure the external site perimeter is monitored for any compromise of ERSED control as part of the environment inspections**. It was noted that ERSED fencing was installed around the internal perimeter well. It was noted that the site had appropriate hoarding and signage, the Principal Contractor Laing O'Rourke Australia, Site Manager Jason Turnbull with Site Contact mobile number: 0448 492 644 was displayed on the gate.
Evidence of environment monitoring, inspections and reporting (e.g. weekly inspection reports, monthly environmental reports).	Weekly inspection reports were sighted, including weekly inspections of ERSED fencing. Materials Tracking Register has been provided by LoR post audit (noting some waste dockets were missing from the tracking register).

Audit scope	Comment
Tree Protection Certification  	The Tree Protection Certification was provided to RPS on 9/1/19, prepared for Laing O'Rourke in relation to the Susan Wakil Health Building. A site inspection was undertaken by Martin Peacock (treeiQ) and Christopher Stone (Laing O'Rourke) on the 23rd October to review the tree protection measures as required by Condition C17 Tree Protection. A number of hold points were placed on certain trees in the treeiQ report dated 25 October 2018. **LoR to provide evidence of toolbox talks to construction staff and contractors regarding these tree protection zones hold points.** It is noted that the Vegetation hold point has been included in the Environment Control Map provided**. It is recommended that document control (date and version) be placed on the Environment Control Map/ESCP.**

3 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.

This audit identified one non-compliance with the CEMP and identified twelve opportunities for improvement, regarding management of the working site. RPS have recommended actions the non-conformance and 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.

Following the draft audit report sent to Laing O'Rourke on 24th January 2019, Laing O'Rourke provided follow up audit responses, as per Appendix A. The status of the audit actions table below has since been updated to reflect the close out of these actions and diligent response by Laing O'Rourke.

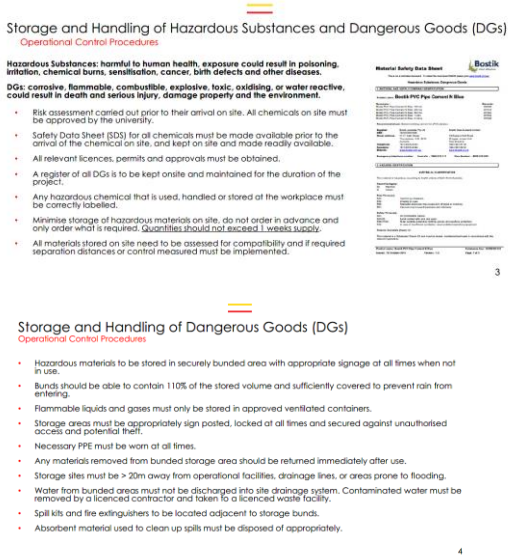
No.	Category	Action	Responsibility	Timing	Status
Susan Wakil Health Building Stage 1					
1.	Non-Conformance	Non-Conformance with CEMP, pg 20, Section 16.8 Handling, Storage, Packaging, Transport. Recommendation that LoR separate DGs from combustibles, label all chemical containers, train all staff and contractors in the storage and handling of Dangerous Goods and hazardous substances.	Laing O'Rourke	Immediate	Closed following audit response from LoR on 1/2/19 (see Appendix A)
2.	Opportunity for improvement	It is recommended that LoR train staff and contractors in spill response procedure and asbestos unexpected finds, evidence of training to be provided by LoR.	Laing O'Rourke	Immediate	Closed following audit response from LoR on 1/2/19 (see Appendix A). Unexpected finds training occurred on 22/1/19.
3.	Opportunity for improvement	Mud tracking is to be monitored, with potential stabilisation of the additional area between the rumble grid and road to be considered. A road sweeper is suggested,prior to Practical Completion.	Laing O'Rourke	Ongoing – Stabilisation/ removal of mud around rumble grid within two weeks	Ongoing to be confirmed in Audit 2.

No.	Category	Action	Responsibility	Timing	Status
4.	Opportunity for improvement	Vibration alert trigger levels for RPAH and Bosch 1B were set at 4 mm/s PPV and 2 mm/s PPV respectively, whereas more stringent trigger levels were required in the CNVMP. Further vibration monitoring results to be provided; as works continue, reasonable and feasible noise and vibration mitigation measures should be implemented on site as per the CNVMP (Resonate CNVMP M17183RP4, Rev C, dated 12/9/18, Section 6).	Laing O'Rourke	Within one month of issuing the final audit report	Ongoing to be confirmed in Audit 2. LoR response provided, Excel Noise and Vibration Data dated 3/11/18
5.	Opportunity for improvement	Recommend stabilisation of internal access road and training in dust control/suppression by site staff and contractors.	Laing O'Rourke	Within two weeks of issuing the final audit report	Ongoing – LoR plans to raise internal road at access point and install a bigger rumble grid and wheel wash, to be confirmed in Audit 2. LoR response advised that dust training was held in monthly environment awareness training held on 22/1/19.
6.	Opportunity for improvement	Recommend training in spill response. Recommend spill kit lids be secured with cable ties to avoid littering and placed closer to chemical storage areas.	Laing O'Rourke	Within two weeks of issuing the final audit report	Closed – LoR advised all spill kits are now secured with cable ties (see Appendix A). New slides have been added to induction regarding environment incident reporting and spill response.
7.	Opportunity for improvement	LoR to provide water quality discharge testing procedure and frequency for stormwater drainage geofabric clean out.	Laing O'Rourke	Within two weeks of issuing the final audit report	Closed – LoR provided this in their response on 1/2/19.
8.	Opportunity for improvement	Noise monitoring for Out of Hours Works on 30 October 2018 to be provided by LoR.	Laing O'Rourke	Within one week of issuing the final audit report	Open – Out of Hours Works Approvals Forms to be provided in Audit 2.

No.	Category	Action	Responsibility	Timing	Status
9.	Opportunity for improvement	Suggest preparation of a separate stand-alone ERSED Map that can be updated easily and is accordance with condition B9 and as per CEMP aPP 5 listing key ERSED control measures. It is recommended that document control (date and version) be placed on the Environment Control Map/ESCP.	Laing O'Rourke	Within two weeks of issuing the final audit report	Open – To be confirmed in Audit 2. LoR advised this will developed.
10.	Opportunity for improvement	LoR to reinstall compromised sand bags along the site perimeter and make sure the external site perimeter is monitored for any compromise of ERSED control as part of the environment inspections.	Laing O'Rourke	Within two weeks of issuing the final audit report	Closed - LoR provided this in their response on 1/2/19. To be confirmed in Audit 2.
11.	Opportunity for improvement	It is recommended that ALL LoR staff and contractors are trained in the Environment Incident Procedure and Spill Response, in accordance with Conditions A20, A21, A22. It is recommended that Environment Incident, Spill Response and Chemicals/Dangerous Goods storage are included in the project Induction presentation.	Laing O'Rourke	Within one month of issuing the final audit report	Closed – LoR advised on 1/2/19 new training in incident response procedures will be rolled out over the next month. This has been included in site Induction slide pack. To be confirmed in Audit 2.
12.	Opportunity for improvement	LoR to provide evidence of toolbox talks to construction staff and contractors regarding these tree protection zones hold points.	Laing O'Rourke	Within two weeks of issuing the final audit report	Closed – evidence provided and presented on 1/2/19. Ongoing in Induction to be confirmed in Audit 2.
13.	Opportunity for improvement	It is recommended that all documents be displayed in hard copy on site for reference by the construction team and subcontractors BKH Group and Brefni Civil Engineering.	Laing O'Rourke	Within two weeks of issuing the final audit report	Closed – LoR advised on 1/2/19 that hard copies of the CEMP and Sub Plans are now available on site. To be confirmed in Audit 2.

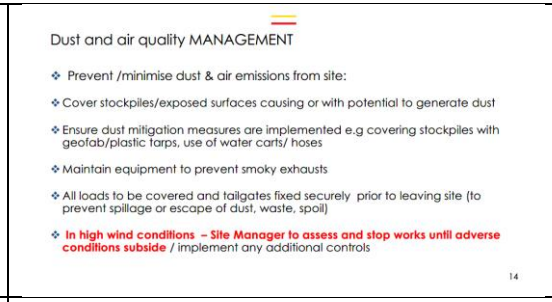
Appendix A

Laing O'Rourke Audit Actions – Sent to RPS on 1st February 2019

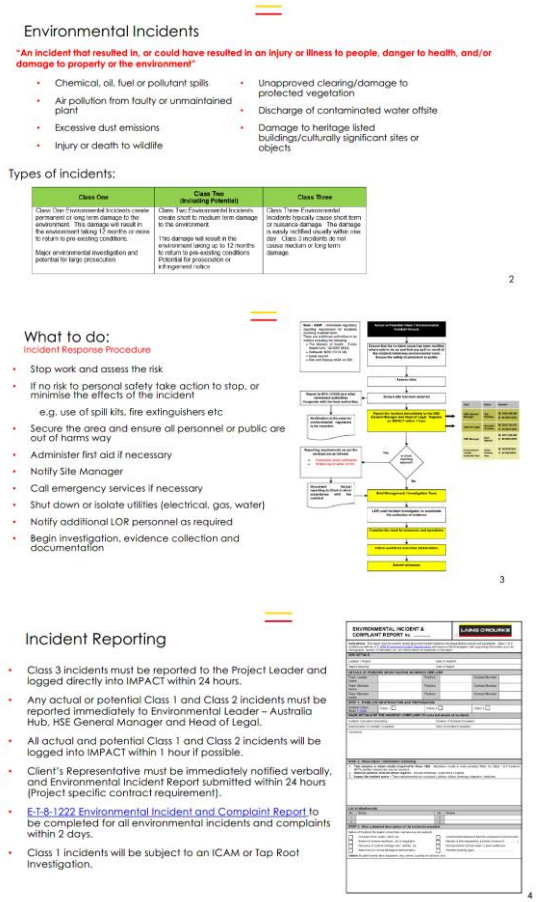
No.	Category	Action	Timing	Status
1	Non-conformance	Dangerous Goods to be separated from combustibles, with all chemical containers labelled. Train all staff and contractors in the storage and handling of Dangerous Goods.	Immediate	All hazardous substances previously found in Brefni container have now been removed from the site. The container is only to be used for storage of tools and will be removed from site completely within the next few weeks. New slides to be included in induction. All LOR site staff will be trained in these procedures. 
2	Room for improvement	Train all staff and contractors in hazardous materials and unexpected finds (Asbestos find).	Immediate	Unexpected finds training included in monthly enviro awareness training held on 22nd Jan. All LOR site staff now trained.

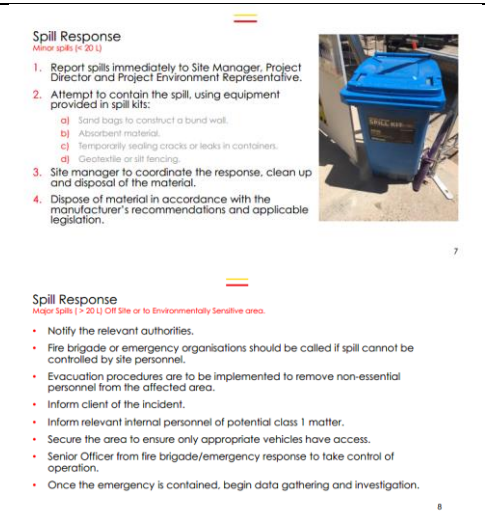
				
3	Room for improvement	Mud tracking is to be monitored, with potential stabilisation of the additional area between the rumble grid and road to be considered.	Ongoing Stabilisation/removal of mud around rumble grid within 2 weeks	Toolbox talk given on tracking mud/dirt onto road on 25/01/2019.  All construction staff made aware of mud monitoring. There are plans to raise/stabilise internal road at access point and put in a wheel wash and bigger rumble grid.
4	Room for improvement	Vibration alert trigger levels for RPAH and Bosch 1B were set at 4mm/s PPV and 2mm/s PPV respectively, whereas more stringent trigger levels were required in the CNVMP. Further vibration monitoring results to be provided as works continue.	Within 1 month of issuing the final audit report	The CNVMP specifies an alert level of 0.6mm/s Peak Particle Velocity (PPV) for RPAH for continuous vibration monitoring as vibration above 0.6mm/s may indicate the potential for disturbance to building occupants. Results from continuous vibration monitoring show that vibration levels at RPAH exceeded 0.6mm/s a total of 11 times during working hours across the monitoring period (26 September 2018 - 24 November 2018). For Bosch 1B the CNVMP specifies a vibration target of 0.1mm/s RMS (which corresponds to 0.4mm/s PPV). Vibration levels at Bosch 1B exceeded 0.4mm/s a total of 13 times during working hours. The majority of these events were short-term in nature, with no associated build-up of vibration levels around the event, indicating that they may have been the result of activities within the space rather than a result of construction activities. For example, staff entering a room for feeding or cleaning activities. These events were also generally followed by periods of low vibration levels indicating that there were no extended periods of vibration above 0.4mm/s.

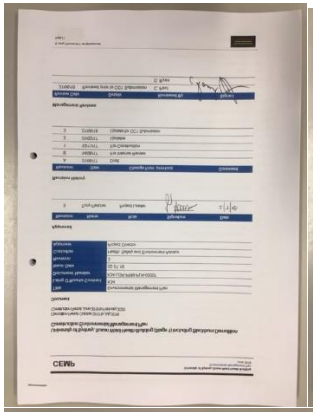
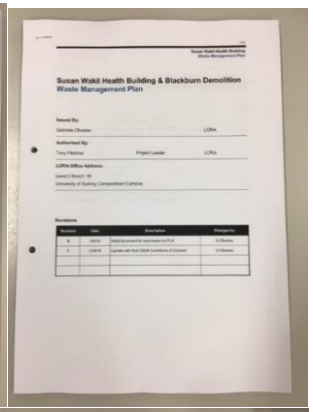
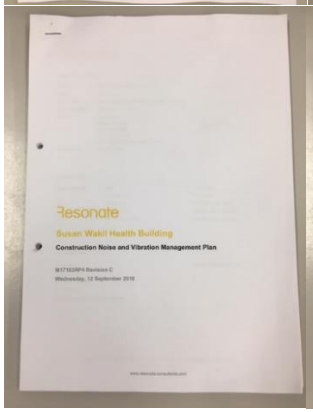
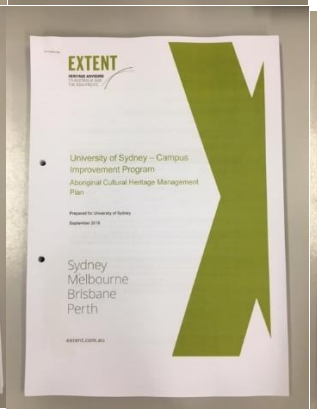
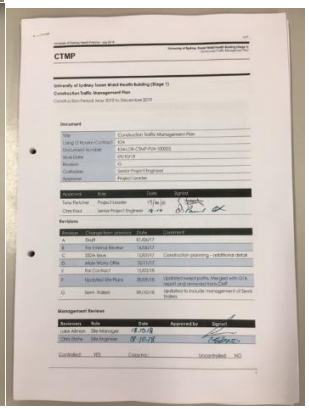
		Reasonable and feasible vibration mitigation measures should be implemented on site as per CNVMP.		Despite higher vibration alert trigger levels being used than those specified in the CNVMP, the monitoring results indicate that measured vibration levels were generally consistent with vibration management levels indicated in the CNVMP, demonstrating that vibration impacts from construction works were managed appropriately during this period. Further vibration monitoring data is available upon request. Prior to any out-of-hours works, neighbours and surrounding community are notified in writing. Complaints and inquiries register has been established with phone number, email address and postal address for complaints all clearly listed on site notice located on site perimeter hoarding on Western Avenue. We have quarterly community consultation to assess any noise or vibration complaints or issues from key stakeholders. All vehicles and trucks are diverted away from the hospital and residential streets. CFA piling was used rather than driven piling as it is a quieter construction method. Quackers are used where possible on plant instead of reversing alarms. Site access and delivery points are located on the side of the site furthest away from the Hospital. Induction/Toolbox talks promote shutting down of equipment and plant when not in use, i.e. no idling.
5	Room for improvement	Recommend stabilisation of internal access road. Training in dust control/suppression by site staff and contractors.	Within 2 weeks of issuing the final audit report	There are plans to raise/stabilise internal road at access point and put in a wheel wash and bigger rumble grid. Dust training included in monthly environmental awareness training held on 22nd January – all LOR site staff now trained.

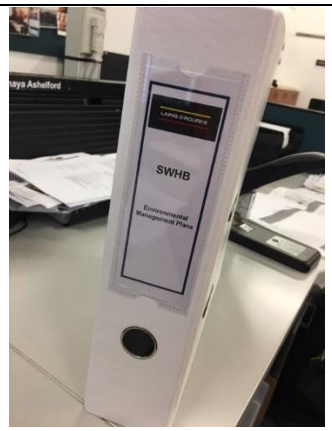
				
6	Room for improvement	All staff and contractors be trained in Spill Response procedures. Spill kit lids to be secured with cable ties to avoid littering and placed closer to chemical storage areas.		All spill kits on site have now been secured shut and are located close to chemical storage areas.  

7	Room for improvement	Provide water quality testing and discharge testing procedures and frequency of Geofabric clean out.	Within 2 weeks of issuing the final report	Please see attached file “SWHB Water Testing Procedures”. Geofabric controls on stormwater drains will be assessed each week on the environmental site walk and replaced as required. This will be also added to E-T-8-1227 Environmental Inspection Report for use in Fieldview.
8	Room for improvement	Noise monitoring for Out of Hours Works on 30 October to be provided.	Within 1 week of issuing the final report	See Excel attachment Noise and Vibration Data 03/11/18.
9	Room for improvement	Suggest separate stand-alone ERSED Map that can be updated easily. Document control (date and version) be placed on the Environment Control Map/ESCP.	Within 2 weeks of issuing the final report	A stand-alone ERSED map will be developed and document control will be placed on ECP.
10	Room for improvement	Reinstall compromised sand bags along site perimeter and make sure external site perimeter is monitored for any compromise of ERSED controls. Monitoring of external site perimeter for any compromise of ERSED controls to be	Within 2 weeks of issuing the final report	   This will be added to E-T-8-1227 Environmental Inspection Report for use in Fieldview.

		included in site inspections.		
11	Room for improvement	All staff and contractors be trained in environmental incident procedure. All staff and contractors be trained in Spill Response procedures. Environment Incident, Spill Response and Chemicals/Dangerous Goods storage are included in the project Induction presentation.	Within 1 month of issuing the final report	New training in incident response procedures to be rolled out early next month.  New slides to be included in induction. All LOR site staff to be trained in these procedures.

				
12	Room for improvement	Provide evidence of toolbox talks to construction staff and contractors regarding tree protection zones hold points.	Within 2 weeks of issuing the final report	TBT prepared and presented Friday 01/02/19.   

13	Room for improvement	All documents be displayed in hard copy on site for reference by the construction team and subcontractors BKH and Brefni. (Project Approval, CEMP including sub-plans, Complaints and Waste Registers, other permits and licences, Environmental policies, Environmental Constraints Map, Incident Reporting Flow Chart)	Within 2 weeks of issuing the final audit report	Hard copies of CEMP including sub-plans (CNVMP, CWMP, CTPMP, ACHMP) are now available on site.     

				  The Environmental Constraints Map is included in Appendix 5 of the CEMP. The Incident Reporting Flow Chart is included in Appendix 1 of the CEMP. Environmental policies are accessible to everyone online through Next Gear public website. https://nextgearsms.com/ Project approval, other permits and licences are all available as hard copies on site. Complaints and waste registers will be maintained electronically only due to the frequency at which they have the potential to be updated

Susan Wakil Health Building (SWHB) Project

Water Quality and Discharge Testing Procedures

No water is to be discharged off site without prior Laing O'Rourke approval.

Discharge quality must comply with the following standards:

- Total suspended solids (TSS): ≤ 50 mg/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 approximately 40kg/100m3.
- pH: Between 6.5 and 8.5.

Discharge Testing Procedure:

- Water will be pumped into a lined bin.
- Gypsum will be added to the water at a rate of 40kg/100m3 and left over night.
- Water will be tested using a TSS Meter to determine that turbidity is below or equal to 50mg/L.
- Water will be tested using a digital pH meter to ensure pH is between 6.5 and 8.5.
- If the results comply with water quality standards, water will then be discharged into the nominated point. The nominated discharge point is a storm water drain at the western boundary of the site shown in Figure 1.
- Sediment left at the bottom of the bin will be discarded into general waste.
- If test does not comply, further treatment will be required and the process repeats until the water is suitable to discharge.
- A 2" Flex Drive pump will be used to pump the water, which has a maximum pump rate of 25,000L/hr.

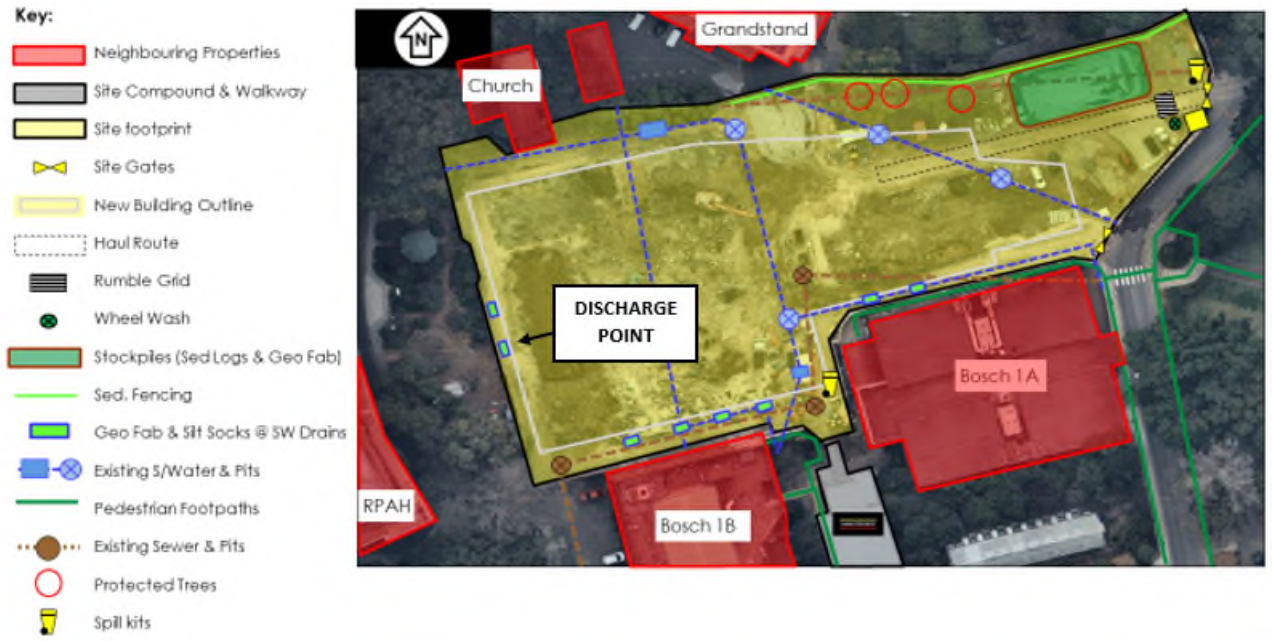


Figure 1. Environmental control map with water discharge point.