Honeysuckle City Campus Development – Stage 1A

The University of Newcastle

Preliminary Construction Management Plan

APP Corporation Pty Limited

APP Project Number 12341

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DISTRIBUTION & AUTHORISATION RECORD

Amendment Record

Revision	Description / Details	Date
1	Original Issue	30 January 2019
2	Revised to include updated CLMP	5 April 2019
3	Revised based on Client comments	18 April 2019
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Authorisation Record

Review by Project Director	*Name*	*Signature*	*Date*
Approval by Branch Manager	*Name*	*Signature*	*Date*

Only the APP **Branch Manager** is authorised to approve amendments to this plan. The APP **Project Manager** is responsible for control, maintenance and issue of this plan, for disposal of any superseded documentation, and for informing other project participants of changes to the project plan in accordance with the APP procedure for ***Project Planning***

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A. Strategic Construction Planning

1. Client Requirements

1.1. Introduction

The University of Newcastle (the University) has positioned itself with a significant opportunity to expand its CBD presence through negotiation with the State Government; Urban Growth NSW (UGNSW) and Hunter and Central Coast Development Corporation (HCCDC).

The University's NeW Futures Strategic Plan (2016-2025) outlines their 2025 vision. The Honeysuckle City Campus Development (HCCD) supports this Plan, which seeks to create a University that is engaged, innovative, has a world perspective and committed to the wider community and the environment. Stage 1A of the HCCD will be the first building of the Campus and will have two occupants;

- Innovation Hub (the University's Research and Innovation Division)
- School of Creative Industries (SOCI)

Stage 1A will be the first development for the University on the HCCD site and will involve a new four storey facility to be located on Lot A1 of the Concept Plan.

The Innovation Hub will be an important innovation-enabling piece of infrastructure providing a strong contribution to transition and propel our regional economy. The Innovation Hub will provide the physical space and catalyst project needed by the University students and staff to create, develop and produce ideas and products to meet market expectations and generate ongoing social and economic benefits for the region. Importantly, the Innovation Hub is intended to be more than a University asset; it will be an asset for the community and region.

The Creative Industries project was generated in response to the establishment of the School of Creative Industries (SOCI) and the desire to accommodate the new school in the heart of Newcastle's CBD. The school includes a consolidation of the School of Creative Arts and the disciplines of Communication and Design (including Natural History Illustration) from the School of Design, Communication and Information Technology.

The vision for SOCI, is for Creative Industries at the University of Newcastle to be a first-choice destination for creative enterprises and artistic endeavours, leading innovative and entrepreneurial approaches to creative output. This incorporates leading edge digital education and research, craftsmanship through physical artistic output, all with high interaction with industry and the local community. This extends to the principles of support for work integrated learning, practice based research, and especially cross discipline interaction of creative coursework that can facilitate new ideas.

Stage 1A will provide a range of flexible spaces capable of reacting to the evolving nature of an Innovation Hub, including spaces for co-working, meetings and informal collaboration. Shared spaces between the Innovation Hub and the SOCI will include small educational seminars/conferences, informal networking events, exhibitions and demonstrations of innovation. These spaces will be supplemented by Learning Studios for creative student learning spaces within SOCI including artistic, innovative and curriculum based areas.

This plan will be further developed by the appointed Contractor and integrated into their Construction Management Plan for the HCCD Stage 1A project.

1.2. The Project and Tender Process

Project Overview

The University intends to construct seven multi-level buildings within the Honeysuckle City Campus as per the separately submitted Concept Plan. This development will be rolled out over a number of stages and subsequent years. Stage 1A if the first of these developments whereby the University intends to construct a multi-level, technology-rich education building that will house the University's Innovation Hub and SOCI disciplines within the Newcastle CBD.

The Project consists of a new four storey building for new teaching and learning facilities on the corner of Honeysuckle Drive and Worth Place Newcastle.

Design Development and the Project Team

Design documentation is currently at the design finalisation stage, and is scheduled for completion mid-2020. The project team has not changed from the team set out in the respective Request for Proposals previously issued by the University.

The State Significant Development (SSD) application in respect of the Project was submitted to the Department of Planning and Infrastructure in Q2 2019.

Overview of the Tender Process

A panel of shortlisted preferred contractors has been established as a result of previous expressions of interest and request for proposals undertaken by the University.
A Request for Tender (RFT) will be issued to the shortlisted contractor panel. The RFT will be followed by final negotiations and the prospective award of the main building contract for the Project.

2. Project Delivery Methodology

2.1. Scope of Work

The main building works for the proposed Project feature four above ground levels plus a plant room on the roof. There is no basement.

The design of the Project is being undertaken by the Principal Design Consultant who will complete the design to a design development stage which will form the basis of the RFT documents.

The scope of work under the Building Contract will include, but is not limited to:

Scope Item 1 – Design

- Adoption of the pre-contract design and the management of design finalisation noting that, in preparing any documentation for the Project (**Contractor's Documents**), the Contractor must not

alter the accepted tender design without the Principal's agreement in accordance with the Building Contract;
- Manage the novated design team;
- Preparation of the Contractor's Documents;
- The Contractor's Documents must include provision of all construction documentation for the works. Construction documentation includes but is not limited to the production of the construction drawings, the verification of the developed sketch plans, the coordination of the design including the structure and the services, and a specification;
- The Principal will refer the Contractor's Documents for review to a number of stakeholders/experts for comment as deemed appropriate by the Principal, including:
  - Principal's consultants engaged on a "watching brief" for quality and adherence with the contracted design intent detailed within the Contract; and
  - Peer reviews, by Principal engaged experts with knowledge in particular aspects or elements of the works for the quality of documentation and detailing.
- Any obligations required for Green Star 5-star design certification;
- During the delivery phase, the Contractor must submit Contractor's Documents to the Principal at least 21 days before the date the Contractor proposes to use them for procurement, manufacture, fabrication, or construction. The Contractor's Documents must be submitted progressively with sufficient detail to demonstrate what is proposed;
- Development of the design for provisional sum items

Scope Item 2 – Construction

The Contractor shall allow for all preliminaries associated with the management of the construction works. The Principal will make available to the Contractor the vacant University land adjacent the Construction Site for use as site laydown area and accommodation facilities.

The Contractor's scope of works will include, but not limited to:
- Temporary works;
- Excavation and foundation preparation;
- Piling;
- Reinforced concrete foundations;
- Pre-cast concrete core structure;
- Cross laminated timber (CLT) and glue laminated timber (Glulam) structure;
- Façade – including glazing, concrete, sandstone and aluminium panelling;
- Fit-out – including public areas, teaching spaces, common spaces, workspaces, office;
- Landscaping works;
- Green Star accreditation;
- Building services including mechanical, electrical, hydraulic and vertical transport;
- Security;
- Technology;
- Coordination with Separate Contractors for the completion of the retail tenancies;
- FF&E; and
- Commissioning.

Scope Item 3 – Consultation

The Contractor shall comply with the following requirements for consultation:

- Community – it is expected that throughout the project the Contractor will proactively engage with the Newcastle community in accordance with the SSD requirements;
- University Executive – during the design finalisation period the Contractor shall allow for a minimum of two sessions with the Executives and the final session to obtain approval of completion of the design; and
- University – it is expected that, throughout the Project, the Contractor will be available for briefings, meetings and presentations with University staff to provide updates on the Project.
- Defects Liability Period - as defined in the Building Contract; and
- All requirements of Green Star 5-star design accreditation.

3. Pre Contract Stakeholder Involvement

The University has developed a Community Engagement Strategy in order to build greater awareness of the Project and to engage with the community through:

- Establishing standard processes for community engagement
- Ensuring those processes are implemented by university/project staff and, where relevant, by external consultants and firms associated with the project
- Ensuring the community and stakeholders are kept informed of decisions emanating from the community engagement processes

For the duration of the project, the University will regularly engage with the wider community and all stakeholders who have a direct or indirect interest to ensure they are kept informed and have an opportunity to participate in the realisation of the HCCD precinct. A broad range of stakeholders have been identified, including but not limited to:

- Individuals and groups within the community
- External stakeholders – such as government agencies, members of Parliament, local government and businesses
- Internal stakeholders – such as university staff, present and future
- Students and alumni
- Media

4. Environmental and Planning Requirements

The following documents will be issued to the Contractor to define the Projects environmental requirements;

- Environmental Impact Statement
- Preliminary Contamination Assessment
- WHS Management Plan
- Preliminary Construction Traffic Management Plan

The Contractor will be required to prepare and submit the following;

- WHS Management Plan
- Quality Management Plan
- Environmental Management Plan
- Workplace Relations Management Plan
- Training Management Plan
- Aboriginal Participation Plan
- Traffic Management Plan

The Traffic Management Plan will be further developed by the Contractor and will propose mitigation measures for the impact on traffic, parking and potential road closures.

B. Construction Management Planning

5. Site Description

The proposed Honeysuckle City Campus is located within the Newcastle City Council LGA at 16 Honeysuckle Drive, Newcastle. The precinct is located on a series of connected sites between Honeysuckle Drive and Civic Lane acquired from HCCDC.
The total precinct comprises three parcels of land within Honeysuckle identified as Sites 1-3. It has an overall area of 24,396m². Site 1 has an overall area of 8,546m² and comprises an undeveloped parcel of land currently used for the temporary storage of construction materials. The site does not contain any buildings or significant vegetation.
The proposed Stage 1A works is located on Lot 1 Site 1 of the precinct. Site 1 is legally described as Lots 1, 2 and 3 in DP 1163346 and is owned by the University of Newcastle.

6. Hours of Operation

The hours of construction including delivery of materials to and from the site shall be restricted to between, as follows or as per Newcastle City Council requirements:

- Monday to Friday inclusive 7.00am to 6.00pm
- Saturday 8:00am – 1:00pm
- No work on Sundays and Public Holidays

7. Site Establishment

The contractor will be responsible to all approvals and coordination required to obtain the approvals. The contractor is to submit all management plans for review and approval before commencing works. Prior to the commencement of Works on site, the following procedures will be undertaken:

- Notify Newcastle City Council and neighbouring properties of intention to commence works.
- Ascertain all relevant project information, applicable standards, statutory requirements and conditions, including authorities having jurisdiction over the Works.
- Obtain all relevant insurances, permits and approvals and pay all associated fees and deposits.
- Undertake a dilapidation report that provides a photographic record of the site and surrounding areas and properties as well as a record of existing noise and dust levels for use as a base for ongoing monitoring.

8. Construction Co-ordination

These following meetings are the primary means for management of work at site and the various trades.

- Site Coordination Meetings (Subcontractor groups)
  Meetings of relevant groups of building or infrastructure subcontractors to coordinate the work across the site, chaired by the Construction Manager.

- Individual Subcontractor Meetings
  Meeting between the Contractor and an individual Subcontractor to deal with issues relating to that subcontract, chaired by the Construction Manager.

- Toolbox Meetings
  Meetings between employers and their employees on site to deal with issues either specific to that employer or site-wide issues, chaired by the employer.

- Site Safety Meetings
  Meetings of the elected safety committee chaired by the Contractor Safety Coordinator.

9. Construction Risk Management

As part of the Construction Management Plan, the Principal Contractor will develop specific Management Plans to meet their contractual and legal obligations as well as detailing specific control measures of known risk through specific detailed control plans.

9.1. Safety Management Plan

Site Inductions

All personnel and visitors to site will need to complete an induction prior to commencing onto site.
It is the contractor's responsibility to ensure that all persons carrying out the nominated work have the relevant training including Occupational Health and Safety (OHS) Induction Training. The minimum requirements regarding inductions is that workers receive the following:

- Industry induction (White Card)
- Client Induction
- Site Specific OHS induction

All workers will need to have the above three OHS induction training requirements before work on site can commence. A record of training is also to be provided. Training required for this project includes:

- White Card induction
- Site induction
- Work SWMS instructions
- Plant operation (if required)
- Light Vehicle operation

Hazard Identification and Control

A detailed site specific risk register and assessment will be completed and included in the Contractors Safety Management Plan. Toolbox talks are to be conducted every morning to notify and address any hazards applicable to duties planned for that day.

Plant and equipment inspection checklists are to be completed prior to start-up.
Hazards are to be reported by the following process;

- Immediate reporting of all identified hazards on site in which works are being undertaken
- Site supervisor will investigate all reported hazards and implement appropriate control measures.
- Corrective actions will be recorded on the Hazard Report form
- Where the hazard cannot be reduced to an acceptable level of risk further consultation is to occur

Specific Site Requirements

Specific site requirements will be communicated and enforced throughout the works as detailed by the Principal Contractor. These include but not limited to;

- Signs to be displayed to identify prescribed areas, hazards, and instructions.
- Accident and incident procedures including First Aid
- Emergency plans and procedures
- Manual Handling procedures
- Fitness for work procedures
- Safe Work Method Statements (SWMS): Included for plant mobilisation, demobilisation, plant operation and also site set-up.

9.2. Environmental Management Plan

Noise and Vibration

All practicable measures will be taken to reduce the noise arising from the Works. Noise from the Site shall not exceed the limits set out in the relevant guidelines as detailed in the Noise and Vibration Impact Assessment (Appendix B). No machine work will occur outside approved working hours unless approval has been given by the consent authority.
The following measures are proposed:

- Use Noise Management Levels (NML's) to identify demolition, excavation and construction noise sources or scenarios that require engineering controls or administrative management;
- Promote clear understanding of ways to identify and minimize noise from construction works;
- Focus on applying all feasible and reasonable work practices to minimize construction noise impacts;
- Provide flexibility in the selection of site - specific and reasonable work practices to minimize noise impacts;
- Encourage construction/ demolition work to be undertaken within approved standard hours where reasonably practicable with noise that is audible to other premises. Approval is required for works undertaken outside standard hours; and
- The use of noise reduction techniques including, but not limited to, barriers, enclosures and silencers shall be employed to ensure compliance with construction and demolition noise criteria.

As part of the noise mitigation treatment for the project, the Principal Contractor will be responsible for complying with the recommendations as set out in 'SSD Noise and Vibration Impact Assessment University of Newcastle 26-Feb-2020 Doc No. 60579316-RPNV-01_C' as provided within Appendix B. The noise mitigation treatment proposed by the Principal Contractor will be included in the detailed Construction Management Plan.

Dust

Management of dust prevention strategy is to be developed by the Principal Contractor, detailed in the Construction Management Plan and agreed by the project stakeholders. Examples of precautions that will be implemented during the Works include water spraying, the covering of all haulage trucks with tarpaulins, monitoring of weather conditions (including wind) and helicopter down draft. Management and contingency plans will be developed to prevent any foreseeable impacts from dust.

Stormwater, Erosion and Sediment Control

As a minimum, the erosion and sediment controls for the Works shall be designed, installed and maintained in accordance with the requirements of Managing Urban Stormwater: Soils and Construction “The Blue Book” 2004 (4th edition) and/or details provided by project engineering consultants.
Appropriate elements of the drainage system on the Site will be cleaned out to remove sediments, prior to commencing the Works on site. Drainage of surface run-off will be allowed to flow along existing contours (down slope) with the existing drainage system on site of kerbs, gutters, gully pits, pipes and stormwater runoff passing through installed filtration systems prior to being discharged off - site. The site will be continually cleaned of rubble to minimise possible sediment flow during rainfall periods. Stormwater kerbs and drainage lines will have sediment controls in the form sedimentation socks.
Stormwater grate inlets surrounding works areas will be covered with geotextile fabric to allow water to enter into drains whilst retaining sediments. Should external surface run - off flow into works areas, it may need to be diverted to reduce sediment transportation. All drainage control devices will be regularly checked particularly during heavy rainfall periods. The Head Contractor will be required to prepare a detailed Stormwater Management Plan which will cover all aspects of stormwater and sediment management and control during construction.

Hazardous/Dangerous Goods

Dangerous goods (such as petrol, diesel, oxy - acetylene, oils, glues etc) will be stored in a lockable compound with sufficient ventilation in accordance with relevant codes of practice and standards. Material safety data sheets on all of these flammable and potentially harmful liquids will be provided by the Principal Contractor undertaking the Works. As a result of the proposed Works, there will be no change in the type or quantities of dangerous goods on site, therefore all current practices for the management of dangerous goods will apply at the completion of the Works.

A Contaminated Land Management Plan and Unexpected Finds protocol is provided within Appendix A. This report is to be utilised with the contractor to further develop a Hazardous Materials Management Plan will be prepared in accordance with the requirements of AS 2601 prior to the commencement of any demolition works. If asbestos is identified;

- Disposal of asbestos materials are to be undertaken only by an appropriately licensed contractor and in accordance with the requirements of the NSW WorkCover Authority and the NSW Office of Environment and Heritage (NSW OEH);
- All asbestos and other hazardous materials are to be appropriately contained and disposed of at a facility holding the appropriate licence issued by the NSW OEH; and
- A sign displaying the words 'DANGER ASBESTOS REMOVAL IN PROGRESS' is to be displayed on sites where asbestos materials are identified.

9.3. Traffic Management Plan

A preliminary construction traffic management plan has been prepared by SECA Solution and provided as part of the documentation package. This is to be reviewed and further developed by the Principal Contractor prior to commencing works on site.

9.4. Quality Control Plan

As part of the Quality Control regime, Inspection and Test Plans (ITP's) are to be implemented to help ensure and verify whether work has been undertaken to the required standard and requirements, and that records are kept.

9.5. Impact on Neighbouring Operations

Construction and administrative activities need to be planned and managed so that any impact on the ongoing Neighbouring business operations are avoided or minimised. Maintenance and appearance of the site and its boundaries will be paramount to keeping relationships with these businesses open and healthy.

9.6. Industrial Relations

The Commonwealth Government requires broad and comprehensive application of the National Code of Practice for the Construction Industry (NCOP) and all current industrial relations (IR) legislation. All Subcontractors will also need to comply with the National Code and the Guidelines.

C. Appendix A – Contaminated Land Management Plan and Unexpected Finds Protocol

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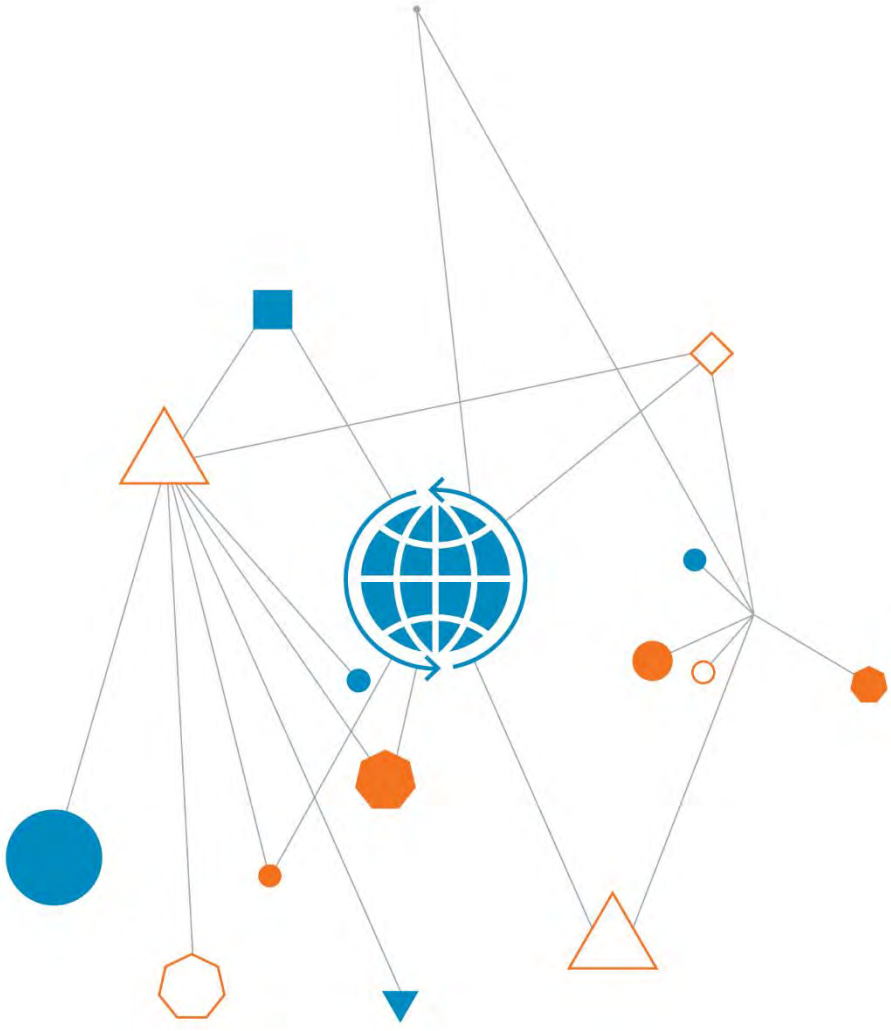
University of Newcastle HCCD Project

Contaminated Land Management Plan and Unexpected Finds Protocol, Site 1

5 March 2019



When you think with a global mind problems get smaller

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University of Newcastle HCCD Project

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Contaminated Land Management Plan and Unexpected Finds Protocol, Site 1

754-NTLEN213472-R05 Rev 1

Quality information

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Appendices

1. Introduction

The University of Newcastle (The University) is preparing to lodge a Development Application (DA) for the enabling works related to Site 1 of the Honeysuckle City Campus Development (the Site). Site 1 consists of lands around buildings A1, A2 and C1. The location of the Site is shown on Figure 1.

Figure 1: Concept Plan University of Newcastle Proposed HCCD

The Site is currently managed under a Site Audit Statement (SAS) WRR15A (Summary Site Audit Report, William Ryall, Contamination Management Pty Ltd, dated 27 September 2002). The Site is also managed under an existing Environmental Management Plan (EMP), Honeysuckle Development Newcastle, Woodward-Clyde 1999 (WDC, 1999) directly linked to the existing WRR15A SAS.

The EMP was developed to address contaminated soils within a wide area called the Waterfront Precinct, formerly known as Civic, Cottage Creek and Hunter Street Precincts. Site 1, under the current HCCD development proposal, falls within the historic area covered under the Waterfront Precinct and therefore, at this time, excavations and management of soils must be undertaken in accordance with the existing WDC 1999 EMP.

The conditions related to the management of soils, generally outlined in the WDC 1999 EMP, will be utilised for the proposed HCCD enabling, early and development works on Site 1.

To guide the excavation programs under the enabling, early and development works packages, the preparation of a Contaminated Land Management Plan (CLMP) with an associated Unexpected Finds Protocol (UFP) was recommended. The CLMP and UFP will allow contractor compliance with Sections 5.2.2 and 5.2.5 of the WDC 1999 EMP and also update soil assessment requirements to the guidelines and legislative requirements currently in force under the Protection of the Environment Operation Act 1997 (POEO Act), National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (ASC NEPM) and NSW EPA Waste Classification Guidelines.

This document contains a Contaminated Land Management Plan (CLMP) and Unexpected Finds Protocol (UFP) prepared by Coffey for the Site. For works to be undertaken within Newcastle City

Council services corridors or on Council lands, the Newcastle City Council, *Newcastle Technical Manual Contaminated Land Management, 2012* has been included as an Appendix for guidance.

This CLMP and UFP must be read in conjunction with the enclosed sheet entitled '*Important Information about your Coffey Environmental Report'*, which can be found attached to this report.

1.1. Objectives

The objectives of the CLMP are to:

- Provide information to alert future contractors of the presence and location of known contamination, and provide strategies to prevent exposure to the identified contamination;
- Provide guidance to undertake excavations and site reinstatement in accordance with the existing EMP (Woodward-Clyde, 1999); and
- Provide procedures to manage potentially contaminated materials and unexpected finds during excavation into the site soils undertaken during site works.

It is noted that this CLMP is not a construction environment management plan (CEMP) and only addresses the management of potentially contaminated site soils during excavation for compliance with the existing site EMP.

2. Roles and responsibilities

Table 2.1 below outlines the roles and responsibilities for implementing this plan.

Table 2.1 Roles and Responsibilities

Role	Responsibility
Developer/Project Manager	Submitting the completed plan to Council. Developing the site in a way that incorporates the plan. Complying with the plan whilst they are in control of the site.
Council	Noting this plan on the relevant Planning documentation. Retaining a copy of the plan on relevant records for the site.
Site owner	Implementing and complying with the plan, including ensuring contractors and maintenance workers comply with the plan. Making the plan available to contractors.
Contractors	Complying with the plan. Notifying the site owner of proposed works, to ensure they comply with the plan.

3. Proposed development

The Site is proposed to be developed in stages to ultimately incorporate three (3) buildings, A1, A2 and C as indicated in Figure 1. The buildings will be constructed in stages 1A, 2 and 3 respectively. The first building proposed for construction, Building A1, will be an Academic facility with no requirement for student accommodation. No student accommodation has been identified for any of the Stages of construction for Site 1.

The enabling works to be covered under this CLMP will include the excavation of trenches for the purposes of services installation as well as bulk earthworks required for the increase in floor level identified in the Honeysuckle Redevelopment Area Study (BMT, 2018). The existing local catchment 1% AEP level is 2.43m AHD. It is proposed that flood planning levels (FPL) be increased to 2.80m AHD. This is an increase of approximately 0.37m above the AEP level. As per the WDC 1999 EMP the site will mainly be covered by buildings and hardstand with any exposed “open space” or “landscaped” areas covered by a minimum a 0.5m clean topsoil.

4. Site information

4.1. Site identification

Site Address	16, 16A and 16B Honeysuckle Drive, Newcastle, NSW, 2300
Title Identifier	Lots 1, 2, 3 DP 1163346
Area	Approximately 9,000m^2
Local Government Area	Newcastle City Council
Site Co-ordinates	32°55'34.21"S 151°46'9.06"E
Surrounding Land Uses	North – Honeysuckle Drive, Lee Wharf Commercial Buildings South – Wright Lane, Wright lane Car Park, Former Rail Corridor East – Settlement Way, Chifley Apartments, Commercial Offices West – Commercial buildings

5. Environmental Requirements

5.1. Relevant Legislation and Guidelines

Legislation in NSW relevant to contaminated land management includes:

- Contaminated Land Management Act (1997);
- Protection of the Environment Operations Act (1997) and Waste Regulation (2014, 2016); and
- The Work Health and Safety Act (2011).

5.2. Guidelines

Relevant guidelines endorsed by the NSW EPA include:

- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Volume 2, Schedule B1 (ASC NEPM 1999 (2013);
- NSW EPA Waste Classification Guidelines 2014;
- NSW EPA Resource Recovery Orders and Resource Recovery Exemptions under Part 9, Clause 93 of the POEO Waste Regulations (2014);
- NSW EPA (2011) Guidelines for Consultants Reporting on Contaminated Sites; and
- NSW EPA Guidelines for NSW Site Auditor Scheme 3rd Edition (2017)

6. Site Contamination Summary

For this review Coffey has provided summary output from three source documents:

- Summary of Previous Contamination Assessments Honeysuckle Central, Coffey (2013);
- Site Wide Remedial Concept Plan (extract p128-144), JBS&G (2016);
- Detailed Site Investigation, Site 1 (Coffey Ref: 754-NTLEN213472-R08 Rev 1, 5 March 2019);

A summary of these reports is provided in the sections below.

6.1. Summary of Previous Contamination Assessments Honeysuckle Central, Coffey (2013)

The Coffey (2013) Report was based on the review of the following contamination assessment reports:

- Waste Classification Assessment of Lot 3 – Proposed Temporary Carpark, ref: N8459/02-AS dated 15 June 2004, Coffey (2004a);
- Waste Classification of Proposed Roadway (Part Lot 3 and Part Lot 24), ref: N8459/02-AT dated 16 June 2004 (Coffey 2004b);
- Water Quality Assessment Lot 4, Lot 24 and Lot 3, ref: N8459/02-BE dated 21 July 2004 (Coffey 2004c);
- Lee Wharf Development – Contamination Assessment, ref: N8459/05-AD 6 July 2004 (Coffey 2004d);
- Lee Wharf Development – Responses to Mallesons Queries Regarding Contamination Matter, ref: N8459/05-AF 2 June 2004, Coffey (2004e);
- Honeysuckle Central Contamination Assessment, ref: GEOTWARA20903AA-AE, dated 17 December 2008 (Coffey, 2008); and
- Data from fieldwork completed and held on file, but not reported in 2011.

The summary found that based on the location of Site 1, there was a high probability of Acid Sulfate Soils (ASS) being present at depth (ASRIS 2015) as it was located within an area categorised as Class 3 for the probability of occurrence of ASS/Potential ASS. As such, development consent was required for works more than 1 m below ground surface or works by which the water table was likely to be lowered more than 1 m below natural ground surface.

Historically, the site contained an electrician workshop, boiler workshop, blacksmiths, locomotive/machine shop, carpenters workshop, electrical substation, and the Bullock Island causeway. In 1993, there was an electrical substation, railway lines, carriage repair sheds, railway goods loading area, and a plumber's workshop located at the site.

The main contaminants of potential concern (COPC) included total recoverable hydrocarbons (TRH) benzene, toluene, ethylbenzene and xylene (BTEX), Polycyclic aromatic hydrocarbons (PAHs), heavy metals and asbestos. It was noted that an electrical substation was present at the site in 1993. Although Coffey reported Poly chlorinated Bi phenols (PCBs) concentrations below the Limits of Reporting (LOR), there was the potential that these samples were not collected from the area near the former substation. As such, PCB remained a COPC in the former electrical substation areas.

6.1.1. Soil Contamination

The site was (and remains) approximately 9,000m^2 and the NSW EPA (1995) Sampling Design Guidelines recommended a minimum of 20 sampling locations for characterisation. Coffey carried out sampling from seven (7) locations directly relevant to the Site 1 with a data set inclusive of TRH, BTEX, PAH and metals (Coffey 2004a). Five sites were sampled along the eastern boundary in 2011

but were focused on asbestos, pesticides and PCB's. Figures 1 and 2 (attached) show the historic sample locations.

Soil from earlier reports were compared to the various land use scenarios contained in the ASC NEPM 1999 (2013). The comparison of results showed that the concentrations of contaminants were generally below the adopted criteria (residential with minimal opportunity for soil access), except for lead in two samples at depths of 0.1m to 0.5m, and asbestos detected in two samples along the eastern boundary at 0.1m depth.

From the data re-assessed and summarised in the Coffey (2013) report the following was surmised:

1. An independent review of various files reports and correspondence regarding the Lee Wharf development at Honeysuckle in Newcastle conducted by Coffey (Coffey 2004d) provided an overview of site assessment, remediation, validation and auditor reviews (including Site Audit Statements) performed at the site by other consultants and NSW EPA Accredited Auditors. From this review it was indicated that the onsite (to about 2m depth) contained heavy metals, total recoverable hydrocarbons and PAHs above suitable levels for residential land use with limited soil access (HIL B);
2. Sampling and analysis carried out in 2004 by Coffey (Coffey 2004a) showed that the fill material (0.0m to 1.9m bgs) in the southeast corner and the eastern boundary was contaminated with lead, at concentrations above the health criteria applicable to residential with minimal access to soil and commercial/industrial land use (HIL B and HIL D). Taking into consideration the 95% UCL calculation for lead, a value of 711.9 mg/kg was obtained, resulting in a concentration within the criteria for both residential with minimal access to soils (HIL-B) and commercial / industrial (HIL-D);
3. Based on the samples assessed (Coffey 2004a), the remainder of the site showed concentrations below the adopted criteria for residential with minimal access to soil and commercial/industrial land use; and
4. Sampling and analysis carried out in 2011 by Coffey showed that there was asbestos impact (free fibres) in fill material along the eastern boundary. It was not known if asbestos impact was present in fill on other parts of the site.

6.1.2. Soil Waste Classification

The soil analyses (Coffey 2004a) results were compared to the to the NSW EPA (2014) Waste Classification Guidelines. The results showed that the soils on site classified as general solid waste, except for soils near the eastern Site 1 boundary) at a depth of 0.0m to 1.9m which were classified as restricted solid waste.

In addition, soils which were impacted with asbestos (two samples on the eastern boundary) were classified as Special Waste and required to be managed as asbestos waste. As asbestos was only detected in two of the samples form 2011, further delineation of the extent of the asbestos may be required depending on the extent of excavations, if any, in that area.

6.1.3. Honeysuckle Central Contamination Assessment, ref: GEOTWARA20903AA-AE, dated 17 November 2008.

Coffey was requested by Eureka 2 Project 8 Pty Ltd and BD (NSW) Project 24 Pty Ltd to prepare a contamination assessment in response to Director General's Requirements in respect of the proposed Honeysuckle Central Development. The contamination assessment was proposed to be submitted as part of a Project Application for a high-rise complex comprising mixed commercial and residential land use (with minimal access to soil) with a basement car park.

The Coffey (2008) Report included review of a Site Audit Statement (SAS) for the site which was prepared by Dr William Ryall of Contamination Management Pty Ltd in 2002. The SAS was prepared for Lot 3 DP 883474, which is the subject site (now known as Lots 1, 2 and 3 of DP 1163346).

The SAS, as issued in 2002, covered the proposed use of Site 1 for residential with minimal access to soils and / or commercial / industrial uses. Given that there have been intermittent activities on site since 2002, related to temporary site offices and lay-downs for materials related to other projects in the Honeysuckle precinct, the SAS will need to be updated. Further work is required to complete an assessment, in accordance with the NSW EPA sampling guidelines, the update of the SAS should be incorporated into this activity.

6.2. Coffey (2019) Detailed Site Investigation (Coffey Ref: 754-NTLEN213472-R08 Rev 1 5 March 2019)

This Detailed Site Investigation (DSI) was requested by The University based on a request from NCC to complete the recommendations made in the previous reports on the Site. The reports included:

- Summary of Previous Contamination Assessments Honeysuckle Central, Coffey (2013); and
- Site Wide Remedial Concept Plan (extract p128-144), JBS&G (2016).

Coffey had previously completed a waste classification assessment across the Site (Coffey Ref: Waste Classification Assessment of Lot 3 – Proposed Temporary Carpark, ref: N8459/02-AS dated 15 June 2004). The assessment included 7 locations across the Site. In order to complete a DSI in general accordance with the NSW EPA Sampling Design Guidelines 1995, an additional 13 locations were required.

The scope of work completed for this DSI included:

- Placement of twelve (12) boreholes, with logging of soil returns and collection of soil samples and the collection of two surface soil samples;
- Installation of three (3) groundwater monitoring wells at selected locations;
- Laboratory analysis of selected soil and water samples plus appropriate quality control samples for the contaminants of concern; and
- Preparation of a detailed site investigation contamination report (including a preliminary in-situ waste classification assessment).

Soil analytical results from BHP08 – BHP20 (minus BHP17 due to Aboriginal Heritage issues) and two surface soil samples (SS1 and SS2) were compared to the site assessment and waste classification criteria. The soil results have been combined with the results of seven (7) locations previously sampled during the Coffey (2004) Waste Classification Assessment of Lot 3 (BHE1, BHE2, BHE3, BHE4, BHE5, BHE6 and BHE7). Sampling locations have been provided in Appendix A, Figure 2.

As identified in the initial results obtained from soil locations BHE1 to BHE7 during the previous investigations on site the main contaminants of potential concern from a site suitability perspective were BaP and Lead. For the purposes of the proposed development the adopted SAC is HIL/HSL C open space/recreational to support the inclusion of an open space communal area within the development.

The highest concentrations of BaP and lead were associated with the presence of slag materials in the fill. Slag was identified in the upper 1m bgs soils at BHP08, BHP10, BHP15 and BHP19. Both Bap and lead were elevated in BHP08 and BHP10, with elevated lead also identified in BHP15 and BHP19. From previous experience with slag-based fill, the leachability of these contaminants under both acidic and neutral conditions are typically low.

A comparison of the analytical results against health-based investigation and screening levels reported eight (8) exceedances of the adopted Site Assessment Criteria (SAC) for Lead (600mg/kg HIL C). These included 1,800mg/kg (BHE7 0.5 – 0.6m), 740mg/kg (BHP8 0.2-0.3), 640mg/kg (BHP8 0.9-1.0), 2,200mg/kg (BHP15 0.2-0.3m), 1,800mg/kg (BHP15 0.9-1.0m), 1,100mg/kg (BHP16 0.0-0.2), 1,100mg/kg (BHP18 0.2-0.3) and 1,000mg/kg (BHP19 0.1-0.3). Five (5) exceedances of the SAC for Bap TEQ (3mg/kg) were recorded for BHP8 0.2 – 0.3 (45mg/kg), BHP8 0.9-1.0 (31mg/kg), BHP10 0.2-0.3 (61mg/kg), BHP15 0.9-1.0 (6.9mg/kg) and BHP18 0.2-0.3 (7.4mg/kg).

Three (3) samples were identified as Lead hotspots based on the SAC used. These included BHE7 0.5-0.6, BHP15 0.2-0.3 and BHP15 0.9-1.0. Three (3) samples were identified as BaP hotspots based on the SAC used. These included BHP8 0.2 – 0.3, BHP8 0.9-1.0, BHP10 0.2-0.3. Given the identified hotspots a 95% UCLaverage calculation was not valid for the assessment of overall lead and BaP average concentrations.

No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.

A preliminary in situ waste classification was completed in accordance with the NSW EPA Waste Classification Guidelines (2014) with the following findings:

- 95%UCL lead concentrations (606 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 restricted solid waste criteria without TCLP (400 mg/kg); and
- 95%UCL B(a)P (not TEQ) concentrations (5.2 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 criteria without TCLP (3.2 mg/kg).

Based on a comparison of the results to the waste classification guidelines and considering the results of the statistical appraisal for lead and B(a)P, fill soils were shown to have a preliminary waste classification of **General Solid Waste (TCLP1/SCC1),** with the exception of soils around BHP08, BHP10 and surface soils to approximately 0.3m bgs at location BHP18.

It was recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on specific stockpiles identified for offsite disposal. Should TCLP results exceed the General Solid Waste TCLP/SCC1 criteria, delineation of the soils in the vicinity of those exceedances should be undertaken to limit the extent of soils classified as Restricted Solid Waste SCC2. Remediation and validation sampling of these areas should then be undertaken.

The results of the laboratory analysis of groundwater samples collected from monitoring wells (MW01, MW02 and MW03), reported the following exceedances of the GILs:

- Copper (Filtered) *(DGV – 0.00133µg/L)* was detected at a concentration of 0.004mg/L (MW01); and
- Zinc (Filtered) *(DGV – 0.0015µg/L)* was detected at a concentration of 0.087mg/L (MW01) and 0.17mg/L (MW03) respectively.

The results of the laboratory analysis of the Acid Sulfate Soil samples collected during the most recent site investigation indicate the following;

- Field screening of 25 primary soil samples collected in the natural material observed on site was undertaken;
- Samples in a 1:5 mixture with distilled water were recorded at a pH between 8.6 to 9.6 (pH units). A pH less than or equal to 4 being potentially indicative of Actual Acid Sulfate Soils;
- pH_{FOX} ranging from 2.8 to 7.8 (pH units), with reactions recorded between no reaction/ slight reaction to extreme reactions with constant froth, after oxidation in hydrogen peroxide, being observed for the samples. pH_{FOX} of less than 3.5 can be indicative of Potential Acid Sulfate Soils (PASS);
- Chromium suite analyses was undertaken on 14 selected samples (BHP9 3.4-3.5, BHP9 3.8-3.9, BHP11 3.3-3.5, BHP13 2.5-2.6, BHP14 3.3-3.5, BHP18 3.5-3.8, BHP19 3.1-3.3, BHP20 2.9-3.0, MW01 3.8-4.0, MW02 3.8-4.0, MW02 4.8-5.0 and MW03 3.8-4.0). The samples were selected following visual and olfactory screening for Potential ASS characteristics (dark grey marine sediment, sulphurous odour);
- The total pH drop was in the range of 0.6 to 6.2 pH units. A drop of more than 1 unit, plus increase in temperature, effervescence, colour and odour factors can be indicative of PASS;

- Results indicated that 12 of the 14 samples tested (excluding BHP15 2.5-2.8 and BHP16 2.8-3.0) exceeded the adopted SAC for the site of 0.03 % S. Results ranged between 0.032 and 0.44.

- Coffey calculated a liming rate of between 1.5 and 20.59 kg/tonne for the samples that exceeded the above criteria.

Based on a review of available data from previous and recent investigations, and observations made during fieldwork, Coffey concluded that the Site in its current form was not suitable for the proposed development, with remediation required for the BaP and lead hotspots identified, to satisfy a HIL/HSL C SAC. Coffey noted that the site was however compliant with HIL/HSL D Commercial/Industrial land use criteria.

The following recommendations have been included for the remediation of the site, management of excess spoil, groundwater and potential acid sulfate soils:

- Given the identification of lead and BaP TEQ hotspots (in excess of HIL/HSL C SAC) the site requires remediation and validation of these impacted areas in order to make it suitable for the proposed development. It is recommended that delineation, remediation and validation of the identified hotspots be completed and a final 95%UCLaverage be undertaken following completion to assess the remediated site status. Coffey recommends the preparation of a remediation action plan (RAP) to address the delineation, remediation and validation of the Site to a final land use of HIL/HSL C Open Space/Recreational. The soil excavated during the remediation and trenching works can be reused as fill on site provided it is placed below 2m bgs and at least 0.5m above the standing water level. If this material is to be taken off site it is recommended that the stockpiles be assessed against the NSW EPA Waste Classification Guidelines including a TCLP for both PAH and metals (lead being the metal found to be in exceedance in the preliminary assessments). Retention of the material on site should be prioritised over export of material to landfill, regardless of the waste classification criteria obtained;

- Ongoing groundwater assessment during the development stages of this project is recommended. This will be used to assess whether the background levels of heavy metal contamination, or any other COPC, are affected by actions during development. The wells installed on the property during this DSI should be retained if possible and utilised for ongoing groundwater monitoring;

- As recommended in the 2004 with further confirmation during this DSI, the groundwater should be of sufficient quality to be considered suitable for stormwater discharge. Dewatering will need to be managed by undertaking a dewatering assessment and preparation of a site-specific Dewatering Management Plan (DMP). Preliminary discussions with Council regarding the requirements for discharge to stormwater during dewatering should also be undertaken prior to the commencement of early earthworks activities such as trenching for services.

- Future groundwater investigations (dewatering assessment) for the assessment of discharge of groundwater resulting from dewatering activities to the stormwater drains should use an expanded suite of chemicals of potential concern including cations and anions including calcium, magnesium, potassium and sodium, chloride), alkalinity, Kjeldahl nitrogen, nitrate, nitrite, total nitrogen, total phosphorus and sulfate;

- Potential Acid Sulfate Soils (PASS) were identified in sub-surface soil samples collected from approximately 2.5 – 4.0mbgs. Preparation of an Acid Sulfate Soils Management Plan (ASSMP) is recommended for use on site during site development works (including early trenching works for the installation of services and future bulk excavation) that are anticipated to exceed 2.5mbgs;

- Nine (9) soil samples (surface) were assessed for the presence of asbestos in the fill materials with no presence detected in the samples. Observation of the surface soils adjacent to the eastern boundary (where surface asbestos was identified in previous investigations) was undertaken. Three suspected pieces of material were sampled and tested for the presence of asbestos. No asbestos was found to present in the materials sampled. No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.;

- A preliminary classification of General Solid Waste (TCLP1/SCC1) has been assessed for the in-situ soils, primarily impacted by elevations of PAH and lead in the 0 – 1.0m bgs fill. With the exception of soils in the vicinity of BHP08, BHP10 and shallow soils (0.3m bgs) at location BHP18 which are classified as Restricted Solid Waste SCC2.

- It is recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on all stockpiles identified for offsite disposal; and

Coffey also recommended that prior to the commencement of site redevelopment works, an appropriate Construction Environmental Management Plan (CEMP) is prepared by the appointed construction contractor to manage environmental risk posed to construction workers, and to the surrounding public and environment, by construction works and to manage waste in accordance with appropriate New South Wales statutes. Coffey recommended inclusion of a Contaminated Land Management Plan (CLMP) and Unexpected Finds Protocol (UFP) within the CEMP, to provide a procedure for emergency response should contaminated material (including asbestos) or items of heritage significance be uncovered during site redevelopment.

7. Management Plan

7.1. Potential exposure pathways

Exposure pathways which are relevant to other contaminants as well as asbestos (except for vapours forming from volatile contaminants) are addressed below.

Table 6.1: Potential Exposure Pathways

Source	Contaminant	Potential Pathway
Fill material	Asbestos	Inhalation of fibres
	Semi-volatile hydrocarbons (heavy fraction TPH, PAH), metals and pesticides	Dermal contact with contaminated soil Ingestion of contaminated soil

7.2. Measures to eliminate exposure pathways

As per the recommendations in the SAS and EMP, the following land use scenarios are allowed:

- Commercial/light industrial;
- Residential (with Limited Soil Access); and
- Public open space.

There are no residential developments identified for Site 1 with mainly commercial buildings (Academic use) being proposed. It is expected that in order to manage the potential for contaminated soils on Site 1 that exposed existing site surfaces be minimised post-development. The majority of the site surface post construction will be covered by the following:

- Buildings;
- Roads and car parks;
- Hard pavement; and/or
- Landscaped areas.

For landscaped or open space areas the SAS mandates that exposed surfaces be covered with a minimum of 0.5m clean imported topsoil. Imported, “clean” soil in this case has been assumed meet the definition of Virgin Excavated Natural Material (VENM) in the NSW EPA Waste Classification Guidelines 2014 or Excavated Natural Material (ENM) as per the NSW EPA Excavated Natural Material Order 2014 Exemption and Order 2014.

The presence of buildings, hardstand and areas landscaped with a minimum of 500mm imported topsoil will minimise access to the potentially contaminated soils and uncontrolled fill materials and also remove the pathway to groundwater. Based on this, the exposure pathway from the site soils to users of the site in these areas would not be complete (i.e. inhalation of fibres, dermal contact and ingestion of contaminants is prevented).

8. Management Plan for Excavations

For proposed excavations within fill materials during enabling, early works and during site development, the following procedures will need to be followed.

- Preparation of a construction environment management plan (CEMP) for excavations noting the depth location, depth and potential volume of excavated material, and management procedures for handling excavated fill including appropriate PPE. The CEMP will also need to include an Contaminated Land Management Plan prepared by the Site Contractor, which should be prepared in line with this document; and
- During excavations, carry out a visual assessment of excavations and stockpiles to check that excavated materials do not include potentially contaminated materials. Section 8.1 outlines indicators of potential contamination. Should contaminated material be encountered, a suitably qualified environmental consultant should be engaged, and the steps outlined in Section 8.2 implemented.

Procedures for the management of asbestos containing materials are provided in Section 9.

8.1. Visual Assessment of Material

The excavated materials will be visually assessed for indications of contamination as they are excavated and/or moved around the site. The visual assessments will be used to identify indicators of potential contamination. Such indicators will include:

- Fragments of potential Asbestos Containing Material (ACM) that may be currently buried in the fill;
- Soils that exhibit a strong odour;
- Soils that appear to be oil-stained, fibrous or have unusual colours;
- Soils that appear to be black, metalliferous or shiny;

If potentially contaminated materials are identified, these will be stockpiled in a location separate from the other site works and further assessed, in accordance with the procedures outlined in the following sections.

8.2. Management of Potentially Contaminated Material

8.2.1. Temporary Stockpiling

The following general procedures will be followed during stockpiling of excavated potentially contaminated material:

- Potentially contaminated material will be stockpiled separately from other stockpiled soils in an isolated area of the site;
- Access to stockpiles of potentially contaminated fill will be limited by keeping the stockpiles within the site's fencing;
- Stockpiles will be placed on level ground and not within 40m of creeks or streams. Stockpiles will not be placed on slopes greater than 5°;
- Stockpiles will be placed on strong impermeable plastic sheeting such as high-density polyethylene (HDPE) or a hardstand area (such as concrete or bitumen pavements). If this procedure is not followed there is the potential for contaminants to migrate into the surface soils;
- The stockpile heights will be kept to a maximum of approximately 2m;

- Where stockpiles are proposed to remain in a location overnight, the stockpiles will be covered by weighted HDPE sheets or tarpaulins to prevent erosion of stockpiled materials. Heavy objects not containing sharp edges will be placed on the sheets to prevent them from being blown by winds;
- Adequate hay bales and/or silt fences will be placed around the perimeter of the stockpile area to filter runoff from the stockpiles and prevent overland stormwater flow from affecting the base of the stockpiles; and
- A stormwater diversion bund will be created up gradient of the stockpiles to prevent stormwater running through the stockpiles.

The stockpiles should be assessed by a suitably qualified environmental consultant, in accordance with Section 8.2.3, as soon as practical, to remove the risk of stockpiling potentially contaminated materials on site.

8.2.2. Management of Open Excavations

Excavations resulting from the removal of potentially contaminated soil will be barricaded in order to restrict access to the excavation areas. Appropriate warning signs will be placed around the excavations, in accordance with applicable regulations and codes of practice.

The excavations will remain barricaded until such time when the excavations have been validated and backfilled (where appropriate).

The validation of excavations should be carried out by a suitably qualified environmental scientist, in accordance with Section 8.2.5, as soon as practical, to remove the risk of open excavations on site.

8.2.3. Assessment of Potentially Contaminated Stockpiled Materials

Sampling Rates

Following stockpiling, the stockpiled material and the excavation will be visually assessed by a suitably qualified environmental consultant. Appropriate stockpile sampling rates will be assessed for stockpiles onsite. Stockpile sampling guidance can be obtained from the ASC NEPM 1999 -2013 and EPA Victoria Industrial Waste Resource Guidelines for Soil Sampling (IWRG, 2009).

Laboratory Analysis

The stockpile samples will be analysed by a NATA-accredited laboratory for the potential chemicals of concern identified.

Based on the previous assessment, this is expected to be asbestos. Asbestos testing will be required in accordance with (ASC NEPM 1999 (2013)).

For odorous, stained, black, metalliferous or shiny soils, analysis will likely include:

- Total Recoverable Hydrocarbons (TRH);
- Asbestos;
- Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX);
- Phenols;
- Organochlorine and organophosphorus pesticides;
- Polycyclic Aromatic Hydrocarbons (PAH); and,
- Metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury).

Based on the results, an assessment can be made on the suitability of the stockpiled material for on-site re-use or offsite disposal.

8.2.4. Re-Use or Disposal of Stockpiled Soil

On-Site Re-Use of Stockpiled Soils

If the stockpiled soils are to be re-used on site, the results of the laboratory analysis will be compared to relevant published human health guidelines (ASC NEPM 1999 (2013)). If the results meet the adopted guidelines, the material will be able to be re-used on site. If the results exceed the adopted guidelines, the soils will be either disposed offsite, or appropriately managed on-site.

Off-Site Disposal of Stockpiled Soils

If the stockpiled soils are to be disposed offsite, the results of the laboratory analysis will be compared to the NSW EPA *Waste Classification Guidelines* 2014 in order to provide a waste classification for the stockpiled soils.

Stockpiled fill material, with an appropriate waste classification, can be disposed of at a landfill licensed to accept that type of waste. For example, hazardous waste can only be disposed of to a landfill licensed to accept hazardous waste.

Materials of different waste classifications should not be mixed prior to offsite disposal. Should they become mixed, the material will take on the higher classification. For example, should hazardous waste be mixed with general solid waste, then the entire stockpile will be classed as hazardous waste.

Waste disposal dockets will need to be retained for material being disposed offsite. The dockets will record the amount of material being disposed, the final fate of the material, and demonstrate that the material was disposed appropriately.

If material is disposed offsite, we recommend that a wash down bay or tyre grid be installed at entrance/exit point of the site in order to minimise potentially contaminating material being tracked offsite in vehicle tyres.

Disposal of Bonded Asbestos Materials

Handling and disposal of asbestos waste will be carried out in accordance with an approved Asbestos Management Plan (AMP) prepared by the Contractor. The following general procedures do not constitute an AMP. Further guidance on asbestos is given in Section 9.

Hand-picked asbestos waste (i.e. removal of bonded asbestos fragments) removed during the construction works shall be collected and double bagged in heavy duty, low density polyethylene 0.2mm thick bags. A maximum bag size of 1,200mm (length) x 900mm (width) shall be used and bags shall be filled to no more than 50 per cent capacity.

The bags must be labelled as containing “Asbestos Waste” and that dust inhalation must be avoided. The bags are to be ‘double-necked’ and sealed by wire ties or tape. The bags shall then be disposed to the nearest licensed facility as asbestos waste. The loaded weight of the bags shall not exceed 20kg each. Each bag or other container shall be labelled on its outermost surface with warning statements.

Bags or primary containers which have held asbestos material shall not be re-used, and containers marked as above shall not be used for other purposes and shall be disposed of accordingly as per requirements for asbestos containing materials (ACM).

Care must be taken to ensure that the integrity of the plastic bags is not damaged during handling or transportation. Vehicles may be checked for cleanliness prior to leaving the work site.

Controlled wetting of waste shall be employed, where practicable, to reduce dust emissions during bag sealing. Excessive water logging shall be avoided as the excess of contaminated water may leak out of the bags, thereby creating a future source of airborne dust.

The asbestos waste shall be disposed of at a landfill licensed to receive asbestos waste in accordance with State and EPA requirements. Documentary evidence (waste disposal dockets) of the disposal shall be collected and provided. This will include name of the authorised waste facility, weighbridge docket and registration number of vehicle for every disposal.

Documentation

Records should be maintained during removal of materials from site, including the quantities of waste disposed offsite. This will also need to be accompanied by waste disposal dockets.

8.2.5. Validation of Excavations

Excavations resulting from the removal of potentially contaminated material will need to be validated prior to works re-commencing in those areas. Validation will be required in order to assess whether the potentially contaminated material has been adequately removed, or if further excavations or management of the material are necessary.

Typically, validation samples are collected at a frequency of one per 25m^2 on walls and bases of excavations.

Depending on the size of the excavation, the environmental consultant will assess the validation sampling frequency.

The validation samples would be tested for the chemicals of concern identified, as outlined in Section 8.2.3 above.

8.2.6. Application of Liners

Should validation of the holes not be possible or practical due to extensive fill contamination another option is the utilisation of a barrier layer between the contaminated materials and clean imported fill. A geotextile liner can be utilised to isolate the contaminated fill materials on the walls and bases of the services trenches followed by backfilling with clean VENM or ENM. This will further protect future maintenance workers from interfacing with contaminated fill materials. In more severe cases of contamination, an HDPE liner can be used to create a more impermeable barrier. The liner will serve to not only reduce future exposure but also serve as a marker layer indicating the location of the interface between clean and contaminated materials.

9. Management of asbestos contaminated materials

During excavations (after the development is completed), the following management measures will be adopted:

- Establishment of a restricted access area; and
- Asbestos management during construction works.

These steps are to be performed or supervised by a suitably licensed asbestos removal contractor under an approved Asbestos Management Plan. A framework for the AMP is given in the sections below.

9.1. Establishment of a Restricted Access Area

The contractor will be required to establish a restricted access area encompassing the excavation area. Access to designated work areas will be determined by the contractor. Only authorised and inducted persons should be permitted in the designated work area. Other site workers and the general public should not be permitted within the restricted access area.

As a minimum, appropriate warning signs should be placed at the entrance and the boundaries of the site, advising the public of the works.

Signage should be in accordance with the following regulations and guidelines:

- AS 1319-1994: “Safety Signs for the Occupational Environment”; and
- National Code of Practice – How to Safely Remove Asbestos in the Workplace (Safe Work Australia, 2011).

9.2. Asbestos Management during Construction Works

Asbestos was previously identified in a fragment of material within fill materials with fibres identified within the soil. This was identified along the Eastern Site boundary. It is therefore assumed that asbestos containing materials may be present in existing fill materials on the site and will be encountered during excavations on site.

To manage asbestos contamination during excavations on the site the following procedures should be carried out:

- Engage a licenced asbestos contractor to undertake or supervise the works;
- Personnel to be made aware of the presence of asbestos and the management procedures;
- Implementation of asbestos management controls;
- Personnel to wear appropriate PPE for handling asbestos;
- Establish and conduct air monitoring;
- If material is required to be removed from site, implement procedures for removal of asbestos impacted materials.

These procedures are discussed in detail in the sections below.

9.2.1. Engage Licenced Asbestos Contractor

An appropriately licenced asbestos Contractor will need to be engaged to undertake or supervise the construction works. A Class B asbestos license is suitable if only bonded asbestos is encountered, a Class A license is required if friable asbestos is encountered.

9.2.2. Asbestos Management Controls

During excavation of soils/fill, the following methods should be employed to minimise dust generation and distribution:

- Dampening the surface of the site and working area; and
- Ceasing work in strong winds.

9.2.3. Establish and Conduct Air Monitoring

Given that asbestos has been detected in fill materials (friable material has not been confirmed) it is recommended that air monitoring will need to be carried out during excavations. Air monitoring is required to verify that the asbestos control measures in place are satisfactory and that there is no egress of fibres to adjacent occupied areas. The air monitoring devices will be placed on the boundaries of the site.

The sample collection and analysis will need to be conducted in accordance with the National Occupational Health and Safety Commission (NOHSC), *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition*, 3003 - 2005.

The analysis will need to be performed by a NATA registered laboratory and reported on endorsed certificates.

The air monitoring samples should be collected from the boundaries of the site, with one located near the decontamination area (see Section 0 for decontamination procedures). The concentration of fibres at the site boundaries should be recorded at <0.01 fibres/mL of air. Concentrations of asbestos fibres should be managed with as follows:

- <0.01 fibres/mL. Action: Continue with control measures;
- Between 0.01 fibres/mL and 0.02 fibres/mL. Action: Review control measures; and
- Greater than or equal to 0.02 fibres/mL. Action: Stop works until the cause of the elevated concentrations is remedied and notify the regulator.

9.2.4. Removal and Disposal of Asbestos Contaminated Fragments and Soil

Should soils and/or asbestos containing materials require removal from the site the procedures in Section 8.2.4 would apply.

9.3. Decontamination of Personnel and Equipment

Machinery used to excavate fill soils are at risk of encountering asbestos containing materials and will need to be decontaminated by washing down.

The decontamination must be carried out such that cross contamination to other areas of the site, or off-site, does not occur. If decontamination is not carried out effectively, and asbestos fibres cross-contaminate other areas of the site, it is likely that additional material will require disposal off-site as asbestos waste.

The wash down area should be established in an area where potential migration of wash-water, or asbestos fibres, will not impact imported material.

Once the machinery has finished, the parts of the machinery that have been in contact with the asbestos (i.e. on an excavator the tracks and bucket) are to be decontaminated in the designated decontamination area. The decontamination area is to be on an impermeable platform if practical.

The decontamination area will need to have appropriate controls to prevent the spread of decontamination water migrating onto other areas of the site. The decontamination will involve hosing and removing soil from the tracks and bucket as far as reasonably practicable by the removalist. Tools used shall be hosed down or wiped clean with a damp cloth. Satisfactory decontamination of the machinery will need to be supervised by the licensed asbestos assessor as part of the clearance process.

Upon completion of works boots and clothing shall be wiped down with a damp cloth and disposable Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) disposed of as asbestos waste. Non-disposable RPE shall be wet-wiped and placed in a sealed container for future use.

9.4. Personal Protective Equipment

In order to reduce short and long-term health risks associated with the potential exposure to the chemicals of concern, the minimum level of Personal Protective Equipment (PPE) required for people, during site preparation, placement of the geo-fabric and placement of the first layer of imported material, is listed below:

- **Body Protection.** Fluorescent disposable coveralls (Tyvek suits) are to be worn during activities undertaken in the asbestos impacted areas. Disposable coveralls are to be considered as potentially contaminated with asbestos and will therefore need to be disposed as asbestos contaminated waste.
- **Respiratory Protection.** Respiratory protection is required to prevent inhalation of airborne dusts. A minimum of a P3 rated disposable mask or respirator fitted with a P3 rated cartridge is to be used whilst working within the impacted areas. The respirator will also be needed to be fit tested.
- **Head Protection.** Personnel working around excavation equipment will be required to wear a hard-hat. The hard hat must be in date, worn properly and not altered in ways that would lessen the degree of protection offered.
- **Eye Protection.** Eye protection is required to prevent eye injuries resulting from contact with dust, contaminated soil or liquid. Safety glasses are required to be worn by site personnel during the works.
- **Foot Protection.** Steel toed boots without laces will be worn by on-site personnel.
- **Skin Protection.** Long sleeves and trousers are to be worn. Skin protection will be required to prevent absorption of contaminated soil into the body. Gloves will be worn by personnel involved

in site activities which will come into contact with contaminated soil or liquid. Sunscreen (SPF +30) shall also be worn to protect exposed skin areas not covered by PPE from the sun.

- **Hearing Protection.** Site workers will be required to have hearing protection (ear plugs or ear muffs) on site during works. Personnel who are likely to be exposed to high noise levels on site will be required to wear hearing protection.

Site personnel will be made aware during induction and at toolbox meetings that PPE required to be worn may limit manual dexterity, hearing, visibility and may increase the difficulty of performing tasks. PPE places an additional strain on the user when performing work that requires physical activity.

Eating, drinking, chewing gum or tobacco, smoking or other practices that involves hand to mouth transfer increases the probability of ingestion of foreign matter into the body. Hands must be thoroughly washed before eating, drinking or smoking.

9.5. Stormwater Management and Sediment Control

Adequate stormwater runoff, run-on and sediment control measures will be put in place for the excavation works. The measures should form a Soil and Water Management Plan, a sub-plan top the CEMP to be prepared by the Contractor for the works.

Where temporary stockpiling of material is required, the stockpiles would need to be managed in a way to prevent harm to the environment and general public from potentially contaminated soils within the stockpiles. Section 8.2.1 provides guidance on managing stockpiled material.

9.6. Dust Control and Air Monitoring

Dust control is required to prevent airborne dust being inhaled by human receptors. Airborne dust may be generated by wind action from loose earth left on the ground. This could cause migration of contaminated dust, as well as cause a nuisance for the surrounding area and must be controlled. A comprehensive Air Quality Management Plan, A sub-plan to the CEMP to be prepared by the Contractor for the works.

Therefore, the following dust control measures are proposed:

- Dust levels will be monitored visually during site work;
- Soil will be kept adequately moist to reduce the generation of dust.

If friable asbestos is encountered, asbestos air monitoring will be established as per Section 9.2.3 to monitor that there is no egress of fibres to adjacent occupied areas.

9.7. Works within the Newcastle City Council Works Corridor

Any works that are conducted within the Newcastle City Council (Council) services corridor on or through lands under the control of the Council will be required to be undertaken in general accordance with the Newcastle City Council, *Newcastle Technical Manual Contaminated Land Management, 2012.* The document outlines the procedures and requirements for the management of contaminated materials encountered on Council lands. The technical manual has been included as Appendix C in this document.

10. References

1. Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth).
2. Coffey (2004a), Waste Classification Assessment of Lot 3 – Proposed Temporary Carpark, ref: N8459/02-AS dated 15 June 2004.
3. Coffey (2004b), Waste Classification of Proposed Roadway (Part Lot 3 and Part Lot 24), ref: N8459/02-AT dated 16 June 2004.
4. Coffey (2004c), Water Quality Assessment Lot 4, Lot 24 and Lot 3, ref: N8459/02-BE dated 21 July 2004.
5. Coffey (2004d), Lee Wharf Development – Contamination Assessment, ref: N8459/05-AD 6 July 2004.
6. Coffey (2004e), Lee Wharf Development – Responses to Mallesons Queries Regarding Contamination Matter, ref: N8459/05-AF 2 June 2004.
7. Coffey, (2008), Honeysuckle Central Contamination Assessment, ref: GEOTWARA20903AA-AE, dated 17 December 2008.
8. Data from fieldwork completed and held on file, but not reported in 2011.
9. Contaminated Land Management Act (1997).
10. Contamination Management Pty Ltd. (2002), Summary Site Audit Report WRR15A, William Ryall.
11. Coroner's Act 2009 (NSW).
12. Heritage Act 1977 (NSW).
13. National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (ASC NEPM 1999 (2013).
14. National Parks and Wildlife Act 1974 (NSW).
15. Newcastle City Council 2012, Newcastle Technical Manual Contaminated Land Management.
16. NSW EPA Waste Classification Guidelines 2014.
17. NSW EPA Excavated Natural Material Order 2014.
18. Protection of the Environment Operations Act (1997) and Waste Regulation (2014, 2016).
19. Roads and Maritime Services (2012), Unexpected Archaeological Finds.
20. The Work Health and Safety Act (2011).
21. Woodward-Clyde 1999 (1999), Environmental Management Plan (EMP), Honeysuckle Development Newcastle.

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Appendix A - Unexpected Finds Protocol

Unexpected Finds Protocol

1. Purpose

This procedure outlines a methodology for consistent response and management of unexpected finds during proposed enabling, early and development works. This procedure considers heritage obligations under the Heritage Act 1977 (NSW), National Park and Wildlife Act 1974 (NSW), Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth) and the Coroners Act 2009 (NSW).

2. Scope

This procedure applies to all contractors and sub-contractors conducting excavation works on Site 1 or in support of works being conducted on Site 1. These include the installation of service trenches, stormwater drains and all bulk earthworks activities.

This procedure considers that an application for a Project specific Aboriginal Heritage Impact Permit (AHIP) has been applied for under Section 90 of the National Parks and Wildlife Act 1974 to manage harm or potential harm to Aboriginal objects and places. Detailed investigations undertaken as part of the AHIP process notwithstanding, unexpected heritage items may still be unearthed during excavation works being undertaken on site. This procedure is applicable in those cases and triggers a cessation of work and guides on the relevant processes of seeking technical advice and regulatory notification.

3. Applicable Legislation and Procedures

- Heritage Act 1977 (NSW);
- National Parks and Wildlife Act 1974 (NSW);
- Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth);
- Coroner's Act 2009 (NSW); and
- Unexpected Archaeological Finds 2012 (RMS).

4. Types of Unexpected Finds

For this procedure an 'Unexpected find' is defined as any unanticipated potential contaminant or archaeological discovery not identified during previous assessments. An unexpected find may include:

- Contaminated materials;
- Buried infrastructure (e.g. underground storage tanks, pipes, footings);
- LNAPL/DNAPL contamination;
- Asbestos;
- Potential acid sulphate soils;
- Aboriginal and Non-Aboriginal Heritage artefacts; and
- Human skeletal remains.

5. General Initial Response

If during enabling, early or development works, there is any unexpected find the following applies;

- Cease Work Immediately and notify the Site Supervisor;
- Identification and classification of the find (Aboriginal/European Heritage, buried infrastructure, possible ACM, Contaminants);
- Evacuate and Isolate the area;

- Provide PPE to workers as required (for contaminated material including Underground Storage Tanks (UST's, pipes, asbestos containing material (ACM);
- Photograph the find and mark the identified location using a GPS;
- Install temporary fencing and signage;
- Notify the University HSE Representative;
- Tool box to all site staff; and
- Notify the University and Engage specialist consultants as required.

6. Management of Asbestos

Asbestos places worker health at risk when elevated levels of asbestos fibres are breathed into the lungs. The Safework NSW guideline for Managing Asbestos in or On Soil, 2014 states the following regarding asbestos exposure:

"The likelihood of exposure occurring depends upon the potential for the asbestos material to release fibres, whether the asbestos material is contained or covered, and any operational control measures or personal protective equipment which have been applied to limit the generation and/or inhalation of airborne fibres.

Non-friable asbestos, previously referred to as 'bonded asbestos', in sound condition represents a low human health risk. However, friable asbestos materials or damaged, crumbling bonded asbestos, have the potential to generate, or be associated with, free asbestos fibres and therefore must be carefully managed to minimise the release of asbestos fibres into the air."

If in situ soil (surface/fill) or stockpiled material is suspected to contain asbestos, the Site Supervisor should be informed immediately. It should be assumed that the soil is asbestos impacted, and work immediately ceased. A suitably qualified environmental consultant or licensed asbestos assessor should be contacted to sample the material for confirmation of asbestos presence and type (friable or bonded).

If confirmed, the Site Supervisor must ensure the implementation of asbestos management procedures as outlined in the approved project specific Asbestos Management Plan based on Section 9 of the CLMP. The control measures will include but not be limited to:

- Identifying contaminant boundaries as determined by an independent licensed asbestos assessor or suitably qualified environmental consultant;
- Minimize disturbance to in situ soils or stockpiles containing potential ACM until the asbestos management procedures have been implemented;
- Isolating, securing and clearly identifying the area of potential ACM impact site using signs and barriers;
- Application of dust reduction/control measures such as spraying of water and application of wetting agents;
- Providing workers with appropriate personal protection equipment (PPE) based on the suspected level of contamination and the control measures implemented;
- Sampling of the suspected contaminated materials and/or air monitoring; and
- Execute a site toolbox talk focused on the provision of information to workers on hazards and safe work practices to minimise airborne dust exposure.

A licensed asbestos assessor should be engaged, and a comprehensive assessment conducted as required. If asbestos is confirmed, any impacted material must be removed by a licensed asbestos removalist and a clearance certificate obtained from a licensed asbestos assessor.

7. Skeletal Remains

During the progression of excavation works bones may be unexpectedly exhumed. If the bones are clearly human in origin, work will cease, access will be prevented to the immediate area by installing barriers and contact the local police immediately. The police may take control of the site for investigative purposes. The bones are not to be touched or disturbed. The coroner will assess the bones to determine if they are under 100 years old. If the bones are assessed to be over 100 years old they are managed, human or otherwise, as heritage items.

If the origin of the bones cannot be immediately identified as human, a suitably qualified Archaeologist or Anthropologist should be engaged to undertake an assessment of origin. Approval from the coroner, police, Aboriginal groups, Office of Heritage, Anthropologist or the client may be required before bones can be removed.

8. Contaminated Materials

In the event suspected contaminated materials (UST's, footings, pipes, flowing free phase hydrocarbons, oily wastes odorous or suspicious looking soils etc.) are discovered, steps must be taken to assess the materials and minimize potential impact on the environment. Upon discovering the items work will cease and an assessment of immediate risks carried out by the Site Supervisor and Project Manager. Following the initial assessment, a suitably qualified environmental consultant will be engaged to assess the short and long-term risks to human health and the environment and provide options for mitigation, management and/or and disposal. Contaminated materials must be disposed at a licensed facility under an appropriate waste classification in accordance with the NSW EPA Waste Classification Guidelines (2014).

All contaminated materials on site to be managed in accordance with the CLMP.

9. Potential Acid Sulphate Soils (PASS)

If PASS materials are identified during excavation the following shall apply:

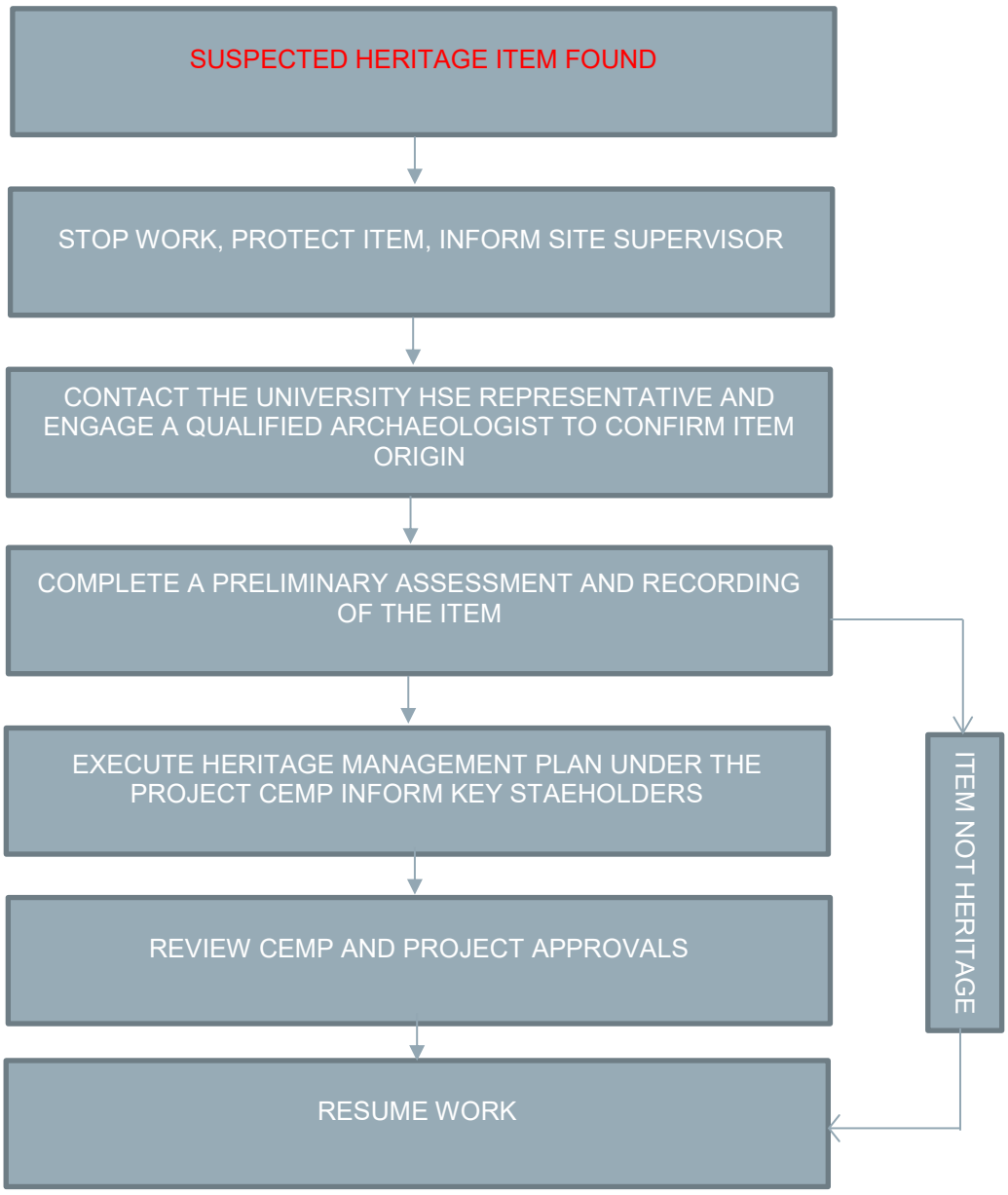
- Works are to stop in the immediate area where the suspected materials are found;
- Engage a suitably qualified environmental consultant to confirm the presence of PASS materials and their mitigation; and
- If PASS materials are identified an Acid Sulphate Management Plan (ASSMP) should be prepared to manage treatment and fins moving forward, if not already available as part of the contractor CEMP.

10. Aboriginal Heritage

The identification of any relic, artefact or material suspected to be of Aboriginal original triggers an immediate cessation of works. The Site Supervisor and or Project Manager shall be notified immediately, who will in turn contact the University HSE representative. A qualified archaeologist must be engaged to confirm the find.

Following this, the Site Supervisor and or Project Manager must complete a preliminary assessment and recording of the item. If the item was identified to not be of Aboriginal origin works will immediately recommence following that clearance. Should Aboriginal Heritage items be confirmed the University HSE representative will then notify NSW Police, National Parks and Wildlife Service and Local Aboriginal stakeholders. If an approved Heritage Management Plan exists as part of an approved CEMP this must be executed.

The following flowchart illustrates the required actions following the suspected identification of Aboriginal heritage objects.



The Office of Environment and Heritage require notification and an AHIP permit is required prior to removal of artefacts. Site inductions should include an introduction and awareness to the possible presence of Aboriginal heritage and the expectation and procedures regarding their management.

Aboriginal Artefacts could include but not limited to stone tools, shell middens, axe grinding grooves, rock art, burials and scarred trees. Please refer to the included RMS guidance (Appendix) (Unexpected Heritage Items Procedure 2014) for further procedural and visual guidance.

Appendix B – RMS, 2015 Standard Management Procedure, Unexpected Heritage Items

Transport Roads & Maritime Services

NSW GOVERNMENT

STANDARD MANAGEMENT PROCEDURE

Unexpected Heritage Items

March 2015

About this release

RMS/ISBN numbers	RMS 12.003 **|** ISBN 9781922040305
Title	Unexpected Heritage Items Procedure

Approval and authorisation		Name
Prepared by	Environmental Officer (Heritage)	Gretta Logue
Revised by	Environmental Officer (Heritage)	Daniel Percival
Approved by	Manager Environmental Policy	Michael Crowley

File location	File name
Objective - SF2013/153770	Unexpected heritage items procedure.doc

Document status	Date
Final	16 March 2015

Version	Date	Revision Description
Final	1 November 2011	First Draft
Revised	23 July 2012	Amended to reflect that (a) unexpected finds do not include items covered by a relevant approval; (b) Aboriginal people must be consulted where an unexpected find is likely to be an Aboriginal object; (c) the Department of Planning and Environment must be notified in accordance with Step 5 of this procedure for Part 3A and Part 5.1 projects.
Revised	09 October 2013	Amended to clarify that the procedure applies to all types of unexpected heritage items, not just archaeological items. The procedure introduces the term ‘Historic Items’ to cover both ‘archaeological relics’ and ‘other historic items’ such as works, structures, buildings and movable objects. The title of the document has been amended to better reflect this clarification.
Revised	16 March 2015	The procedure was streamlined to address all project types including maintenance works. The separate maintenance procedure (formerly Appendix B) was removed. Names and titles updated throughout.

Prepared by
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Please note

This procedure applies to all development and activities concerning roads, road infrastructure and road related assets undertaken by Roads and Maritime.

For advice on how to manage unexpected heritage items as a result of activities related to maritime infrastructure projects, please contact the Senior Environmental Specialist (Heritage).

Contents

Unexpected heritage items procedure

1. Purpose

This procedure has been developed to provide a consistent method for managing unexpected heritage items (both Aboriginal and non-Aboriginal) that are discovered during Roads and Maritime activities. This procedure includes Roads and Maritime's heritage notification obligations under the *Heritage Act 1977* (NSW), *National Parks and Wildlife Act 1974* (NSW), *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) and the *Coroner's Act 2009* (NSW).

This document provides relevant background information in Section 3, followed by the technical procedure in Sections 6 and 7. Associated guidance referred to in the procedure can be found in Appendices A-H.

2. Scope

This procedure assumes that an appropriate level of Aboriginal and non-Aboriginal heritage assessment has been undertaken prior to on site project work commencing. In some case, such as exempt development, detailed heritage assessment may not be required.

Despite appropriate and adequate investigation, unexpected heritage items may still be discovered during maintenance and construction works. When this happens, this procedure must be followed. This procedure provides direction on when to stop work, where to seek technical advice and how to notify the regulator, if required.

This procedure applies to <u>all</u> Road and Maritime construction and maintenance activities

This procedure **applies to**:

- The discovery of any unexpected heritage item (usually during construction), where Roads and Maritime does not have approval to disturb the item or where safeguards for managing the disturbance (apart from this procedure) are not contained in the environmental impact assessment.
- All Roads and Maritime projects that are approved or determined under Part 3A (including Transitional Part 3A Projects), Part 4, Part 5 or Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), or any development that is exempt under the Act.

This procedure must be followed by Roads and Maritime staff, alliance partners (including local council staff working under Road Maintenance Council Contracts, [RMCC]), developers under works authorisation deeds or any person undertaking Part 5 assessment for Roads and Maritime.

This procedure **does not apply** to:

- The legal discovery and disturbance of heritage items as a result of investigations being undertaken in accordance with OEH's *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (2010); an Aboriginal Heritage Impact Permit (AHIP) issued under the *National Parks and Wildlife Act*

1974; or an approval issued under the *Heritage Act 1977*[1].

- The legal discovery and disturbance of heritage items as a result of investigations (or other activities) that are required to be carried out for the purpose of complying with any environmental assessment requirements under Part 3A (including Transitional Part 3A Projects) or Part 5.1 of the EP&A Act.
- The legal discovery and disturbance of heritage items as a result of construction related activities, where the disturbance is permissible in accordance with an AHIP[2]; an approval issued under the *Heritage Act 1977*; the Minister for Planning's conditions of project approval; or safeguards (apart from this procedure) that are contained in the relevant environmental impact assessment.

All construction environment management plans (CEMPs) must make reference to and/or include this procedure (often included as a heritage sub-plan). Where approved CEMPs exist they must be followed in the first instance. Where there is a difference between approved CEMPs and this procedure, the approved CEMP must be followed. Where an approved CEMP does not provide sufficient detail on particular issues, this procedure should be used as additional guidance. When in doubt always seek environment and legal advice on varying approved CEMPs.

3. Types of unexpected heritage items and their legal protection

The roles of project, field and environmental staff are critical to the early identification and protection of unexpected heritage items. **Appendix A** illustrates the wide range of heritage discoveries found on Roads and Maritime projects and provides a useful photographic guide. Subsequent confirmation of heritage discoveries must then be identified and assessed by technical specialists (usually an archaeologist).

An 'unexpected heritage item' means any unanticipated discovery of an actual or potential heritage item, for which Roads and Maritime does not have approval to disturb[3] or does not have a safeguard in place (apart from this procedure) to manage the disturbance.

These discoveries are categorised as either:

(a) Aboriginal objects

(b) Historic (non-Aboriginal) heritage items

(c) Human skeletal remains.

The relevant legislation that applies to each of these categories is described below.

3.1 Aboriginal objects

The *National Park and Wildlife Act 1974* protects *Aboriginal objects* which are defined as:

[1] RMS' heritage obligations are incorporated into the conditions of heritage approvals.
[2] RMS *Procedure for Aboriginal cultural heritage consultation and investigation* (2011) recommends that Part 4 and Part 5 projects that are likely to impact Aboriginal objects during construction seek a whole-of-project AHIP. This type of AHIP generally allows a project to impact known and potential Aboriginal objects within the entire project area, without the need to stop works. It should be noted that an AHIP may exclude impact to certain objects and areas, such as burials or ceremonial sites. In such cases, the project must follow this procedure.
[3] Disturbance is considered to be any physical interference with the item that results in it being destroyed, defaced, damaged, harmed, impacted or altered in any way (this includes archaeological investigation activities).

> "*any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non Aboriginal extraction, and includes Aboriginal remains*"[4].

Examples of Aboriginal objects include stone tool artefacts, shell middens, axe grinding grooves, pigment or engraved rock art, burials and scarred trees.

IMPORTANT!

All Aboriginal objects, regardless of significance, are protected under law.

If any impact is expected to an Aboriginal object, an Aboriginal Heritage Impact Permit (AHIP) is usually required from the Office of Environment and Heritage (OEH)[5]. Also, when a person becomes aware of an Aboriginal object they must notify the Director-General of OEH about its location[6]. Assistance on how to do this is provided in Section 7 (Step 5).

3.2 Historic heritage items

Historic (non-Aboriginal) heritage items may include:

- Archaeological 'relics'
- Other historic items (i.e. works, structures, buildings or movable objects).

3.2.1 Archaeological relics

The *Heritage Act 1977* protects *relics* which are defined as:

> "*any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance*"[7].

Relics are archaeological items of local or state significance which may relate to past domestic, industrial or agricultural activities in NSW, and can include bottles, remnants of clothing, pottery, building materials and general refuse.

[4] Section 5(1) *National Park and Wildlife Act 1974*.
[5] Except when Part 3A, Division 4.1 of Part 4 or Part 5.1 of the *EP&A Act* applies.
[6] This is required under s89(A) of the *National Park and Wildlife Act 1974* and applies to **all projects** assessed under Part 3A, Part 4, Part 5 and Part 5.1 of the *EP&A Act*, including exempt development.
[7] Section 4(1) *Heritage Act 1977*.

IMPORTANT!

<u>All</u> relics are subject to statutory controls and protections.

If a relic is likely to be disturbed, a heritage approval is usually required from the NSW Heritage Council[8]. Also, when a person discovers a relic they must notify the NSW Heritage Council of its location[9]. Advice on how to do this is provided in Section 7 (Step 5).

3.2.2 Other historic items

Some historic heritage items are not considered to be 'relics'; but are instead referred to as works, buildings, structures or movable objects. Examples of these items that Roads and Maritime may encounter include culverts, historic road formations, historic pavements, buried roads, retaining walls, tramlines, cisterns, fences, sheds, buildings and conduits. Although an approval under the *Heritage Act 1977* may not be required to disturb these items, their discovery must be managed in accordance with this procedure.

As a general rule, an archaeological relic requires discovery or examination through the act of excavation. An archaeological excavation permit under Section 140 of the *Heritage Act 1977* is required to do this. In contrast, 'other historic items' either exist above the ground's surface (e.g. a shed), or they are designed to operate and exist beneath the ground's surface (e.g. a culvert).

Despite this difference, it should be remembered that relics can often be associated with 'other heritage items', such as archaeological deposits within cisterns and underfloor deposits under buildings.

3.3 Human skeletal remains

Human skeletal remains can be identified as either an Aboriginal object or non-Aboriginal relic depending on ancestry of the individual (Aboriginal or non-Aboriginal) and burial context (archaeological or non-archaeological). Remains are considered to be archaeological when the time elapsed since death is suspected of being 100 years or more. Depending on ancestry and context, different legislation applies.

As a simple example, a pre-contact archaeological Aboriginal burial would be protected under the *National Park and Wildlife Act 1974*, while a historic (non-Aboriginal) archaeological burial within a cemetery would be protected under the *Heritage Act 1977*. For these cases, the relevant heritage approval and notification requirements described in the above sections 3.1 and 3.2 would apply. In addition to the *National Park and Wildlife Act 1974*, finding Aboriginal human remains also triggers notification requirements to the Commonwealth Minister for the Environment under s20(1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth).

[8] Except when Part 3A, Division 4.1 of Part 4 or Part 5.1 of the *EP&A Act* applies.
[9] This is required under s146 of the *Heritage Act 1977* and applies to **all projects** assessed under Part 3A, Part 4, Part 5 and Part 5.1 of the *EP&A Act*, including exempt development.

IMPORTANT!

<u>All</u> human skeletal remains are subject to statutory controls and protections.

All bones must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated urgently.

However, where it is suspected that less than 100 years has elapsed since death, the human skeletal remains come under the jurisdiction of the State Coroner and the *Coroners Act 2009* (NSW). Such a case would be considered a 'reportable death' and under legal notification obligations set out in s35(2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old[10] regardless of ancestry (ie both Aboriginal and non-Aboriginal remains). Public health controls may also apply.

Guidance on what to do when suspected human remains are found is provided in **Appendix E**.

[10] Under s19 of the *Coroners Act 2009*, the coroner has no jurisdiction to conduct an inquest into reportable death unless it appears to the coroner that (or that there is reasonable cause to suspect that) the death or suspected death occurred within the last 100 years.

4. Responsibilities

The following roles and responsibilities are relevant to this procedure.

Role	Definition/responsibility
Aboriginal Cultural Heritage Advisor (ACHA)	Provides Aboriginal cultural heritage advice to project teams. Acts as Aboriginal community liaison for projects on cultural heritage matters. Engages and consults with the Aboriginal community as per the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*.
Aboriginal Sites Officer (ASO)	Is an appropriately trained and skilled Aboriginal person whose role is to identify and assess Aboriginal objects and cultural values. For details on engaging Aboriginal Sites Officers, refer to Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*.
Archaeologist (A)	Professional consultant, contracted on a case-by-case basis to provide heritage and archaeological advice and technical services (such as reports, heritage approval documentation etc). Major projects with complex heritage issues often have an on call Project archaeologist.
Project Manager (PM)	Ensures all aspects of this procedure are implemented. The PM can delegate specific tasks to a construction environment manager, Roads and Maritime site representatives or regional environment staff, where appropriate.
Regional Environment Staff (RES)	Provides advice on this procedure to project teams. Ensuring this procedure is implemented consistently by supporting the PM. Supporting project teams during the uncovering of unexpected finds. Reviewing archaeological management plans and liaising with heritage staff and archaeological consultants as needed.
Registered Aboriginal Parties (RAPs)	RAPs are Aboriginal people who have registered with Roads and Maritime to be consulted about a proposed Roads and Maritime project or activity in accordance with OEH's Aboriginal cultural heritage consultation requirements for proponents (2010).
Senior Environmental Specialist (Heritage) (SES(H))	Provides technical assistance on this procedure and archaeological technical matters, as required. Reviewing the archaeological management plans and facilitating heritage approval applications, where required. Assists with regulator engagement, where required.
Team Leader - Regional Maintenance Delivery (TL-RMD)	Ensures Regional Maintenance Delivery staff stop work in the vicinity of an unexpected heritage item. Completes Unexpected Heritage Item Recording Form 418 and notifies WS-RMD.
Technical Specialist	Professional consultant contracted to provide specific technical advice that relates to the specific type of

	unexpected heritage find (eg a forensic or physical anthropologist who can identify and analyse human skeletal remains).
Works Supervisor - Regional Maintenance Delivery (WS-RMD)	Ensures Regional Maintenance Delivery staff are aware of this procedure. Supports the Team Leader - Regional Maintenance Delivery during the implementation of this procedure and ensures reporting of unexpected heritage items through environment management systems.

5. Acronyms

The following acronyms are relevant to this procedure.

Acronym	Meaning
A	Archaeologist
ACHA	Aboriginal Cultural Heritage Advisor
AHIP	Aboriginal Heritage Impact Permit
ASO	Aboriginal Site Officer
CEMP	Construction Environment Management Plan
OEH	Office of Environment and Heritage.
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PM	Project Manager
RAP	Registered Aboriginal Parties
RES	Regional Environmental Staff
SES(H)	Senior Environmental Specialist (Heritage)
TL-RMD	Team Leader – Regional Maintenance Division
RMD	Regional Maintenance Delivery
RMS	Roads and Maritime
WS-RMD	Works Supervisor - Regional Maintenance Division

6. Overview of the procedure

On discovering something that could be an unexpected heritage item ('the item'), the following procedure must be followed. There are eight steps in the procedure. These steps are summarised in **Figure 1** below and explained in detail in Section 7.

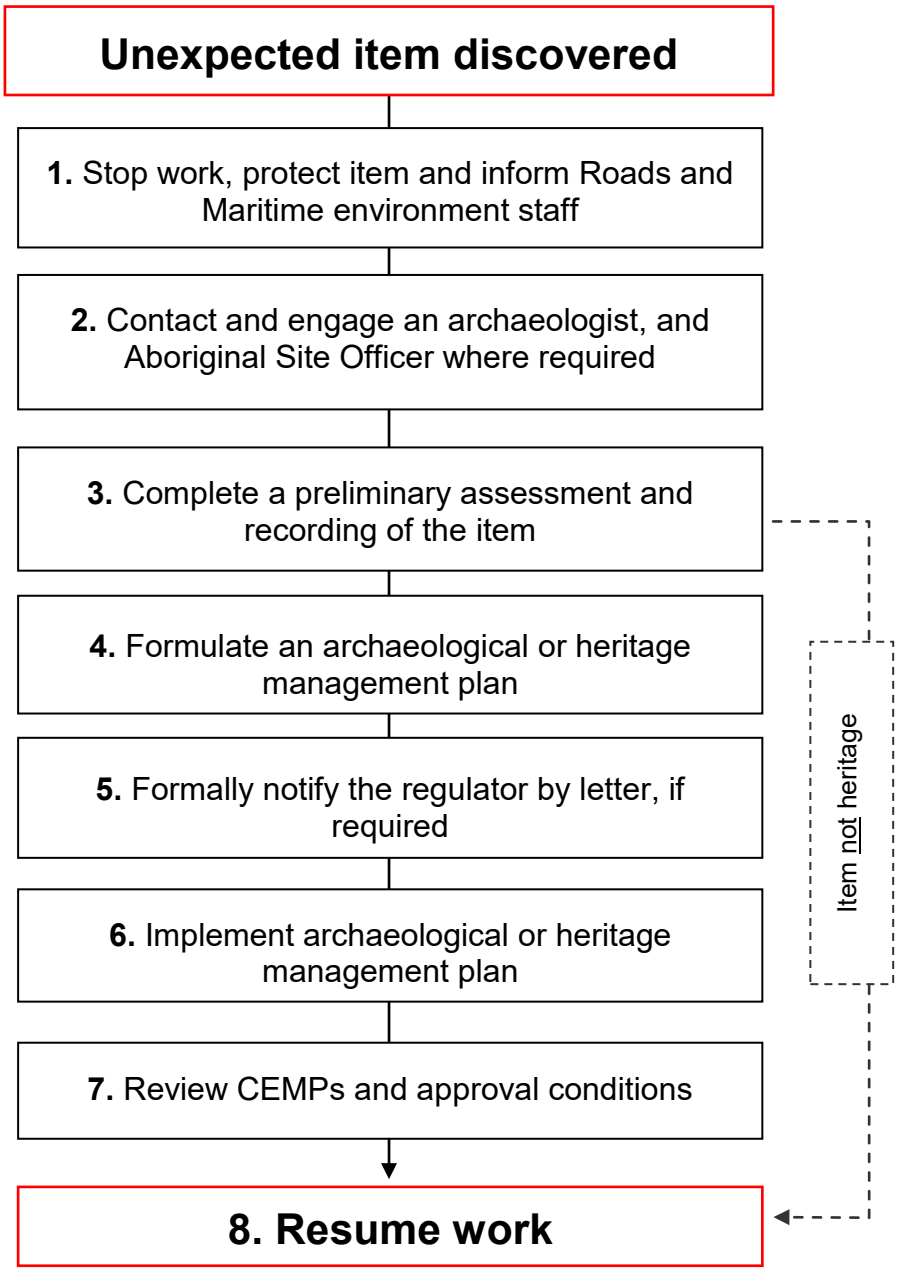


Figure 1: Overview of steps to be undertaken on the discovery of an unexpected heritage item.

IMPORTANT!

RMS may have approval or specific safeguards in place (apart from this procedure) to impact on certain heritage items during construction. If you discover a heritage item and you are unsure whether an approval or safeguard is in place, STOP works and follow this procedure.

7. Unexpected heritage items procedure

Table 1: Specific tasks to be implemented following the discovery of an unexpected heritage item.

Aboriginal Cultural Heritage Advisor (ACHA); Aboriginal Sites Officer (ASO); Archaeologist (A); Project Manager (PM); Regional Environment Staff (RES); Registered Aboriginal Parties (RAPs); Senior Environmental Specialist (Heritage) (SES(H)); Team leader – Roads and Maintenance Division (TL - RMD); Works supervisor – Roads and Maintenance Division (WS - RMD).

Step	Task	Responsibility	Guidance & Tools
1	**Stop work, protect item and inform Roads and Maritime environment staff**		
1.1	Stop all work in the immediate area of the item and notify the Project Manager or Team Leader-RMD. (For maintenance activities, the Team Leader is to also notify the Works Supervisor-RMD)	All	**Appendix A** (Identifying Unexpected Heritage items)
1.2	Establish a 'no-go zone' around the item. Use high visibility fencing, where practical.	PM or TL-RMD	
1.3	Inform all site personnel about the no-go zone. No further interference, including works, ground disturbance, touching or moving the item must occur within the no-go zone.	PM or TL-RMD	
1.4	Inspect, document and photograph the item using 'Unexpected Heritage Item Recording Form 418'.	PM or TL-RMD	**Appendix B** (Unexpected Heritage Item Recording Form 418) **Appendix C** (Photographing Unexpected Heritage items)

Step	Task	Responsibility	Guidance & Tools
1.5	Is the item likely to be bone? If **yes**, follow the steps in Appendix E – 'Uncovering bones'. Where it is obvious that the bones are human remains, you must notify the local police by telephone immediately. They may take command of all or part of the site. If **no**, proceed to next step.	PM or WS-RMD	**Appendix E** (Uncovering Bones)
1.6	Is the item likely to be: a) A relic? (A relic is evidence of past human activity which has local or state heritage significance. It may include items such as bottles, utensils, remnants of clothing, crockery, personal effects, tools, machinery and domestic or industrial refuse) and/or b) An Aboriginal object? (An Aboriginal object may include a shell midden, stone tools, bones, rock art or a scarred tree). If **yes**, proceed directly to Step 1.8 If **no**, proceed to next step.	PM or WS-RMD	**Appendix A** (Identifying heritage items)
1.7	Is the item likely to be a "work", building or standing structure? (This may include tram tracks, kerbing, historic road pavement, fences, sheds or building foundations). If **yes**, can works avoid further disturbance to the item? (E.g. if historic road base/tram tracks have been exposed, can they be left in place?) If **yes**, works may proceed without further disturbance to the item. Complete Step 1.8 within 24 hours. If works cannot avoid further disturbance to the item, works must not recommence at this time. Complete the remaining steps in this procedure.	PM or WS-RMD	**Appendix A** (Identifying heritage items)

Step	Task	Responsibility	Guidance & Tools
1.8	Inform relevant Roads and Maritime Regional Environmental Staff of item by providing them with the completed 'Form 418'.	PM or WS-RMD (RES)	**Appendix D** (Key Environmental Contacts)
1.9	Regional Environmental Staff to advise Project Manager or Works Supervisor whether RMS has an approval or safeguard in place (apart from this procedure) to impact on the 'item'. (An approval may include an approval under the *Heritage Act*, the *National Parks and Wildlife Act* or the *Planning and Assessment Act*). Does RMS have an approval, permit or appropriate safeguard in place to impact on the item? If **yes**, work may recommence in accordance with the approval, permit or safeguard. There is no further requirement to follow this procedure. If **no**, continue to next step.		
1.10	Liaise with Traffic Management Centre where the delay is likely to affect traffic flow.	PM or WS-RMD	
1.11	Report the item as a 'Reportable Event' in accordance with the Roads and Maritime *Environmental Incident Classification and Reporting Procedure*. Implement any additional reporting requirements related to the project's approval and CEMP, where relevant.	PM or WS-RMD	RMS Environmental Incident Classification and Reporting Procedure
2	**Contact and engage an archaeologist and, where required, an Aboriginal site officer**		
2.1	Contact the Project (on-call) Archaeologist to discuss the location and extent of the item and to arrange a site inspection, if required. The project CEMP may contain contact details of the Project Archaeologist. OR	PM or WS-RMD (A; RES; SES(H))	Also see **Appendix D** (Key Environmental Contacts)

Step	Task	Responsibility	Guidance & Tools
	Where there is no project archaeologist engaged for the works, engage a suitably qualified and experienced archaeological consultant to assess the find. A list of heritage consultants is available on the RMS contractor panels on the Buyways homepage. Regional environment staff and Roads and Maritime heritage staff can also advise on appropriate consultants.		Buyways
2.2	Where the item is likely to be an Aboriginal object, speak with your Aboriginal Cultural Heritage Advisor to arrange for an Aboriginal Sites Officer to assess the find. Generally, an Aboriginal Sites Officer would be from the relevant local Aboriginal land council. If an alternative contact person (ie a RAP) has been nominated as a result of previous consultation, then that person is to be contacted.	PM or WS-RMD (ACHA; ASO)	
2.3	If requested, provide photographs of the item taken at Step 1.4 to the archaeologist, and Aboriginal Sites Officer if relevant.	PM or WS-RMD (RES)	**Appendix C** (Photographing Unexpected Heritage items)
3	**Preliminary assessment and recording of the find**		
3.1	In a minority of cases, the archaeologist (and Aboriginal Sites Officer, if relevant) may determine from the photographs that no site inspection is required because no archaeological constraint exists for the project (*eg the item is not a 'relic', a 'heritage item' or an 'Aboriginal object'*). Any such advice should be provided in writing (eg via email) and confirmed by the Project Manager or Works Supervisor - RMD.	A/PM/ASO/ WS-RMD	Proceed to Step 8
3.2	Arrange site access for the archaeologist (and Aboriginal Sites Officer, if relevant) to inspect the item as soon as practicable. In the majority of cases a site inspection is required to conduct a preliminary assessment.	PM or WS-RMD	
3.3	Subject to the archaeologist's assessment (and the Aboriginal Sites Officer's assessment, if relevant), work may recommence at a set distance from the item. This is to protect any other archaeological material that may exist in the vicinity, which has not yet been uncovered. Existing protective fencing established in Step 1.2 may need to be adjusted to	A/PM/ASO/ WS-RMD	

Step	Task	Responsibility	Guidance & Tools
	reflect the extent of the newly assessed protective area. No works are to take place within this area once established.		
3.4	The archaeologist (and Aboriginal Sites Officer, if relevant) may provide advice after the site inspection and preliminary assessment that no archaeological constraint exists for the project (*eg the item is not a 'relic', a 'heritage item' or an 'Aboriginal object'*). Any such advice should be provided in writing (eg via email) and confirmed by the Project Manager or Works Supervisor - RMD.	A/PM/ASO/ WS-RMD	Proceed to Step 8
3.5	Where required, seek additional specialist technical advice (such as a forensic or physical anthropologist to identify skeletal remains). Regional environment staff and/or Roads and Maritime heritage staff can provide contacts for such specialist consultants.	RES/SES(H)	**Appendix D** (Key Environmental Contacts)
3.6	Where the item has been identified as a 'relic', 'heritage item' or an 'Aboriginal object' the archaeologist should formally record the item.	A	
3.7	The regulator can be notified informally by telephone at this stage by the archaeologist, Project Manager (or delegate) or Works Supervisor - RMD. Any verbal conversations with regulators must be noted on the project file for future reference.	PM/A/WS-RMD	
4	**Prepare an archaeological or heritage management plan**		
4.1	The archaeologist must prepare an archaeological or heritage management plan (with input from the Aboriginal Sites Officer, where relevant) shortly after the site inspection. This plan is a brief overview of the following: (a) description of the feature, (b) historic context, if data is easily accessible, (c) likely significance, (d) heritage approval and regulatory notification requirements, (e) heritage reporting requirements, (f) stakeholder consultation requirements, (g) relevance to other project approvals and management plans etc.	A/ASO	**Appendix F** (Archaeological/ Heritage Advice Checklist)
4.2	In preparing the plan, the archaeologist with the assistance of regional environment staff must review the CEMP, any heritage sub-plans, any conditions of heritage approvals, conditions of project approval (and or Minister's Conditions of Approval) and heritage assessment documentation (eg Aboriginal Cultural Heritage Assessment Report). This will outline if the unexpected item is consistent with previous heritage/project approval(s)	A/RES/PM	**Appendix F** (Archaeological/ Heritage Advice Checklist)

Step	Task	Responsibility	Guidance & Tools
	and/or previously agreed management strategies. The Project Manager and regional environment staff must provide all relevant documents to the archaeologist to assist with this. Discussions should occur with design engineers to consider if re-design options exist and are appropriate.		
4.3	The archaeologist must submit this plan as a letter, brief report or email to the Project Manager outlining all relevant archaeological or heritage issues. This plan should be submitted to the Project Manager as soon as practicable. Given that the archaeological management plan is an overview of all the necessary requirements (and the urgency of the situation), it should take no longer than two working days to submit to the Project Manager.	A	
4.4	The Project Manager or Works Supervisor must review the archaeological or heritage management plan to ensure all requirements can reasonably be implemented. Seek additional advice from regional environment staff and Roads and Maritime heritage staff, if required.	PM/RES/SES(H)/ WS-RMD	
5	**Notify the regulator, if required.**		
5.1	Review the archaeological or heritage management plan to confirm if regulator notification is required. Is notification required? If **no**, proceed directly to Step 6 If **yes**, proceed to next step.	PM/RES/SES(H)/ WS-RMD	
5.2	If notification is required, complete the template notification letter.	PM or WS-RMD	**Appendix G** (Template Notification Letter)
5.3	Forward the draft notification letter, archaeological or heritage management plan and the site recording form to regional environment staff and Senior Environmental Specialist (Heritage) for review, and consider any suggested amendments.	PM/RES/SES(H)/ WS-RMD	

Step	Task	Responsibility	Guidance & Tools
5.4	Forward the signed notification letter to the relevant regulator (ie notification of relics must be given to the Heritage Division, Office of Environment and Heritage (OEH), while notification for Aboriginal objects must be given to the relevant Aboriginal section of OEH). Informal notification (via a phone call or email) to the regulator prior to sending the letter is appropriate. The archaeological management plan and the completed site recording form must be submitted with the notification letter. For Part 3A and Part 5.1 projects, the Department of Planning and Environment must also be notified.	PM or WS-RMD	**Appendix D** (Key Environmental Contacts)
5.5	A copy of the final signed notification letter, archaeological or heritage management plan and the site recording form should be kept on file by the Project Manager or Works Supervisor- RMD and a copy sent to the Senior Environmental Specialist (Heritage).	PM or WS-RMD	
6	**Implement archaeological or heritage management plan**		
6.1	Modify the archaeological or heritage management plan to take into account any additional advice resulting from notification and discussions with the regulator.	A/PM or WS-RMD (RES)	
6.2	Implement the archaeological or heritage management plan. Where impact is expected, this would include such things as a formal assessment of significance and heritage impact assessment, preparation of excavation or recording methodologies, consultation with registered Aboriginal parties, obtaining heritage approvals etc, if required.	PM or WS-RMD (RAPs and RES)	PACHCI Stage 3
6.3	Where heritage approval is required contact regional environment staff for further advice and support material. Please note time constraints associated with heritage approval preparation and processing. Project scheduling may need to be revised where extensive delays are expected.	PM/RES/WS-RMD	
6.4	For Part 3A/Part 5.1 projects, assess whether heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning and Environment. Seek advice from regional environment staff and Environment Branch specialist staff if unsure.	PM/RES	

Step	Task	Responsibility	Guidance & Tools
6.5	Where statutory approvals (or project approval modification) are required, impact upon relics and/or Aboriginal objects must not occur until heritage approvals are issued by the appropriate regulator.	PM or WS-RMD	
6.6	Where statutory approval (or Part 3A/Part 5.1 project modification) is not required and where recording is recommended by the archaeologist, sufficient time must be allowed for this to occur.	PM or WS-RMD	
6.7	Ensure short term and permanent storage locations are identified for archaeological material or other heritage material is removed from site, where required. Interested third parties (eg museums or local councils) should be consulted on this issue. Contact regional environment staff and Senior Environmental Specialist (Heritage) for advice on this matter, if required.	PM or WS-RMD	
7	**Review CEMPs and approval conditions**		
7.1	Check whether written notification is required to be sent to the regulator before re-commencing work. Where this is not explicit in heritage approval conditions, expectations should be clarified directly with the regulator.	PM	
7.2	Update the CEMP, site mapping and project delivery program as appropriate with any project changes resulting from final heritage management (eg retention of heritage item, salvage of item). Updated CEMPs must incorporate additional conditions arising from any heritage approvals, and Aboriginal community consultation if relevant. Include any changes to CEMP in site induction material and update site workers during toolbox talks.	PM	
8	**Resume work**		
8.1	Seek written clearance to resume project work from regional environment staff and the archaeologist (and regulator, if required). Clearance would only be given once all archaeological excavation and/or heritage recommendations (where required) are complete. Resumption of project work must be in accordance with the all relevant project/heritage approvals/determinations.	RES/A/PM/WS-RMD	
8.2	If required, ensure archaeological excavation/heritage reporting and other heritage	PM/A/WS-RMD	

Step	Task	Responsibility	Guidance & Tools
	approval conditions are completed in the required timeframes. This includes artefact retention repositories, conservation and/or disposal strategies.		
8.3	Forward all heritage/archaeological assessments, heritage location data and its ownership status to the Senior Environmental Specialist (Heritage). They will ensure all heritage items in Roads and Maritime ownership and/or control are considered for the Roads and Maritime S170 Heritage and Conservation Register.	PM/SES(H)/ WS-RMD	
8.4	If additional unexpected items are discovered this procedure must begin again from Step 1.	PM/TL-RMD	

8. Seeking advice

Advice on this procedure should be sought from Roads and Maritime regional environment staff in the first instance. Contractors and alliance partners should ensure their own project environment managers are aware of and understand this procedure. Regional environment staff can assist non-Roads and Maritime project environment managers with enquires concerning this procedure.

IMPORTANT!

Roads and Maritime Services staff and contractors are not to seek advice on this procedure directly from the Office of Environment and Heritage without first seeking advice from regional environment staff and heritage policy staff.

Technical archaeological or heritage advice regarding an unexpected heritage item should be sought from the contracted archaeologist. Technical specialist advice can also be sought from heritage policy staff within Environment Branch to assist with the preliminary archaeological identification and technical reviews of heritage/archaeological reports.

9. Related information

Contact details: Senior Environmental Specialist (Heritage), Environment Branch, 02 8588 5754

Effective date: 01 February 2015

Review date: 01 February 2016

This procedure should be read in conjunction with:

- Roads and Maritimes' *Heritage Guidelines 2015.*
- Roads and Maritime Services *Environmental Incident Classification and Reporting Procedure*
- Roads and Maritime's *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*
- RTA *Environmental Impact Assessment Guidelines.*

This procedure replaces:

- Procedure 5.5 ("*unexpected discovery of an archaeological relic or Aboriginal object*") outlined in the RTA's *Heritage Guidelines* 2004.

Other relevant reading material:

- NSW Heritage Office (1998), *Skeletal remains: guidelines for the management of human skeletal remains*.
- Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal remains.*
- Department of Health (April 2008), *Policy Directive: Burials - exhumation of human remains*[11].

[11] http://www.health.nsw.gov.au/policies/pd/2008/pdf/PD2008_022.pdf

10. List of appendices

The following appendices are included to support this procedure.

Appendix A	Identifying Unexpected Heritage items
Appendix B	Unexpected Heritage Item Recording Form 418
Appendix C	Photographing Unexpected Heritage Items
Appendix D	Key Environment Contacts
Appendix E	Uncovering Bones
Appendix F	Archaeological Advice Checklist
Appendix G	Template Notification Letter

Appendix A

Identifying unexpected heritage items

The following images can be used to assist in the preliminary identification of potential unexpected items (both Aboriginal and non-Aboriginal) during construction and maintenance works. Please note this is not a comprehensive typology.

Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta); Linear archaeological feature with post holes (Hume Highway Duplication), Animal bones (Hume Highway Bypass at Woomargama); Cut wooden stake; Glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area).

Top left hand picture continuing clockwise: Woodstave water pipe with tar and wire sealing (Horsley Drive); Tram tracks (Sydney); Brick lined cistern (Clyde); Retaining wall (Great Western Highway, Leura).

Top left hand picture continuing clockwise: Road pavement (Great Western Highway, Lawson); Sandstone kerbing and guttering (Parramatta Road, Mays Hill); Telford road (sandstone road base, Great Western Highway, Leura); Ceramic conduit and sandstone culvert headwall (Blue Mountains, NSW); Corduroy road (timber road base, Entrance Road, Wamberai).

Top left hand corner continuing clockwise: Alignment Pin (Great Western Highway, Wentworth Falls); Survey tree (MR7, Albury); Survey tree (Kidman Way, Darlington Point, Murrumbidgee); Survey tree (Cobb Highway, Deniliquin); Milestone (Great Western Highway, Kingswood, Penrith); Alignment Stone (near Guntawong Road, Riverstone). Please note survey marks may have additional statutory protection under the *Surveying and Spatial Information Act 2002*.

Top left hand corner continuing clockwise: Remnant bridge piers (Putty Road, Bulga); Wooden boundary fence (Campbelltown Road, Denham Court); Dairy shed (Ballina); Golden Arrow Mine Shaft.

Top left hand corner: Culturally modified stone discovered on Main Road 92, about two kilometres west of Sassafras. The remaining images show a selection of stone artefacts retrieved from test and salvage archaeological excavations during the Hume Highway Duplication and Bypass projects from 2006-2010.

Appendix B

Unexpected heritage item recording form 418

Transport Roads & Maritime Services	Unexpected heritage item recording form	418

This form is to be filled in by a project manager (or their delegate) or a team leader – Road and Maintenance Division, on the discovery of an unexpected heritage item during construction or maintenance works.			
Date:		**Recorded by:** (Include name and position)	
Project name:			
Description of works being undertaken (eg Removal of failed pavement by excavation and pouring concrete slabs in 1m x 1m replacement sections).			
Description of exact location of item (eg Within the road formation on Parramatta Road, east bound lane, at the corner of Johnston Street, Annandale, Sydney).			

Description of item found (What type of item is it likely to be? Tick the relevant boxes).

A. A relic	☐	A 'relic' is evidence of a past human activity relating to the settlement of NSW with local or state heritage significance. A relic might include bottles, utensils, plates, cups, household items, tools, implements, and similar items.
B. A 'work, building or structure'	☐	A 'work' can generally be defined as a form infrastructure such as tram tracks, a culvert, road base, a bridge pier, kerbing, and similar items.
C. An Aboriginal object	☐	An 'Aboriginal object' may include stone tools, stone flakes, shell middens, rock art, scarred trees and human bones.
D. Bone	☐	Bones can either be human or animal remains. **Remember that you must contact the local police immediately by telephone if you are <u>certain</u> that the bone(s) are <u>human remains</u>.**
E. Other	☐	

Provide short description of item (eg Metal tram tracks running parallel to road alignment. Good condition. Tracks set in concrete, approximately 10cms (100 mm) below the current ground surface).	

Sketch
(Provide a sketch of the item's general location in relation to other road features so its approximate location can be mapped without having to re-excavate it. In addition, please include details of the location and direction of any photographs of the item taken).

Action taken (Tick either A *or* B)

A. Unexpected item **would not** be further impacted on by works ☐

Describe how works would avoid impact on the item. (eg The tram tracks will be left *in situ*, and recovered with road paving).

B. Unexpected item **would be** further impacted on by works ☐

Describe how works would impact on the item. (eg Milling is required to be continued to 200 mm depth to ensure road pavement requirements are met. Tram tracks will need to be removed).

Important:

It is a statutory offence to disturb Aboriginal objects and historic relics (including human remains) without an approval. All works affecting objects and relics must cease until an approval is sought.

Approvals may also be required to impact on certain works. Contact your regional environment staff for guidance.

Project manager / works supervisor signature	

Appendix C

Photographing unexpected heritage items

✋ Removal of the item from its context (e.g. excavating from the ground) for photographic purposes is not permitted.

Photographs of unexpected items in their current context (*in situ*) may assist heritage staff and archaeologists to better identify the heritage values of the item. Emailing good quality photographs to specialists can allow for better quality and faster heritage advice. The key elements that must be captured in photographs of the item include its position, the item itself and any distinguishing features. All photographs must have a scale (ruler, scale bar, mobile phone, coin) and a note describing the direction of the photograph.

Context and detailed photographs

It is important to take a general photograph (Figure 1) to convey the location and setting of the item. This will add much value to the subsequent detailed photographs also required (Figure 2).

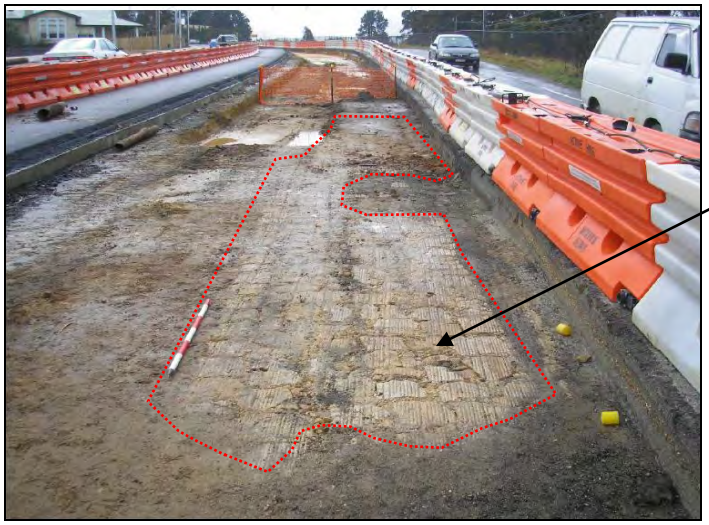


Figure 2: Close up detail of the sandstone surface showing material type, formation and construction detail. This is essential for establishing date of the feature.

Figure 1: Telford road uncovered on the Great Western Highway (Leura) in 2008.

Photographing distinguishing features

Where unexpected items have a distinguishing feature, close up detailed photographs must be taken of this, where practicable. In the case of a building or bridge, this may include diagnostic details architectural or technical features. See Figures 3 and 4 for examples.

Figure 3: Ceramic bottle artefact with stamp.

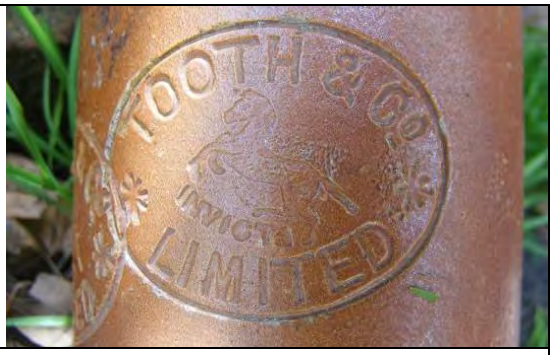


Figure 4: Detail of the stamp allows '*Tooth & Co Limited*' to be made out. This is helpful to a specialist in gauging the artefact's origin, manufacturing date and likely significance.

Photographing bones

The majority of bones found on site will those of be recently deceased animal bones often requiring no further assessment (unless they are in archaeological context). However, if bones are human, Roads and Maritime must contact the police immediately (see Appendix F for detailed guidance). Taking quality photographs of the bones can often resolve this issue quickly. Heritage staff in Environment Branch can confirm if bones are human or non-human if provided with appropriate photographs. Ensure that photographs of bones are not concealed by foliage (Figure 5) as this makes it difficult to identify. Minor hand removal of foliage can be undertaken as long as disturbance of the bone does not occur. Excavation of the ground to remove bone(s) should not occur, nor should they be pulled out of the ground if partially exposed. Where sediment (adhering to a bone found on the ground surface) conceals portions of a bone (Figure 6) ensure the photograph is taken of the bone (if any) that is not concealed by sediment.

Figure 5: Bone concealed by foliage.

Figure 6: Bone covered in sediment

Ensure that all close up photographs include the whole bone and then specific details of the bone (especially the ends of long bones, the *epiphysis*, which is critical for species identification). Figures 7 and 8 are examples of good photographs of bones that can easily be identified from the photograph alone. They show sufficient detail of the complete bone and the epiphysis.

Figure 7: Photograph showing complete bone.

Figure 8: Close up of a long bone's epiphysis.

Appendix D

Key environmental contacts

Hunter region	Environmental Manager (Hunter)	4924 0440
	Aboriginal Cultural Heritage Advisor	4924 0383
Northern region	Environment Manager (North)	6640 1072
	Aboriginal Cultural Heritage Advisor	6604 9305
Southern region	Environmental Manager (South)	6492 9515
	Aboriginal Cultural Heritage Advisor	4221 2767
South West region	Environment Manager (South West)	6937 1634
	Aboriginal Cultural Heritage Advisor	6937 1647
Sydney region	Environment Manager (Sydney)	8849 2516
	Aboriginal Cultural Heritage Advisor	8849 2583
Western region	Environment Manager (West)	6861 1628
	Aboriginal Cultural Heritage Advisor	6861 1658
Pacific Highway Office	Environment Manager	6640 1375
Regional Maintenance Delivery	Environment Manager	9598 7721
Environment Branch	Senior Environmental Specialist (Heritage)	8588 5754

Heritage Regulators

Heritage Division Office of Environment and Heritage Locked Bag 5020 Parramatta NSW 2124 Phone: (02) 9873 8500	Department of the Environment (Clth) GPO Box 787 Canberra ACT 2601 Phone: (02) 6274 1111
Office of Environment and Heritage (Sydney Metropolitan) Planning and Aboriginal Heritage Section PO Box 668 Parramatta NSW 2124 Phone: (02) 9995 5000	Office of Environment and Heritage (North Eastern NSW) Planning and Aboriginal Heritage Section Locked Bag 914 Coffs Harbour NSW 2450 Phone: (02) 6651 5946
Office of Environment and Heritage (North Western NSW) Environment and Conservation Programs PO Box 2111 Dubbo NSW 2830 Phone: (02) 6883 5330	Office of Environment and Heritage (Southern NSW) Landscape and Aboriginal Heritage Protection Section PO Box 733 Queanbeyan NSW 2620 Phone: (02) 6229 7188

Project-Specific Contacts

Position	Name	Phone Number
Project Manager		
Site/Alliance Environment Manager		
Regional Environmental Officer		
Aboriginal Cultural Heritage Advisor		
Consultant Archaeologist		
Local Police Station		
OEH: Environment Line		131 555

Appendix E

Uncovering bones

All matters relating to uncovering bones and RMS' human remains notification obligations should involve RMS regional environment and heritage staff. They will guide Project Managers through occurrences of uncovering bones.

This appendix provides Project Managers with advice (1) on what to do on first uncovering bones (2) the range of human skeletal notification pathways and (3) additional considerations and requirements when managing the discovery of human remains.

1. First uncovering bones

Stop all work in the vicinity of the find. All bones uncovered during project works should be **treated with care and urgency** as they have the potential to be human remains. Therefore they must be identified as either human or non-human as soon as possible by a qualified forensic or physical anthropologist. These specialist consultants can be sought by contacting regional environment staff and/or heritage staff at Environment Branch.

On the very rare occasion where it is *instantly obvious* from the remains that they are human, the Project Manager (or a delegate) should **inform the police by telephone** prior to seeking specialist advice. It will be obvious that it is human skeletal remains where there is no doubt, as demonstrated by the example in Figure 1. Often skeletal elements in isolation (such as a skull) can also clearly be identified as human. Note it may also be obvious that human remains have been uncovered when soft tissue and clothing are present.

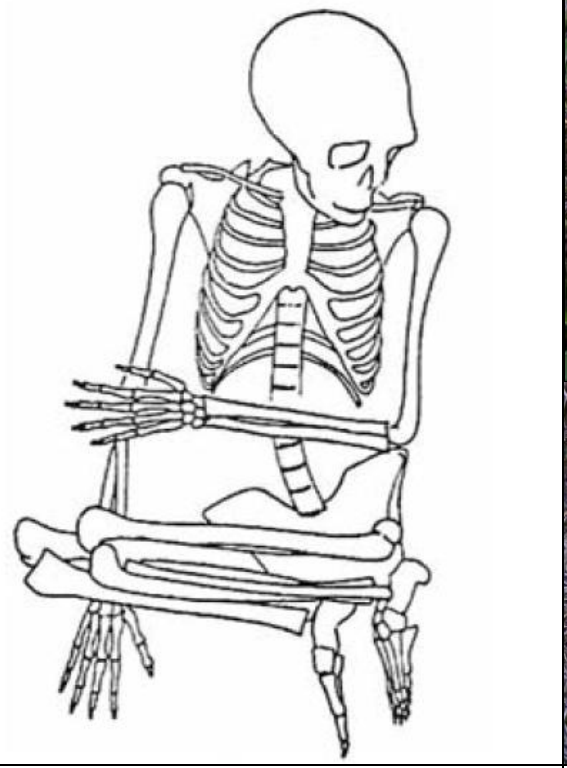


Figure 1: Schematic of a complete skeleton that is 'obviously' human[12].

Figure 2: Disarticulated bones that require assessment to determine species.

[12] After Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal Remains*: 17.

This preliminary phone call is to let the police know that Roads and Maritime is undertaking a specialist skeletal assessment to determine the approximate date of death which will inform legal jurisdiction. The police may wish to take control of the site at this stage. If not, a forensic or physical anthropologist must be requested to make an on-site assessment of the skeletal remains.

Where it is not 'obvious' that the bones are human (in the majority of cases, illustrated by Figure 2), specialist assessment is required to establish the species of the bones. Photographs of the bones can assist this assessment if they are clear and taken in accordance with guidance provided in Appendix C. Good photographs often result in the bones being identified by a specialist without requiring a site visit; noting they are nearly always non-human. In these cases, non-human skeletal remains must be treated like any other unexpected archaeological find.

If the bones are identified as human (either by photographs or an on-site inspection) a technical specialist must determine the likely ancestry (Aboriginal or non-Aboriginal) and burial context (archaeological or forensic). This assessment is required to identify the legal regulator of the human remains so **urgent notification** (as below) can occur. Preliminary telephone or verbal notification by the Project Manager or regional environment staff is considered appropriate. This must be followed up later by Roads and Maritime's formal letter notification as per Appendix G when a management plan has been developed and agreed to by the relevant parties.

2. Range of human skeletal notification pathways

The following is a summary of the different notification pathways required for human skeletal remains depending on the preliminary skeletal assessment of ancestry and burial context.

A. Human bones are from a recently deceased person (*less than* 100 years old).

> **☑ Action**
> A police officer must be notified immediately as per the obligations to report a death or suspected death under s35 of the *Coroners Act 2009* (NSW). It should be assumed the police will then take command of the site until otherwise directed.

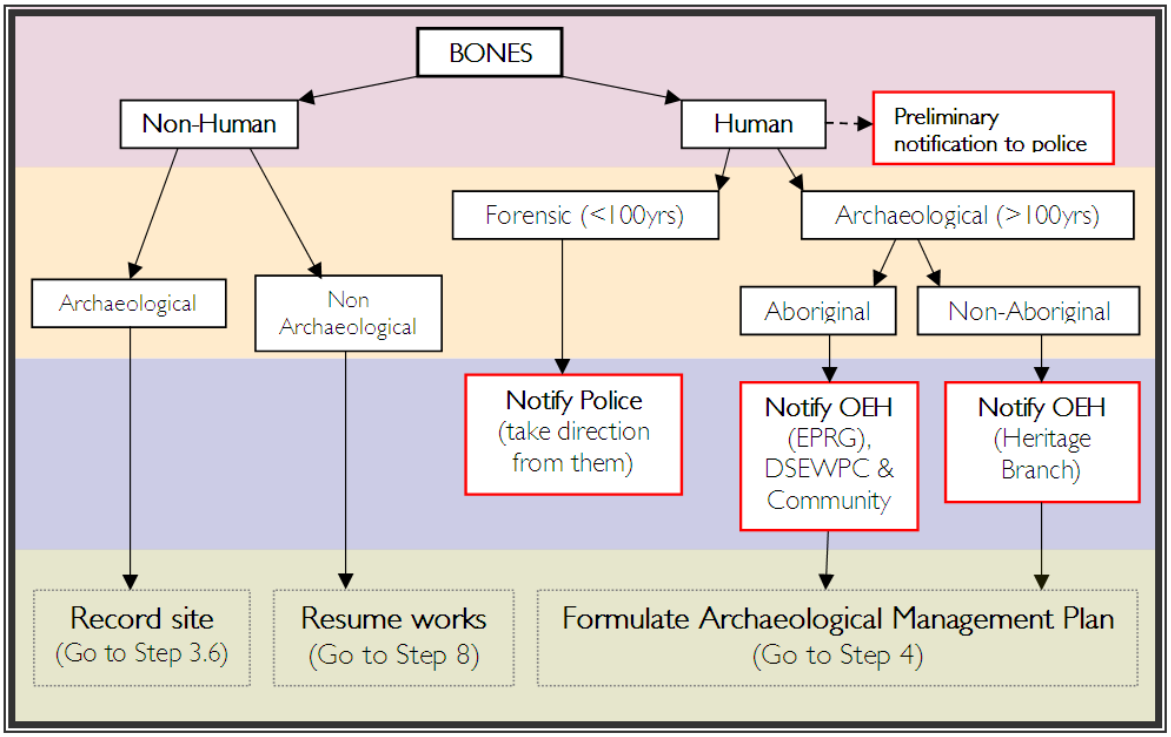
B. Human bones are archaeological in nature (*more than* 100 years old) and are likely to be *Aboriginal* remains.

> **☑ Action**
> The OEH and the RMS Aboriginal Cultural Heritage Advisor (ACHA) must be notified immediately. The ACHA must contact and inform the relevant Aboriginal community stakeholders who may request to be present on site. Relevant stakeholders are determined by the RTA's *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*.

C. Human bones are archaeological in nature (*more than* 100 years old) and likely to be *non-Aboriginal* remains.

> **☑ Action**
> The OEH (Heritage Branch, Conservation Team) must be notified immediately.

The simple diagram below summarises the notification pathways on finding bones.



After the appropriate verbal notifications (as described in B and C), the Project Manager must proceed through the *Unexpected Heritage Items Procedure* to formulate an archaeological management plan (Step 4). Note no archaeological management plan is required for forensic cases (A), as all future management is a police matter. Non-human skeletal remains must be treated like any other unexpected archaeological find and so must proceed to recording the find as per Step 3.6.

3. Additional considerations and requirements

Uncovering archaeological human remains must be managed intensively and needs to consider a number of additional specific issues. These issues might include facilitating culturally appropriate processes when dealing with Aboriginal remains (such as repatriation and cultural ceremonies). Roads and Maritime's ACHA can provide advice on this and how to engage with the relevant Aboriginal community. Project Managers, more generally, may also need to consider overnight site security of any exposed remains and may need to manage the onsite attendance of a number of different external stakeholders during assessment and/or investigation of remains. Project Managers may also be advised to liaise with local church/religious groups and the media to manage community issues arising from the find. Additional investigations may be required to identify living descendants, particularly if the remains are to be removed and relocated.

If exhumation of the remains (from a formal burial or a vault) is required, Project Managers should also be aware of additional approval requirements under the *Public Health Act 1991* (NSW). Specifically, Roads and Maritime is required to apply to the Director General of NSW Department of Health for approval to exhume human remains as per Clause 26 of the *Public Health (Disposal of Bodies) Regulation 2002* (NSW)[13]. Further, the exhumation of such remains needs to consider health risks such as infectious disease control, exhumation procedures and reburial approval and registration. Further guidance on this matter can be found at the NSW Department of Health website.

In addition, due to the potential significant statutory and common law controls and prohibitions associated with interfering with a public cemetery, project teams are

[13] This requirement is in addition to heritage approvals under the *Heritage Act 1977*.

advised, when works uncover human remains adjacent to cemeteries, to confirm the cemetery's exact boundaries.

Appendix F

Archaeological/heritage advice checklist

The archaeologist must advise the Project Manager of an appropriate archaeological or heritage management plan as soon as possible after site inspection (see Step 4). An archaeological or heritage management plan can include a range of activities and processes, which differ depending on the find and its significance. In discussions with the archaeologist the following checklist can be used by the Project Manager and the archaeologist as a prompt to ensure all relevant archaeological issues are considered when developing this plan. This will allow the project team to receive clear and full advice to move forward quickly and in the right direction. Archaeological and/or heritage advice on how to proceed can be received in a letter or email outlining all relevant archaeological and/or heritage issues.

	Required	**Outcome/notes**
Assessment and investigation		
• Assessment of significance	Yes/No	
• Assessment of heritage impact	Yes/No	
• Archaeological excavation	Yes/No	
• Archival photographic recording	Yes/No	
Heritage approvals and notifications		
• AHIPs, Section 140, S139 exceptions etc	Yes/No	
• Regulator relics/objects notification	Yes/No	
• Roads and Maritime's S170 Heritage and Conservation Register listing requirements	Yes/No	
• Compliance with CEMP or other project heritage approvals	Yes/No	
Stakeholder consultation		
• Aboriginal stakeholder consultation requirements and how it relates to RTA *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI).	Yes/No	
• Advice from regional environmental staff, Aboriginal Cultural Heritage Advisor, Roads and Maritime heritage team.	Yes/No	
Artefact/ heritage item management		
• Retention or conservation strategy (eg items may be subject to long conservation and interpretation) • Disposal strategy (eg former road pavement) • Short term and permanent storage locations (interested third parties should be	Yes/No	

Level 00, Building Name 000, Street Name, City NSW 0000 **|** PO Box 000 City NSW 0000 DX00 City
T 02 0000 0000 **|** **F** 02 0000 0000 **|** **E** xxxx@rta.nsw.gov.au **www.rta.nsw.gov.au | 13 22 13**

consulted on this issue).		
• Control Agreement for Aboriginal objects.	Yes/No	
Program and budget		
• Time estimate associated with archaeological or heritage conservation work.		
• Total cost of archaeological/heritage work.		

Appendix G

Template notification letter

[Select and type date]

[Select and type reference number]

[Select and type file number]

[Insert recipient's name and address, see **Appendix D**]

[Select and type salutation and name],

Re: Unexpected heritage item discovered during Roads and Maritime Services project works.

I write to inform you of an unexpected [select: relic, heritage item or Aboriginal object] found during Roads and Maritime Services construction works at [insert location] on [insert date]. [Where the regulator has been informally notified at an earlier date by telephone, this should be referred to here].

This letter is in accordance with the notification requirement under [select: Section 146 of the *Heritage Act 1977* (NSW) or Section 89(A) of the *National Parks and Wildlife Act 1974* (NSW) **NB:** There may be not be statutory requirement to notify of the discovery of a 'heritage Item that is not a relic or Aboriginal object].

NB: On finding Aboriginal human skeletal remains this letter must also be sent to the Commonwealth Minister for Sustainability, Environment, Water, Populations and Communities (SEWPC) in accordance with notification requirements under Section 20(1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth).

[Provide a brief overview of the project background and project area. Provide a summary of the description and location of the item, including a map and image where possible. Also include how the project was assessed under the *Environmental Planning and Assessment Act 1979* (NSW) (eg Part 5). Also include any project approval number, if available].

Roads and Maritime Services [*or contractor*] has sought professional archaeological advice regarding the item. A preliminary assessment indicates [provide a summary description and likely significance of the item]. Please find additional information on the site recording form attached.

Resulting from these preliminary findings, Roads and Maritime Services *[or contractor]* is proposing [provide a summary of the proposed archaeological/heritage approach (eg develop archaeological research design (where relevant), seek heritage approvals, undertake archaeological investigation or conservation/interpretation strategy). Also include preliminary justification of such heritage impact with regard to project design constraints and delivery program].

The proposed approach will be further developed in consultation with a nominated Office of Environment and Heritage staff member.

Please contact me if you have any input on this approach or if you require any further information.

Yours sincerely

[Sender name and position]

[Attach the archaeological/heritage management plan and site recording form].

Appendix C – Newcastle City Council, Technical Manual Contaminated Land Manual

Technical Manual

Contaminated Land Management

Production:

Newcastle Technical Manual Contaminated Land Management was prepared by the Future City Group of The City of Newcastle.

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Updated June 2012

CONTENTS

1. Contaminated Land Management

This Manual:

- supplements Section 5.02 of the Newcastle DCP 2012 by providing detailed technical information relating to the use and development of land that is or may be contaminated
- outlines procedures and requirements for the early identification of sites, determination of rezoning and development applications, the recording and use of information and the provision of information to the community
- outlines requirements for the carrying out of remediation work.
- provides a statement of policy to be followed by The City of Newcastle when exercising its planning functions in relation to land that may be contaminated
- provides a local context for decision making that is generally consistent with the Contaminated Land Planning Guidelines notified under Section 145C of the *Environmental Planning and Assessment Act 1979*.

2. Contaminated Land Management Principles

Contaminated land management is a process that may take place at any phase of development including plan making, site preparation, construction, demolition and ongoing site use.

Appropriate management of contaminated land is important to the health and safety of the community and to ensure that contaminated sites can be remediated for sustainable reuse.

Council functions to which this Technical Manual applies

- the preparation of local environmental plans
- the preparation and approval of development control plans
- the preparation and adoption of plans of management for community land
- the determination of development applications
- the modification of development consents
- the determination of activities under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (where the Council is the determining authority)
- the recording and keeping of information relating to land contamination, and the furnishing of such information to the public, such as by the issue of Planning Certificates under section 149 of the EP&A Act.

SEPP 55 - Remediation of Land

This Technical Manual specifies requirements in respect of 'category 2 remediation work', as provided for under clause 9(f) of State Environmental Planning Policy No. 55 - Remediation of Land.

Category 2 remediation work does not require Council development consent however it is required to comply with the requirements of this Technical Manual.

3. Development Assessment

Initial evaluation

When making a determination in respect of any of the applicable matters referred to above that would authorise a change of use of land or the carrying out of earthworks, the Council is to undertake an initial evaluation generally in accordance with the Contaminated Land Planning Guidelines.

Matters to be considered include:

- whether the land is within an investigation area or remediation area
- whether the land is currently used for an activity listed in Part 8 – Potentially Contaminating Activities
- whether Council records show that an activity listed in Part 8 – Potentially Contaminating Activities has ever been carried out, approved, licensed or otherwise regulated on the land
- if a site inspection is held, whether there is any obvious evidence that the land may have been associated with an activity listed in Part 8 – Potentially Contaminating Activities
- whether the land has at any time been previously zoned for industrial, agricultural or defence purposes
- whether any Council records indicate that the use of the land has been restricted due to possible contamination (for example, notices issued by the NSW State Government that have been forwarded to the Council)
- whether any Council records indicate that the land has been the subject of complaints concerning pollution or illegal dumping of wastes
- whether the Council is aware of the results of previous investigations concerning contamination of the land
- whether the Council is aware of information concerning contamination impacts on immediately adjacent land which could affect the subject land.

Conditions of consent

In making its determination, the Council is to consider:

- the need to impose conditions relating to the remediation issues outlined in Part 5 – Remediation Work
- in the case of development applications, whether it would be appropriate to issue a deferred commencement consent or a staged consent
- the management of soil and groundwater contamination to ensure that the community is not unduly disadvantaged by accepting the dedication of public assets which have increased human health or environmental risks or have potentially higher asset management costs due to contamination.

4. Dedication of assets to Council

Contamination investigation requirements

The investigation of soil and groundwater contamination should be carried out in accordance with NSW State Government approved contaminated sites sampling design guidelines.

Acceptable soil contaminations levels

Assets to be dedicated to Council must meet the following National Environment Protection (Assessment of Site Contamination) Measure (**NEPM) Health Investigation Level (HIL)** and must also at a minimum meet the **General solid waste** (non-putrescible) criteria as defined in the NSW DECC Waste Classification Guidelines as outlined in Table 1 below.

Table 1. Investigation levels and waste classification criteria that must be met:

	Investigation levels and waste criteria that must be met	
	NEPM Health Investigation Level (HIL)	Waste classification
Soil under roads	HIL 'F' (Commercial/Industrial)	General solid waste
Open space & footpath areas	HIL 'E' (Parks, recreational open space)	General solid waste
Other assets	Use appropriate HIL for most sensitive landuse permissible under the zoning	General solid waste

Specific investigation requirements for sampling of road parcels

For the detailed investigation of contamination of road areas the road must be regarded as a separate parcel of land for the purposes of the sampling design. Accordingly an appropriate number of samples must be taken within the actual parcel of land to be dedicated to Council in order to adequately investigate/delineate contamination.

At a minimum soil samples should be taken at 3 depths per sampling location to define the possible vertical extent of contamination including one surface sample and one at the depth of the lowest possible service.

Note: this should be considered a minimum requirement and further samples may be required to adequately categorise contamination in accordance with NSW State Government approved sampling guidelines.

5. Remediation Work

Applicable matters

This Part applies to remediation work, that is, works carried out for the purpose of:

- removing, dispersing, destroying, reducing, mitigating or containing the contamination of any land
- eliminating or reducing any hazard arising from the contamination of the land (including by preventing the entry of persons or animals on the land).

Category 1 remediation work

Category 1 remediation work is a special category of remediation work defined by State Environmental Planning Policy No. 55 - Remediation of Land (SEPP 55). Under SEPP 55, category 1 remediation work may only be carried out with development consent.

The exact definition of category 1 remediation is complicated, and interested persons should refer to clauses 9 and 14 of SEPP 55.

Category 2 remediation work

Category 2 remediation work is any remediation work that is not Category 1 remediation work.

Under SEPP 55, category 2 remediation work may be carried out without development consent. However, if remediation work is carried out in a manner that does not comply with a policy adopted under the Contaminated Land Planning Guidelines (that is, this Technical Manual), such work is then classified as category 1 remediation work.

In accordance with clause 16 of SEPP 55, prior notice of category 2 remediation work to Council is required at least 30 days before commencement of works.

In addition to the information that must be submitted to Council in clause 16 of SEPP 55, Council will require the following information to be submitted at least 14 days prior to the commencement of category 2 remediation works:

- copies of any Preliminary Investigation, Detailed Investigation and Remedial Action Plan for the subject site
- contact details for the remediation contractor and party responsible for ensuring compliance of remediation work with all relevant regulatory requirements (if different to remediation contractor).

Although consent is not required for Category 2 remediation work, Council will need to be satisfied that the site is suitable for the proposed use when considering any subsequent development applications for the subject site. Hence it is recommended that comprehensive records are maintained during the remediation and validation works for all sites.

Requirements for category 2 remediation work

Category 2 remediation work must be carried out in accordance with the following required site management provisions. These provisions have been formulated to ensure that category 2 remediation work does not adversely impact on the environment or public amenity.

> *Note:* These site management provisions have been adapted from the SSROC (1999) Model Policy on Contaminated Land.

All category 2 remediation works shall be conducted in accordance with the site management provisions listed below. The site management provisions apply to all of the Newcastle Local Government Area (LGA).

Category 2 remediation work that does not comply with the site management provisions outlined in this section will be classified as category 1 remediation work and will require development consent.

Development applications lodged for category 1 remediation works should identify any areas of non-compliance with the site management provisions listed below and identify any alternative site management measures to be implemented.

Note: It is the responsibility of those remediating a site to ensure compliance with all relevant environmental legislation and regulations. Compliance with the site management provisions outlined below does not imply that all relevant environmental legislation and regulations have been complied with. Non-compliance with relevant environmental legislation and regulations such as the Protection of the Environment Operations Act 1997 may incur on-the-spot fines for minor offences or more substantial fines and imprisonment for more serious offences.

It is the responsibility of those remediating a site to ensure compliance with the Heritage Act 1995 in relation to excavation permits for land that is likely to result in the disturbance of relics.

Hours of Operation

All remediation work which is audible on residential premises shall be conducted within the following hours:

Monday - Friday 7am - 6pm

Saturday 8am - 1pm

No work is permitted on Sundays or Public Holidays.

Soil and Water Management

The *Managing Urban Stormwater: Soils and Construction 4th Edition - Vol. 1* (the "Blue Book") published by Landcom, 2004 outlines Council's requirements for the preparation of a soil and water management plan. All remediation works shall be conducted in accordance with a soil and water management plan. A copy of the plan shall be kept onsite and made available to Council Officers on request. All erosion and sediment measures must be maintained in a functional condition throughout the remediation works.

A summary of the soil and water management measures for category 2 remediation work in relation to stockpiles, site access, excavation pump-out, landscaping/rehabilitation and bunding are discussed below:

Stockpiles

- no stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior Council approval has been obtained
- all stockpiles of soil or other materials shall be placed away from drainage lines, gutters or stormwater pits or inlets
- all stockpiles of soil or other materials likely to generate dust or odours shall be covered
- all stockpiles of contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours. (A secure area is addressed by the requirement for **Site Security** below.)
- if landfarming techniques are being employed, alternative control measures and contingencies must be put in place to address the potential for odour and dust impacting off-site.

Site Access

Vehicle access to the site shall be stabilised to prevent the tracking of sediment onto the roads and footpath. Soil, earth, mud or similar materials must be removed from the roadway by sweeping, shovelling, or a means other than washing, on a daily basis or as required. Soil washings from wheels shall be collected and disposed of in a manner that does not pollute waters.

Excavation Pump-out

All excavation pump-out water must also be analysed for suspended solid concentrations, pH and any contaminants of concern identified during the preliminary or detailed site investigation, prior to discharge to the stormwater system. The analytical results must comply with relevant NSW State Government endorsed standards and guidelines for water quality as applicable to the contaminants and the receiving waters. Other options for the disposal of excavation pump-out water include disposal to sewer with prior approval from the Hunter Water Corporation, or off-site disposal by a liquid waste transporter for treatment/disposal to an appropriate waste treatment/processing facility.

Landscaping/Rehabilitation

All exposed areas shall be progressively stabilised and/or revegetated to prevent dust and erosion on the completion of remediation works.

Bunding

All landfarming areas for hydrocarbon contaminated soils shall be bunded to contain surface water runoff from the landfarm areas and to prevent the leaching of hydrocarbons into the subsurface. All surface water discharges from the bunded areas to Council's stormwater system must comply with relevant NSW State Government endorsed standards and guidelines for water quality as applicable to the contaminants and the receiving waters.

Noise

Category 2 remediation work shall comply with appropriate NSW State Government construction noise guidelines.

All equipment and machinery shall be operated in an efficient manner to minimise the emission of noise.

Vibration

The use of any plant and/or machinery shall not cause vibrations in excess of the relevant NSW State Government guidelines and Australian Standards, on any premises.

Dust Control

Dust emissions shall be confined within the site boundary. The following dust control procedures shall be employed to comply with this requirement:

- erection of dust screens around the perimeter of the site
- securely covering all loads entering or exiting the site
- use of water sprays across the site to suppress dust
- covering of all stockpiles of contaminated soil remaining more than 24 hours
- keeping excavation surfaces moist.

Odour Control

No offensive odours shall be detected at any boundary of the site during remediation works by an authorised Council Officer relying solely on sense of smell. The following procedures may be employed to comply with this requirement:

- use of appropriate covering techniques such as the use of plastic sheeting to cover excavation faces or stockpiles
- use of fine mist sprays
- use of a hydrocarbon mitigating agent on the impacted areas/materials
- adequate maintenance of equipment and machinery to minimise exhaust emissions.

Volatile or semi-volatile compounds that could generate odours include monocyclic aromatic hydrocarbons (styrene, benzene, toluene, xylene, ethyl benzene, butyl benzene), polycyclic aromatic hydrocarbons (PAHs), hydrogen sulfide, hydrogen cyanide, pesticides, polychlorinated biphenyls (PCBs) and herbicides.

Groundwater

Any contamination assessment should address the potential for contamination of groundwater at the site to have occurred. Any work below the water table requires a licence from the NSW State Government under Part 5 of the *Water Act 1912*, and the *Water Management Act 2000*. These works include bores for water supply, testing and monitoring, and any extraction. If groundwater at the site is found to be contaminated then the appropriate NSW State Government agency is to be notified. Any remedial actions proposed for the site to remediate contaminated groundwater should consider monitoring provisions and the NSW State Government groundwater policies.

Copies of all Groundwater Investigations (Preliminary and Detailed) and the Remedial Action Plan for the site are to be submitted to the appropriate NSW State Government department 14 days prior to the commencement of works.

Groundwater shall be analysed for pH and any contaminants of concern identified during the preliminary or detailed site investigation, prior to discharge to the stormwater system. The analytical results must comply with relevant NSW State Government guidelines and standards for water quality.

Other options for the disposal of groundwater include disposal to sewer with prior approval from the Hunter Water Corporation, or off-site disposal by a liquid waste transporter for treatment/disposal to an appropriate waste treatment/processing facility.

Transport

All haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site shall be selected to meet the following objectives:

- comply with all road traffic rules
- minimise noise, vibration and odour to adjacent premises
- utilise State Roads and minimise use of local roads.

Applicants may consult Council prior to selecting the most suitable transport route.

Category 2 remediation work shall ensure that all site vehicles:

- conduct deliveries of soil, materials, equipment or machinery during the hours of remediation work identified above under **Hours of Operation**
- securely cover all loads to prevent any dust or odour emissions during transportation
- exit the site in a forward direction
- do not track soil, mud or sediment onto the road.

Hazardous Materials

Hazardous and/or liquid wastes arising from the remediation work shall be removed and disposed of in accordance with the requirements of the relevant NSW State Government agencies, together with the relevant regulations, namely:

- *Protection of the Environment Operations Act 1997* and Regulations
- *Occupational Health and Safety* Act *2000* and Regulations
- *Contaminated Land Management Act 1997* and Regulations
- *Environmentally Hazardous Chemicals Act 1985* and Regulations.

Disposal of Contaminated Soil

The disposal of contaminated soil shall have regard to the provision of both the *Protection of the Environment Operations Act 1997* and Regulations and relevant state agency waste guidelines.

Any queries associated with the off-site disposal of waste from a contaminated site should be referred to the appropriate NSW state government agency. If contaminated soil or other waste is transported to a site unlawfully, the owner of the waste and the transporter are both guilty of an offence.

Containment/Capping of Contaminated Soil

No contaminated soil shall be encapsulated or capped on the site that contains concentrations of contaminants that are above the soil investigation levels for urban development sites in NSW for the range of landuses permissible on the subject site. For example, a site zoned commerical/industrial shall not encapsulate or cap soil containing concentrations of contaminants above the ‘commercial or industrial NEHF F health-based investigation levels’. The soil investigation levels for urban redevelopment in NSW are contained in Guidelines approved by the NSW State Government.

Note: Approval to cap contaminated soil which exceeds the soil investigation levels for the range of landuses permissible on the site can be sought through a development application to Council (category 1 remediation).

Importation of Fill

All fill imported on to the site shall be validated to ensure it is suitable for the proposed land use from a contamination perspective and will not impact adversely on the drainage of the site.

Council may require details of appropriate validation of imported fill material to be submitted with any application for future development of the site. Hence all fill imported onto the site should be validated by either one or both of the following methods during remediation works:

- imported fill should be accompanied by documentation from the supplier which certifies that the material has been excavated or quarried from areas that are not contaminated with manufactured chemicals or

process residues, as a result of industrial, commercial, mining or agricultural activities, and that it does not contain any sulfidic ores or soils or any other waste

- sampling and analysis of the fill material conducted in accordance with the NSW State Government approved sampling design guidelines to ensure that the material is not contaminated.

Site Signage and Contact Numbers

A sign displaying the contact details of the remediation contractor (and site manager if different to remediation contractor) shall be displayed on the site adjacent to the site access. This sign shall be displayed throughout the duration of the remediation works.

Community Consultation

Owners and/or occupants of premises adjoining and across the road from the site shall be notified by the proponent at least two days prior to the commencement of category 2 remediation works.

Site Security

The site shall be secured to prevent unauthorised access by means of an appropriate fence.

Occupational Health & Safety

It is the employer's responsibility to ensure that all site remediation works comply with all Occupational Health and Safety and Construction Safety Regulations of the NSW WorkCover Authority.

Removal of Underground Storage Tanks

The removal of underground storage tanks shall be undertaken in accordance with the requirements of all relevant NSW State Government Agencies including WorkCover NSW. The tank removal shall be conducted in accordance with all relevant standards, guidelines, codes of practice and legislation including the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008*.

6. Plan Making

Initial evaluation

Evaluation is to be based upon records held by Newcastle City Council that are readily accessible, and may also be based upon factual information gained from a site inspection. There is no requirement to research or consider records held by other agencies.

Matters to be considered include:

- whether the land is within an investigation area or remediation area
- whether the land is currently used for an activity listed in Part 8 – Potentially Contaminating Activities
- whether Council records show that an activity listed in Part 8 – Potentially Contaminating Activities has ever been carried out, approved, licensed or otherwise regulated on the land
- if a site inspection is held, whether there is any obvious evidence that the land may have been associated with an activity listed in Part 8 – Potentially Contaminating Activities

- whether the land has at any time been previously zoned for industrial, agricultural or defence purposes
- whether any Council records indicate that the use of the land has been restricted due to possible contamination (for example, notices issued under the *Contaminated Land Management Act 1997* by State Government Agencies that have been forwarded to the Council)
- whether any Council records indicate that the land has been the subject of complaints concerning pollution or illegal dumping of wastes
- whether the Council is aware of the results of previous investigations concerning contamination of the land
- whether the Council is aware of information concerning contamination impacts on immediately adjacent land which could affect the subject land.

Is a site investigation required?

Where a site investigation is required, it is to be carried out in accordance with the Contaminated Land Planning Guidelines.

Insufficient information on which to make a decision exists if there are significant gaps in historical information for a site, or if land uses are not described in sufficient detail to identify the presence or absence of uses listed in Part 8 - Potentially Contaminating Activities during periods in which such uses could be lawfully carried out.

Site investigation process

If contamination is or may be present, the site is to be the subject of a site investigation process. Please refer to Part 3 – Development Assessment for details pertaining to the site investigation process.

7. Information Management

Record keeping

So as to facilitate the exercise of its planning functions generally in accordance with the Contaminated Land Planning Guidelines, the Council is to keep sufficient and appropriate records relating to the existence or likelihood of land contamination. Such records may include:

- previous property descriptions (for cross-referencing purposes)
- chronological land use history
- complaints about contamination or potentially contaminating activities and whether the complaints were substantiated
- information from any initial evaluations
- information from any site investigations, including preliminary investigation reports, detailed investigation reports, remedial action plans, validation and site monitoring reports or any other contamination assessment reports
- site audit statements and site audit reports

- notifications of remediation given under State Environmental Planning Policy No. 55 - Remediation of Land
- previous zones and permissible uses, particularly uses listed in Part 8 – Potentially Contaminating Activities
- rezoning requests, development consents and building approvals for uses listed in Part 8 -Potentially Contaminating Activities or where contamination was an issue
- rezoning requests, development applications and building applications that were refused on the basis of contamination-related issues
- declarations, orders and notices under the *Contaminated Land Management Act 1997* (where the Council has been informed by the Environment Protection Authority)
- voluntary investigation proposals and voluntary remediation proposals under the *Contaminated Land Management Act 1997* (where the Council has been informed by the Environment Protection Authority).

Supply of information

Information about land contamination held within the Council's records is to be supplied to the public only by the following means:

- by issuing Planning Certificates (upon application by any person, and subject to payment of the prescribed fee)
- by making the following documents identified on the Planning Certificates and held by the Council available for inspection (upon request by the holder of the Planning Certificate, free of charge):
  - site investigation reports (including preliminary investigation reports, detailed investigation reports, remedial action plans, validation and site monitoring reports) or any other contamination assessment reports prepared by consultants
  - site audit reports
  - site audit statements.
- by making the following documents held by the Council available for inspection (upon request by any person, free of charge):
  - the register of development applications and consents kept under clause 264 of the *Environmental Planning and Assessment Regulation 2000*
  - documents relating to development applications and development consents kept available for public inspection under clause 266 of the *Environmental Planning and Assessment Regulation 2000*
  - the record of approvals kept under section 113 of the *Local Government Act 1993*
  - business papers and minutes of council and committee meetings
  - other documents that may be inspected under section 12(1) of the *Local Government Act 1993.*
- by providing access to documents in accordance with the *Government Information (Public Access) Act 2009 (GIPA Act)*.

Planning Certificates - prescribed information

This clause applies to the provision of information on planning certificates under section 149(2) of the EP&A Act, as prescribed by Schedule 4 of *the Environmental Planning and Assessment Regulation 2000* and section 59(2) of the *Contaminated Land Management Act 1997.*

The Council is to provide the following prescribed information:

- a statement that Council has by resolution adopted a policy to restrict development of the land because of the likelihood of the land being contaminated – if it is considered to be contaminated or potentially contaminated
- a statement that the land is significantly contaminated land - if it is within such an area or site at the date when the certificate is issued*

> Note: This disclosure relates to the matter "whether or not the council has adopted a policy to restrict the development of the land because of the likelihood of land slip, bushfire, flooding, tidal inundation subsidence, acid sulphate soils or any other risk". (Item 7 of Schedule 4, EP&A Regulation 2000).

- a statement that the land is subject to a management order - if it is subject to such an order at that date*
- a statement that the land is the subject of a voluntary management proposal or ongoing maintenance order that is subject to an agreement with the NSW State Government - if it is the subject of such a proposal or order which has not been fully carried out, at the date when the certificate is issued*
- a statement that the land is the subject of a site audit statement - if a copy of such a statement has been provided at any time to the Council.

*** Information provided only to the extent that the Council has been informed by the NSW State Government.**

Planning Certificates – additional information

This clause applies to the provision of additional information on planning certificates under section 149(5) of the EP&A Act.

Where an applicant for a Planning Certificate has requested (and paid for) additional information under section 149(5), the Council is to disclose the following information.

- If the Council is in possession of a site investigation report, site audit report, or any other contamination assessment report relating to the land:
  - a statement that the Council is in possession of any such report
  - details of the author, title and date of each report
  - whether or not the report or reports indicate that the land is affected by elevated concentrations of soil or groundwater contaminants, (and if so, whether any recommendations have been made regarding restrictions or special conditions over the use or development of the land)
  - a statement that the reports held by the Council may be examined upon request at the office of the Council
  - a statement that any person relying on the certificate is advised to examine and consider the contents of each report.

- If the Council is in possession of records evidencing that a potentially contaminating activity may have been conducted on the land:
  - a statement that a potentially contaminating activity may have been conducted on the land
  - brief details of the known potentially contaminating activity
  - a statement that any person relying on the certificate is advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants.
- If the Council is in possession of records evidencing that the land may be affected by soil or groundwater contaminant migration originating from nearby land:
  - a statement that the land may be affected by soil or groundwater contaminant migration originating from nearby land
  - brief details of the known possible source of soil or groundwater contaminant migration
  - a statement that any person relying on the certificate is advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants.
- Details of the date, subject matter and informant of any notice of remediation work under State Environmental Planning Policy No. 55 - Remediation of Land - if any such notice has been received by the Council in relation to the land.

Note: It is the aim of Council to record all contaminated sites on the property information system and s149 certificates, however this is a very time consuming process which requires continual updating and review as land is subdivided and new potentially contaminating activities are commenced and discovered. Therefore, the lack of reference to contamination on a s149 certificate should not be taken as an assurance that the site is not contaminated.

8. Potentially Contaminating Activities

- acid or alkali plant and formulation
- agricultural or horticultural activities
- airports
- asbestos production and disposal
- chemicals manufacture and formulation
- defence works
- drum reconditioning works
- dry cleaning establishments
- electrical manufacturing (transformers)
- electroplating and heat treatment processes
- engine works
- explosives industry
- gas works

- iron and steel works
- landfill sites
- metal treatment
- mining and extractive industries
- oil production and storage
- paint formulation and manufacture
- pesticide manufacture and formulation
- power stations
- railway yards
- scrap yards
- service stations
- sheep and cattle dips
- smelting and refining
- tanning and associated trades
- waste storage and treatment
- wood preservation
- other activities that the Council considers to be a potentially contaminating activity.

Source: Based on Table 1 in Department of Urban Affairs and Planning and Environment Protection Authority (1998) Managing Land Contamination: Planning Guidelines, DUAP, Sydney.

9. Sources of Site History Information

- Past aerial photographs
- Council records - town planning, development and building applications, complaints, pollution incident reports
- local historical publications
- current and previous site owners
- current and previous site workers
- long-term residents
- past and present telephone books
- Noxious Trades Act register of Noxious Trades
- NSW Environment Protection Authority Section 35 Notices, past and present scheduled premises, unhealthly building land
- Hunter Water Corporation Trade Waste Agreements

- WorkCover Authority Dangerous Goods Branch
- Energy Australia sites containing present and past electrical substations.

Source: Adapted from SSROC (1999) Model Policy on Contaminated Land.

10. References

These references include both current and superseded references on which the policy was made.

- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites 1992* (Australia and New Zealand Environment Conservation Council and National Health and Medical Research Council)
- *Code of Practice The Removal and Disposal of Underground Petroleum Storage Tanks AIP CP22 -1994* (Australian Institute of Petroleum)
- *Contaminated Land Management Act 1997* and Regulations
- *Contaminated Land Management Technical Manual 13*
- *Contaminated Sites: Guidelines for Assessing Service Station Sites 1994* (EPA)
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 1998* (EPA)
- *Contaminated Sites: Sampling Design Guidelines 1995* (EPA)
- *Draft Noise Guide for Local Government 2002* (EPA)
- *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes 1999* (EPA)
- *Environmentally Hazardous Chemicals Act 1985* and Regulations
- *Environmental Criteria for Road Traffic Noise 1999* (EPA)
- *Environmental Guidelines: Solid Waste Landfills 1996* (EPA)
- *Environmental Noise Control Manual* (EPA)
- *Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report 1999* (EPA)
- *Government Information (Public Access) Act 2009 (GIPA Act).*
- *Guidelines for Consultants Reporting on Contaminated Sites 1997* (EPA)
- *Interim Construction Noise Guideline 2009* (NSW DECC)
- *Managing Land Contamination: Planning Guidelines SEPP55 - Remediation of Land 1998* (DUAP and EPA)
- *Managing Urban Stormwater: Soils and Construction 4th Edition - Vol. 1* (the "Blue Book") published by Landcom, 2004
- *Model Policy on Contaminated Land 1999* (SSROC)
- *NSW Industrial Noise Policy 2000* (EPA)
- *Occupational Health and Safety Act 2000* and Regulations

- *Preparing an Erosion and Sediment Control Plan* (Department of Land and Water Conservation)
- *Protection of the Environment Operations Act 1997* and Regulations
- *State Environmental Planning Policy No. 55 - Remediation of Land 1998* (NSW Government)
- *Waste Classification Guidelines* (NSW DECC).

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D. Appendix B – SSD Noise and Vibration Impact Assessment

AECOM Imagine it. Delivered.

SSD Noise and Vibration Impact Assessment
University of Newcastle
26-Feb-2020
Doc No. 60579316-RPNV-01_C

University of Newcastle - HCCD Stage 1A

SSD Noise and Vibration Impact Assessment

University of Newcastle - HCCD Stage 1A

SSD Noise and Vibration Impact Assessment

Client: University of Newcastle

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Quality Information

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Reviewed by	Gayle Greer

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Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	20-Feb-2019	Revision A	Joe Mescall	
B	20-Feb-2020	Revision B	Peter Skeen Team Leader - Buildings & Places, Hunter	
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Table of Contents

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) has been engaged by the University of Newcastle (UoN) to provide a State Significant Design (SSD) Noise and Vibration Impact Assessment Report to support their application for the Honeysuckle City Campus Development (HCCD) Stage 1 Building 1A (Stage 1A) located at 16B Honeysuckle Drive, Newcastle, NSW.

The Honeysuckle City Campus at 16 Honeysuckle Drive comprises three parcels of land with a total area of 20,412 m^2. The land identified for HCCD Stage 1A has an area of 8,546 m^2 and is described as Part Lot 1 DP 1163346.

This Noise and Vibration Impact Assessment has been prepared on behalf of UoN and includes an operational and indicative construction noise and vibration impact assessment. The assessment has been prepared in support of an Environmental Impact Statement (EIS), which has been prepared to assess the environmental impacts associated with the project.

The Secretary's Environmental Assessment Requirements (SEARs) issued on 27 August 2018 states that the EIS must include the following:

> *"…a noise and vibration assessment prepared in accordance with the relevant EPA guidelines. This assessment must detail construction and operation noise impacts on nearby noise sensitive receivers and outline proposed noise mitigation and monitoring procedures"*

Operational noise management levels and vibration criteria have been established using:

- *Noise Policy for Industry* (NPfI), Environment Protection Authority (EPA), 2017
- *State Environment Protection Policy (SEPP) (Infrastructure*), 2007
- *Development Near Rail Corridors and Busy Roads – interim guideline*, Department of Planning, 2008
- *Assessing Vibration: A Technical Guideline* (AVATG), Department of Environment and Conservation (DEC), 2006
- *NSW Road Noise Policy* (RNP), Department of Environment, Climate Change and Water (DECCW), 2011
- *Newcastle Development Control Plan (DCP)*, City of Newcastle, 2012

Construction noise management levels and vibration criteria have been established using:

- *Interim Construction Noise Guideline* (ICNG), Department of Environment and Climate Change (DECC), 2009
- *Assessing Vibration: A Technical Guideline* (AVATG), Department of Environment and Conservation (DEC), 2006
- *NSW Road Noise Policy* (RNP), Department of Environment, Climate Change and Water (DECCW), 2011.

The operational and construction noise and vibration impact assessment is presented in this report along with noise and vibration mitigation treatments and strategies. The scope of the assessment includes:

- Operational noise and vibration
  - Major noise emitting plant
  - Traffic noise generation
  - Design of building envelope to attenuate traffic noise intrusion
  - Patron noise emission from event spaces
  - Recommendations for noise control measure to be incorporated into the architectural and services design strategies

- Construction noise and vibration
  - Noise predictions for construction scenarios
  - Noise impact assessment
  - Recommendations for construction noise control measures to be incorporated into a construction noise management strategy.

1.1 Site description

The site is bounded to the north, west and south by Honeysuckle Drive, Worth Place and Wright Lane respectively. It is bounded to the east by 16A Honeysuckle Drive which comprises part of the Honeysuckle City Campus Development.

Land use to the north of the site is predominantly residential with some commercial and tourism. The Honeysuckle Hotel is located beyond this, on the edge of the Hunter River. East of the site is the HCCD with residential, commercial, tourism and Newcastle Museum beyond. South of the site is also the HCCD with low to medium commercial and the NeW Space development on the other side of this. West of the site is predominantly residential and commercial developments.

The site location is shown in Figure 1.

Figure 1 Site location and noise monitoring locations

1.2 Proposed development

HCCD Stage 1A comprises a new building on the Honeysuckle City Campus to accommodate the UoN School of Creative Industries (SOCI) and an Innovation Hub. These facilities will provide learning studios and flexible spaces for co-working, meetings and informal collaboration. HCCD Stage 1A includes:

- Design and construction of a single standing, multi-storey building on the corner of Worth Place and Honeysuckle Drive

- Space for the use of the Innovation Hub, SOCI and building fit out to make these spaces suitable for their uses
- Associated landscaping and infrastructure works.

1.3 Document purpose

This Noise and Vibration Impact Assessment is intended to provide a reference for the policies, guidelines and standards that apply to the treatment and management of operational and construction noise and vibration associated with a large building project.

The Noise and Vibration Impact Assessment also sets out the applicable criteria, standard noise and vibration mitigation measures and monitoring, reporting and complaint management requirements.

2.0 Noise Monitoring

Long-term unattended measurements at two locations were undertaken to establish the existing ambient and background noise environment at potentially affected receivers in the vicinity of the proposed HCCD site. AECOM has conducted noise monitoring from Tuesday 8 May 2018 to Thursday 17 May 2018 to establishing existing background noise levels. One noise logger was located within the development boundary at 16 Honeysuckle Drive the other was located at 558 Hunter Street.

2.1 Instrumentation

The equipment used for site measurements is detailed below in Table 1.

Table 1 Environmental noise monitoring equipment

Location	Equipment	Serial Number
16 Honeysuckle Drive, Newcastle	Rion NL21	265112
558 Hunter Street, Newcastle West	Rion NL21	765701

Calibration of the meters was checked on site with a Rion NC74 Sound Calibrator (serial number 34283659) at the beginning and end of the measurement periods. No significant drifts in calibration were observed. All the acoustic instrumentation employed during the noise measurements comply with the requirements of AS IEC 61672.1-2004 Electroacoustics - Sound level meters - Specifications and were within their current National Association of Testing Authorities, Australia (NATA) certified in-calibration period (i.e. calibration in the last two years). The noise measurements have been conducted in accordance with AS1055.1 – 1997 “Acoustics – Description and measurement of environmental noise – Part 1: General procedures”.

In accordance with the EPA’s Noise Policy for Industry (NPfI), noise monitoring affected by adverse weather conditions or extraneous noise events was excluded from the monitoring data. The NPfI advises that data may be affected where adverse weather, such as wind speeds higher than five metres per second or rain, occurs. Weather data were acquired from the Bureau of Meteorology’s Williamtown weather station (station ID 061078).

2.2 Noise monitoring locations

The first noise logger was located close to the southern end of the development boundary at 16 Honeysuckle Drive, close to Wright Lane and the second was located in the front garden of 558 Hunter Street adjacent to the front fence. The microphones of both loggers were 1.5 m above ground level.

The loggers were set for sample periods of 15 minutes. The loggers measured the noise levels over the sample period and then determined L_{A10}, L_{A90}, L_{Amax}, and L_{Aeq} levels of the noise environment. The L_{A10} and L_{A90} levels are the levels exceeded for 10% and 90% of the sample period respectively. The L_{Amax} is indicative of the maximum noise levels due to individual noise events such as the pass-by of a heavy vehicle. The L_{A90} is taken as the background noise level. The L_{Aeq} level is the equivalent continuous sound level and has the same sound energy over the sample period as the actual noise environment with fluctuating sound levels.

The background noise level is defined by the EPA as ‘the underlying level of noise present in ambient noise when all unusual extraneous noise is removed’. It can include sounds that are normal features of a location and may include birds, traffic, insects etc. The background noise level is considered to be represented by the L_{A90} descriptor. The noise levels measured at the proposed development site were analysed to determine a single assessment background level (ABL) for each day, evening and night period in accordance with the EPA’s NPfI, for each monitoring location. The ABL is established by determining the lowest ten percentile level of the L_{A90} noise data acquired over each period of interest.

A summary of the measurement data is presented in Table 2. Noise levels are also graphically presented in Appendix B.

Table 2 Existing background (L_{A90}) and ambient (L_{Aeq}) noise levels

Measurement Date	L_{A90} Background Noise Levels, dB(A)			L_{Aeq} Ambient Noise Levels, dB(A)		
	Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
16 Honeysuckle Drive, Newcastle						
Tuesday 08 May 2018		45	42		54	55
Wednesday 09 May 2018	50	46	44	66	57	56
Thursday 10 May 2018	50	46	-	62	56	0
Friday 11 May 2018	-	-	-	-	-	-
Saturday 12 May 2018	-	-	-	-	-	-
Sunday 13 May 2018	-	-	-	-	-	-
Monday 14 May 2018	-	46	44	0	56	57
Tuesday 15 May 2018	51	46	43	64	57	56
Wednesday 16 May 2018	52	46	44	62	58	56
Thursday 17 May 2018	-			-		
RBL/Log Average	**50**	**46**	**44**	**64**	**56**	**56**
558 Hunter Street, Newcastle West						
Tuesday 08 May 2018		45	43		58	56
Wednesday 09 May 2018	50	46	43	63	58	56
Thursday 10 May 2018	49	45	-	62	58	-
Friday 11 May 2018	-	-	-	-	-	-
Saturday 12 May 2018	-	-	-	-	-	-
Sunday 13 May 2018	-	-	-	-	-	-
Monday 14 May 2018	-	44	42	0	58	56
Tuesday 15 May 2018	50	43	41	63	57	55
Wednesday 16 May 2018	51	48	43	62	58	55
Thursday 17 May 2018	-			-		
RBL/Log Average	**50**	**45**	**43**	**63**	**58**	**56**

Notes:

1. *Day is defined as 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.*
2. *Evening is defined as 6pm to 10pm Monday to Sunday and Public Holidays.*
3. *Night is defined as 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.*

2.3 Traffic noise monitoring

Attended measurements of traffic noise were conducted at the proposed HCCD Stage 1A façade on Honeysuckle Drive on 13 February 2019 at 5:15 pm to determine external traffic noise levels for the purposes of façade design. The results of these measurements are presented in Table 3.

Table 3 Traffic noise levels at HCCD Stage 1A facade

	Sound Pressure Level at HCCD Stage 1A Façade, dB								
	Octave Band Centre Frequency, Hz								
	31.5	63	125	250	500	1k	2k	4k	8k
Road Traffic	40	46	51	52	55	57	55	49	44

3.0 Operational Noise Criteria

3.1 Environmental noise emission – Noise Policy for Industry

Under the NSW Protection of the Environment (Operations) Act 1997, the Environment Protection Authority (EPA) document Noise Policy for Industry (NPfI) provides guidance in relation to acceptable noise trigger levels for industrial noise emission.

The Department of Planning and Environment has advised that the EPA's NPfI should be used to assess noise emission from developments.

The NPfI provides noise levels for assessing the potential impact of noise from industry and includes a framework for considering feasible and reasonable noise mitigation measures. The NPfI applies to all noise emission from permanent operations fixed facilities for the project. The assessment procedure for industrial noise sources has two components that must be considered:

- Controlling intrusiveness noise impacts in the short term for residences; and
- Maintaining noise level amenity for residences and other land uses.

The NPfI provides noise levels for assessing the potential impact of noise from industry and includes a framework for considering feasible and reasonable noise mitigation measures. The NPfI applies to all noise emission from permanent operations fixed facilities for the project. The assessment procedure for industrial noise sources has two components that must be considered:

- Controlling intrusiveness noise impacts in the short term for residences; and
- Maintaining noise level amenity for residences and other land uses.

3.1.1 Intrusiveness noise impacts

The NPfI states that the intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (L_{Aeq} level), measured over a 15 minute period, does not exceed the background noise level measured by more than 5 dB. The Rating Background Levels (RBLs) and resultant project intrusiveness noise levels are presented in Table 4.

Table 4 NPfI recommended $L_{Aeq,15\ minute}$ intrusiveness noise levels from industrial noise sources

Location		Period	RBL (L_{A90}), dB(A)	Intrusive Noise Level (RBL+5), dB(A)
Residential Receivers	Honeysuckle Drive, Wright Lane and Workshop Way[1]	Day	50	55
		Evening	46	51
		Night	44	49
	Hunter Street and King Street[2]	Day	50	55
		Evening	45	50
		Night	43	48

Notes:

1. *Based upon measured noise levels at 16 Honeysuckle Drive, Newcastle*
2. *Based upon measured noise levels at 558 Hunter Street, Newcastle West*
3. *Day is defined as 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.*
4. *Evening is defined as 6pm to 10pm Monday to Sunday and Public Holidays.*
5. *Night is defined as 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.*

As per the NPfI, intrusiveness noise levels are only applied to residential receivers. For other receivers, only the amenity levels apply.

3.1.2 Protecting noise amenity

To limit continuing increases in noise levels, the maximum ambient noise level resulting from all industrial noise sources in an area should not normally exceed the recommended amenity noise levels specified in Table 2.2 of the NPfI. As per the definitions of receiver types within the NPfI, residences are classified as being in urban and suburban areas.

Table 5 NPfI recommended L_{Aeq} amenity noise levels from industrial sources

Type of Receiver	Noise Amenity Area	Time of Day	Recommended Noise Level (L_{Aeq}), dB(A)
Residential	Urban	Day	60
		Evening	50
		Night	45
Hotel/motel	Urban	Day	65[1]
		Evening	55[1]
		Night	50[1]
Commercial Premises	All	When in Use	65

Notes:

1. *Recommended amenity noise level is 5 dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day*

The amenity level applicable to the project is equal to the recommended level minus 5 dB(A). The approach of deriving the project amenity noise level resulting from a new development on the basis of the recommended amenity noise level minus 5 dB is based on a receiver not being impacted by more than three to four individual industrial noise sources.

As per the NPfI, the project amenity level is converted to a 15 minute period by adding 3 dB(A).

3.1.3 Project noise trigger levels

Table 6 presents the applicable project noise trigger levels.

Table 6 NPfI project noise trigger levels

Type of Receiver		Time of Day	Intrusive Noise Level (RBL+5) ($L_{Aeq, 15\ minutes}$), dB(A)	Project Amenity Level ($L_{Aeq, 15\ minutes}$), dB(A)	Project Noise Trigger Level ($L_{Aeq\ 15\ minutes}$), dB(A)
Residential Receivers	Honeysuckle Drive, Wright Lane and Workshop Way	Day	55	58	55
		Evening	51	48	48
		Night	49	43	43
	Hunter Street and King Street	Day	55	58	55
		Evening	50	48	48
		Night	48	43	43
Hotel/Motel		Day	-	63	63
		Evening	-	53	53
		Night	-	48	48
Commercial Premises		When in Use	-	63	63

Adjustments to the level of noise predicted at the assessment location may be applied in accordance with Fact Sheet C of the NPfI to account for the subjective effects of specific noise characteristics including tonality, low frequency content, intermittency, impulsiveness and duration.

3.1.4 Sleep disturbance trigger levels

The NPfI requires the potential for sleep disturbance to be assessed by considering maximum noise level events during the night-time period.

Where night-time noise levels from the proposed development at a residential location exceed the following screening levels, a detailed maximum noise level event assessment should be undertaken:

- $L_{Aeq,\ 15\ minute}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is greater; and/or
- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater.

The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the RBL and the number of times this happens during the night-time period.

Based on the measured background noise levels during the night, the sleep disturbance trigger levels for the noise sensitive residential receivers are presented in Table 7.

Table 7 Night-time sleep disturbance trigger levels

Type of Receiver	Measured Night Period RBL ($L_{Aeq,\ 15\ minute}$), dB(A)	Sleep Disturbance Screening Trigger Levels	
		$L_{Aeq,\ 15\ minutes,\ dB(A)}$	$L_{AFmax,\ dB(A)}$
Residential	44	49	59

3.2 Noise from road traffic generation – Road Noise Policy

Land use developments with the potential to create additional traffic on surrounding roads should be assessed using the EPA's Road Noise Policy (RNP). The external noise criteria are applied at 1 metre from the affected external building façade.

Table 8 Road traffic noise assessment criteria for existing residences affected by additional traffic

Period	Parameter	Criterion
Hunter Street (Arterial) and King Street (Sub-Arterial)		
Day (7am – 10pm)	$L_{Aeq\ (15hr)}$	60 dB(A)
Night (10pm – 7am)	$L_{Aeq\ (9hr)}$	55 dB(A)
Surrounding Local Roads		
Day (7am – 10pm)	$L_{Aeq\ (1hr)}$	55 dB(A)
Night (10pm – 7am)	$L_{Aeq\ (1hr)}$	50 dB(A)

In cases where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

To assess noise impacts from additional traffic generated by the project, an initial screening test is been undertaken by evaluating whether existing road traffic noise levels would increase by more than 2 dB(A). Where the predicted noise increase is 2 dB(A) or less, then no further assessment is required. However, where the predicted noise level increase is greater than 2 dB(A), and the predicted road traffic noise level exceeds the road category specific criterion then noise mitigation should be considered for those receivers affected. The RNP does not require assessment of noise impact to commercial or industrial receivers.

3.3 Traffic noise intrusion

3.3.1 Development Near Rail Corridors and Busy Roads – Interim Guideline

The NSW Department of Planning document Development Near Rail Corridors and Busy Roads – Interim Guideline, presents noise criteria for sensitive receivers. Criteria relevant to the HCCD Stage 1 development are outlined in

Table 9 Traffic noise intrusion – Development Near Rail Corridors and Busy Roads – Interim Guideline

Type of Occupancy	Noise Criteria, dB(A)
Educational Institutions	40

3.3.2 Australian and New Zealand Standard AS/NZS 2107:2016

Australian and New Zealand Standard AS/NZS 2107:2016 *Acoustics – Recommended design levels and reverberation times for building interiors* recommends internal noise levels for building interiors based on room designation and location of the development with respect to external noise sources. Internal noise levels should not exceed the levels recommended in this standard. Internal noise levels will consist of both traffic noise intrusion and noise from air conditioning and mechanical ventilation plant. To allow equal contribution from both sources, traffic noise intrusion levels should be 3 dB below the levels presented in AS 2107:2016.

Table 10 Traffic noise intrusion – AS/NZS 2107:2016

Type of Occupancy / Activity	Design Sound Level (L_{Aeq}), dB(A)	Traffic Noise Intrusion Criteria (L_{Aeq}), dB(A)
Meeting Rooms	40 to 45	37 to 42
Audio-Visual Areas	35 to 45	32 to 42
Film or Television Studios	25 to 30	22 to 27
Teaching Spaces	35 to 45	32 to 42
Office Areas`	40 to 45	37 to 42

4.0 Construction Noise

Construction of the proposed development has the potential to temporarily contribute to the existing external noise environment. Noise is expected to be generated by construction works as well as construction traffic movements. This section will establish management levels in order to address the following acoustical issues:

- Construction noise and vibration impacts
- Construction road traffic impacts.

4.1 Construction noise management levels

The risk of adverse impact of construction noise on a community is determined by the extent of its emergence above the existing background noise level, the duration of the event and the characteristics of the noise.

The Interim Construction Noise Guideline (ICNG) is a NSW Government document that sets out ways to deal with the impacts of construction noise on residences and other sensitive land uses. It presents assessment approaches tailored to the scale of the construction project and identifies practices to minimise noise impacts. The ICNG recommends that a quantitative assessment is carried out for all major construction proposals that are typically subject to the environmental impact assessment processes. A quantitative assessment, based on the likely construction scenarios, has been carried out for the project.

Predicted noise levels at nearby noise sensitive receivers (eg residences, schools, hospitals, places of worship, passive and active recreation areas) are compared to the levels provided in the ICNG. Where an exceedance of the management levels is predicted the ICNG advises that receivers can be considered 'noise affected' and the proponent should apply all feasible and reasonable work practices to minimise the noise impact. The proponent should also inform all potentially impacted residents of the nature of the works to be carried out, the expected noise level and duration, as well as contact details.

Where construction noise levels reach 75 dB(A) residential receivers can be considered as 'highly noise affected' and the proponent should, in consultation with the community, consider restricting hours to provide respite periods.

The ICNG defines what is considered to be feasible and reasonable as follows:

Feasible

> *A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.*

Reasonable

> *Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.*

The construction noise management levels (NMLs) for the residential and other sensitive land uses in proximity to the site are detailed below.

4.1.1 Residential receivers

Guidance for setting construction noise management levels for residential receivers are summarised in Table 11.

Table 11 Construction noise management levels – residential receivers

Time of Day	NML, $L_{Aeq,15min}$, dB(A)[1]	How to Apply
Recommended standard hours[2]: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2 (ICNG).

Notes:

1. *Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.*
2. *As noted Standard construction hours are Monday to Friday 7 am to 6 pm and Saturday 8 am to 1 pm*

The above guidance has been utilised to define NMLs applicable to residences adjacent to the development. The project specific NML's are summarised in Table 12.

Table 12 Construction noise management levels – Residential receivers

Residential receivers location	Recommended Standard Hours RBL	Recommended Standard Hours Noise Management Levels L_{Aeq} dB(A)	Highly Noise Affected Level L_{Aeq} dB(A)
Honeysuckle development precinct	50	60	75

4.1.2 Other sensitive land uses and commercial receiver noise management levels

Noise management levels for non-residential receivers located adjacent to the site have been determined using the recommended levels in the ICNG for other sensitive land uses and commercial buildings. The NMLs are presented in Table 13.

Table 13 Noise at sensitive land uses (other than residences) and commercial buildings

Land Use	External noise levels, $L_{Aeq,15min}$ (applies when properties are in use)
Educational institutions	65 dB(A)[1]
Theatre	60 dB(A)[1]
Museum	65 dB(A)[1]
Commercial Premises (including cafes, bars, restaurants and retail stores)	70 dB(A)

Notes:

1. *Assumes an external to internal noise level reduction through a close window of 20 dB(A)*

4.2 Construction traffic noise

Noise from construction traffic on public roads is not covered by the ICNG. However the ICNG does refer to the Environmental Criteria for Road traffic Noise (ECRTN), now superseded by the NSW Road Noise Policy (RNP), for the assessment of noise arising from construction traffic on public roads.

To assess noise impacts from construction traffic, an initial screening test should be undertaken by evaluating whether existing road traffic noise levels would increase by more than 2 dB(A). Where the predicted noise increase is 2 dB(A) or less, then no further assessment is required. However, where the predicted noise level increase is greater than 2 dB(A), and the predicted road traffic noise level exceeds the road category specific criterion then noise mitigation should be considered for those receivers affected. An increase of up to 2 dB(A) represents a minor impact that is considered barely perceptible to the average person.

The RNP does not require assessment of noise impact to commercial or industrial receivers.

5.0 Vibration Criteria

Vibration, at levels high enough, has the potential to cause damage to structures and disrupt human comfort. Vibration and its associated effects are usually classified as continuous, impulsive or intermittent as follows:

- continuous vibration continues uninterrupted for a defined period and includes sources such as machinery and continuous construction activities
- impulsive vibration is a rapid build up to a peak followed by a damped decay. It may consist of several cycles at around the same amplitude, with durations of typically less than two seconds and no more than three occurrences in an assessment period. This may include occasional dropping of heavy equipment or loading activities
- intermittent vibration occurs where there are interrupted periods of continuous vibration, repeated periods of impulsive vibration or continuous vibration that varies significantly in magnitude. This may include intermittent construction activity, impact pile driving, jack hammers.

The relevant standards and guidelines for the assessment of construction vibration are summarised in Table 14.

Table 14 Standards/guidelines used for assessing construction vibration

Item	Standard/guideline
Structural damage	German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (DIN 4150)
Human comfort (tactile vibration)	Assessing Vibration: A Technical Guideline (AVATG)[1]

Notes:

1. *This document is based upon the guidelines contained in British Standard 6472:1992, "Evaluation of human exposure to vibration in buildings (1-80 Hz)". This British Standard was superseded in 2008 with BS 6472-1:2008 "Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting" and the 1992 version of the Standard was withdrawn. However the Environment Protection Authority still requires vibration to be assessed in accordance with the 1992 version of the Standard at this point in time.*

5.1.1 Structural damage

At present, no Australian Standards exist for the assessment of building damage caused by vibration. The German Standard (DIN 4150) provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration and are presented in Table 15. DIN 4150 states that buildings exposed to higher levels of vibration than recommended limits would not necessarily result in damage. In this assessment of DIN 4150 structural damage safe limits have been adopted for residential, non-residential and heritage structures.

Table 15 Structural damage safe limits (DIN 4150) for building vibration (Vibration peak particle velocity)

Group	Type of structure	At foundation – Less than 10 Hz	At foundation – 10 Hz to 50 Hz	At foundation – 50 Hz to 100 Hz[1]	Vibration at the horizontal plane of the highest floor for all frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20 mm/s	20 to 40 mm/s	40 to 50 mm/s	40 mm/s
2	Dwellings and buildings of similar design and/or use	5 mm/s	5 to 15 mm/s	15 to 20 mm/s	15 mm/s
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order/heritage listed)	3 mm/s	3 to 8 mm/s	8 to 10 mm/s	8 mm/s

Notes:

1. At frequencies above 100 Hz, the values given in this column may be used as minimum values

5.1.2 Human comfort

The assessment of intermittent vibration outlined in the NSW EPA guideline A*ssessing Vibration: A Technical Guideline* (AVTG) is based on Vibration Dose Values (VDVs). The VDV accumulates the vibration energy received over the daytime and night-time periods.

Maximum and preferred VDVs for intermittent vibration arising from construction activities are listed in Table 16. The VDV criteria are based on the likelihood that a person would comment adversely on the level of vibration over the entire assessment period.

Table 16 Preferred and maximum vibration dose values for intermittent vibration (m/s$^{1.75}$)

Location	Daytime (7am – 10pm)		Night-time (10pm – 7am)	
	Preferred	Maximum	Preferred	Maximum
Critical areas[1]	0.1	0.2	0.1	0.2
Residences	0.2	0.4	0.13	0.26
Offices, schools, educational institutions and places of worship	0.4	0.8	0.4	0.8
Workshops[2]	0.8	1.6	0.8	1.6

Notes:

1. Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. Places where sensitive equipment is stored or delicate tasks are undertaken require more stringent criteria than the residential criteria specified above

2. Examples include automotive repair shops, manufacturing or recycling facilities. This includes places where manufacturing, recycling or repair activities are undertaken but do not require sensitive or delicate tasks.

6.0 Operational Noise Impact Assessment

The operational noise assessment, including assessment of noise emission and noise intrusion, is detailed in this section of the report with regard to the established criteria presented in Section 3.0. The acoustic assessment is based on the architectural drawings issued by EJE Architecture detailed below:

11749-SD-A-000 Rev B 18/01/2019
11749-SD-A-011 Rev B 18/01/2019
11749-SD-A-100 Rev M 18/01/2019
11749-SD-A-100A Rev F 18/01/2019
11749-SD-A-101 Rev L 18/01/2019
11749-SD-A-102 Rev L 18/01/2019
11749-SD-A-102 Rev L 18/01/2019
11749-SD-A-103 Rev L 18/01/2019
11749-SD-A-104 Rev E 18/01/2019
11749-SD-A-107 Rev B 18/01/2019
11749-SD-A-200 Rev F 18/01/2019
11749-SD-A-201 Rev F 18/01/2019
11749-SD-A-202 Rev F 18/01/2019
11749-SD-A-203 Rev F 18/01/2019
11749-SD-A-330 Rev A 12/12/2018

6.1 Building services noise emission assessment

6.1.1 Equipment selections and noise levels

Proposed major plant items and indicative associated sound power levels are provided in Table 17.

Table 17 Major plant items and associated sound power levels

Location	Plant Item	Sound Power Level (per unit), dB							
		Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	8k
Mezzanine Plant Room	AHU (4 units)	79	79	79	75	74	71	68	-
Level 1 Plant Room	AHU (4 units)	79	79	79	75	74	71	68	-
Level 2 Plant Room	AHU (4 units)	79	79	79	75	74	71	68	-
Plant Level (External)	Cooling Tower – 100% (2 units)[1]	102	98	93	89	87	82	79	74
	Cooling Tower – 75% (2 units)[1]	94	90	85	82	79	74	72	67
	Cooling Tower – 48% (2 units)[1]	84	80	75	71	69	64	62	59
Plant Level (Plant Room)	Chiller	69	84	80	78	82	76	77	76
	Chilled Water Pump[2,3]	78 dB(A)							
	Condenser Water Pump[2,3]	78 dB(A)							
	Heating Water Pumps (2 units)[3]	65dB(A)							
	AHU (4 units)	79	79	79	75	74	71	68	-
	Fans (3 units)	80	74	80	73	77	74	74	-

Notes:

1. *The cooling towers will operate at a reduced capacity of 75% and 48% for the evening (6pm - 10pm) and night (10pm to 7am) respectively*
2. *Additional stand-by pumps will be provided, however only one chilled water and one condenser pump will operate at any one time*

3. Either chilled water and condenser water pumps or the heating water pumps will operate. Not all pumps will operate simultaneously

6.1.2 Acoustic treatments

In order for plant noise emission to meet the applicable project noise trigger levels presented in Section 3.1, the following acoustic treatments will be incorporated into the HCCD Stage 1 design:

- Acoustic louvres to the following plant rooms:
  - Mezzanine plant room (maximum 12 m^2 louvred area)
  - Level 1 plant room (maximum 12 m^2 louvred area)
  - Level 2 plant room (maximum 12 m^2 louvred area)
  - Rooftop chiller plant room (maximum 6 m^2 louvred area)
  - Rooftop AHU plant room (maximum 12 m^2 louvred area)

  Acoustic louvres are meet the minimum transmission loss presented in Table 18
- External walls (with exception of louvred area) to be of masonry construction for the following plant rooms:
  - Mezzanine plant room
  - Level 1 plant room
  - Level 2 plant room
- External walls (with exception of louvred area) to be of minimum R_w 35 construction for the following plant rooms:
  - Rooftop chiller plant room
  - Rooftop AHU plant room
- Chiller and AHU plant room roofs to be of minimum 0.55 mm metal deck roof construction (minimum surface density 5.5 kg/m^2).

Table 18 Minim acoustic louvre transmission loss

Louvre location	Indicative Length, mm	Transmission Loss, dB							
		Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	8k
Plant room	300	4	7	9	13	14	12	12	8

6.1.3 Plant noise emission

Noise emission from the proposed plant has been calculated at the most affected receivers as follows:

- 10 Worth Place (mixed use including residential)
- 19A Honeysuckle Drive (mixed use including residential).
- 522 Hunter Street (mixed use including residential)

It is considered that compliance with the project noise trigger levels at these residential receivers will result in compliance at both residential receivers and receivers of different usages (with less stringent trigger levels) and further from HCCD Stage 1A.

Table 19 Predicted plant noise emission

Receiver	Time of Day	Project Noise Trigger Level (L_{Aeq}), dB(A)	Predicted HCCD Stage 1A Plant Noise Level at Receiver, dB(A)
10 Worth Place	Day	55	53
	Evening	48	46
	Night	43	41
19A Honeysuckle Drive	Day	55	53
	Evening	48	47
	Night	43	42
522 Hunter Street	Day	55	48
	Evening	48	43
	Night	43	40

The receivers presented in Table 19 represent the potentially most affected residential receivers located to the north, south and west. Residential receivers located a further distance from the proposed development would experience lower levels of noise emission from the development/.

The predicted plant noise emission levels meet the project noise trigger levels for all periods.

6.2 Event space noise emission assessment

Generally the flexible event space and entry foyer will comprise the main thoroughfare and circulation space on the ground floor. These areas are expected to be heavily trafficked with people entering the building and accessing the other floors of the building. However, on occasion it will be utilised to host events for a larger number of attendees.

There are operable doors located on the northern façade allowing the flexible event space to become a seamless indoor-outdoor venue.

The following scenario is considered to be representative of the most noise intensive use of the space:

- Total 150 attendees
- One third of attendees (50 attendees) speaking in a raised voice
- Day time (7 am to 6 pm):
  - Half of the attendees (75 attendees) located in external areas
  - Operable doors open
- Evening (6 pm to 10 pm)
  - Half of the attendees (75 attendees located in external areas
  - Operable doors partially closed (up to 10 m^2 may remain open to allow attendee access inside to outside)
- Night time (10 pm to 7 am)
  - All attendees located in inside
  - Operable doors fully closed
- Amplified music to be limited to internal areas with the operable doors fully closed.

The above scenarios will result in compliance with the project noise trigger levels presented in Section 3.1.

6.3 Traffic generation noise assessment

SECA Solution Pty Ltd (SECA Solution) have prepared a Parking and Traffic Assessment Report P01069. Existing traffic flows are established in this report along with predicted traffic generation for the HCCD Stage 1A development. The report states:

> *"The proposed development will generate minimal additional vehicle traffic however will see an increase in demand for cycling facilities and public transport use…….The vehicle demands associated with HCCD Stage 1A are primarily related to servicing for the site with some demands for the pick up and drop off of people as well as for those staff and students requiring accessible parking"*

Any changes in road traffic noise on surrounding streets, occurring as a result of the HCCD Stage 1A development, is predicted to be under the 2 dB allowable increase due to the minimal traffic generation.

6.4 Noise intrusion assessment and acoustic façade design

Both road and light rail traffic will result in noise intrusion into the HCCD Stage 1A development. The façade of HCCD Stage 1A should be designed to attenuate traffic noise intrusion to meet the criteria presented in Section 3.3.

External design noise levels used to determine the required façade acoustic performance are presented in Table 20. These nose levels have been established based upon the GHD document *Newcastle Light Rail – Technical Paper 2 – Noise and Vibration Assessment* (2016) and attended measurements conducted on site by AECOM.

Table 20 Sound pressure levels at HCCD Stage 1A facade

	Sound Pressure Level at HCCD Stage 1A Façade, dB								
	Octave Band Centre Frequency, Hz								
	31.5	63	125	250	500	1k	2k	4k	8k
Light Rail[1]	40	43	49	44	50	42	38	32	27
Road Traffic[2]	40	46	51	52	55	57	55	49	44

Notes:

1. *CAF Urbos 3 LRV measured on Inner West Light Rail extracted from the TfNSW Rail Noise Database and normalised for speed, distance and train length using the NMT method and adjusted based upon overall predicted level of 49 dB(A) as presented in Appendix D – Operational Noise Contours of Newcastle Light Rail – Technical Paper 2 – Noise and Vibration Assessment (GHD 2016)*
2. *Attended road traffic noise measurement spectrum 13 February 2019, 5:15 pm.*

It is expected that the façade will be constructed of double glazing consisting of 2 layers of 6 mm glass separated by a 12 mm air gap for thermal purposes. This is sufficient to meet the internal design sound levels presented in Section 3.3 for most areas of HCCD Stage 1A with the exception of highly noise sensitive spaces, such as studios and edit suites.

The majority of the sensitive spaces are intended to be located away from the facade with buffer zones separating these spaces from the façade. However, the Level 2 Studio is located on the façade. The Level 2 Studio façade glazing will be required to have a minimum transmission loss as provided in Table 21.

Table 21 Façade transmission losses

Location	Indicative Construction	Glazing Transmission Loss, dB						
		Octave Band Centre Frequency, Hz						
		63	125	250	500	1k	2k	4k
General	6 mm glass/12 mm air gap/6 mm glass	18	21	21	33	37	36	41
Level 2 Studio	6 mm glass / 12 mm air gap / 10.38 mm laminated glass	23	23	29	37	41	40	47

6.5 Newcastle light rail vibration impacts

The proposed HCCD Stage 1A development is located more than 50 metres from the Newcastle Light Rail line. The Newcastle Light Rail Environmental Impact Statement has provided predictions on vibration generated by the project. This document identifies that at distances greater than 25 metres vibration levels would be below 0.05 mm/s (RMS), a criterion used for critical working spaces. This vibration level would not generally be discernible and would be compliant for general use of the space.

It is understood that HCCD Stage 1A may include studios which may have more stringent vibration transmission and associated ground-borne noise requirements. This should be investigated further when more is understood about the proposed building structure and room layout during the detailed design phase of the project.

7.0 Construction Noise Impact Assessment

An indicative construction noise and vibration impact assessment has been completed for the HCCD. Whilst the HCCD Stage 1A is likely to be completed in multiple stages the assessment has considered a worst case scenario for the three most noise and vibration intensive stages.

7.1 Construction noise

This construction noise and vibration assessment is based on typical construction scenario for this type of development.

7.1.1 Construction phases and sources

The construction scenarios that have been assessed are detailed below:

1) Site establishment and enabling works
2) Foundations
3) Frame and facade.

The equipment and associated sound powers for the scenarios are shown in Table 22.

Table 22 Construction phases and equipment

Phase	Equipment / Activity	Percentage time on	'A' Weighted SWL dB(A)
Site establishment and enabling works	Large excavator	100	98
	Vibratory roller	100	103
	Backhoe	100	102
	Grader	100	109
	Water Cart	100	100
	Dump Truck	100	95
	Overall	**-**	**111**
Foundations	Crane	100	106
	Piling Rig	100	103
	Large excavator	100	98
	Pneumatic jackhammer	33	111
	Concrete truck	100	106
	Concrete pump	100	106
	Large truck	100	108
	Overall	**-**	**114**
Frame & facade	Concrete truck	100	106
	Concrete pump	100	106
	Crane	100	106
	General hand tools	100	94
	Large truck	100	108
	Overall	**-**	**113**

Construction is scheduled to be undertaken during recommended standard hours only. As such the impacts of construction activities on sleep disturbance do not need to be assessed. Sound power

levels were obtained from published datasets in AS2436:2010 “Guide to noise and vibration control on construction, demolition and maintenance sites”, the UK Department for Environmental, Food and Rural Affairs (DEFRA) and AECOM’s database.

7.1.2 Modelling and conditions

Modelling of the proposed construction scenarios has been performed using SoundPLAN 8.0. Neutral weather conditions were applied.

It can be expected that there may be differences between predicted and measured noise levels due to variations in instantaneous operating conditions, plant in operation during the measurement and also the location of the plant equipment. The acoustic shielding calculated in the model due to localised fixed building structures will also vary as the construction equipment moves around the site.

7.1.3 Results

Table 23 presents properties where the NMLs are exceeded. Construction noise contours are presented in Appendix C.

Table 23 NML Exceedances

Receiver		Noise Management Level, dB(A)	NML Exceedance
Site establishment and enabling works			
2-4 Honeysuckle Drive	Mixed Use[1]	60	1-5 dB(A)
14 Honeysuckle Drive	Mixed Use[1]	60	1-5 dB(A)
17 Honeysuckle Drive	Mixed Use[1]	60	>75 dB(A) Highly Affected
19A Honeysuckle Drive	Residential	60	6-15 dB(A)
10 Worth Place	Mixed Use[1]	60	>75 dB(A) Highly Affected
522 Hunter Street	Mixed Use[1]	60	4-7 dB(A)
510 Hunter Street	Mixed Use[1]	60	2-3 dB(A)
502 Hunter Street	Mixed Use[1]	60	1-2 dB(A)
Foundation			
17 Honeysuckle Drive	Mixed Use[1]	60	1-5 dB(A)
19A Honeysuckle Drive	Residential	60	1-5 dB(A)
10 Worth Place	Mixed Use[1]	60	6-15 dB(A)
Frame and Facade			
17 Honeysuckle Drive	Mixed Use[1]	60	1-5 dB(A)
19A Honeysuckle Drive	Residential	60	1-5 dB(A)
10 Worth Place	Mixed Use[1]	60	6-15 dB(A)

Notes:

1. Mixed use including residential

In general it can be seen that the construction phases and activities are expected to exceed the noise management levels at various times during the HCCD Stage 1A construction. Noise from the site establishment and enabling works phase is the most noise intensive due to the use of large plant and nature of the activities. Noise from construction activities are less noise intensive and will affect fewer locations. There are still, however, expected exceedances of NMLs at some locations.

It is expected that careful selection of well-maintained and quiet plant will result in some noise reduction. Provision of a site-perimeter noise barrier will have minimal effect on construction noise emission due to the relative height of the affected buildings.

The site establishment, excavation, substructure and frame phases are expected to exceed the highly noise affected level of 75 dB(A) at up to two residential properties. As such it is recommended that respite periods are considered for the affected community.

7.2 Construction vibration

Vibration-intensive works may include the use of the following items of equipment:

- Vibratory rollers
- Piling rigs
- Jackhammers.

The minimum working distances of these items of equipment to nearby receivers are shown in Table 24 which is based on recommendations of the TfNSW *Construction Noise Strategy* (CNS) and AECOM's previous project experience. If these minimum working distances are complied with no adverse impacts from vibration intensive works are likely in terms of human response or cosmetic damage. Based on the indicative construction activities assessed for the proposed development, works are unlikely to occur within the minimum working distances.

Table 24 Recommended minimum working distances for vibration intensive plant

Plant	Rating/Description	Minimum Working Distance	
		Cosmetic Damage	Human Response
Vibratory Roller	<300 kN (Typically 7-13 tonnes)	15 m	100 m
Piling Rig	≤800 mm	2 m nominal	4 m
Jackhammer	Handheld	1 m nominal	Avoid contact with structure

7.3 Construction traffic

The construction work would be undertaken in stages and would require a number of trucks, to deliver materials including concrete to the site. During early stages of construction workers may be able to park on site, during later stages they would park away from the site and either walk or use public transport to get to the site.

From the Newcastle Light Rail – Noise and vibration assessment technical paper dated 1 April 2016 the estimated daytime road traffic volume on Hunter Street is 11,664 vehicles in 2018. Given the high volumes of existing traffic on this road construction traffic would have a negligible impact, increasing road traffic noise levels by significantly less <1 dB(A). This complies with RNP requirements.

8.0 Construction Noise and Vibration Mitigation

Given that NMLs are likely to be exceeded, reasonable and feasible noise mitigation measures and work practices will need to be considered. Where receivers are predicted to be 'noise affected' the ICNG states that all feasible and reasonable works practices should be applied to meet the NMLs. It is recommended that a construction noise and vibration management plan (CNVMP) be prepared for each stage of HCCD Stage 1A.

Details of noise and vibration mitigation measures and management practices which should be considered for each CNVMP are detailed below.

The CNVMPs would include the following:

- Identification of nearby residences and other sensitive land uses.
- Description of approved hours of work.
- Description and identification of all construction activities, including work areas, equipment and duration.
- Description of what work practices (generic and specific) would be applied to minimise noise and vibration.
- A complaint handling process.
- Noise and vibration monitoring procedures.
- Overview of community consultation required for identified high impact works.

Noise and vibration mitigation measures which should be considered in the CNVMP are detailed below in Table 25. Details of an indicative monitoring program and complaints handling procedure are provided in Section 8.1 and 8.2.

Table 25 Recommended noise mitigation measures

Action required	Safeguard details
Management measures	
Implement community consultation measures	Periodic notification (monthly letterbox drop or equivalent), website, Project Infoline, Construction Response Line, email distribution list and community and stakeholder meetings.
Site inductions	All employees, contractors and subcontractors are to receive an environmental induction.
Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Monitoring	A noise monitoring program should be considered in accordance with the CNVMP. Further details are provided in Section 8.1.
Attended vibration measurements	Attended vibration measurements are recommended at the commencement of vibration generating activities to determine site specific minimum working distances. Vibration intensive work should not proceed within the minimum working distances unless a permanent vibration monitoring system is installed approximately a metre from the building footprint, to warn operators (via flashing light, audible alarm, SMS etc.) when vibration levels are approaching the peak particle velocity objective.
Building condition surveys	It is advisable to carry out building condition surveys of any sensitive historical structures before vibration intensive work begins close to minimum working distances.
Source controls	
Construction hours and scheduling	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods. Consideration should be given to avoiding examination periods.
Construction respite period	High noise and vibration generating activities (eg rock breaking) may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block.
Equipment selection and maintenance	Use quieter and less vibration emitting construction methods where feasible and reasonable. Equipment would be regularly inspected and maintained to ensure it is in good working order.
Maximum noise levels	The noise levels of plant and equipment must have operating sound power or sound pressure levels that would meet the predicted noise levels.
Rental plant and equipment	Noise emissions should be considered as part of the selection process.

Action required	Safeguard details
Use and siting of plant	Avoid simultaneous operation of noisy plant within discernible range of a sensitive receiver. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Plant and vehicles to be turned off when not in use. Noise-emitting plant to be directed away from sensitive receivers.
Plan works site and activities to minimise noise and vibration	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.
Non-tonal reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work.
Minimise disturbance arising from delivery of goods to construction sites	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.
Construction related traffic	Schedule and route vehicle movements away from sensitive receivers and during less sensitive times. Limit the speed of vehicles and avoid the use of engine compression brakes. Maximise on-site storage capacity to reduce the need for truck movements during sensitive times.
Silencers on Mobile Plant	Where possible reduce noise from mobile plant through additional fittings including: • Residential grade mufflers • Damped hammers such as “City” Model Rammer Hammers • Air parking brake engagement is silenced
Alternative methods	The use of less vibration-intensive methods of construction or equipment is preferred where practical to reduce the potential for cosmetic damage. All equipment should be maintained and operated in an efficient manner, in accordance with manufacturer’s specifications, to reduce the potential for adverse vibration impacts
Site specific minimum working distances	Attended vibration measurements are undertaken when work commences, to determine site-specific minimum working distances. Vibration intensive work should not proceed within the minimum working distances unless a permanent vibration monitoring system is installed around one metre from the building footprint, to warn operators (e.g. via flashing light, audible alarm, SMS) when vibration levels are approaching the peak particle velocity objective.

Action required	Safeguard details
Path controls	
Shield stationary noise sources such as pumps, compressors, fans etc.	Stationary noise sources should be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained.
Shield sensitive receivers from noisy activities	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

8.1 Construction monitoring

8.1.1 Monitoring and reporting

A monitoring program should be developed and include recommendations to complete attended measurements at the commencement of construction stages and in response to any complaints. The sections below outline items to be considered for inclusion in the program.

8.1.2 Monitoring procedure

The measurements should be conducted in accordance with the procedures outlined in Australian Standard AS 1055 *Acoustics – Description and measurement of environmental noise* and in accordance with methods outlined in the NSW Noise Policy for Industry (NPfI). The following points should be followed when conducting noise monitoring:

- a field calibration should be conducted before and after measurements
- the sound level meters must be set to an A-weighting and Fast
- the sound level meters sample period should be set to 15 minutes
- the following descriptors should be measured as a minimum: L_{A1}, L_{Aeq} and L_{A90}
- measurements should be conducted a minimum of 3 metres from the nearest façade and/or solid fence/wall. If it is not possible to do this, corrections for façade reflection should be applied to the measurement results.

8.1.3 Monitoring of equipment procedure

In addition to the residential noise monitoring procedures described above, the following equipment measurements should be undertaken:

- noise emission levels of all critical items of mobile plant and equipment should be checked for compliance with noise limits appropriate to those items prior to the equipment going into regular service
- for equipment and mobile plant used for construction works, L_{Aeq} measurements should be taken at an appropriate distance, normally 7m and converted to a Sound Power Level
- an Equipment Noise Certificate, presenting relevant sound levels of the equipment tested, should be issued within the first week of the equipment commencing at the construction site.

The equipment sound power levels should be compared to the levels contained in Section Table 17. If noise checks on any equipment result in a prediction of non-compliance, noise mitigation strategies to achieve compliance should be developed.

8.1.4 Equipment

All acoustic instrumentation employed throughout the monitoring programme should comply with the requirements of AS IEC 61672.1-2004 Electroacoustics - Sound level meters – Specifications. All sound level meters must have current calibration certificate from a NATA accredited laboratory in

accordance with NATA guidelines. Instrument calibration should be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dB.

8.1.5 Monitoring & reporting schedule

8.1.5.1 Construction monitoring schedule

Table 26 below provides an indicative monitoring schedule for construction.

Table 26 Construction noise monitoring schedule

Schedule Day	Action
During first month of construction	Complete one round of operator-attended 15 minute noise monitoring on separate days at site boundaries and closest residences
	Carry out equipment noise level checks on all critical items of plant and issue Equipment Noise Certificates
During subsequent months of construction period	Carry out equipment noise level checks on any new (untested) items of critical plant and issue Equipment Noise Certificates

8.1.6 Reporting

8.1.6.1 Reporting details

The following information should be included in the quarterly reports:

- Field calibration results (before and after measurements)
- Measurement times and dates
- Qualitative description of the noise environment during the measurements
- L_{A1}, L_{Aeq} and L_{A90} levels
- Meteorological conditions during the measurements
- Estimation of or recorded noise contribution from other major noise sources.

8.1.6.2 Record keeping

A system of records which provides full documentation of all noise monitoring results, complaint handling and responses to non-compliances should be established and maintained.

8.1.7 Roles and Responsibilities

Roles and responsibilities for the implementation of the CNVMP should be clearly stated within the CNVMP.

8.2 Complaints handling procedure

A complaint handling procedure should be developed and documented within each CNVMP. The following section outlines items to be considered for inclusion in the procedure.

If complaints are received, an Environmental Incident Report Form should be completed to record details of the occurrence and actions taken. Where applicable, completed forms should detail the following:

- the date and time of the complaint
- the method by which the complaint was made
- any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect
- the nature of the complaint

- description of noise source that is the subject of complaint, duration of event
- location of complainant during time of incident, and general area in which the noise source was located
- identification of project related noise activities and locations that could have or are known to have contributed to the incident
- if known, identification of non-project related noise emission activities and location at time of incident
- meteorological conditions at the time of the incident
- the action taken in relation to the complaint
- any follow-up contact with the complainant
- if no action was taken, the reason why no action was taken.

All records are to be kept in a legible form, or in a form that can readily be reduced to a legible form and kept for at least 4 years after the complaint or event to which they relate took place.

The Site Environmental Officer will make available a report on complaints received to the relevant Government Agencies upon request. A summary will be included in the annual environmental report.

A response should be provided to the complainant within 24 hours. Corrective actions may involve supplementary monitoring to identify any non-compliances, and/or may involve modification of construction or operational techniques to avoid any recurrence or minimise impacts.

9.0 Conclusion

This report presents the results of a Noise and Vibration Impact Assessment of the proposed HCCD Stage 1A development located at 16B Honeysuckle Drive, Newcastle.

Operational noise emission from the development has been assessed with consideration to the project noise trigger levels established in accordance with the NSW NPfI and measured noise levels at the development site. The impact of noise emission from new developments can be widespread when noise issues are not correctly considered, however, this assessment indicates that standard amelioration strategies will sufficiently treat noise emission to meet the project noise trigger levels and, as such, will minimise possible acoustic impacts on neighbouring areas.

Noise and vibration intrusion to the development form road and light rail traffic has been assessed and complies with the criteria established in accordance with AVATG, AS/NZS 2107:2016 and *Development Near Rail Corridors and Busy Roads – Interim Guideline.*

Traffic generation as a result of the proposed development is minimal and predicted traffic noise increases will comply with the applicable criteria outlined in the NSW Road Noise Policy.

Construction noise has been assessed in accordance with the EPA's Interim Construction Noise Guideline. Worst case construction scenarios have been considered. Construction works will be undertaken during standard hours. The level and number of exceedances of the construction noise management levels are provided in Section 7.1.3. It should be noted that the exceedances presented are the highest at each receiver during the HCCD Stage 1A construction phase.

Based upon this assessment documented above, all environmental noise and vibration impacts can be appropriate managed in accordance with the relevant guidelines and standards.

Appendix A

Glossary of Acoustic Terminology

Appendix A Glossary of Acoustic Terminology

The following is a brief description of acoustic terminology used in this report.

Sound power level	The total sound emitted by a source.
Sound pressure level	The amount of sound at a specified point.
Decibel [dB]	The measurement unit of sound.
A Weighted decibels [dB(A)]	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:

0dB(A)	Threshold of human hearing
30dB(A)	A quiet country park
40dB(A)	Whisper in a library
50dB(A)	Open office space
70dB(A)	Inside a car on a freeway
80dB(A)	Outboard motor
90dB(A)	Heavy truck pass-by
100dB(A)	Jackhammer/Subway train
110 dB(A)	Rock Concert
115dB(A)	Limit of sound permitted in industry
120dB(A)	747 take off at 250 metres

Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.
Equivalent continuous sound level [L_{eq}]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
L_{max}	The maximum sound pressure level measured over the measurement period.
L_{min}	The minimum sound pressure level measured over the measurement period.
L_{10}	The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the L_{10}.

L_{90}	The sound pressure level exceeded for 90% of the measurement period. For 90% of the measurement period it was louder than the L_{90}.
Ambient noise	The all-encompassing noise at a point composed of sound from all sources near and far.
Background noise	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The L_{90} sound pressure level is used to quantify background noise.
Traffic noise	The total noise resulting from road traffic. The L_{eq} sound pressure level is used to quantify traffic noise.
Day	The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays.
Evening	The period from 1800 to 2200 h Monday to Sunday and Public Holidays.
Night	The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays.
Assessment background level [ABL]	The overall background level for each day, evening and night period for **each day** of the noise monitoring.
Rating background level [RBL]	The overall background level for each day, evening and night period for the **entire length** of noise monitoring.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 *"Acoustics – Glossary of terms and related symbols"*, the EPA's NSW Noise Policy for Industry and Road Noise Policy.

Appendix B

Graphical Noise Monitoring Results

Logger 1 - 08/05/18 - 17/05/18

Logger Setup

Logger Type: Rion NL21

Serial No : 265112

Address: 16 Honeysuckle Drive , Newcastle

Location: Site

Facade / Free Field: Free Field

Environment: Noise environment dominated by road traffic noise with construction noise from light rail also contributing. Logger is located within light rail construction compound.

Logger Setup Photo

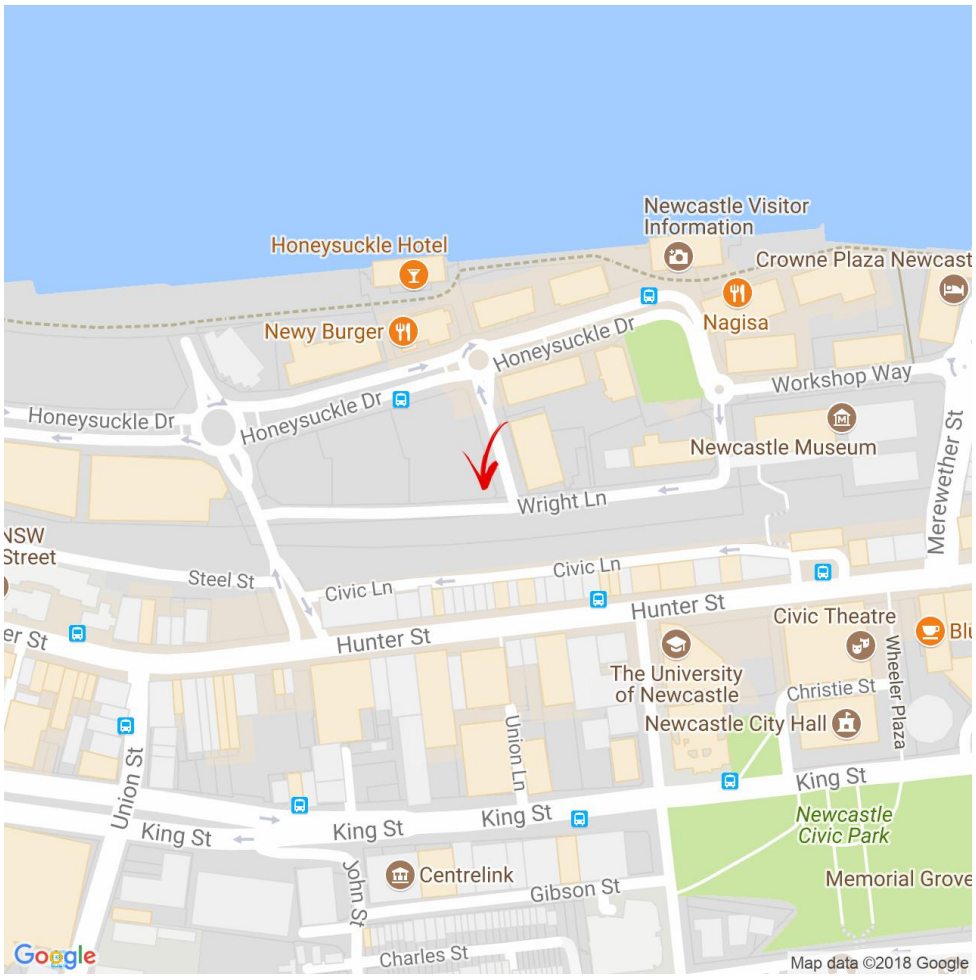
INP Noise Level, dB(A)

	Log Average	RBL
Day	65	50
Evening	56	46
Night	56	44

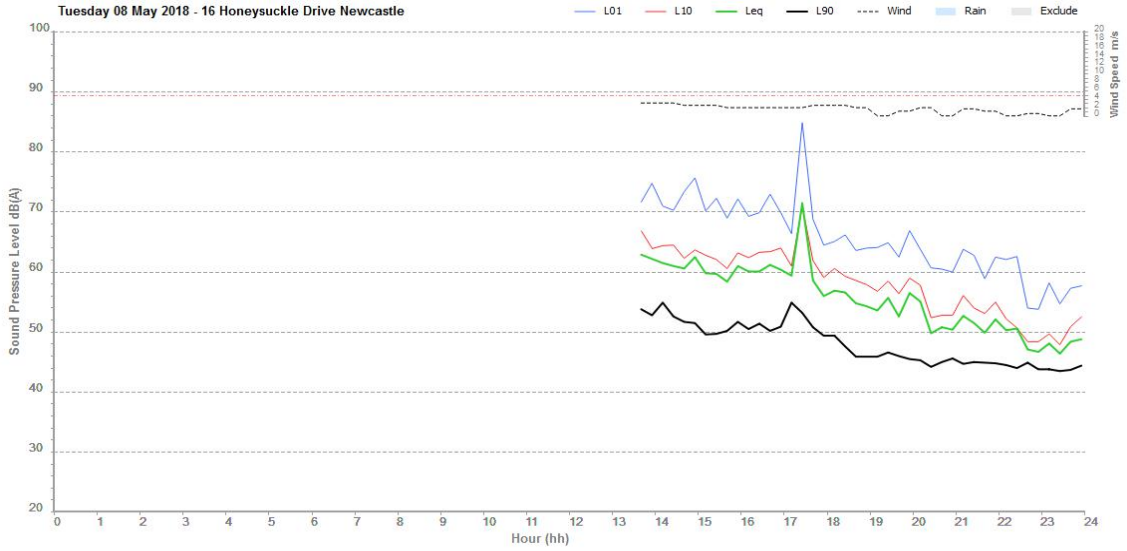
RNP Noise Level, dB(A)

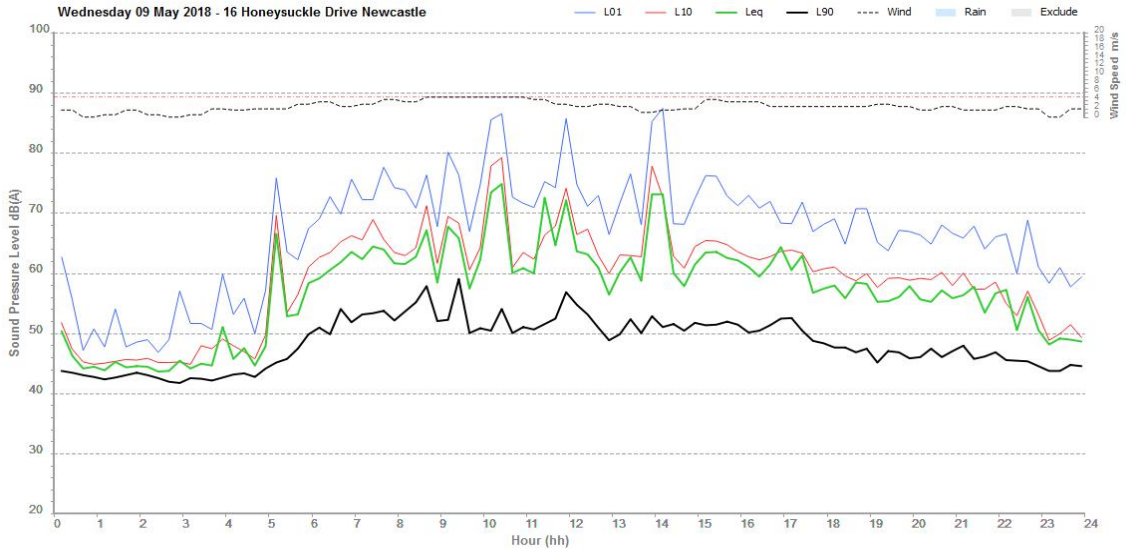
	$L_{Aeq(1hr)}$	$L_{Aeq(period)}$
Day (7am - 10 pm)	-	-
Night (10pm - 7am)	-	-

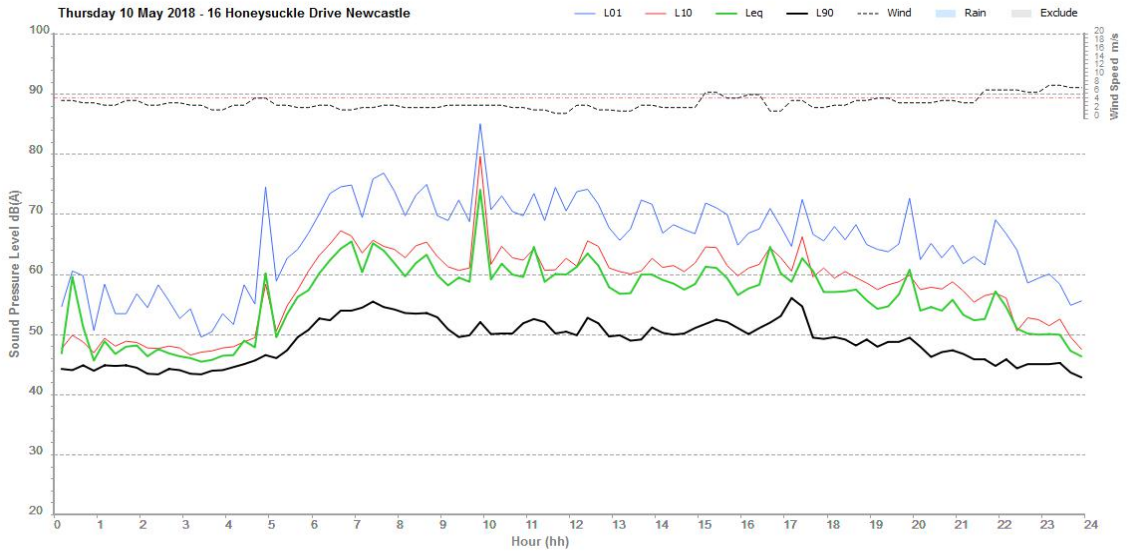
Logger Location Map



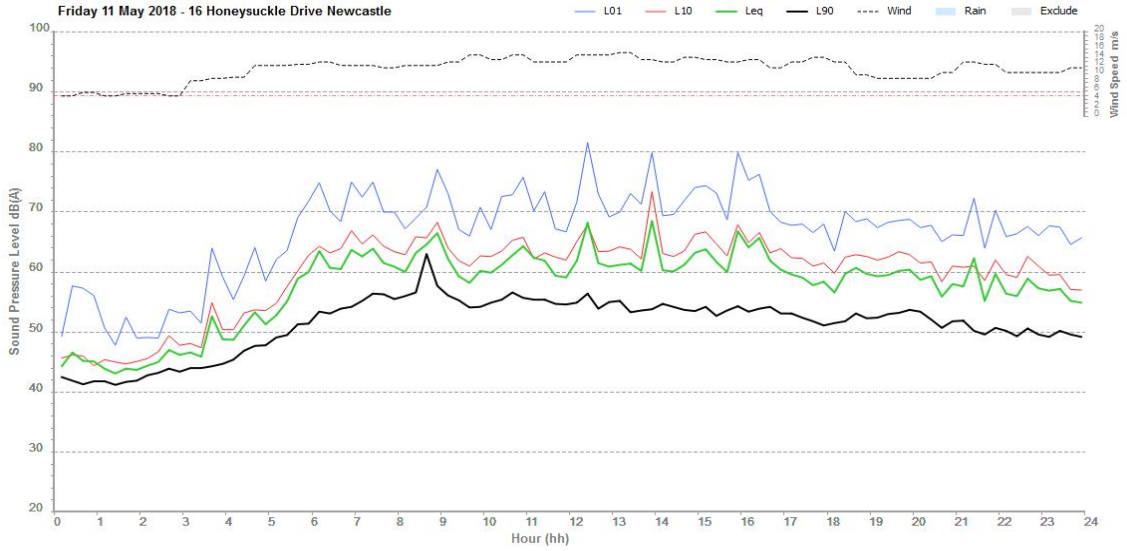
Logger Graphs

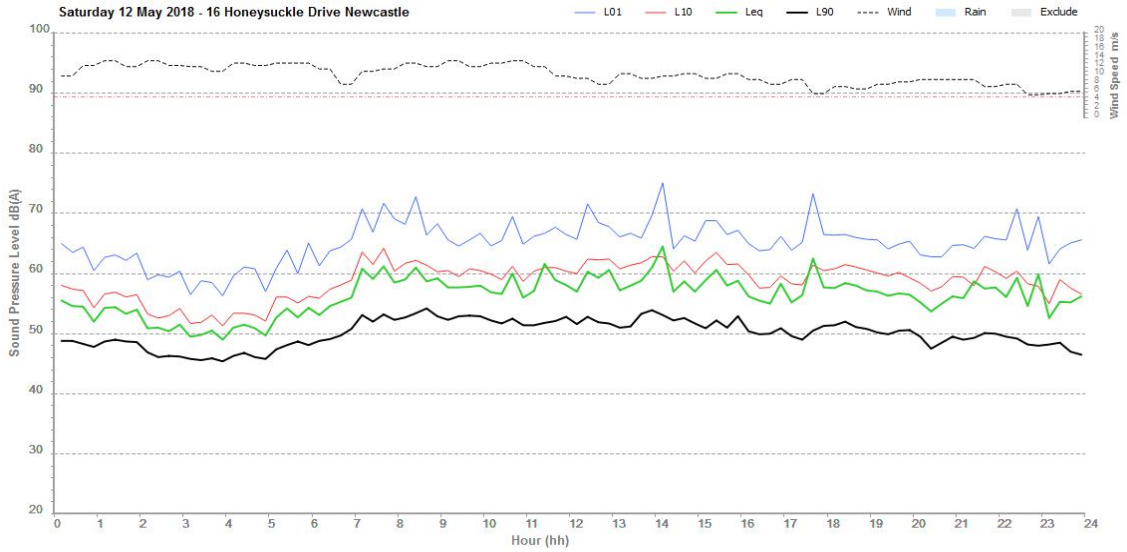


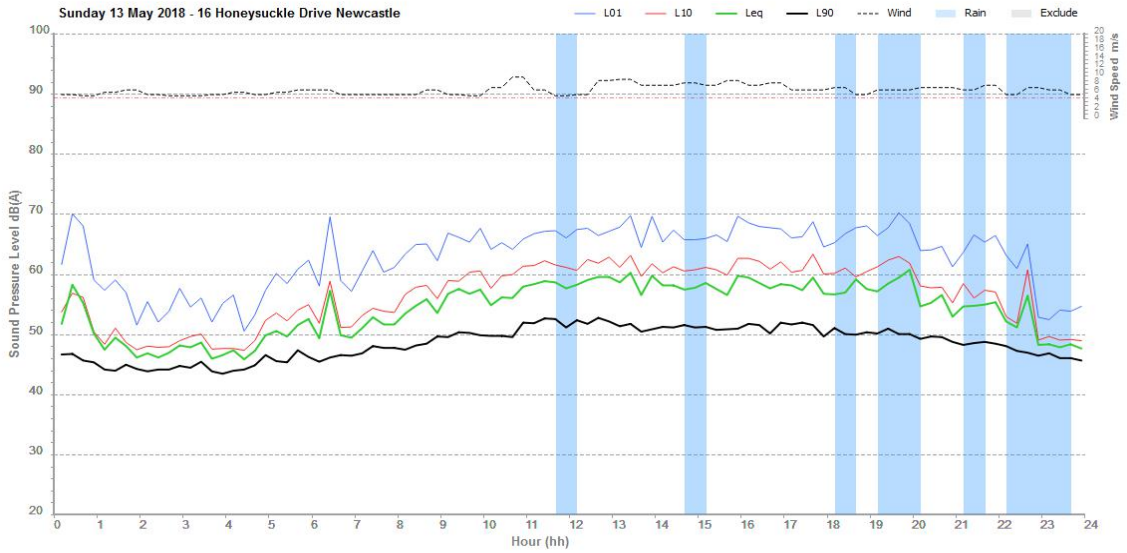




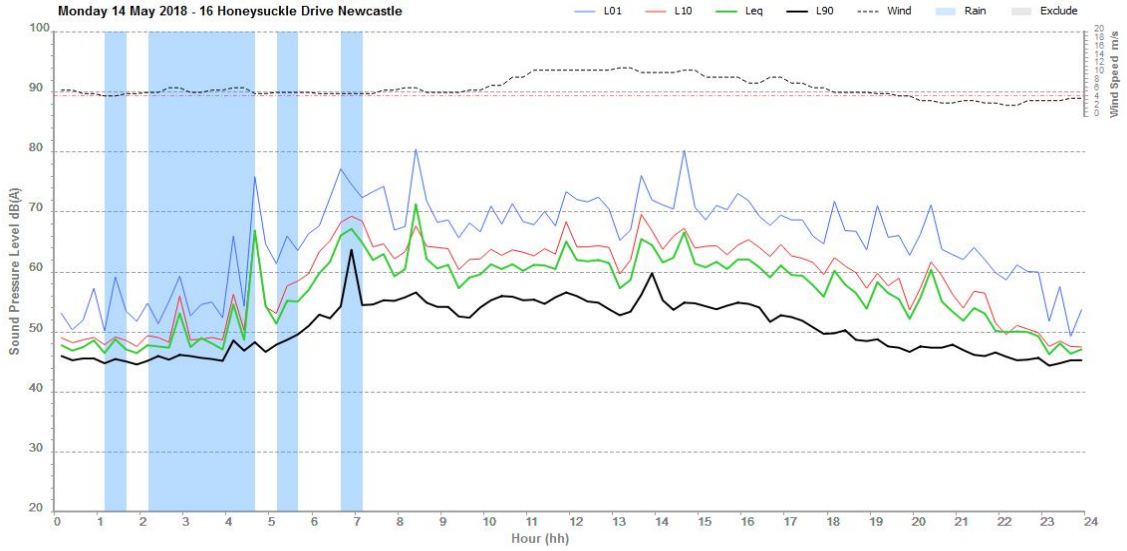
Logger Graphs

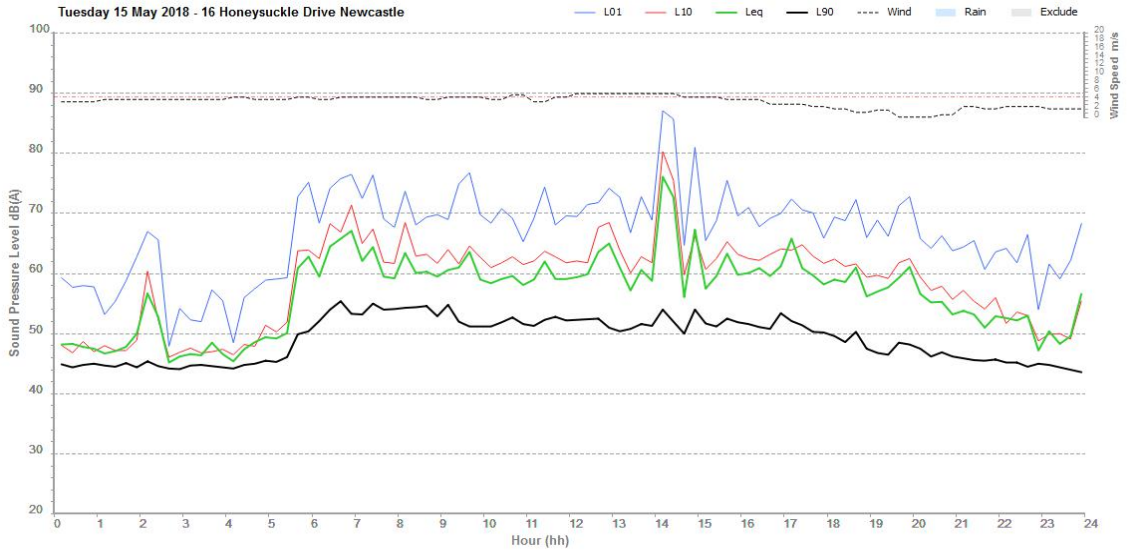


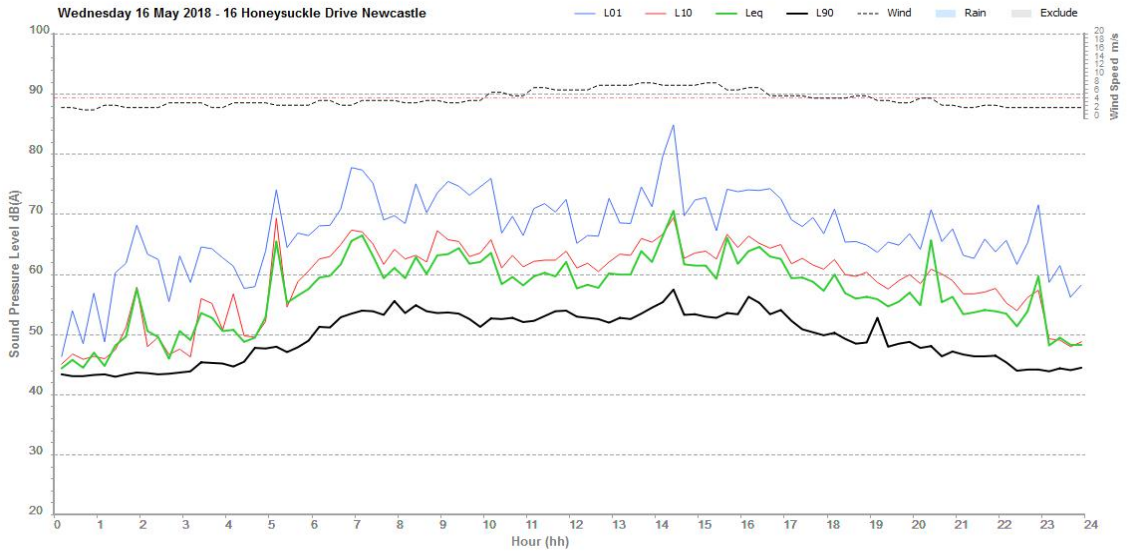




Logger Graphs







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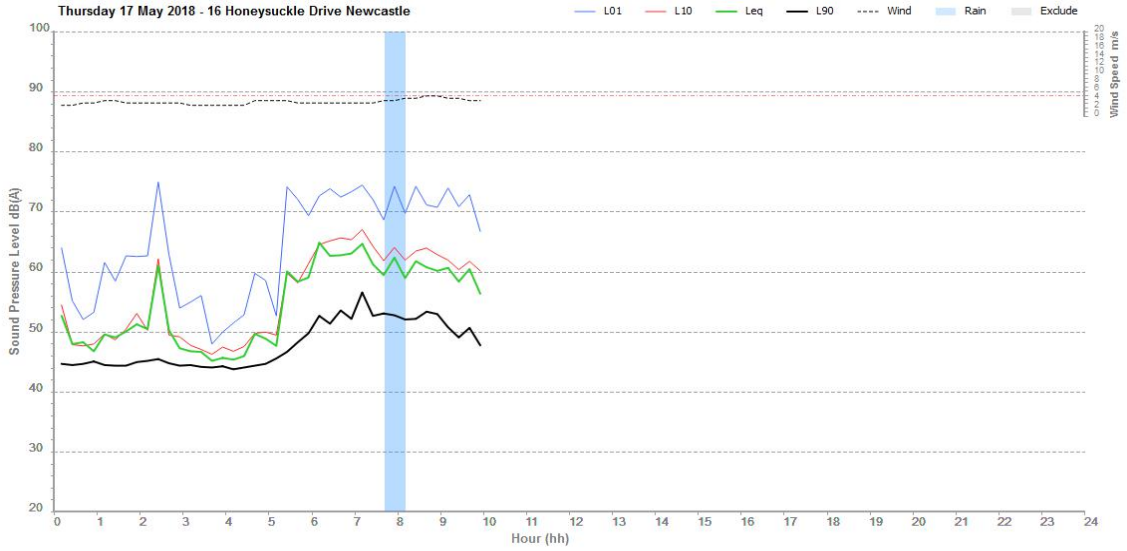


Logger 2 - 08/05/18 - 17/05/18

Logger Setup

Logger Type: Rion NL21

Serial No : 765701

Address: 558 Hunter Street , Newcastle West

Location: Front Yard

Facade / Free Field: Free Field

Environment: Noise environment dominated by road traffic noise with construction noise from light rail also contributing. Noise from construction includes sawing 58 dB(A)

Logger Setup Photo

INP Noise Level, dB(A)

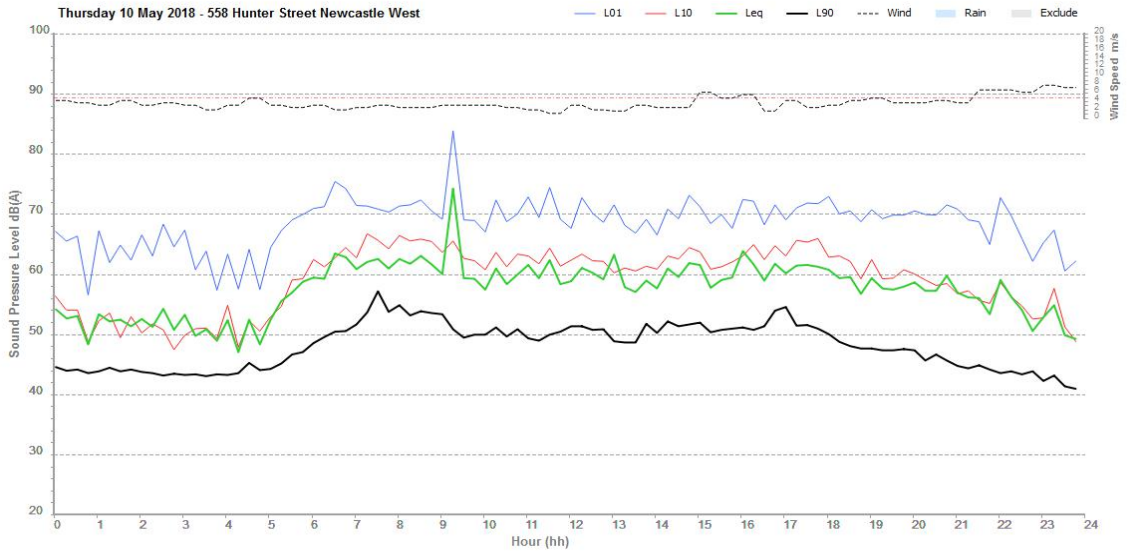
	Log Average	RBL
Day	63	50
Evening	58	45
Night	56	43

RNP Noise Level, dB(A)

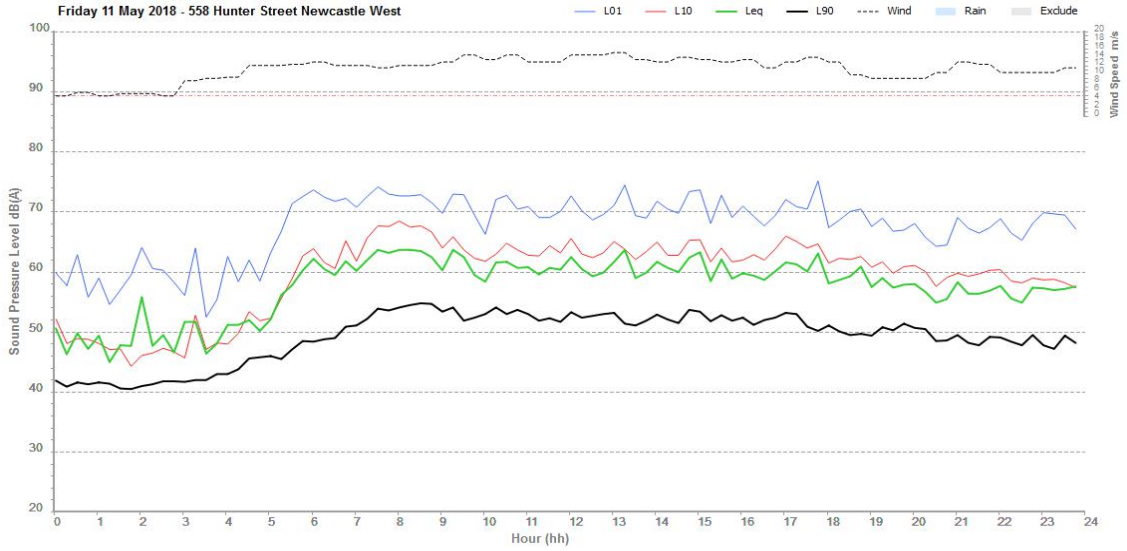
	$L_{Aeq(1hr)}$	$L_{Aeq(period)}$
Day (7am - 10 pm)	-	-
Night (10pm - 7am)	-	-

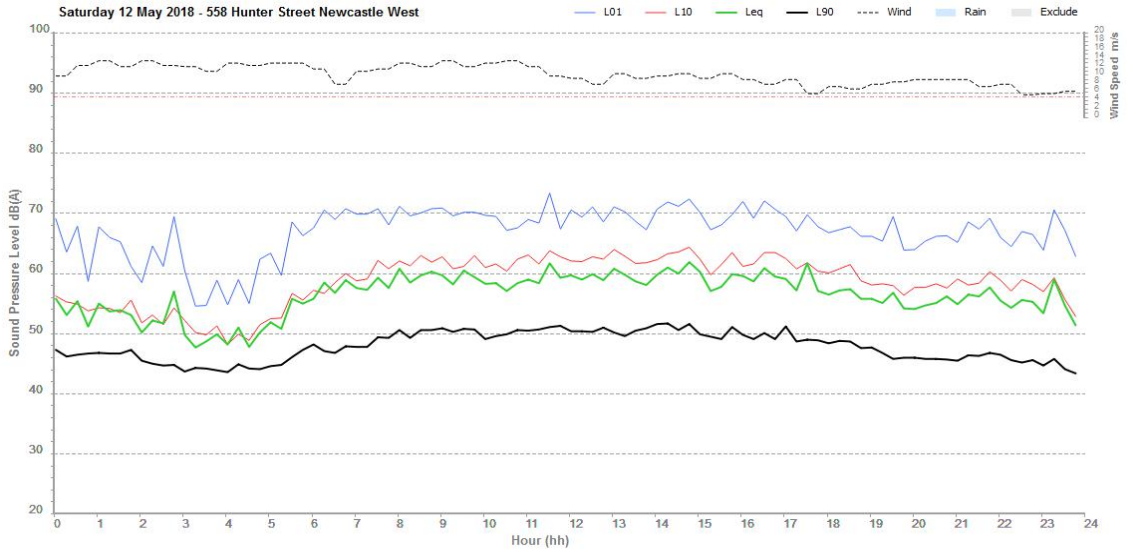
Logger Location Map

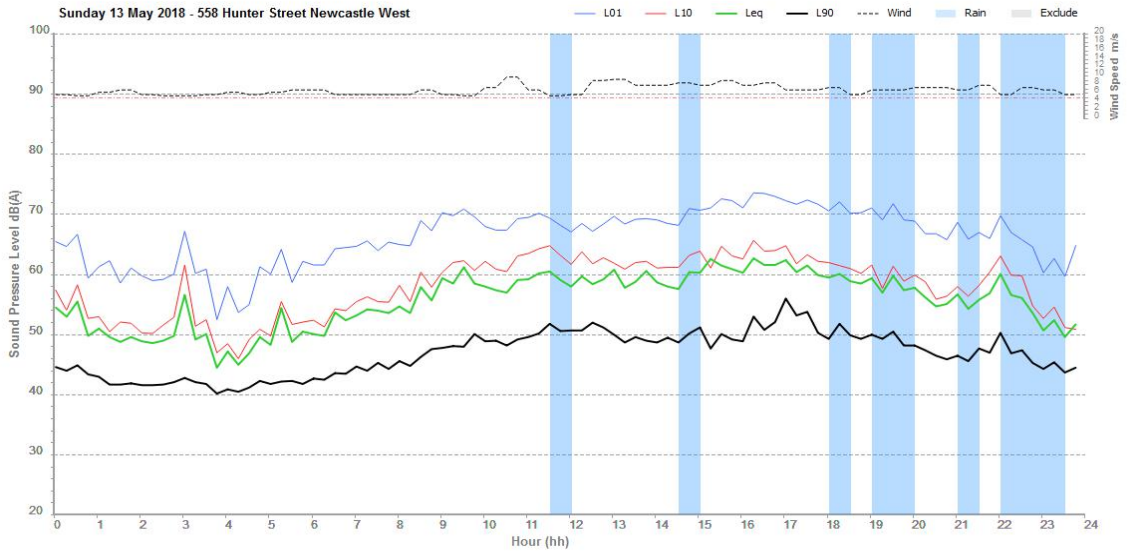
Logger Graphs



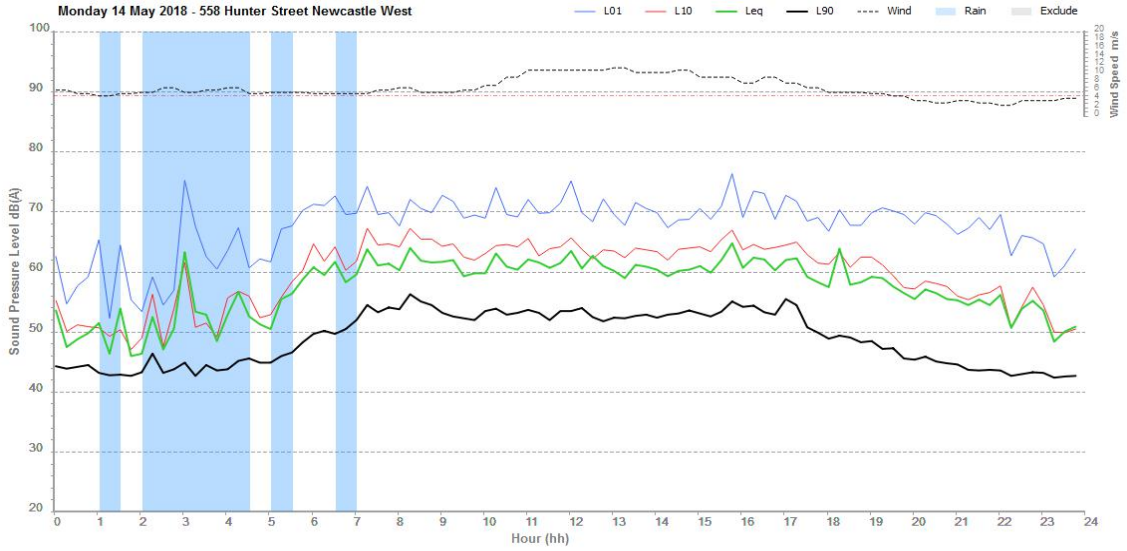
Logger Graphs

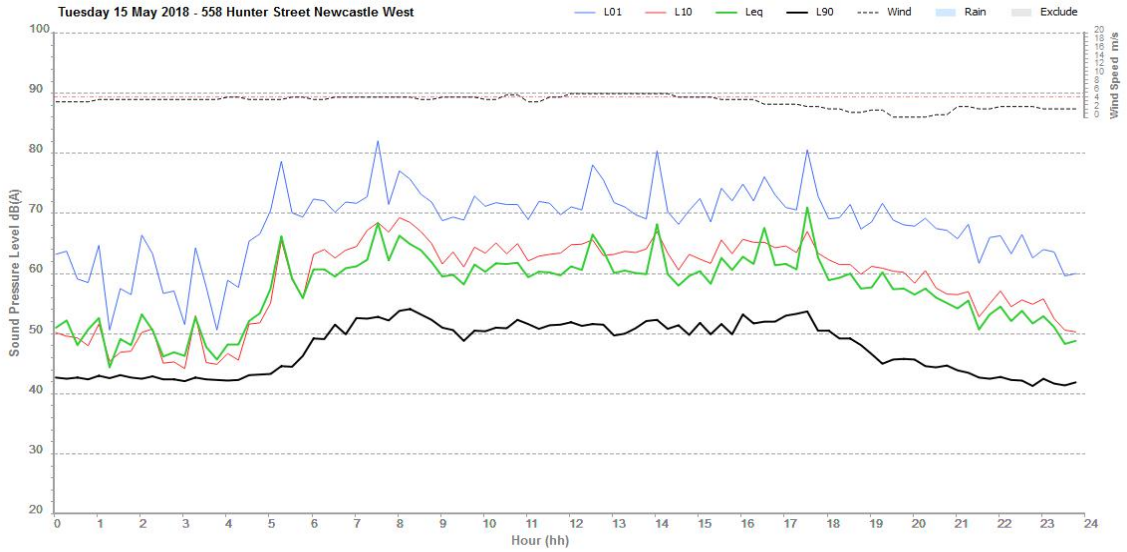






Logger Graphs





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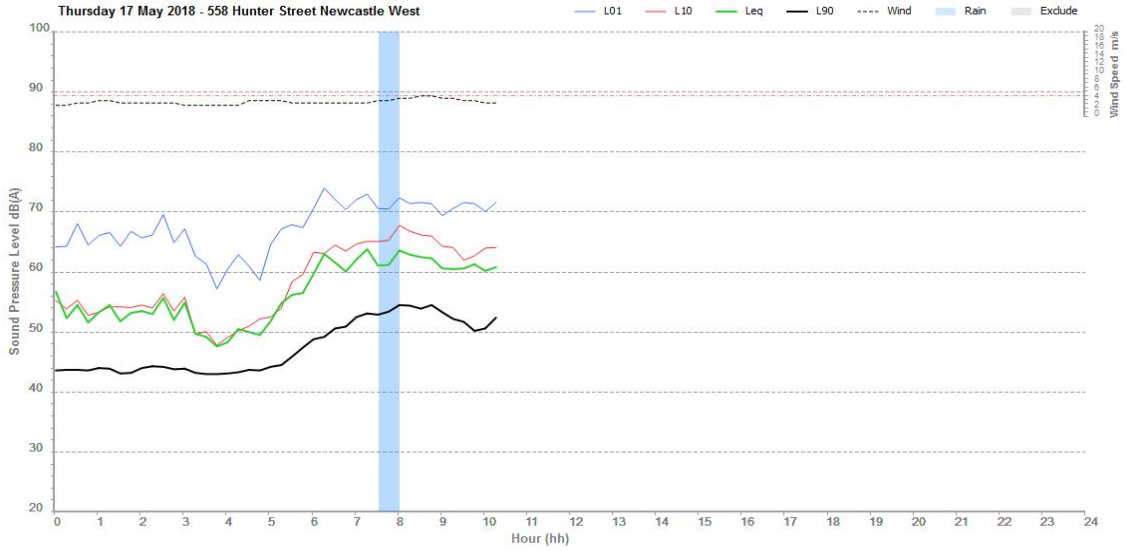
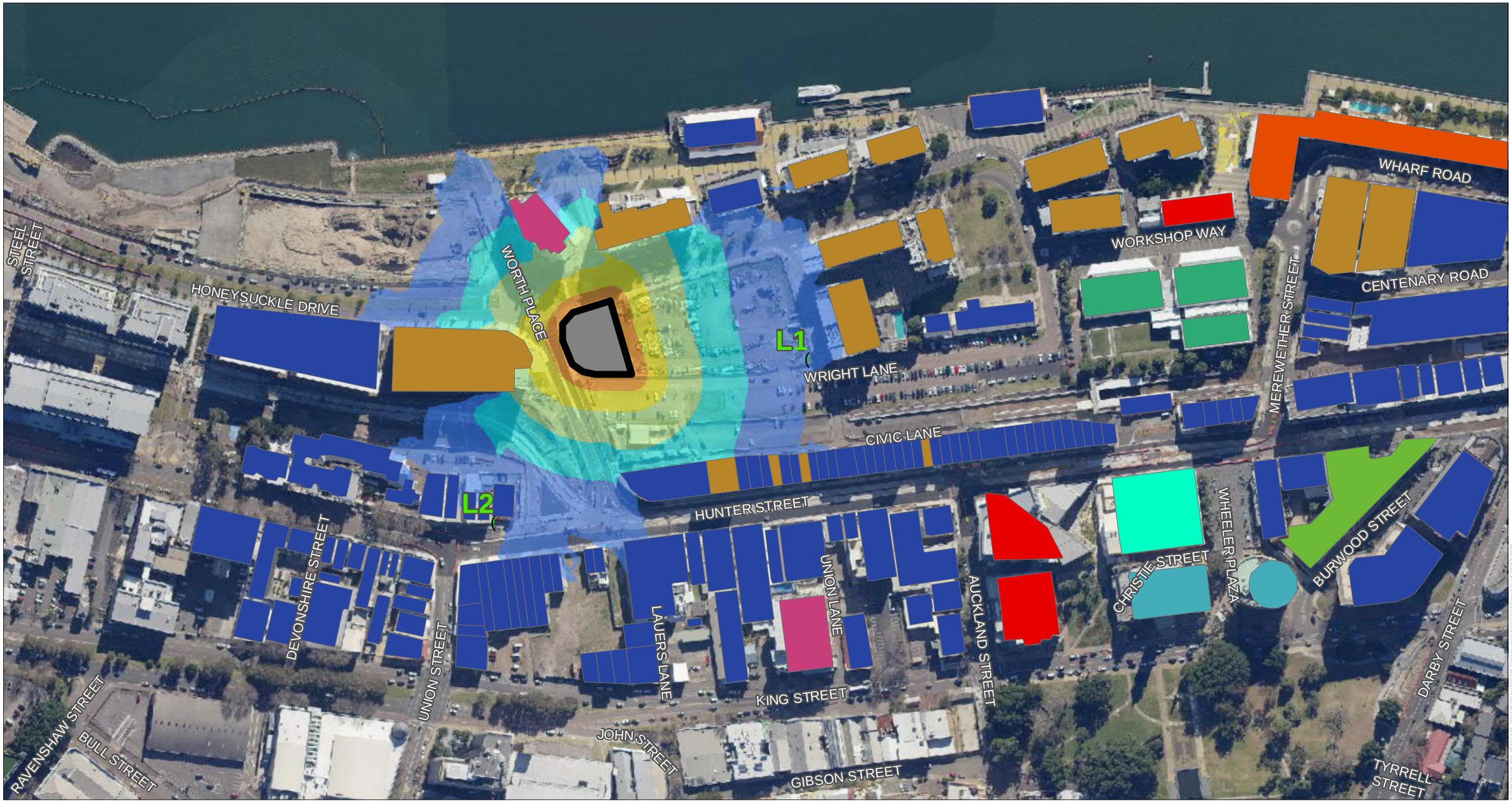


Appendix C

Construction Noise Contours



- Commercial
- Court
- Education
- Government
- Hotel
- Mixed Use
- Museum
- Residential
- Theatre
- HCCD Stage 1A
- Loggers

Sound Pressure Level, dB(A)

< 60 | 60 - 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | > 85

Honeysuckle City Campus Development - Stage 1A

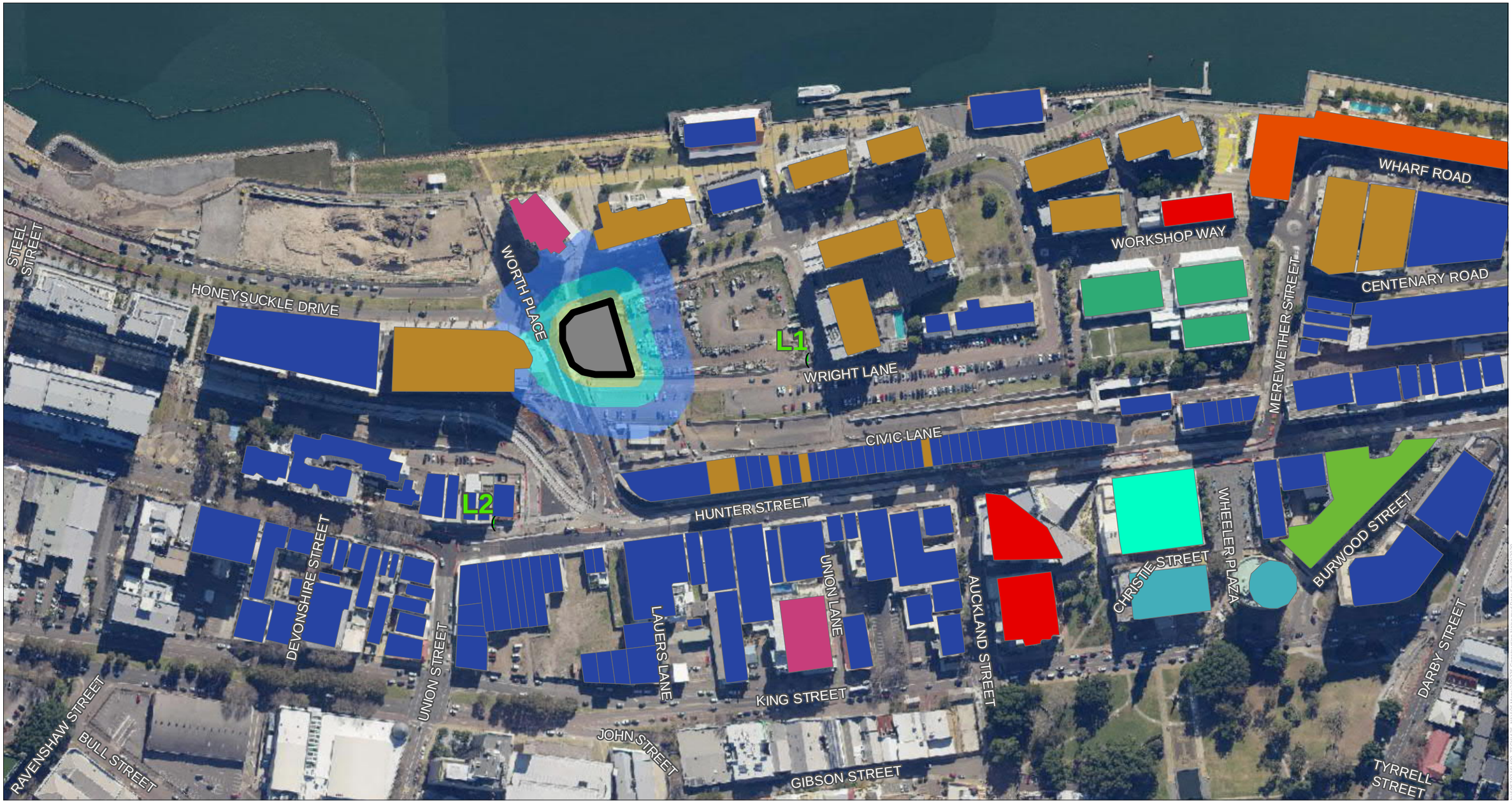
Site Establishment and Enabling Works

AECOM

N

0 0.04 0.08 km

Source:



Commercial
Court
Education
Government
Hotel
Mixed Use
Museum
Residential
Theatre

HCCD Stage 1A
Loggers

Sound Pressure Level, dB(A)

< 60 | 60 - 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | > 85

Honeysuckle City Campus Development - Stage 1A

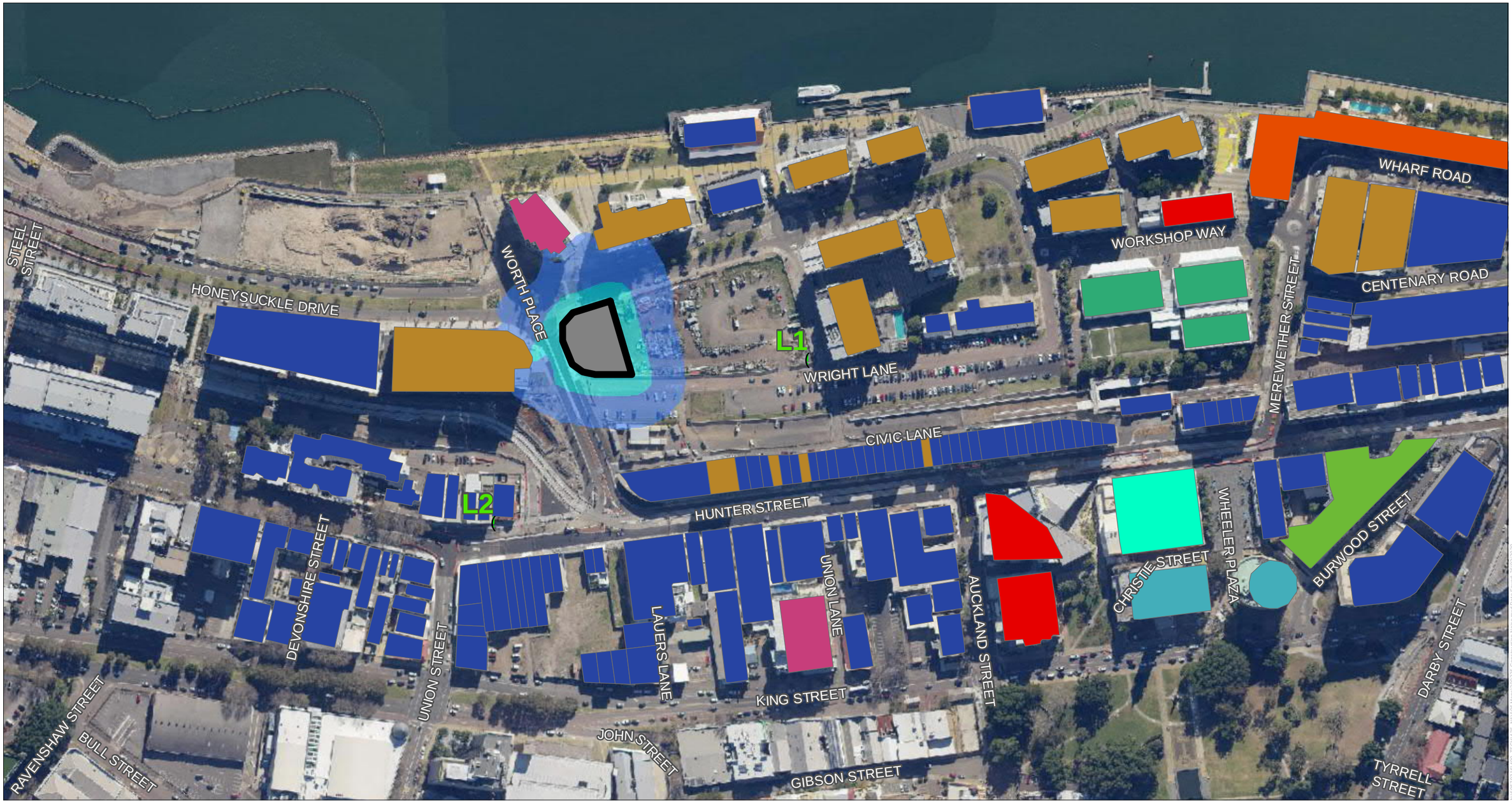
Foundations

AECOM

N

0 0.04 0.08 km

Source:



Commercial
Court
Education
Government
Hotel
Mixed Use
Museum
Residential
Theatre

HCCD Stage 1A
Loggers

Sound Pressure Level, dB(A)

< 60 | 60 - 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | > 85

Honeysuckle City Campus Development - Stage 1A

Frame and Facade

AECOM

N

0 0.04 0.08 km

Source: